DILLON CONSULTING

SHINING HILL ESTATE COLLECTION, INC.

Shining Hill Estates, Phase 3, Towns of Newmarket and Aurora

Transportation Mobility Plan

October 2019 — 19-1250

Table of Contents

Figures

Tables

Appendices

1.0 Introduction

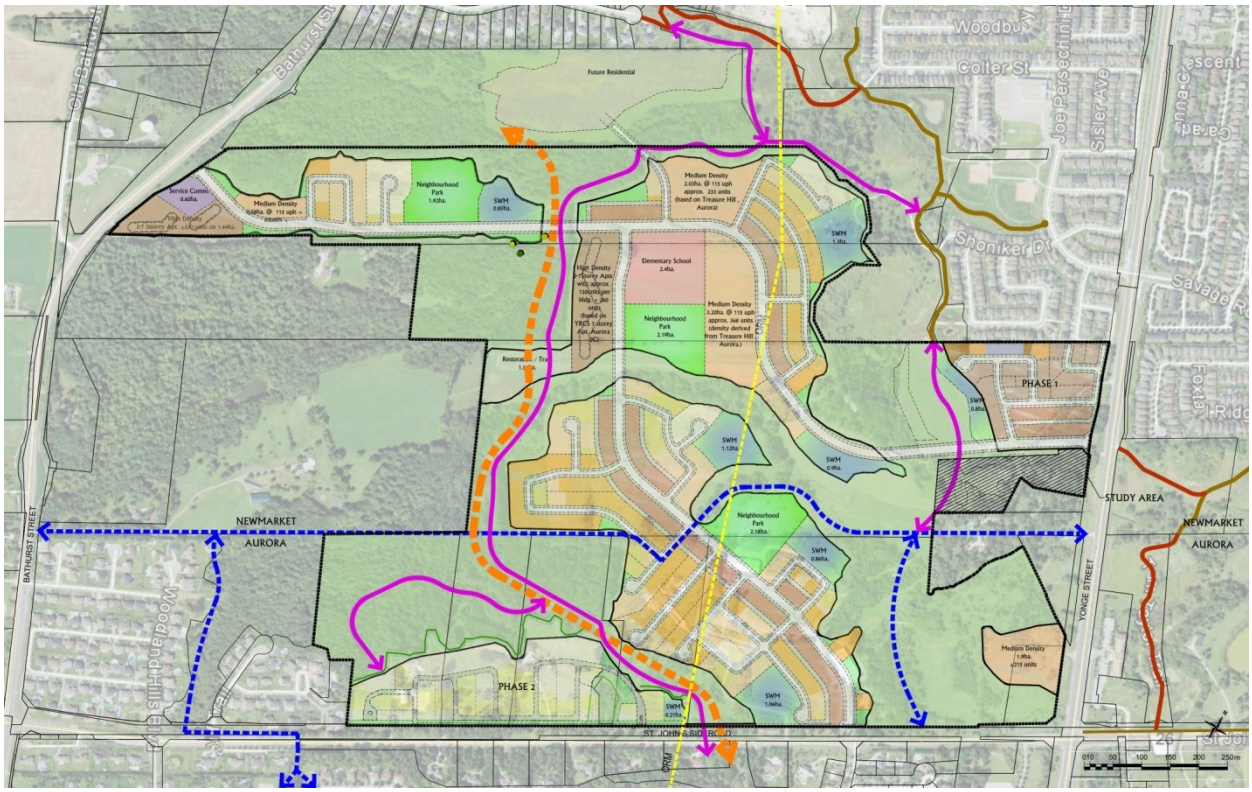
1.1 Purpose

Dillon Consulting Limited ("Dillon") has been retained by Shining Hill Estates Collection Inc. to prepare a Transportation Mobility Plan (TMP) for Phase 3 of the proposed Shining Hill Estates development in the Towns of Newmarket and Aurora. Development applications have previously been submitted for the first two phases of the subject lands on Yonge Street in Newmarket and on St. John's Sideroad in Aurora. The focus is now shifting to obtaining Official Plan amendments for the remaining Phase 3, which would form much of the remaining undeveloped lands between Bathurst Street and Yonge Street, from St. John's Sideroad approximately 1.4 km northerly. A preliminary concept plan has been prepared by Malone Given Parsons Ltd. (MGP) that envisions approximately 3,500 residential units, a service commercial block, a school, and an open space / natural heritage system including a potential trail network. Access is proposed to Bathurst Street, St. John's Sideroad and Yonge Street (via Street "A", now known as Bennington Road, being constructed for Phase 1). The concept plan is illustrated in ***Figure 1*** and is also provided in ***Appendix A***.

It is anticipated that Phase 3 will be built out incrementally over a number of years, with full built-out not occurring for 15 to 20 years. Given the long-term nature of development and the preliminary nature of the concept plan prepared by MGP, this study is intended to form an initial overall assessment of anticipated transportation conditions, constraints and opportunities that would then inform any future iterations or modifications of the concept plan. This study documents the following:

- Anticipated traffic volumes under future background conditions and under total future conditions (i.e., with development of the site);
- Analyses of intersection operations under future background conditions and total future conditions, and identification of potential operational constraints;
- Potential measures to mitigate operational constraints;
- Opportunities to provide service to the Phase 3 lands and to improve the attractiveness of transit service;
- Measures to improve conditions for pedestrian and cyclist trips; and
- Strategies for management of traffic within the subdivision.

Figure 1: Development Concept Plan



1.2 Development Concept

The proposed concept plan is presented in ***Figure 1*** and in ***Appendix A***. The concept plan is predominantly residential, and envisions approximately 3,500 residential units in a variety of types:

- 400 single-family residential units;
- 900 townhouse units; and
- 2,200 apartment units.

The majority of development (approximately 2,600 units, or 74% of the total units in Phase 3) is proposed in the Newmarket portion of the subject lands. The remaining 900 units would be in Aurora (200 units in the main part of the development; 700 units in a separate block along Yonge Street).

The concept plan also includes a small 0.6-hectare service commercial block at the west end of the site, and an elementary school in the central area of the subject lands.

The majority of development would be accessed via two collector roads extending through the subject lands:

- An ***east-west collector (Bennington Road)*** is proposed to extend between Bathurst Street and Yonge Street. The 150-metre section extending westerly from Yonge Street is Bennington Road (formerly Street "A") being constructed for Phase 1 of the subject development, with a stop-controlled right-in/

right-out (RI/RO) intersection at Yonge Street. Phase 3 would see Bennington Road extended westerly to Bathurst Street, and would see the Yonge Street intersection converted to a full-movement signalized intersection.

- A ***north-south collector*** would extend southerly from Bennington Road, intersecting with St. John's Sideroad opposite Willow Farm Lane.

A conceptual network of off-street trails has been proposed that would provide active transportation routes within the site and would link to other existing trails to the north and east.

1.3 Scope of Analyses

It is anticipated that Phase 3 will be built out incrementally over a number of years, with full built-out not occurring for 15 to 20 years. A 20-year horizon of 2039 has been assumed. No interim development phases have been assessed; subdivision of the concept plan into sub-phases of development is still to be determined, and any interim development phases would be the subject of separate applications.

Traffic forecasts and analyses have been undertaken for the weekday AM and PM peak hours. Traffic analyses have focused on the intersections of the four nearest arterial roads that surround the site (Yonge Street, Bathurst Street, Mulock Drive and St. John's Sideroad), since the four intersections where those roadways meet experience the highest volumes, greatest amount of competition for capacity and green time, and the greatest level of congestion. They also are the intersections (other than the site access points) where site traffic would be likely to contribute the most to lower-capacity left turn movements (as opposed to other intersections in the study area where site traffic would primarily contribute to through traffic). The traffic analyses also consider the site's primary access points to the arterial road network.

The comparative depth and focus of the analyses and recommendations for each mode reflect the different needs of each mode given the context of the study area.

- For automobile travel, the primary consideration in the study area is the capacity of the road network and its ability to accommodate additional traffic due to background growth and site development, and the delays associated with existing and future volumes.
- For other modes (transit; walking; cycling), existing levels of usage are lower, and the primary considerations are the quality of service and infrastructure, and whether they are amenable to attracting increased use by non-auto travelers. The assessment and recommendations focus on measures to accommodate and improve conditions for transit riders, pedestrians and cyclists traveling to, from and within the site.

2.0 Existing Conditions

2.1 Existing Road Network

The road network in the study area is affected by two features:

- The original concession road network resulting in east-west and north-south arterials at relatively consistent 2-kilometre spacing; and
- The historic town centres and surrounding older residential areas of Newmarket and Aurora, located near Main Street and Water Street, and near Yonge Street and Wellington Street, respectively.

North-south travel in the study area is via Yonge Street and Bathurst Street. More broadly, Bayview Avenue is also available as the next concession road east of Yonge Street. In the study area, both Bathurst Street and Yonge Street are arterial roads with four-lane cross-sections; Bathurst Street has a 70 km/h speed limit, while Yonge Street has a 60 km/h speed limit. However, while Bathurst Street has relatively consistent characteristics through Newmarket and Aurora, Yonge Street has varying characteristics and functions, serving as a suburban arterial with a primary traffic movement function through Newmarket and northern Aurora but a historic main street function within central Aurora. In a similar fashion, Bayview Avenue is a predominantly suburban arterial with a primary traffic movement function through Aurora and southern York Region, but in central Newmarket it becomes Prospect Street, a two-lane primary collector road through an older residential area east of the town centre. As such, while all three streets serve north-south travel through York Region, Bathurst Street is the only north-south arterial offering a continuous high-capacity route through both towns.

Yonge Street is also currently in transition, with investments in transit service and infrastructure that are intended to change the characteristics of the street to a more urban context that supports transit and active transportation rather than focusing on traffic movement.

East-west travel in the study area is via Mulock Drive (19th Sideroad west of Bathurst Street) and St. John's Sideroad (18th Sideroad west of Bathurst Street). Both are arterial roads under the jurisdiction of York Region. Mulock Drive has a four-lane urban cross-section between Bathurst Street and Highway 404 and a posted speed limit of 60 km/h. St. John's Sideroad has a four-lane urban cross-section through the eastern part of Aurora (east of Yonge Street), but a two-lane rural cross-section west of Yonge Street. It has a 60 km/h posted speed limit, except for the section between Yonge Street and Industrial Parkway, which is posted at 50 km/h. West of Bathurst Street, both roads are rural two-lane concession roads with 60 km/h speed limits, although 18th Sideroad is a Regional road with a predominantly straight alignment whereas 19th Sideroad is a town road and has winding sections with reduced speed limits.]

The local and collector road network in the developed areas surrounding the subject lands are characterized by a hierarchical and curvilinear street network that is typical for a suburban environment. The primary street of relevance to the subject development is Willow Farm Lane, a collector road that

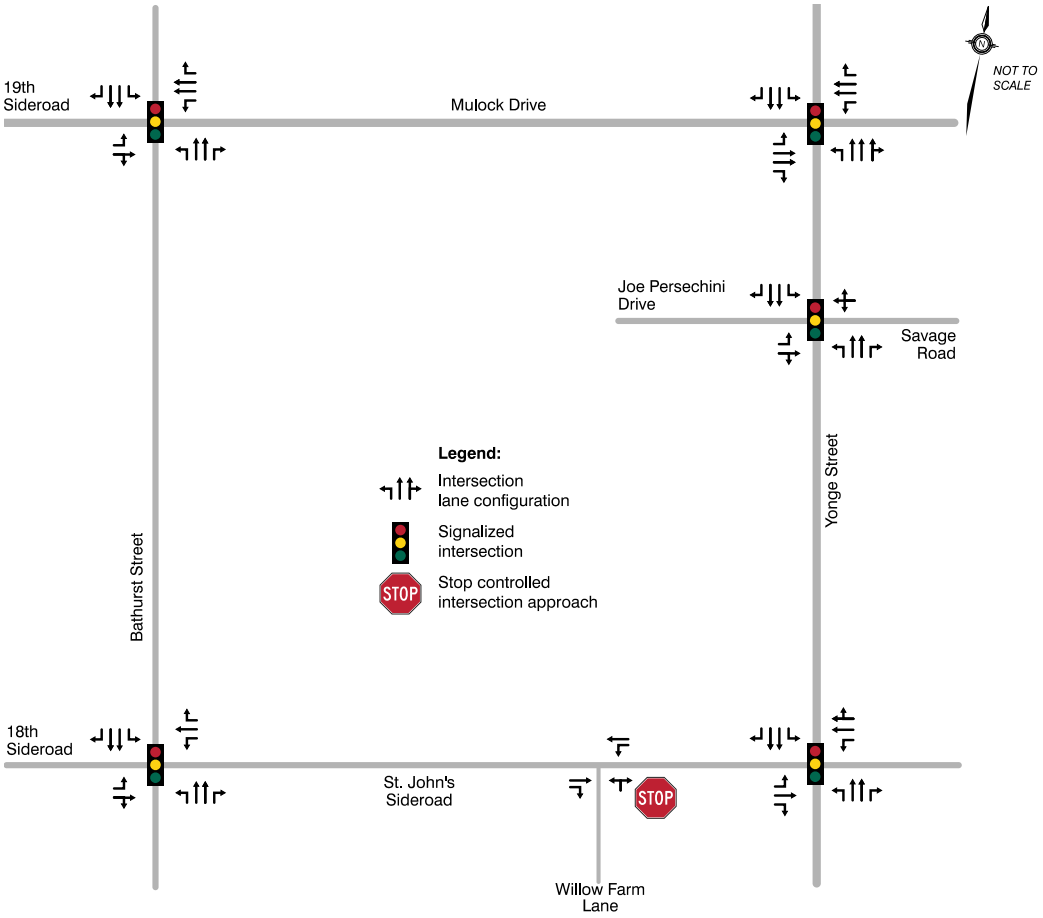
begins at St. John's Sideroad roughly 450 metres west of Yonge Street and then curves westerly and continues through the residential subdivision south of St. John's Sideroad. It has a two-lane cross-section and a posted speed limit of 40 km/h. It intersects with St. John's Sideroad at a two-way stop controlled intersection. While it is not anticipated to be used by site traffic, it is relevant in that the north-south collector that is proposed to provide site access from the south would intersect with St. John's Sideroad opposite Willow Farm Lane.

Northern York Region is served by two north-south 400-series provincial highways:

- ***Highway 400*** is roughly 7 km west of Bathurst Street. Access from the study area is via 18th Sideroad / Lloydtown-Aurora Road (the westerly continuation of St. John's Sideroad). 19th Sideroad (the westerly continuation of Mulock Drive) and Kettleby Road also provide a route to Highway 400; however, this route is signed for local traffic only due to geometric constraints (curvature and cross-section), the loose surface section west of Dufferin Street, and to reduce traffic impacts on the village of Kettleby.
- ***Highway 404*** is roughly 5 km east of Yonge Street. Access from the study area is either via Mulock Drive or via Wellington Street (2 km south of St. John's Sideroad). St. John's Sideroad crosses Highway 404 but does not currently interchange with it.

Figure 2 illustrates the existing traffic control and lane configuration at the primary intersections within the study area.

Figure 2: Existing Lane Configuration and Traffic Controls



2.2 Existing Active Transportation Infrastructure

Much of the surrounding area is rural or has been developed with limited development at very low densities, and the on-street active transportation infrastructure is limited.

- Yonge Street:
  - North of Joe Persechini Drive, sidewalks exist on both sides of the road.
  - South of Joe Persechini Drive, a sidewalk extends 350 metres southerly on the east side of the street to the entrance to the Nokiidaa Trail. A sidewalk will also be built on the west side through this section (to the future Bennington Road) as part of the development of Phase 1.
  - Between Bennington Road and St. John's Sideroad, no sidewalks exist other than a 150-metre section on the east side between St. John's Sideroad and the Hadley Grange driveway. There are paved shoulders that could be used by cyclists, although they are not signed or marked as cycling facilities.
  - South of St. John's Sideroad, a sidewalk exists on the west side of the road.
- Bathurst Street:
  - No sidewalks or bicycle facilities exist within the study area.
- St. John's Sideroad:
  - No sidewalks or bicycle facilities west of Yonge Street, other than a sidewalk on the south side of the bridge over Tannery Creek, immediately west of Yonge Street.
  - East of Yonge Street, a sidewalk exists on the south side of the road, and a sidewalk and bicycle path exist on the north side of the street.

All signalized intersections in the study area have crosswalks and pedestrian signals.

Beyond the study area, there is an extensive network of off-street bicycle paths and trails in the subdivisions to the north, south and east.

2.3 Existing Transit Network

2.3.1 York Region Transit (YRT)/VIVA

Local transit service in the study area is provided by York Region Transit (YRT). ***Figure 3*** illustrates the bus routes operating within the study area.

Three different routes operate along Yonge Street through the study area:

- ***VIVA Blue*** is a limited-stop bus rapid transit (BRT) route that operates along Yonge Street between Davis Drive in Newmarket and Finch subway station in Toronto. It generally operates with frequent service and with limited, dedicated stops. Dedicated median lanes ("rapidways") are currently under construction along portions of the route in Newmarket and Richmond Hill, including through part of the study area (through the intersection with Mulock Drive). The only stop within the vicinity of the subject lands is at Joe Persechini Drive.
- The VIVA BRT service is supplemented by local service on two routes following Yonge Street through Newmarket and Aurora: ***98 Yonge*** and ***96 Keele-Yonge***. Both of these routes operate less frequently but stop at additional locations not served by VIVA. In the vicinity of the site, this includes the stops on Yonge Street at St. John's Sideroad. 98 Yonge operates 7 days per week along Yonge Street between Green Line and Finch subway station. 96 Yonge-Keele operates weekdays only; it also follows Yonge Street through Newmarket and Aurora but then turns westerly to Keele Street, which it follows to York University.

Two other routes operate within the study area but are of limited service to the subject site:

- ***31 Aurora North*** operates in a clockwise loop predominantly through the northwest part of Aurora, with a stop at Yonge Street and St. John's Sideroad. It operates during weekday peak periods only.
- ***57 Mulock*** operates along Mulock Drive through the intersection with Yonge Street en route between the Newmarket GO Bus Terminal and the 404 Town Centre near Davis Drive and Highway 404. While this route travels through the study area, it does not stop within walking distance of the subject site.

Table 1 lists the operating hours and scheduled headway (interval between buses) on each of the routes listed above. To provide additional context related to typical transit service conditions in northern York Region, and recognizing the network effect of transit service, the operating periods and headways are also listed for other routes operating in Newmarket and Aurora. Most routes operate at infrequent headways of 30 minutes or greater, and service is limited on Sundays. Most routes also operate at irregular headways (e.g., 41 minutes) that result in buses arriving at different times each hour, rather than clockface headways that allow for consistent schedules from one hour to the next (e.g., at 17 and 47 minutes past each hour). Conversely, there are several routes in Newmarket that have common headways to allow for coordinated arrivals and connections at the Newmarket GO Bus terminal.

Figure 3: YRT/VIVA Network in Study Area

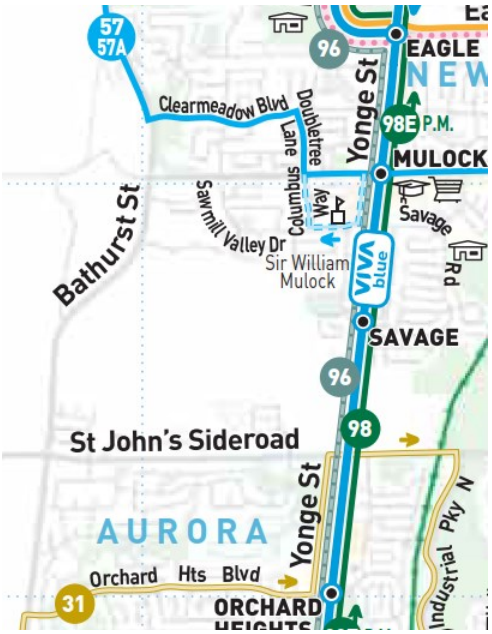


Table 1: Existing Transit Headways

Route	Scheduled headway *(minutes)*														
	Weekday					Saturday					Sunday				
	AM	Mid	PM	Eve.	Late	Early	Morn.	Aft.	Eve.	Late	Early	Morn.	Aft.	Eve.	Late
Routes within the study area:															
VIVA Blue	7.5	9	7.5	7.5	18	16	9	9	9	19	—	10.5	10.5	10.5	22
98 Yonge	37	52	39	39	36	39	39	50	42	47	40	40	45	44	47
96 Keele-Yonge	32	32	25	27	32	—	—	—	—	—	—	—	—	—	—
57 Mulock	47	—	41	41	—	—	—	—	—	—	—	—	—	—	—
57A Mulock	35	60	35	35	60	—	60	60	60	60	—	60	60	60	60
31 Aurora North	35	—	35	—	—	—	—	—	—	—	—	—	—	—	—
Other routes in Newmarket:															
VIVA Yellow	15	15	15	15	20	18	18	18	18	36	18	18	18	18	36
44 Bristol	35	60	35	—	—	—	60	60	60	—	—	—	—	—	—
50 Queensway	33	33	33	33	43	54	54	54	54	54	81	81	81	81	81
52 Holland Landing	35	60	35	—	—	—	60	60	60	—	—	—	—	—	—
54 Bayview	30	75	30	70	65	—	57	57	62	57	—	—	—	—	—
55/55B Davis Drive	35	45	35	35	45	42	42	42	42	42	42	42	42	42	42
56 Gorham-Eagle	35	60	35	—	—	—	60	60	60	—	—	60	60	60	—
58 Mount Albert	83	—	83	—	—	—	—	—	—	—	—	—	—	—	—
Other routes in Aurora:															
32 Aurora South	30	60	29	—	—	—	—	—	—	—	—	—	—	—	—
33 Wellington	53	73	53	53	—	66	66	66	66	—	—	—	—	—	—
33A Wellington	30	71	30	30	—	66	66	66	66	—	—	—	—	—	—
222 Aurora-Newmarket GO Shuttle	30*	—	30*	—	—	—	—	—	—	—	—	—	—	—	—

**AM peak hour: southbound only; PM peak hour: northbound only*

2.3.2 GO Transit

Commuter rail service to Toronto is provided via the Barrie GO line. The closest GO station to the subject site is the Aurora GO station, approximately 2 km south of St. John's Sideroad. The station is located on the south side of Wellington Street, 625 metres east of Yonge Street. It has a parking supply of 1,382 spaces (including 847 spaces in a parking garage), as well as a kiss-and-ride lot.

Trains operate about every 15 to 30 minutes toward Toronto during the AM peak period, hourly during the morning and early afternoon, and hourly during the early evening. On the return trip from Toronto, trains operate hourly during the midday and early evening, and about every half hour during the PM peak period. There is also hourly train service in both directions on weekends. At times when trains are not operating, service is provided by GO buses that stop at the Aurora GO station.

2.4 Existing Traffic Volumes

Turning movement counts were undertaken on Wednesday, July 31, 2019 at the following intersections:

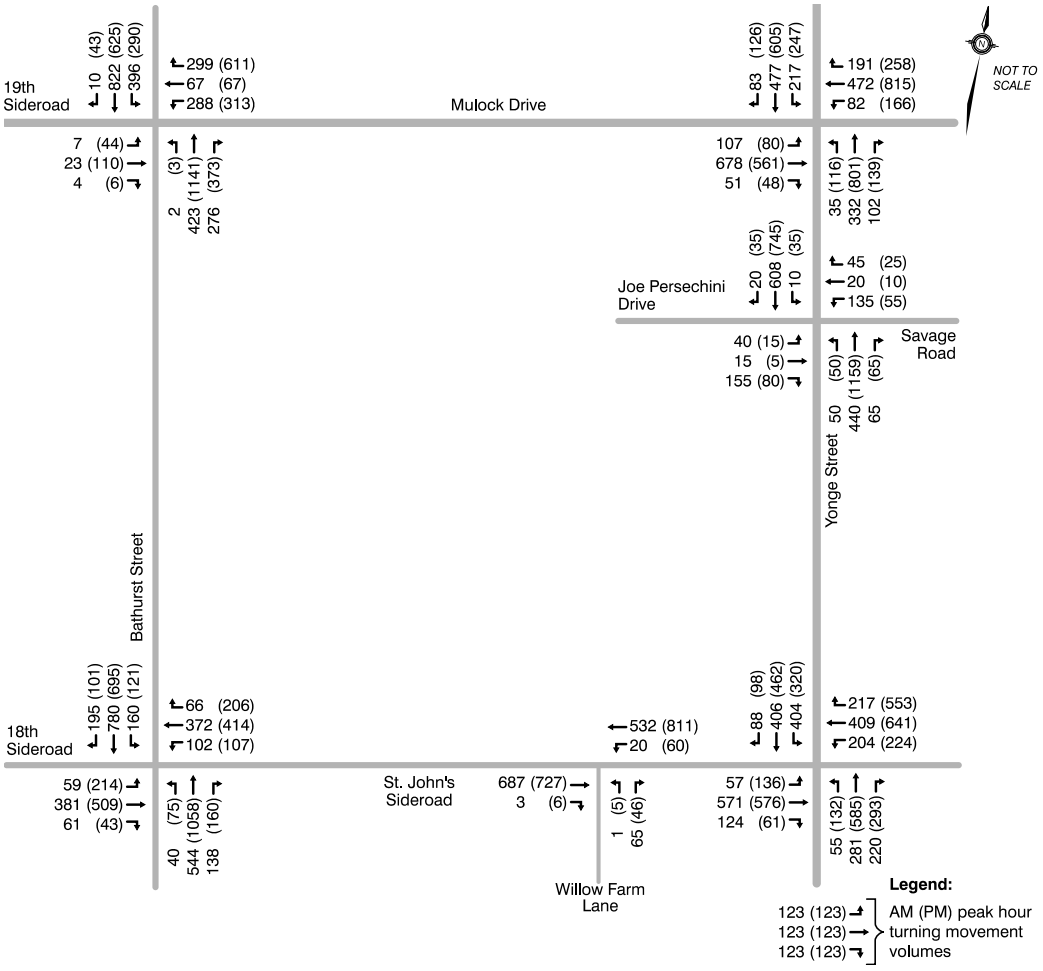
- Bathurst Street and Mulock Drive;
- Yonge Street and Mulock Drive;
- Bathurst Street and St. John's Sideroad;
- Willow Farm Lane and St. John's Sideroad; and
- Yonge Street and St. John's Sideroad.

The surveys were undertaken for Dillon by Horizon Data Services Limited (HDSL) and were conducted from 7:00–9:00 AM and from 4:00–6:00 PM. The detailed count data are provided in ***Appendix B***.

In addition to the turning movement counts listed above, traffic counts undertaken in 2016 at Yonge Street and Joe Persechini Drive / Savage Road as part of the Phase 1 application were carried forward for this assessment (movements to and from minor legs only; north/south through volumes were balanced with approaching and departing volumes at St. John's Sideroad).

Figure 4 illustrates the peak hour traffic volumes surveyed at each intersection.

Figure 4: Existing Traffic Volumes (Surveyed)



The traffic volumes at the St. John's Sideroad intersections with Bathurst Street and with Yonge Street were compared against historical turning movement count data collected by Dillon in December 2015 and May / June 2017 as part of the applications for Phases 1 and 2. It was observed that the July 2019 data were understated on Bathurst Street and Yonge Street, and to a lesser extent on St. John's Sideroad, during the AM peak hour. Volumes on Yonge Street also appeared to be understated during the PM peak hour. It is possible that the 2019 volumes were understated due to the different months when the counts were undertaken (July vs. December, May and June); it is also possible that the traffic volume on Yonge Street reflects upstream constraints due to construction that was being undertaken for the Yonge North VIVA rapidway. The counts were adjusted as follows:

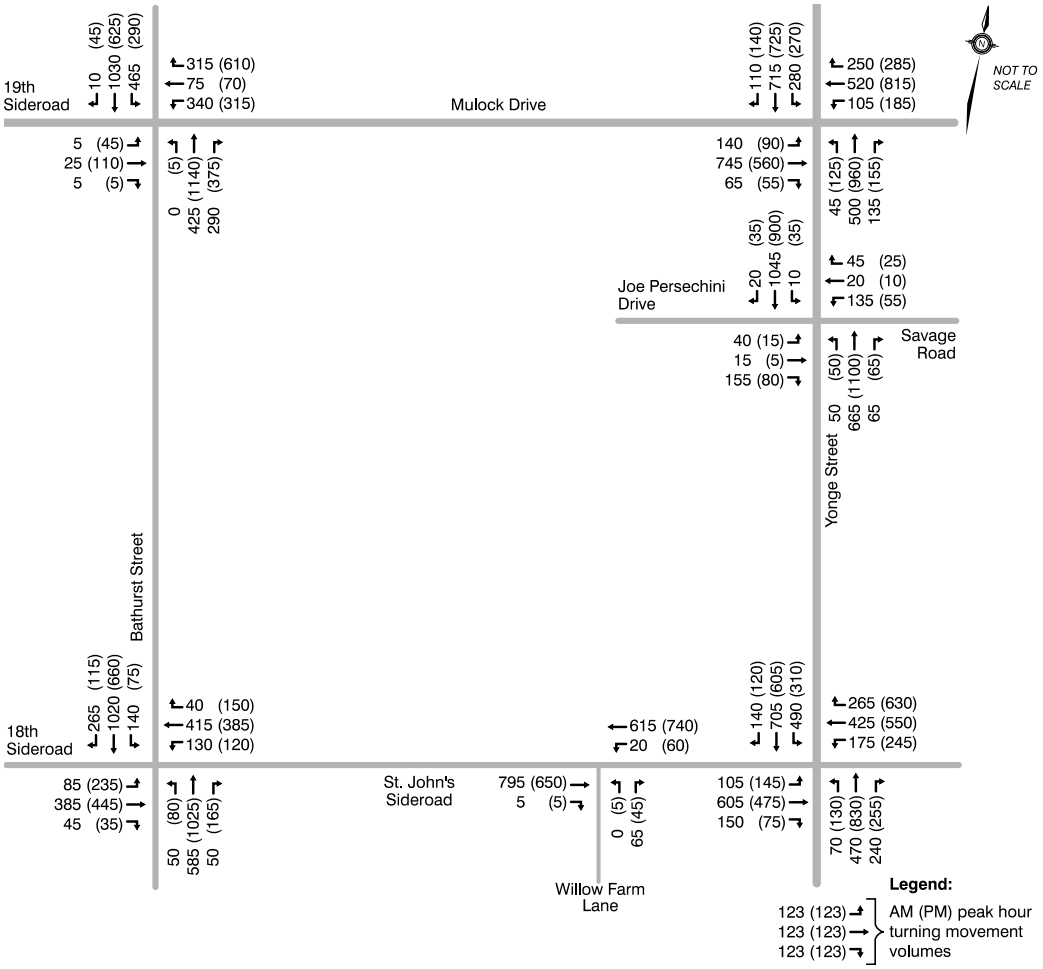
- For the intersections on St. John's Sideroad, the 2017 counts were used, and the volumes were increased to reflect two years of background traffic growth (using the same rates and method as documented in ***Section 3.2***).
- For the intersections on Mulock Drive, where historical counts were not available, midblock volumes were increased based on the adjustments along St. John's Sideroad, and the additional traffic was

applied proportionally to turning movements at the two intersections. The following percentage increases were applied:

- AM peak hour:
  - Bathurst Street: 0% northbound, 25% southbound
  - Yonge Street: 50% northbound and southbound
  - Mulock Drive: 10% eastbound and westbound
- PM peak hour:
  - Yonge Street: 20%

Figure 5 illustrates the existing peak hour traffic volumes after making the adjustments noted above.

Figure 5: Existing Traffic Volumes (Adjusted)



2.5 Existing Pedestrian Activity

Pedestrian volumes were recorded as part of the July 2019 traffic surveys referenced in ***Section 2.4***. ***Table 2*** lists the number of pedestrians observed in each crosswalk during the AM and PM peak hours. Pedestrian activity at most intersections in the study area was observed to be negligible. A moderate amount of pedestrian activity was observed at the Yonge Street and Mulock Drive intersection, equivalent to approximately one to two pedestrians crossing per traffic signal cycle.

Table 2: Existing Pedestrian Crossing Activity

Intersection	AM peak hour					PM peak hour				
	North leg	South leg	West leg	East leg	Total	North leg	South leg	West leg	East leg	Total
Bathurst Street at Mulock Drive	0	0	0	1	**1**	0	0	0	0	**0**
Yonge Street at Mulock Drive	0	4	9	22	**35**	0	24	32	19	**75**
Bathurst Street at St. John's Sideroad	0	0	0	0	**0**	0	0	0	0	**0**
Yonge Street at St. John's Sideroad	0	2	4	0	**6**	2	3	5	1	**11**
St. John's Sideroad at Willow Farm Lane	0	0	0	0	**0**	0	0	0	0	**0**

2.6 Existing Cycling Activity

Cyclists were counted as part of the July 2019 traffic surveys referenced in ***Section 2.4***. The number of cyclists observed was minimal. Over the four-hour survey period, the following numbers of cyclists were observed in total at each intersection:

- 4 cyclists at Bathurst Street and Mulock Drive;
- 7 cyclists at Bathurst Street and St. John's Sideroad;
- 1 cyclist at Yonge Street and Mulock Drive;
- 6 cyclists at Yonge Street and St. John's Sideroad; and
- 1 cyclist at St. John's Sideroad and Willow Farm Lane.

2.7 Existing Modal Split

The existing modal split in the surround area was determined from data in the 2016 Transportation Tomorrow Survey (TTS) database. The modal split was calculated for home-based trips made by residents in Newmarket and Aurora, and reflects both inbound and outbound trips during the three-hour AM and PM peak periods. ***Table 3*** presents the unadjusted modal split results as extracted from the TTS database.

Table 3: Existing Modal Split (Unadjusted)

Primary travel mode:	AM peak hour		PM peak hour	
	In	Out	In	Out
Auto driver	85%	66%	74%	68%
Auto passenger	7%	13%	12%	27%
Taxi passenger	1%	0%	0%	0%
Local transit	2%	4%	3%	0%
GO rail + local transit	0%	1%	2%	0%
GO rail only	0%	3%	3%	0%
School bus	0%	4%	1%	0%
Walking	5%	7%	5%	3%
Cycling	2%	1%	0%	1%

Note: Numbers may not add to 100% due to rounding.

A closer examination of the transit component of the TTS results indicates that the transit modal split is overstated when the point of reference is the "home" end of the trip:

- "GO rail" trips are largely made by transit, but the "home" end of the trip may involve use of a private vehicle to travel to and from the train station.
- For "Joint GO rail and local transit" trips, the "local transit" component does not necessarily refer to the "home" end of the trip; it can also refer to park-and-ride / kiss-and-ride trips where the rider transferred to the TTC subway after arriving at Union Station.
- "Local transit" trips similarly do not necessarily indicate use of YRT or VIVA services. This category is also used for trips where the rider drove to (or was dropped off at) a subway station in Toronto and completed the rest of their trip on transit, but began their trip in a private vehicle.

The TTS transit database, which uses the same data set as the main TTS database, was referenced for outbound AM peak period trips to determine the access mode to transit (to determine the proportion of GO trips involving a private vehicle) and to determine the correlation between first and second links on transit trips (to determine how many transit trips begin locally on a YRT or VIVA bus vs. how many start at a remote point on a TTC bus or subway line). The following was observed for outbound trips during the AM peak period:

- GO rail passengers access the GO station via the following modes:
  - 55% – auto driver (park-and-ride)
  - 17% – auto passenger (kiss-and-ride)
  - 14% – walking
  - 12% – transfer from YRT
  - 2% – bicycle
- Although 6% of trips are identified as being on "local transit," only 70% of these trips begin locally on YRT/VIVA while the remaining 30% are passengers that board the TTC subway at Union Station or at an outlying station with park-and-ride facilities.

Table 4 presents the existing modal split as experienced at the "home" end of the trip.

Table 4: Existing Modal Split ("Home" End of Trip)

Primary travel mode:	AM peak hour		PM peak hour	
	In	Out	In	Out
Auto driver	85%	68%	76%	68%
Auto passenger	7%	14%	13%	27%
Taxi passenger	1%	0%	0%	0%
Local transit	2%	5%	4%	0%
School bus	0%	4%	1%	0%
Walking	5%	8%	5%	3%
Cycling	2%	1%	0%	1%

Note: Numbers may not add to 100% due to rounding.

2.8 Existing Intersection Operations

Intersection operational analyses were completed for each of the four main arterial intersections using Trafficware's Synchro software (version 10). The analyses generally reflect the existing lane configurations at each intersection and current traffic signal timings obtained from the Region of York. The Yonge Street and Mulock Drive intersection is under construction at the time of this report; this intersection was analyzed according to the lane configuration believed to have been in place during the traffic surveys and using signal timings observed in the field.

At each intersection, the volume-to-capacity (v/c) ratio, average vehicular delay, level of service and 95th percentile queue were noted for each individual movement, and the average delay and level of service were noted for the intersection as a whole. Level of service definitions are provided in ***Appendix D.*** Synchro analysis worksheets reports are provided in ***Appendix E***.

At each intersection, critical movements were identified. The Region of York's Transportation Mobility Plan guidelines indicate that an individual movement or lane group is considered to be "critical" when its v/c ratio exceeds 0.85, or when its level of service is E or F.

Table 5: Existing Signalized Intersection Operations

Intersection	Movement	AM peak hour				PM peak hour			
		v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Yonge Street and Mulock Drive	EB left	0.87	E	73.4	72	0.61	D	48.8	35
	EB through	0.93	E	67.9	166	0.74	E	58.7	117
	EB right	0.13	A	0.5	0	0.11	A	0.4	0
	WB left	0.71	D	53.9	46	0.91	E	78.5	80
	WB through	0.98	E	73.4	170	1.43	F	241	312
	NB left	0.51	F	80.6	29	1.24	F	217	99
	NB through	0.55	D	42.2	90	0.84	D	51.4	187
	NB right	0.24	A	3.1	9	0.24	A	4.9	16
	SB left	1.27	F	198	175	1.29	F	207	178
	SB through	0.57	C	34.6	119	0.54	C	34	116
	SB right	0.17	A	3.8	11	0.20	A	4.3	14
	Overall	—	**E**	**63.4**	—	—	**F**	**109**	—
Bathurst Street and Mulock Drive	EB left	0.02	C	27.6	4	0.13	C	28.6	17
	EB through	0.05	C	28.2	11	0.20	C	30.2	34
	EB right	0.01	A	0.0	0	0.01	A	0.0	0
	WB left	0.91	E	67.5	132	0.88	E	64.4	113
	WB through	0.08	C	29.0	13	0.07	C	27.8	12
	WB right	0.50	A	5.9	21	1.04	E	73.7	187
	NB left	0.00	A	0.0	0	0.02	C	23.0	4
	NB through	0.33	C	26.7	56	0.76	C	34.0	172
	NB right	0.38	A	4.3	19	0.44	A	5.5	28
	SB left	0.87	C	34.2	131	1.24	F	162	133
	SB through	0.53	B	17.6	110	0.32	B	15.1	62
	SB right	0.01	A	0.0	0	0.05	A	4.2	6
	Overall	—	**C**	**24.9**	—	—	**D**	**46.6**	—
Yonge Street and St. John's Sideroad	EB left	0.50	C	28.8	31	0.78	D	49.5	54
	EB through	1.01	E	76.6	207	0.64	D	37.5	104
	WB left	0.96	F	84.0	85	0.92	E	61.9	83
	WB through	0.80	D	51.3	160	0.95	E	65.2	208
	WB right	0.44	A	6.7	24	0.91	D	37.8	170
	NB left	0.50	D	54.1	36	0.66	E	55.2	60
	NB through	0.62	D	46.2	85	0.88	D	52.5	147
	NB right	0.48	B	16.0	44	0.41	A	6.4	22
	SB left	1.10	F	95.2	193	1.07	F	103	133
	SB through	0.50	C	26.2	95	0.41	C	24.4	73
	SB right	0.21	A	3.7	12	0.18	A	4.2	12
	Overall	—	**D**	**50.6**	—	—	**D**	**46.3**	—
Bathurst Street and St. John's Sideroad	EB left	0.29	B	19.0	22	0.74	D	35.5	61
	EB through	0.62	C	26.9	114	0.65	C	30.4	128
	WB left	0.54	D	40.8	50	0.61	D	49.9	47
	WB through	0.84	D	49.3	157	0.86	E	57.0	136
	WB right	0.08	A	0.3	0	0.31	B	11.0	22
	NB left	0.44	D	41.4	22	0.32	C	30.5	28
	NB through	0.55	C	29.7	75	0.81	D	36.9	146
	NB right	0.09	A	0.3	0	0.25	A	8.6	22
	SB left	0.44	C	20.6	31	0.43	C	22.6	18
	SB through	0.72	C	26.4	126	0.45	C	21.3	72
	SB right	0.33	A	4.7	19	0.10	A	3.9	8
	Overall	—	**C**	**27.9**	—	—	**C**	**32.0**	—

2.8.1 Yonge Street and Mulock Drive

The intersection of Yonge Street and Mulock Drive is operating at a poor overall level of service (LOS E to F) during the AM and PM peak hours. Several movements are identified as being critical from a capacity perspective:

- During the AM peak hour, the eastbound and westbound through movements, and the southbound left turn, are all near or above capacity. The eastbound left turn is also just over the critical threshold.
- During the PM peak hour, the northbound and southbound left turns and the westbound through movement are all above capacity, and the westbound left turn is near capacity.

Because the v/c ratios for existing volumes would not normally be above 1.00, it is possible that the volume adjustments described in ***Section 2.4*** were overly conservative, or that the lane configuration and/or signal timings during the surveys were different than estimated (since the intersection is under construction). However, on-site observations confirm that the critical movements noted above are essentially operating at capacity.

Several movements are also operating at critical levels of service (LOS E or F). This is due to a combination of oversaturated movements, a long cycle length and fully protected left turn phases.

2.8.2 Bathurst Street and Mulock Drive

One adjustment was made to the analysis parameters at Bathurst Street and Mulock Drive to better calibrate calculated conditions against observed conditions. During the AM peak hour, there is little to no eastbound traffic, and the westbound left turn is essentially unimpeded, operating as a *de facto* protected movement. The HCM method applies a saturation flow rate adjustment of 0.95 (i.e., a 5% capacity reduction) to left turns with no opposing lanes, but a higher saturation flow rate adjustment of 0.757 (i.e., a 24% capacity reduction) to left turns with opposing lanes but no opposing traffic. From on-site observations, the HCM saturation flow rate adjustment overstates the impact of the minimal-volume eastbound approach on the westbound left turn movement, and therefore the westbound left turn factor was manually set to 0.95 to match conditions with no opposing lanes.

The intersection of Bathurst Street and Mulock Drive operates at a reasonable overall level of service (LOS C to D) during both peak hours. The westbound and southbound left turns are both near or at capacity during both peak hours; the westbound right turn is also at capacity during the PM peak hour.

2.8.3 Yonge Street and St. John's Sideroad

At Yonge Street and St. John's Sideroad, two adjustments were to better calibrate the analysis results with observations made in the field.

- The left turn saturated flow rate during the advance southbound left turn phase was increased. The unadjusted analyses resulted in a calculated capacity of 9 vehicles per cycle during the protected phase. Operations of the left turn movement were observed and videotaped over several cycles during the AM peak period, and the southbound advance phase was regularly observed to

accommodate 12 vehicles per cycle. The protected saturation flow rate was increased by 28% to match observed conditions.

- The eastbound approach has two through lanes (one of which is shared with the right turn movement). However, the capacity of the eastbound approach is reduced because the second lane is only developed roughly 60 metres upstream from the stop bar. Both lanes of capacity are usable for the first 16 seconds of eastbound green, corresponding to eight vehicles discharging from both lanes. After this part of the eastbound queue is served, however, the eastbound approach is only fed by a single lane and the capacity during the remaining green interval is only half utilized. The eastbound lane utilization factor was reduced to 0.75 to better represent the existing eastbound capacity. This resulted in the eastbound through movement reaching capacity during the AM peak hour, with a queue nearly reaching Willow Farm Lane, which matches conditions observed in the field during the AM peak hour.

The intersection of Yonge Street and St. John's Sideroad operates at a reasonable overall level of service (LOS D) during both peak hours. However, there are several movements identified as being critical from a capacity perspective:

- During the AM peak hour, the southbound and westbound left turns, and the eastbound through movement, are at or near capacity.
- During the PM peak hour, the southbound left turn is at capacity, all westbound movements are near capacity, and the northbound through movement is just above the critical threshold.

Most of the movements listed above are also critical from a level of service perspective.

Region staff specifically expressed interest in the queues on the eastbound approach during the AM peak hour. The 95th percentile queue was calculated at 207 metres in the eastbound through lanes. However, this reflects a queue distributed between two lanes, with a combined total of 415 metres of queued vehicles. The available storage length in the outside lane is only approximately 60 to 65 metres, resulting in a 350-metre queue in the inside lane. This queue would extend approximately to the start of the westbound left turn taper for Willow Farm Lane. This calculation matches queue lengths observed during a site visit during the AM peak period in September 2019.

2.8.4 Bathurst Street and St. John's Sideroad

The intersection of Bathurst Street and St. John's Sideroad operates at a reasonable overall level of service (LOS C) during both peak hours. No critical movements are identified during the AM peak hour. During the PM peak hour, the westbound through movement is just over the critical capacity threshold and with delays just over the critical level of service threshold.

3.0 Future Background Conditions

This section identifies changes to the transportation network that are proposed in the broader study area, and establishes the magnitude of traffic growth under future background conditions (i.e., traffic volumes that are forecasted without the proposed development in place).

Given the long-term nature of the Phase 3 development, a 20-year horizon (2039) has been assessed.

3.1 Future Transportation Network Changes

The following sections list changes are planned to the transportation network in and around the study area, and identify how those changes were reflected in the future background analyses.

3.1.1 St. John's Sideroad Widening

In their most recent Transportation Master Plan, the Region of York identified the widening of St. John's Sideroad to a 4-lane cross-section between Bathurst Street and Yonge Street. The Transportation Master Plan tentatively identified this widening for the period between 2027 and 2031. This widening is also reflected in the Region's long-range transportation model (and therefore the model's growth forecasts, which formed the basis of the growth rates derived in ***Section 3.2***, reflect the availability of this added capacity). It is anticipated that this project would also include the road's conversion from a rural to an urban cross-section including curb and gutter along with active transportation facilities. However, this widening is unfunded and unscheduled, and is not part of the Region's 10-year capital program. Further, an environmental assessment still needs to be undertaken to confirm the need for roadway modifications and to establish a preferred design / cross-section and a preferred means for undertaking the modifications (e.g., widen symmetrically; widen on north or south side).

Given that the project has been identified but not funded or programmed, the baseline future background analyses have been undertaken assuming the existing road cross-section, with the expectation that the planned widening could be considered as mitigation.

3.1.2 St. John's Sideroad / Highway 404 Interchange

The Region's Transportation Master Plan also identifies the future construction of an interchange at Highway 404 and St. John's Sideroad. Although the Region is protecting for this interchange in terms of property and policy measures (e.g., access management), there is similarly no funding or schedule associated with an interchange and it is not being actively pursued. As such, the trip distribution for site traffic has assumed that an interchange is not present.

3.1.3 Yonge North VIVA Rapidway

York Region is currently constructing a VIVA rapidway (median bus lanes) along Yonge Street in Newmarket, from Davis Drive southerly to Sawmill Valley Drive, south of Mulock Drive. The project's extents include the Yonge Street and Mulock Drive intersection, which is currently under construction. Drawings illustrating the roadway design in this section are provided in ***Appendix C***.

Although the project's primary focus is on providing exclusive lanes for VIVA buses traveling along Yonge Street, the design also includes the introduction of cycling lanes along Yonge Street.

York Region staff provided the signal timing plan that is anticipated to be implemented at Yonge Street and Mulock Drive at the completion of construction. This timing plan, and the planned intersection configuration, have been applied at the Yonge Street and Mulock Drive intersection.

3.1.4 Mulock GO Station

Metrolinx is planning for the construction of a new GO station on the south side of Mulock Drive. Current concepts for the station envision an unspecified number of parking spaces; kiss-and-ride facilities; and a bus loop. Access is envisioned from Mulock Drive and from Bayview Avenue via existing and proposed local streets connecting to those roadways. The new Mulock GO station may be an alternative to the Aurora GO station for Phase 3 residents and has been considered as such in the trip distribution of resident trips.

3.2 Background Traffic Growth

Typically future background traffic volumes are calculated by applying a background growth rate to traffic volumes on major roadways in the study area, and adding site-specific traffic volumes generated by developments in the study area.

Given the long-range, high-level nature of this study, background traffic increases were primarily determined by applying growth rates derived from the Region's long-range transportation model. The study horizon is far enough into the future (2039) that even a modest annual growth rate would result in a substantial total level of growth (e.g., a 2% linear growth rate applied over 20 years would result in a 40% increase in traffic compared to existing levels).

The Region provided AM peak hour model runs for the 2016, 2021, 2031 and 2041 horizon years. From the model results, the following annual growth rates were estimated during the AM peak hour:

- Bathurst Street: 0.5% northbound / 2.0% southbound
- Yonge Street: 0.5% northbound / 1.0% southbound
- Mulock Drive: 0.5% eastbound and westbound
- St. John's Sideroad: 2.0% eastbound / 1.0% westbound

The growth rates listed above were applied to midblock volumes upstream and downstream from the major arterial intersections, and then the calculated approach and departure growth was distributed proportionally between the individual intersection turning movements.

The Region's model reflects AM peak hour conditions. For PM peak hour conditions, the AM peak hour growth rates were reversed (e.g., the AM peak hour's northbound growth rate was applied to the southbound direction during the PM peak hour).

3.3 Shining Hill Estates, Phases 1 and 2

Although background developments were generally not explicitly considered, traffic generated by Phase 1 and 2 of the Shining Hills development was added separately given the impact on roadways within the subdivision (e.g., the future Bennington Road and its intersection with Yonge Street).

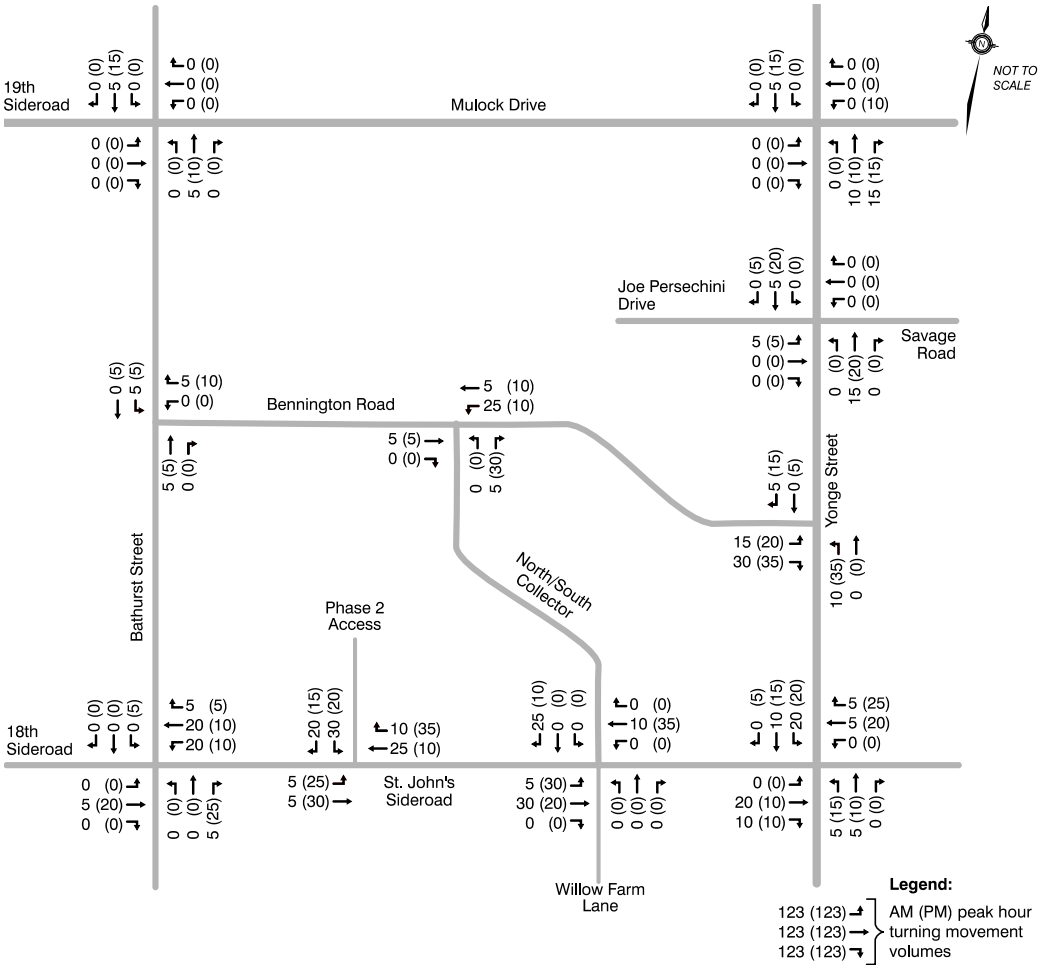
Phase 1 is located southwest of Yonge Street and Joe Persechini Drive. It will include the construction of a new east-west road (Bennington Road) intersecting with Yonge Street approximately 365 metres south of Joe Persechini Drive. For the development of Phase 1, the projected traffic volumes were not expected to warrant the installation of traffic signals, and the Region of York required that the intersection be limited to right turns only until such time as traffic signals are warranted. The intersection has been designed such that it can be converted to a full-movement, signalized access once traffic volumes on Bennington Road increase to the point where traffic signals are warranted.

Traffic volumes for Phase 1 were most recently documented in a February 2018 letter report. These volumes reflected the interim intersection configuration at Yonge Street and Bennington Road whereby the left turn movements are prohibited. It is anticipated that traffic generated by Phase 3 will result in traffic signals being warranted at Yonge Street and Bennington Road (see ***Section 6.1.1***). As such, for the Phase 3 background assessment, the traffic assignment for Phase 1 has been modified to reflect the availability of full movements at this intersection (recognizing that the reassignment would technically only occur as part of Phase 3, since it relies on the installation of traffic signals that will only be warranted as part of Phase 3). For analysis purposes, it has also been assumed that the Phase 3 collector road network is available for traffic reassignment.

Phase 2 is located on the north side of St. John's Sideroad, and is planned to have a single unsignalized full-movement access to St. John's Sideroad approximately 750 metres west of Willow Farm Lane. It will not have a vehicular connection to the Phase 3 collector road network. Traffic volumes for Phase 2 were most recently documented in a May 2019 letter report. These volumes were carried forward for the Phase 3 background analyses.

Figure 6 illustrates the traffic volumes associated with Phases 1 and 2 of the Shining Hill Estates development.

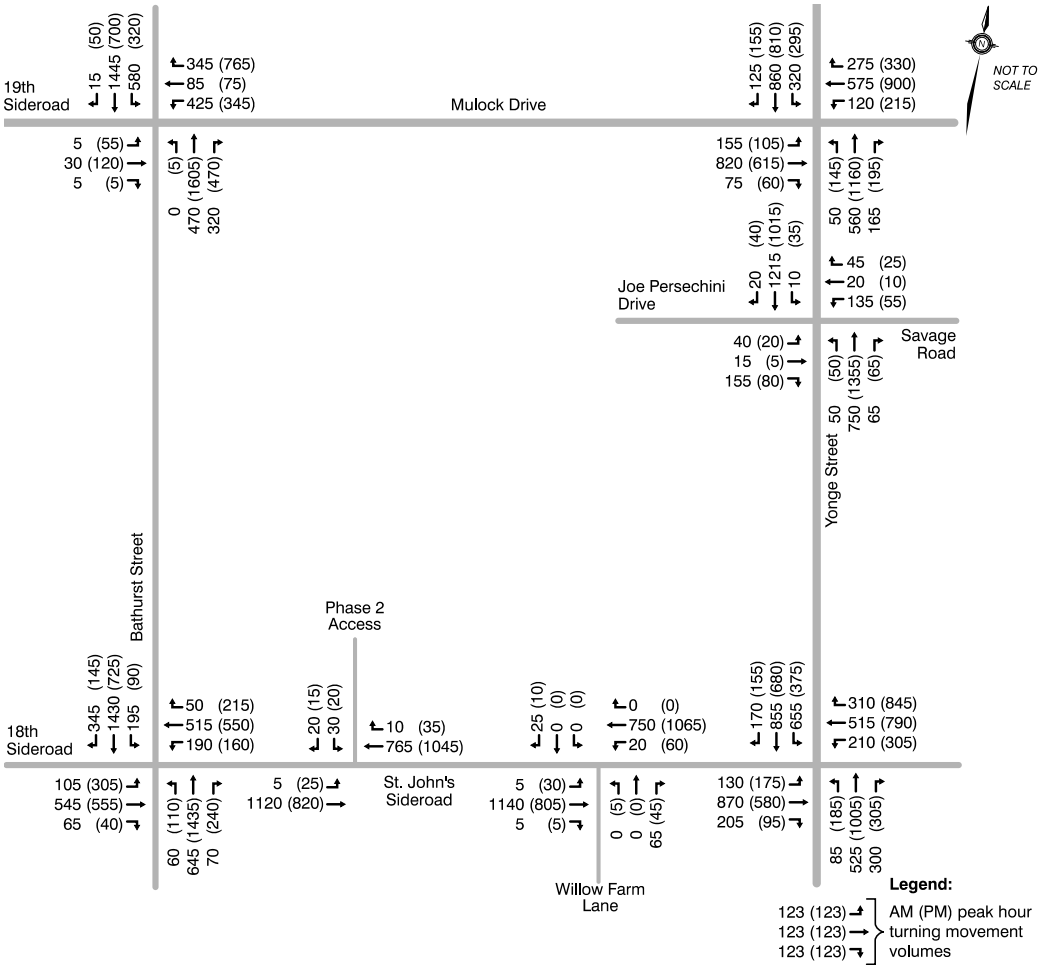
Figure 6: Shining Hill Estates Phases 1 & 2 Traffic Volumes



3.4 Future Background Traffic Volumes

Future background traffic volumes were calculated by applying the growth rates documented in ***Section 3.2*** and adding the traffic generated by Phases 1 and 2 as documented in ***Section 3.3***. The resulting future background traffic volumes are illustrated in ***Figure 7***.

Figure 7: Future Background Traffic Volumes



4.0 Development Traffic

4.1 Development Concept

The proposed concept plan is presented in ***Appendix A***. The concept plan is predominantly residential, and envisions approximately 3,500 residential units in a variety of types:

- 400 single-family residential units;
- 900 townhouse units; and
- 2,200 apartment units.

The majority of development (approximately 2,600 units, or 74% of the total units in Phase 3) is proposed in the Newmarket portion of the subject lands. The remaining 900 units would be in Aurora (200 units in the main part of the development; 700 units in a separate block along Yonge Street).

The concept plan also includes a small 0.6-hectare service commercial block at the west end of the site, and an elementary school in the central area of the subject lands.

The majority of development would be accessed via two collector roads extending through the subject lands:

- An ***east-west collector (Bennington Road)*** is proposed to extend between Bathurst Street and Yonge Street. The 150-metre section extending westerly from Yonge Street is Bennington Road (formerly Street "A") being constructed for Phase 1 of the subject development, with a stop-controlled right-in / right-out (RI/RO) intersection at Yonge Street. Phase 3 would see Bennington Road extended westerly to Bathurst Street, and would see the Yonge Street intersection converted to a full-movement signalized intersection.
- A ***north-south collector*** would extend southerly from Bennington Road, intersecting with St. John's Sideroad opposite Willow Farm Lane.

A conceptual network of off-street trails has been proposed that would provide active transportation routes within the site and would link to other existing trails to the north and east.

4.2 Trip Generation

The number of vehicle trips generated by the proposed development was calculated based on trip generation rates published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual* (10th edition). Trip generation rates were referenced for the following land used codes:

- 210 – Single-Family Detached Housing (used for trips generated by the proposed single-family units);
- 220 – Multi-Family Housing (Low-Rise) (used for trips generated by the proposed townhouse units);
- 221 – Multi-Family Housing (Mid-Rise) (used for trips generated by the proposed apartment units); and

- 820 – Shopping Centre (used for trips generated by the proposed service commercial block).

For the trips generated by the school, it was assumed that the student population would either be drawn from within the site (and would therefore not result in traffic on the surrounding arterial network), and/or would travel on school buses that would result in limited vehicle trips. (To the extent that students from the local area are picked up or dropped off by private vehicle, they may result in additional traffic on internal streets, depending on whether the pick-up / drop-off trips are combined with other trips, such as a parent dropping off their child at school in the morning while they are on the way to work.) Non-local trips generated by the school trips would therefore primarily consist of trips by staff members, assumed to be approximately 45 including teachers and administrative / support staff. Each staff member was assumed to generate one inbound trip during the AM peak hour; most outbound staff trips were assumed to occur before the PM peak hour of street traffic.

Trips were generated for the service commercial block based on an assumed gross floor area of 16,150 sq. ft., which is equivalent to a lot coverage of 25%. This lot coverage can be considered to be somewhat conservatively high for a typical suburban service commercial block.

The trips generated by the service commercial block were subdivided into primary trips and pass-by trips. Primary trips are new trips made by motorists that would not otherwise be traveling in the area. Pass-by trips are made by motorists that are already passing the site and are making a stop along the way at the subject site; these trips are observed on the site driveways but do not represent an increase in traffic on the road network. The ITE *Trip Generation Handbook* contains pass-by rates for shopping centres of varying sizes. For small commercial blocks of a comparable size to that shown in the concept plan, the ITE data indicate a typical PM peak hour pass-by rate in the order of 45%, which was applied to the subject site. No pass-by trips were assumed during the AM peak hour.

Table 6 presents the trip generation rates applied to each of the different land uses within the site.

Table 6: Trip Generation Rates

Land use	ITE land use code	Trip generation rate per	AM peak hour			PM peak hour		
			Rate	% in	% out	Rate	% in	% out
Single-family detached housing	210	unit	0.74	25%	75%	0.99	63%	37%
Multi-family housing (low-rise)	220	unit	0.68	33%	67%	0.56	63%	37%
Multi-family housing (mid-rise)	221	unit	0.36	26%	74%	0.44	61%	39%
Shopping centre	820	1,000 sq. ft.	0.94	62%	38%	3.81	48%	52%
Elementary school	—	employee	1.0	100%	0%	0.25	0%	100%

Table 7 documents the number of vehicle trips expected to be generated by the proposed development.

Table 7: Trip Generation

Land use / magnitude	AM peak hour					PM peak hour				
	Rate	% in / out	Trips in	Trips out	Total trips	Rate	% in / out	Trips in	Trips out	Total trips
Single-family homes (408)	0.74	25 / 75	77	224	301	0.99	63 / 37	255	150	405
Townhouses (899)	0.68	33 / 67	96	318	414	0.56	63 / 37	319	185	504
Apartments (2,210)	0.36	26 / 74	207	589	796	0.44	61 / 39	593	379	972
Commercial (16,150 sq. ft.)	0.94	62 / 38	9	6	15	3.81	48 / 52	29	33	62
School (45 employees)	1.0	100 / 0	45	0	45	0.25	0 / 100	0	10	10
Total			**364**	**1,137**	**1,571**			**1,196**	**757**	**1,953**
Commercial pass-by	0%		0	0	0	45%		-13	-15	-28
Net (primary) trips			364	1,137	1,571			1,183	742	1,925

4.3 Trip Distribution and Assignment

Residential site traffic was distributed based on origin-destination data from the 2016 Transportation Tomorrow Survey (TTS). The TTS data reflect inbound and outbound home-based auto driver trips made by residents of western Newmarket and Aurora during the AM and PM peak periods. These trips were discounted to reflect local travel for which the trip purpose was listed as “facilitate passenger”; from the location of these trips, it appears that many of these are trips made to drop off or pick up children from school, and this trip purpose will be served locally within the subject lands. Conversely, the TTS auto driver trip distribution was adjusted to also reflect the auto driver or passenger component of GO train trips (i.e., a trip categorized in the TTS database as primarily involving GO rail would be experienced in the local area as an auto trip).

Because of the relatively broad geographic extents of the subject lands (extending 2 km between Bathurst Street and Yonge Street), separate distributions were prepared for trips generated in the western, central, southern, and eastern / southeastern areas of the site, recognizing that the preferred route to a given external area may vary depending on where the trip originates locally.

Table 8 and ***Table 9*** present the trip distribution applied to residential traffic generated in different areas of the site during the AM and PM peak hours, respectively.

Table 8: Residential Trip Distribution (AM Peak Hour)

To/from:	West zones		Central zones		East zones		South zones	
	In	Out	In	Out	In	Out	In	Out
North via Bathurst Street	25%	15%	10%	8%	10%	5%	15%	4%
North via Yonge Street	5%	2%	14%	5%	14%	8%	9%	7%
West via 19th Sideroad	0%	0%	0%	0%	0%	0%	0%	0%
West via 18th Sideroad	0%	20%	4%	19%	4%	18%	7%	22%
East via Mulock Drive	6%	17%	6%	16%	6%	16%	2%	14%
East via St. John's Sideroad	8%	7%	15%	20%	15%	23%	18%	19%
South via Bathurst Street	22%	32%	10%	13%	9%	11%	10%	14%
South via Yonge Street	4%	2%	10%	13%	11%	13%	10%	13%
Internal trips	30%	6%	30%	6%	30%	6%	30%	6%

Table 9: Residential Trip Distribution (PM Peak Hour)

To/from:	West zones		Central zones		East zones		South zones	
	In	Out	In	Out	In	Out	In	Out
North via Bathurst Street	18%	30%	7%	9%	7%	9%	9%	9%
North via Yonge Street	3%	2%	12%	9%	12%	9%	7%	7%
West via 19th Sideroad	0%	0%	0%	0%	0%	0%	0%	0%
West via 18th Sideroad	17%	2%	16%	11%	17%	9%	22%	12%
East via Mulock Drive	8%	14%	9%	20%	9%	19%	5%	17%
East via St. John's Sideroad	9%	6%	26%	21%	28%	23%	26%	26%
South via Bathurst Street	38%	28%	18%	5%	12%	2%	19%	3%
South via Yonge Street	2%	3%	9%	10%	11%	14%	7%	11%
Internal trips	5%	15%	5%	15%	5%	15%	5%	15%

The service commercial block was assumed to have a customer base evenly divided between new residents in the Phase 3 lands and existing residents in the surrounding lands. The distribution of commercial primary trips reflects 50% of commercial trips originating within Phase 1, and the remaining 50% relatively evenly distributed within the surrounding urban areas to the north, south and east. The distribution of commercial pass-by trips was assumed to be proportional to the directional volumes of through traffic traveling along Bathurst Street past the commercial block.

The school trips, which are predominantly made by staff, were assumed to be relatively evenly distributed between the cardinal directions.

Table 10 presents the trip distribution applied to the non-residential uses within the site.

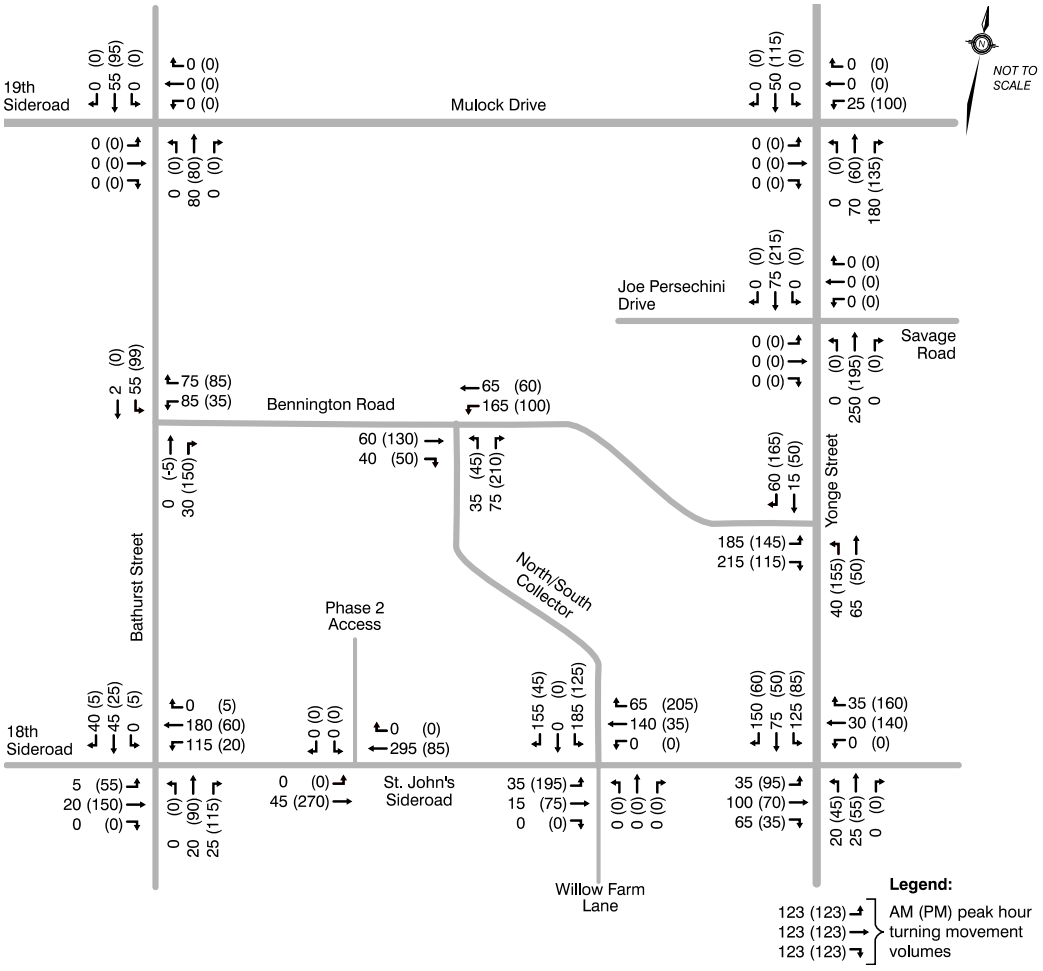
Table 10: Non-Residential Trip Distribution

To/from:	Commercial	School
North via Bathurst Street	12.5%	15%
North via Yonge Street	7.5%	10%
West via 19th Sideroad	0.0%	0%
West via 18th Sideroad	0.0%	20%
East via Mulock Drive	7.5%	15%
East via St. John's Sideroad	7.5%	15%
South via Bathurst Street	10.0%	15%
South via Yonge Street	5.0%	10%
Internal trips	50%	0%

For the purpose of the assignment of site trips, the subject lands were subdivided into a set of 12 traffic zones. Separate trip assignments were prepared for each traffic zone within the site, with trips assigned logically based on the available connections and the attractiveness of each available route, taking into account factors such as directness and the effect of turning movements experiencing congestion or high levels of delay. The trip assignment assumes that the Bennington Road and Yonge Street intersection, which is currently being constructed for Phase 1 as a RI/RO intersection, will be converted to a full-movement signalized intersection.

Figure 8 illustrates the intersection traffic volumes projected to be generated by the site.

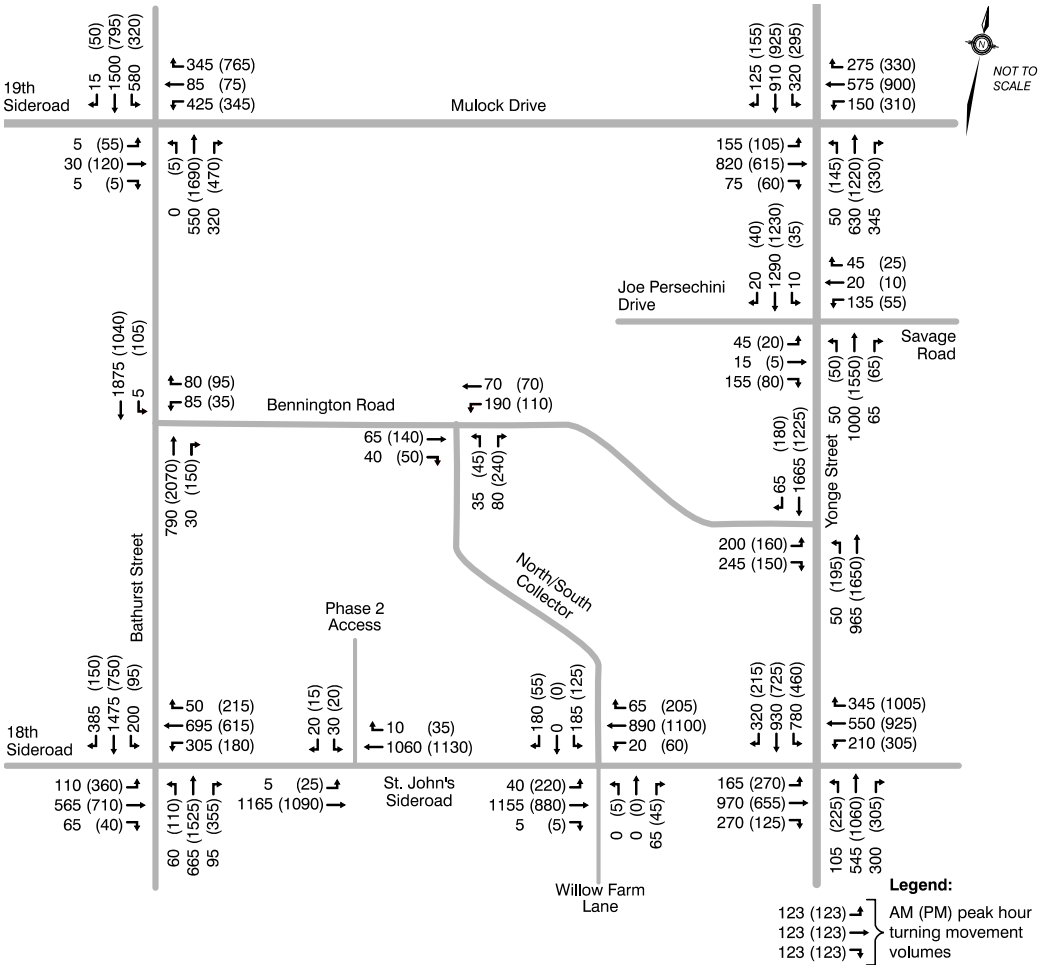
Figure 8: Site Traffic Volumes



4.4 Total Future Traffic Volumes

Total future traffic volumes represent the level of traffic that would be anticipated with the development of the site, and were calculated by adding the site traffic volumes to the projected future background traffic volumes. The resulting total future traffic volumes are illustrated in ***Figure*** 9.

Figure 9: Total Future Traffic Volumes



5.0 Primary Intersection Operations

This section documents the anticipated intersection operations at the four primary intersections at the corners of the block bounded by Mulock Drive, Yonge Street, St. John's Sideroad and Bathurst Street under future background and total future conditions. (Analyses and other considerations related to the proposed site access intersections are documented in ***Section 6.0***.)

The Region of York has identified St. John's Sideroad for eventual widening to four lanes between Bathurst Street and Yonge Street. However, this widening is not part of the Region's 10-year capital plan and the timing is unknown. As such, the baseline future background operations were assessed assuming the existing roadway cross-section, while the mitigation scenarios assumed that the widening has been completed.

5.1 Yonge Street and Mulock Drive

The analyses of Yonge Street and Mulock Drive reflect the completion of intersection modifications associated with the VIVA rapidway, and the implementation of the traffic signal timing and phasing plan developed by the Region for post-completion conditions. ***Table 11*** presents the intersection operations under future background, mitigated future background and total future conditions.

Under future background conditions, the Yonge Street and Mulock Drive intersection is expected to operate at a poor overall level of service (LOS E to F). During the AM peak hour, the southbound left turn demand is expected to substantially exceed capacity, and the eastbound through movement and westbound left turn are expected to be near capacity. During the PM peak hour, the westbound and southbound left turns, and the westbound and northbound through movements, are expected to exceed capacity.

Opportunities are limited to mitigate the future background capacity constraints. Minor adjustments were made to phase lengths, generally in the order of 1 second shorter or longer. However, the effect of these mitigations is limited; the overall delay would not substantially change and the same critical movements would continue to exist. The greatest opportunity is to increase capacity somewhat on the southbound left turn during the AM peak hour when opposing northbound demand is relatively low.

The addition of site traffic is not expected to substantially impact overall delay during the AM peak hour, but would increase delay by approximately 16 seconds per vehicle during the PM peak hour. The greatest impact at this intersection is expected to be on the westbound left turn movement, in particular during the PM peak hour when residents will be returning home from the future Mulock GO station.

Table 11: Future Intersection Operations, Yonge Street and Mulock Drive

Scenario:	Movement	AM peak hour				PM peak hour			
		v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Future background	EB left	0.72	D	45.2	51	0.79	E	64.4	51
	EB through	0.93	E	60.3	162	0.71	D	50.2	116
	EB right	0.15	A	0.5	0	0.12	A	0.4	0
	WB left	0.92	F	86.5	62	1.12	F	133	113
	WB through	0.66	D	43.6	100	1.05	F	90.4	206
	WB right	0.44	A	5.8	21	0.57	B	17.1	61
	NB left	0.45	F	85.2	25	0.72	E	76.1	67
	NB through	0.67	C	30.5	80	1.26	F	167	287
	NB right	0.34	A	4.6	8	0.37	B	10.4	29
	SB left	1.51	F	288	195	1.10	F	133	167
	SB through	0.77	D	42.9	170	0.78	D	48.7	167
	SB right	0.22	A	5.2	14	0.28	A	10.5	26
	Overall	—	**E**	**59.8**	—	—	**F**	**88.4**	—
Future background (mitigated)	EB left	0.72	D	45.2	51	0.79	E	64.4	51
	EB through	0.93	E	60.3	162	0.71	D	50.2	116
	EB right	0.15	A	0.5	0	0.12	A	0.4	0
	WB left	0.92	F	86.5	62	1.12	F	133	113
	WB through	0.66	D	43.6	100	1.05	F	90.4	206
	WB right	0.44	A	5.8	21	0.57	B	17.1	61
	NB left	0.45	F	82.8	26	0.72	E	76.1	67
	NB through	0.69	D	33.9	86	1.26	F	167	287
	NB right	0.34	A	4.7	8	0.37	B	10.4	29
	SB left	1.42	F	252	192	1.10	F	133	167
	SB through	0.77	D	42.9	170	0.78	D	48.7	167
	SB right	0.22	A	5.2	14	0.28	B	10.5	26
	Overall	—	**E**	**57.6**	—	—	**F**	**88.4**	—
Total future (mitigated)	EB left	0.71	D	44.4	50	0.85	E	78.0	55
	EB through	0.94	E	63.1	166	0.73	D	51.7	117
	EB right	0.15	A	0.5	0	0.12	A	0.5	0
	WB left	1.07	F	123	83	1.57	F	305	195
	WB through	0.65	D	43.2	100	1.02	F	82.8	202
	WB right	0.44	A	5.7	21	0.55	B	16.4	59
	NB left	0.45	E	68.0	29	0.72	E	76.1	67
	NB through	0.78	D	50.6	117	1.33	F	194	308
	NB right	0.74	C	34.4	98	0.64	C	28.6	86
	SB left	1.42	F	252	192	1.10	F	133	167
	SB through	0.82	D	45.5	187	0.89	E	55.9	207
	SB right	0.22	A	5.2	14	0.28	B	10.5	26
	Overall	—	**E**	**61.7**	—	—	**F**	**105**	—

5.2 Bathurst Street and Mulock Drive

Table 12 presents the intersection operations at Bathurst Street and Mulock Drive under future background, mitigated future background and total future conditions.

Table 12: Future Intersection Operations, Bathurst Street and Mulock Drive

Scenario:	Movement	AM peak hour				PM peak hour			
		v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Future background	EB left	0.01	C	27.4	4	0.15	C	28.3	20
	EB through	0.05	C	27.9	13	0.20	C	29.3	36
	EB right	0.01	A	0.0	0	0.01	A	0.0	0
	WB left	1.03	F	90.6	183	0.92	E	67.9	135
	WB through	0.08	C	28.0	14	0.07	C	26.9	12
	WB right	0.50	A	5.6	22	1.27	F	161	280
	NB left	0.00	A	0.0	0	0.02	C	23.4	4
	NB through	0.40	C	29.4	63	1.13	F	99.5	312
	NB right	0.43	A	4.5	19	0.58	B	12.7	69
	SB left	1.20	F	131	256	1.53	F	285	162
	SB through	0.79	C	26.0	184	0.37	B	16.7	70
	SB right	0.02	A	0.5	1	0.05	A	4.1	6
	Overall	—	**D**	**46.2**	—	—	**F**	**93.7**	—
Future background (mitigated)	EB left	0.02	C	27.8	4	0.15	C	32.0	21
	EB through	0.06	C	28.7	13	0.21	C	32.4	39
	EB right	0.01	A	0.0	0	0.01	A	0.0	0
	WB left	0.89	E	61.1	151	0.97	F	82.6	151
	WB through	0.09	C	29.5	14	0.07	C	30.1	13
	WB right	0.53	A	6.1	22	1.05	E	74.2	222
	NB left	0.00	A	0.0	0	0.02	C	24.8	4
	NB through	0.44	C	34.3	71	1.27	F	163	321
	NB right	0.45	A	5.6	22	0.63	B	14.9	73
	SB left	1.04	E	65.8	223	1.02	F	91.0	132
	SB through	0.74	C	22.5	184	0.36	B	14.7	62
	SB right	0.02	A	0.5	1	0.05	A	3.3	6
	Overall	—	**C**	**32.3**	—	—	**F**	**88.8**	—
Total future (mitigated)	EB left	0.02	C	27.8	4	0.15	C	32.0	21
	EB through	0.06	C	28.7	13	0.21	C	32.4	39
	EB right	0.01	A	0.0	0	0.01	A	0.0	0
	WB left	0.89	E	61.1	151	0.97	F	82.6	151
	WB through	0.09	C	29.5	14	0.07	C	30.1	13
	WB right	0.53	A	6.1	22	1.05	E	74.2	222
	NB left	0.00	A	0.0	0	0.02	C	24.8	4
	NB through	0.52	D	35.7	84	1.34	F	191	344
	NB right	0.45	A	5.6	22	0.64	B	16.2	77
	SB left	1.10	F	90.1	202	1.02	F	91.0	132
	SB through	0.77	C	23.5	197	0.41	B	15.4	72
	SB right	0.02	A	0.5	1	0.05	A	3.3	6
	Overall	—	**D**	**36.4**	—	—	**F**	**99.0**	—

Under future background conditions, the Bathurst Street and Mulock Drive intersection is expected to operate at a reasonable overall level of service during the AM peak hour (LOS D), but a poor level of

service during the PM peak hour (LOS F). The westbound and southbound left turns are expected to approach or exceed capacity during both peak hours, and the westbound right turn and northbound through movement are expected to exceed capacity during the PM peak hour. In particular, the southbound left turn is expected to reach 53% over capacity.

To mitigate operations under future background conditions, the signal timings were adjusted to provide additional green time on the southbound left turn phase, and a westbound right turn overlap phase was added to increase the efficiency of the westbound right turn movement. With this mitigation in place, the same critical movements will continue to exist, but the degree of the capacity constraint will be reduced and the AM peak hour level of service will improve to LOS C.

The addition of site traffic will result in the AM peak hour level of service declining from LOS C to LOS D, although the actual change in average delay is expected to be only 4 seconds per vehicle. The level of service during the PM peak hour will continue to be LOS F. The critical movements identified under background conditions are not expected to be substantially affected, and no new critical movements are anticipated due to site traffic.

5.3 Yonge Street and St. John's Sideroad

Table 13 presents the intersection operations at Yonge Street and St. John's Sideroad under future background, mitigated future background and total future conditions.

Table 13: Future Intersection Operations, Yonge Street and St. John's Sideroad

Scenario:	Movement	AM peak hour				PM peak hour			
		v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Future background	EB left	0.86	E	68.5	61	0.94	E	77.0	74
	EB through	1.43	F	236	345	0.77	D	42.1	134
	WB left	1.15	F	140	110	1.41	F	231	140
	WB through	0.97	E	74.1	225	1.33	F	192	345
	WB right	0.52	B	11.4	43	1.21	F	134	299
	NB left	0.72	E	74.7	53	1.04	F	121	101
	NB through	0.69	D	48.4	96	1.10	F	99.4	199
	NB right	0.62	C	28.7	77	0.52	B	14.6	48
	SB left	1.54	F	278	307	1.30	F	187	173
	SB through	0.61	B	15.6	50	0.47	C	25.8	83
	SB right	0.25	A	0.8	0	0.23	A	3.9	13
	Overall	—	**F**	**118**	—	—	**F**	**108**	—
Future background (mitigated)	EB left	0.48	C	28.0	37	0.90	E	68.1	66
	EB through	0.92	E	58.3	167	0.63	D	40.9	86
	EB right	0.42	C	21.5	49	0.19	A	5.0	10
	WB left	1.15	F	141	109	1.13	F	124	121
	WB through	0.52	D	38.3	84	0.85	D	49.9	122
	WB right	0.39	B	11.3	51	1.14	F	104	249
	NB left	0.72	E	75.5	54	0.96	F	96.5	102
	NB through	0.69	D	48.7	97	1.00	E	71.1	203
	NB right	0.62	C	29.2	78	0.49	B	14.9	51
	SB left	1.49	F	256	304	1.06	F	98.7	158
	SB through	0.60	B	14.9	50	0.41	C	21.3	79
	SB right	0.24	A	0.8	0	0.20	A	3.5	12
	Overall	—	**E**	**68.9**	—	—	**E**	**63.2**	—
Total future (mitigated)	EB left	0.65	D	37.5	47	1.26	F	176	127
	EB through	1.00	E	72.6	201	0.65	D	39.9	98
	EB right	0.54	C	28.0	73	0.23	A	4.4	11
	WB left	1.15	F	140	110	1.06	F	95.5	103
	WB through	0.52	D	36.5	88	0.91	D	54.0	157
	WB right	0.43	B	13.5	66	1.38	F	206	429
	NB left	1.00	F	132	73	0.88	E	58.9	81
	NB through	0.74	D	50.9	101	1.08	F	94.3	211
	NB right	0.67	D	35.6	88	0.49	B	11.9	42
	SB left	1.83	F	405	402	1.60	F	310	225
	SB through	0.66	C	30.0	135	0.62	D	35.4	104
	SB right	0.45	A	9.1	42	0.34	A	5.1	17
	Overall	—	**F**	**97.8**	—	—	**F**	**103**	—

Under future background conditions, the Yonge Street and St. John's Sideroad intersection is expected to operate at a poor level of service (LOS F) during both the AM and PM peak hours. During the AM peak hour, the eastbound through movement and southbound left turn are both expected to substantially

exceed capacity, and the westbound left turn and westbound through movement are also expected to be at or above capacity. During the PM peak hour, all movements on the westbound approach are expected to exceed capacity, along with the southbound left turn and the northbound left turn and through movement.

The baseline analysis of future background conditions identified numerous movements substantially exceeding capacity and a poor level of service. These conditions are associated with growth rates projected in the Regional model, which assumes no development on the subject lands. As such, the St. John's Sideroad widening would be recommended to mitigate capacity constraints associated with background traffic. At the Yonge Street and St. John's Sideroad intersection, the widening was assumed to change the lane configuration as follows:

- ***Northbound approach:*** no change
- ***Southbound approach:*** no change
- ***Eastbound approach:*** addition of a dedicated right turn lane, and elimination of the lane utilization factor associated with the existing limited storage in the second through lane
- ***Westbound approach:*** conversion of the through / right turn movements to two dedicated through lanes plus one exclusive right turn lane

In addition, minor adjustments were made to phase lengths, generally in the order of 1 to 4 seconds shorter or longer, and a westbound right turn phase was added (overlapping with the parallel southbound left turn phase) to increase the efficiency of the westbound right turn movement.

With these modifications in place, the westbound and southbound left turns would continue to exceed capacity during the AM peak hour, but the eastbound through movement would fall below capacity, and the overall level of service would be improved to LOS E. During the PM peak hour, the westbound left and right turns would continue to reach or exceed capacity, along with the southbound left turn and northbound through movement, but the degree of the capacity deficiency would be reduced, and the overall level of service would be improved to LOS E.

Traffic associated with the Phase 3 development would result in the intersection level of service returning to LOS F. The critical westbound left turn movement would be unaffected, but other critical movements would be impacted (the southbound left turn; the eastbound left turn, westbound right turn, and westbound through movement during the PM peak hour) and some new critical movements would be created (the northbound left turn during the AM peak hour; the westbound through movement during the PM peak hour).

The St. John's Sideroad EA should consider opportunities to further increase capacity at its intersections with Bathurst Street and Yonge Street. At Yonge Street, alternate measures could include a second southbound left turn lane and a channelized westbound right turn lane, or less conventional

configurations (e.g., a continuous flow intersection or a separate connecting roadway in the northeast quadrant) favouring the movements between the north and east legs. These measures were not assumed in the mitigation scenario documented above because typically the Region's preference is not to construct new dual left turn lanes. The development and evaluation of alternatives would need to balance any added capacity against factors such as intersection footprint and complexity, conditions for active transportation, property availability, and cost.

5.4 Bathurst Street and St. John's Sideroad

Table 14 presents the intersection operations at Bathurst Street and St. John's Sideroad under future background, mitigated future background and total future conditions.

Table 14: Future Intersection Operations, Bathurst Street and St. John's Sideroad

Scenario:	Movement	AM peak hour				PM peak hour			
		v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Future background	EB left	0.48	C	25.9	27	1.19	F	142	128
	EB through	0.88	D	45.0	199	0.80	D	38.1	172
	WB left	2.00	F	505	120	1.35	F	235	95
	WB through	1.10	F	110	212	1.16	F	131	225
	WB right	0.10	A	0.4	0	0.43	B	17.8	41
	NB left	1.00	F	153	44	0.49	D	36.8	40
	NB through	0.53	C	29.8	84	1.17	F	119	261
	NB right	0.11	A	1.3	3	0.37	B	13.5	39
	SB left	0.65	C	28.6	43	0.55	C	28.6	22
	SB through	0.96	D	44.3	230	0.48	C	22.6	80
	SB right	0.42	A	8.6	41	0.18	A	3.4	11
	Overall	**—**	**E**	**67.2**	**—**	**—**	**F**	**82.5**	**—**
Future background (mitigated)	EB left	0.57	C	30.6	27	1.12	F	121	131
	EB through	1.13	F	117	246	1.06	F	92.7	240
	WB left	1.08	F	113	83	1.04	F	112	74
	WB through	0.96	E	69.2	195	1.23	F	162	245
	WB right	0.09	A	0.3	0	0.43	B	15.6	37
	NB left	1.02	F	160	45	0.46	D	35.5	41
	NB through	0.55	C	31.3	85	1.10	F	94.0	265
	NB right	0.11	A	1.3	3	0.34	B	11.7	36
	SB left	0.68	C	31.6	44	0.59	C	32.5	26
	SB through	0.98	D	50.7	233	0.47	C	22.6	82
	SB right	0.43	A	9.1	42	0.18	A	3.3	11
	Overall	**—**	**E**	**57.7**	**—**	**—**	**E**	**79.6**	**—**
Total future (mitigated)	EB left	0.53	C	27.6	27	1.49	F	265	172
	EB through	1.27	F	169	269	1.31	F	187	327
	WB left	1.34	F	204	144	1.18	F	153	87
	WB through	1.33	F	195	307	1.27	F	175	271
	WB right	0.09	A	0.3	0	0.41	B	14.5	36
	NB left	1.03	F	167	46	0.49	D	37.0	42
	NB through	0.57	C	33.0	93	1.19	F	127	292
	NB right	0.16	A	4.0	9	0.50	B	16.5	63
	SB left	0.74	D	38.0	57	0.62	D	35.5	30
	SB through	1.03	E	64.3	260	0.49	C	23.3	86
	SB right	0.48	B	11.4	55	0.19	A	3.3	12
	Overall	**—**	**F**	**95.5**	**—**	**—**	**F**	**117**	**—**

Under future background conditions, the Bathurst Street and St. John's Sideroad intersection is anticipated to operate at a poor overall level of service (LOS E to F). During the AM peak hour, the westbound left turn is anticipated to significantly exceed capacity, and other movements are also anticipated to be critical (the eastbound, westbound and southbound through movements; the

northbound left turn). During the PM peak hour, several movements are critical (the northbound and westbound through movements; the eastbound, westbound left and southbound left turns).

Although the St. John's Sideroad widening is envisioned as a general mitigation measure, its effect at Bathurst Street would be more limited because the cross-section would return to two lanes on the west side of the intersection, and the second westbound lane would become a "must exit" right turn lane. Mitigation included the introduction of a westbound left turn phase and other minor adjustments to signal timings, generally in the range of 2 to 5 seconds shorter or longer. The maximum cycle length was also extended slightly (recognizing that this intersection is actuated and does not have a fixed cycle length). This would not substantially change the overall level of service (LOS E) but would improve conditions on the westbound left turn movement.

With introduction of site traffic, the overall intersection would operate at LOS F. The same critical movements would continue to exist as under future background conditions. Some of these critical movements would not be substantially affected (the southbound through movement and northbound left turn during the AM peak hour; the westbound and northbound through movements during the PM peak hour). However, other movements would become more constrained due to the addition of site traffic (the eastbound and westbound through movements and the westbound left turn during the AM peak hour; the eastbound through movement and the eastbound and westbound left turns during the PM peak hour).

The analyses assumed that the St. John's Sideroad widening would only reach as far as Bathurst Street. Some additional capacity could be achieved on the eastbound and westbound approaches if the cross-section transition occurs west of the intersection instead of at the intersection. It is anticipated that this would be examined more closely as part of the EA study for the St. John's Sideroad widening.

5.5 Additional Mitigation

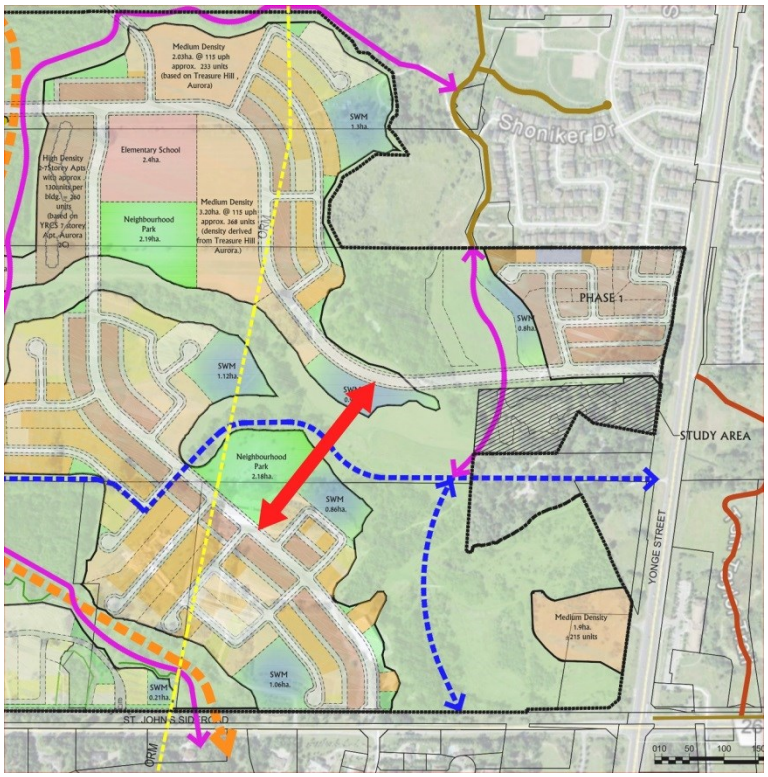
The mitigation described in the preceding sections assumes limited roadway modifications, other than the St. John's Sideroad widening that has been identified in the Region's Transportation Master Plan and in their long-range transportation model. Further opportunities for mitigation of operating conditions are identified below.

5.5.1 Internal Roadway Connections

The concept plan proposes curvilinear collector roads following the topography of the site. The collector road alignment results in any movements between the east and south sides of the site being indirect. This indirectness influences the anticipated assignment of site traffic as documented in ***Section 4.3***. As an example, trips generated by the residential block southwest of the Bennington Road and Yonge Street intersection and destined to/from St. John's Sideroad would most logically travel through the Yonge Street and St. John's Sideroad intersection. An additional connection between the north-south collector and the east half of Bennington Road (approximately as shown in ***Figure 10***) would increase the

directness of travel for some trips and would provide residents with a wider range of viable routing options that would enable them to bypass (and reduce pressure on) congested movements, such as the southbound left turn and westbound right turn at Yonge Street and St. John's Sideroad.

Figure 10: Potential Additional Internal Roadway Connection



An additional link in the area shown in ***Figure 10*** would also result in more direct walking and cycling trips for Phase 3 residents destined to transit stops on Yonge Street. More residents would be within walking distance of transit service (or, if a bus route is added that specifically serves Phase 3, would be within walking distance of different routes traveling in different directions). Additionally, more residents would be within walking distance of higher-order VIVA service. If it is determined that a vehicular connection as shown in ***Figure 10*** is not feasible or not desirable for other reasons, a pedestrian and cycling connection should still be considered in that general location and alignment.

5.5.2 Additional Capacity for Strategic Movements

Certain movements are expected to experience particularly high volumes. One such pair of movements is the southbound left turn and westbound right turn pair at Yonge Street and St. John's Sideroad. The high volumes on these complementary movements reflects the discontinuity in the north-south arterial network through Newmarket and Aurora (i.e., Yonge Street becomes more constrained south of St. John's Sideroad; Bayview Avenue becomes more constrained north of Mulock Drive). While the Region currently prefers not to introduce new dual left turn lanes, in particular due to considerations related to

urban design, pedestrian conditions and intersection footprint, this intersection may be a location where a dual left turn lane or alternative unconventional higher-capacity treatment may be desirable to accommodate a strategic movement pair and/or to encourage diversion of traffic away from more traffic-sensitive areas. It would be appropriate to consider alternative treatments as part of a future EA assessing alternatives for the St. John's Sideroad corridor. Such a venue would allow proper comparison of different considerations and priorities (e.g., traffic capacity; impact on other travel modes; urban design; environmental impact; property and cost implications, etc.).

5.5.3 Transportation Demand Management

The traffic projections prepared for site traffic do not account for reductions to reflect transportation demand management measures that would increase the attractiveness of non-auto travel. The following measures are described in more detail in ***Section 7.0***:

- Introduction of a new VIVA stop at Bennington Road or St. John's Sideroad.
- Creation of a new transit route traveling through the site and offering connections to VIVA and other destinations within the surrounding area, provided that the level of service (particularly service frequency, but also the directness of the route and the span of service) is high enough to be attractive to potential riders).
- Creation of a YRT GO shuttle linking residents to the Aurora or future Mulock GO station.
- Provision of an extensive trail and pathway network within the site, generally as envisioned in the concept plan, with connections to other existing trails outside the site.
- Provision of sidewalks on both sides of all collector roads and potentially both sides of local streets, and off-street bicycle paths within collector road rights of way.
- Provision of pedestrian and cyclist crossing opportunities along collector roads at regular intervals and at strategic locations (e.g., at trail crossings).
- Consideration of means of providing complementary land uses within the site, particularly in proximity to the higher-density residential areas, to allow daily activities to be undertaken within walking distance and without requiring travel by vehicle on the surrounding road network.

6.0 Site Access Considerations

Three primary access points are proposed to the site:

- Bennington Road at Yonge Street;
- Bennington Road at Bathurst Street; and
- The new North/South Collector at St. John's Sideroad (opposite Willow Farm Lane).

The following sections document the anticipated intersection operations and other operational and design considerations at each of these locations.

6.1 Yonge Street at Bennington Road

The Yonge Street and Bennington Road intersection is currently being constructed to accommodate Phase 1 of the Shining Hill development. It is being constructed in an interim configuration to be limited to right turns only, with a channelizing island on Bennington Road and a median island along Yonge Street to discourage left turns. However, the outside curbs have been located to enable the intersection to be converted to a full-movement intersection as such time as traffic volumes satisfy traffic signal warrants; the Bennington Road channelizing island and Yonge Street median island would be removed and/or reconstructed to accommodate left turn lanes.

The intersection volumes were compared against traffic signal warrant thresholds, and the intersection operations were assessed.

6.1.1 Traffic Signal Warrants

The projected peak hour traffic volumes were compared against traffic signal warrant criteria published by the Ministry of Transportation of Ontario (MTO) in Book 12 of the Ontario Traffic Manual (OTM). In most cases, traffic signals are justified on one of three bases:

- ***Traffic volumes*** (including both the total volume of traffic entering the intersection during each of the busiest 8 hours of the day, and the volume of traffic entering the intersection from the side street approaches during each of those same 8 hours.
- ***Traffic delays*** (represented by the combination of the volume of traffic entering the intersection from the main street approaches during each of the busiest 8 hours of the day, and "crossing traffic" during those same 8 hours, comprised primarily of left turns from the side street, pedestrians crossing the main street, some of the through traffic crossing the main street, and potentially some left turns from the main street if certain criteria are met).
- ***A combination*** of volume and delay criteria (i.e., if both the volume and delay warrants are nearly met).

At this location (and the other two proposed access locations), the main street volumes are high enough that the signal justification will depend on the minor leg components of the warrant. The AM and PM

peak hour traffic projections for the turning movements to and from Bennington Street were extrapolated to 8 hours of data. Traffic volumes during the off-peak hours were estimated using an hourly distribution published in the January 2015 edition of *ITE Journal*. The hourly distributions published in *ITE Journal* are reproduced in ***Table 15***; the full article is presented in ***Appendix*** *Error! Reference source not found.*. The majority of projected traffic turning from Bennington Road is associated with the proposed residential units, meaning that the *ITE Journal* hourly distribution of residential trips would be reasonably representative for the traffic using Bennington Road.

Table 15: Typical Hourly Distribution of Trips Generated by Residential Uses

Time	Average weekday	
	% of 24-hour entering traffic	% of 24-hour exiting traffic
6–7 a.m.	1.8	2.4
7–8 a.m.	3.8	1.2
8–9 a.m.	6	2.9
9–10 a.m.	6.6	3.8
10–11 a.m.	9.7	7.5
11–12 p.m.	8.9	9.6
12–1 p.m.	6.9	9.1
1–2 p.m.	8.6	12
2–3 p.m.	6.6	8.2
3–4 p.m.	4.6	6.3
4–5 p.m.	5.5	7.5
5–6 p.m.	3.1	6.7
6–7 p.m.	3.5	4.1
7–8 p.m.	2.7	2.9
8–9 p.m.	3.3	4.3
9–10 p.m.	3.1	3.1
10 p.m.–6 a.m.	15.3	8.4

Source: Aaron T. Zimmeran, PTP. "Hourly Variation in Trip Generation for Office and Residential Land Uses." ITE Journal, January 2015, pp. 20-22.

Table 16 presents the factors that were applied to inbound and outbound volumes during the AM and PM peak hours to derive off-peak volumes.

Table 16: Adjustment Factors for Estimating Hourly Residential Trips

Time	Inbound trips		Outbound trips	
	% of 24-hour volume	% of peak hour volume	% of 24-hour volume	% of peak hour volume
7–8 a.m.	2.5%	67.6% of AM peak	9.0%	98.9% of AM peak
8–9 a.m.	3.7%	100.0% of AM peak	9.1%	100.0% of AM peak
9–10 a.m.	3.7%	100.0% of AM peak	6.5%	71.4% of AM peak
11 a.m.–12 p.m.	4.5%	41.7% of PM peak	5.7%	87.7% of PM peak
12–1 p.m.	5.3%	49.1% of PM peak	5.3%	81.5% of PM peak
3–4 p.m.	8.1%	75.0% of PM peak	6.3%	96.9% of PM peak
4–5 p.m.	9.8%	90.7% of PM peak	6.3%	96.9% of PM peak
5–6 p.m.	10.8%	100.0% of PM peak	6.5%	100.0% of PM peak

Table 17 lists the estimated hourly volume of traffic on the turning movements leading to and from Bennington Road; the volume of traffic associated with the MTO traffic signal warrant criteria; and the percentage to which the projected volumes meet the MTO criteria. (For 8-hour projections of future conditions, the MTO methodology recommends that the volume or delay warrant be met to 120% of the warrant threshold due to the level of uncertainty underlying future traffic projections.) The "crossing traffic" projections do not include pedestrians or cyclists crossing Yonge Street to reach the entrance to the Nokiidaa Trail. While this type of crossing activity is likely to occur, the level of crossing activity is unknown and is therefore not included in the warrant calculations. As a result, the volume inputs to the warrant calculations may be conservatively low.

Table 17: Hourly Turning Movement Volumes, Yonge Street at Bennington Road

Time	Inbound trips		Outbound trips		1b: Volume from minor street		2b: Traffic crossing major street	
	NB left	SB right	EB left	EB right	Vol.	% met	Vol.	% met
7–8 a.m.	34	44	198	242	440	173%	297	396%
8–9 a.m.	50	65	200	245	445	175%	300	400%
9–10 a.m.	50	65	143	175	318	125%	214	286%
11 a.m.–12 p.m.	81	75	140	132	272	107%	210	281%
12–1 p.m.	96	88	130	122	253	99%	196	261%
3–4 p.m.	146	135	155	145	300	118%	233	310%
4–5 p.m.	177	163	155	145	300	118%	233	310%
5–6 p.m.	195	180	160	150	310	122%	240	320%

Warrant thresholds: (1b) 255 veh/h; (2b) 75 veh/h

The projected demand at Yonge Street and Bennington Road would consistently reach or exceed 100% of the volume warrant criteria, and would consistently exceed 120% of the delay criteria. As such, traffic signals are anticipated to be warranted at this intersection.

6.1.2 Intersection Operations

Intersection operations were assessed under traffic signal control. The intersection lane configuration includes northbound and eastbound left turn lanes (as discussed above), as well as a southbound right turn lane (which is part of the interim intersection configuration). The intersection was assumed to be coordinated with a 120-second cycle length. Basic two-phase operations were applied during the AM peak hour; during the PM peak hour, a northbound advance left turn phase was added. ***Table 18*** presents the anticipated total future intersection operations under traffic signal control.

Table 18: Total Future Intersection Operations, Yonge Street and Bennington Road

Scenario:	Movement	AM peak hour				PM peak hour			
		v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Total future Signalized	EB left	0.64	D	53.0	73	0.69	E	62.6	63
	EB right	0.82	E	61.7	85	0.45	B	10.5	19
	NB left	0.59	D	42.3	33	0.65	A	9.4	19
	NB through	0.44	A	9.0	78	0.71	B	12.6	115
	SB through	0.76	B	15.2	197	0.64	B	18.1	157
	SB right	0.07	A	2.7	6	0.20	A	4.7	19
	Overall	—	**B**	**19.4**	—	—	**B**	**16.1**	—

Under total future traffic volumes, and with traffic signals installed, this intersection is anticipated to operate at a good overall level of service (LOS B). No critical movements are anticipated from a capacity perspective during the AM or PM peak hours, although the eastbound right turn and eastbound left turn are anticipated to reach LOS E during the AM and PM peak hours, respectively. The projected eastbound queues can be accommodated without reaching the first upstream intersection west of Yonge Street.

6.2 Bathurst Street and Bennington Road

The proposed Bennington Road westerly access will result in a new intersection along Bathurst Street approximately 300 metres north of Old Bathurst Street. This location corresponds approximately to the midpoint between two horizontal curves. The following aspects of the proposed intersection were reviewed:

- Sight distance at and approaching the intersection;
- Traffic signal warrants; and
- Anticipated intersection operations.

6.2.1 Sight Distance

The proposed new intersection was reviewed to determine whether adequate sight distance will be available for motorists turning from Bennington Road onto Bathurst Street (turning sight distance).

Turning sight distance was reviewed according to the methodology and parameters published by the Transportation Association of Canada (TAC) in Geometric Design Guidelines for Canadian Roads (2017 edition). Turning sight distance requirements were assessed based on an assumed design speed of 90 km/h on Bathurst Street (20 km/h higher than the 70 km/h posted speed limit). For vehicles turning onto a four-lane road with a 90 km/h design speed, the following sight distance is recommended:

- 200 metres to the left (to the south); and
- 185 metres to the right (to the north).

This calculation is based on the following parameters:

- Speed limit (posted) = 70 km/h
- Assumed design speed = 90 km/h
- Number of lanes to cross turning left = 2 lanes
- Time gap turning left = 8.0 seconds (TAC Section 9.9.2.2/Table 9.9.3
- Time gap turning right = 7.5 seconds (TAC Section 9.9.2.2/Table 9.9.3)
- Sight distance required to the left = 200 metres (TAC Section 9.9.2.2/Table 9.9.4)
- Sight distance required to the right = 185 metres (TAC Section 9.9.2.2/Table 9.9.4)

The primary controlling factor on sight distance at the proposed new intersection is the horizontal curvature on Bathurst Street both to the north and to the south of the intersection. Sight triangles were prepared on an air photo (see ***Appendix G***) and reviewed to establish whether adequate sight distance is anticipated. The sight line assessment was completed for the following two cases:

- Decision point at the stop bar; and
- Decision point = 4.4 metres from edge of roadway (as per TAC Section 9.9.2.2)

From this review, there is adequate turning sight distance both to the north and to the south.

6.2.2 Traffic Signal Warrants

The projected peak hour traffic volumes were compared against the OTM Book 12 traffic signal warrants. The same methodology was followed as described in ***Section 6.1.1*** for the Bennington Road and Yonge Street intersection, except that the traffic signal warrant thresholds are lower at this location because of the higher posted speed limit on Bathurst Street.

Table 19 lists the estimated hourly volume of traffic on the turning movements leading to and from Bennington Road; the volume of traffic associated with the MTO traffic signal warrant criteria; and the percentage to which the projected volumes meet the MTO criteria.

Table 19: Hourly Turning Movement Volumes, Bathurst Street at Bennington Road

Time	Inbound trips		Outbound trips		1b: Volume from minor street		2b: Traffic crossing major street	
	NB right	SB left	WB left	WB right	Vol.	% met	Vol.	% met
7–8 a.m.	41	20	84	79	163	91%	84	168%
8–9 a.m.	60	30	85	80	165	92%	85	170%
9–10 a.m.	60	30	61	57	118	65%	61	121%
11 a.m.–12 p.m.	44	63	31	83	114	63%	31	61%
12–1 p.m.	52	74	29	77	106	59%	29	57%
3–4 p.m.	79	113	34	92	126	70%	34	68%
4–5 p.m.	95	136	34	92	126	70%	34	68%
5–6 p.m.	105	150	35	95	130	72%	35	70%

Warrant thresholds: (1b) 180 veh/h; (2b) 50 veh/h

The projected demand at Bathurst Street and Bennington Road is not anticipated to reach the volume warrant criteria. It is anticipated to reach the delay warrant criteria during the morning, but not during the afternoon. As such, traffic signals are not currently anticipated to be warranted at this intersection. Notwithstanding, given the function of Bennington Road as a primary access route, it would be appropriate to design the intersection for potential future installation of traffic signals, and to survey traffic volumes once the development is built out to determine whether traffic demand is higher than projected in this report and whether traffic signals are warranted.

6.2.3 Intersection Operations

Table 20 presents the anticipated intersection operations under total future conditions. Recognizing that traffic signals are not anticipated to be warranted, intersection operations were analyzed under two-way stop control. However, as a sensitivity test, the intersection was also analyzed under traffic signal control. The analyses assumed that southbound and westbound left turn lanes are present; a

northbound right turn lane was also assumed. The signalized analyses assume semi-actuated operations with no advance left turn phases.

Table 20: Total Future Intersection Operations, Bathurst Street and Bennington Road

Scenario:	Movement	AM peak hour				PM peak hour			
		v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Total future Unsignalized	WB left	1.96	F	>200	75	>2.00	F	>200	[n/a]
	WB right	0.15	B	12.4	4	0.52	E	41.0	21
Total future Signalized	WB left	0.37	C	29.4	22	0.15	C	24.9	11
	WB right	0.29	A	9.3	11	0.44	C	30.7	24
	NB through	0.34	A	5.5	36	0.87	B	16.3	211
	NB right	0.03	A	2.1	3	0.14	A	2.1	8
	SB left	0.15	A	6.2	9	0.98	F	106	36
	SB through	0.80	B	12.8	179	0.44	A	6.1	53
	Overall	—	**B**	**11.0**	—	—	**B**	**15.8**	—

Under two-way stop control, the westbound left turn from Bennington Road is expected to substantially exceed capacity during both peak hours. While the projected volume of left-turning traffic is not great (85 vehicles during the AM peak hour; 35 vehicles during the PM peak hour), the high volumes on Bathurst Street provide limited gaps for vehicles to turn.

In the event that traffic signals are installed, the intersection would operate at a good overall level of service (LOS B). No critical movements are identified during the AM peak hour. During the PM peak hour, the northbound through movement and southbound left turn are both anticipated to have exceeded critical v/c thresholds. However, it is possible that the northbound through volumes may be lower than projected since northbound demand at this intersection would be limited by upstream capacity constraints at Bathurst Street and St. John's Sideroad.

6.3 St. John's Sideroad at North/South Collector / Willow Farm Lane

The intersection of St. John's Sideroad and Willow Farm Lane currently operates under two-way stop control. There is a short (approximately 15 metres) westbound left turn lane on St. John's Sideroad, in addition to an eastbound right turn taper.

As noted in ***Section 5.3***, it is anticipated that the planned widening of St. John's Sideroad to 4 lanes will be required to accommodate background growth. It is expected that design alternatives for this intersection would be included as part of an EA study undertaken in advance of the widening. For analysis purposes, it was assumed that the intersection configuration would include left turn lanes on the eastbound, westbound and southbound approaches to the intersection. (Northbound left turn demand is low, and so the northbound approach was assumed to maintain its single existing approach lane.)

6.3.1 Traffic Signal Warrants

The projected peak hour traffic volumes were compared against the OTM Book 12 traffic signal warrants. The same methodology was followed as described in ***Section 6.1.1*** for the Bennington Road and Yonge Street intersection, except that the traffic signal warrant thresholds for justification 1b are lower at this location because the intersection has two side street approaches.

Table 21 lists the estimated hourly volume of traffic on the turning movements leading to and from Bennington Road; the volume of traffic associated with the MTO traffic signal warrant criteria; and the percentage to which the projected volumes meet the MTO criteria.

Table 21: Hourly Turning Movement Volumes, St. John's Sideroad at North/South Collector / Willow Farm Lane

Time	Inbound trips				Outbound trips				1b: Volume from minor street		2b: Traffic crossing major street	
	EB left	EB right	WB left	WB right	NB left	NB right	SB left	SB right	Vol.	% met	Vol.	% met
7–8 a.m.	27	3	14	44	0	64	183	178	361	212%	183	244%
8–9 a.m.	40	5	20	65	0	65	185	180	365	215%	185	247%
9–10 a.m.	40	5	20	65	0	46	132	129	261	153%	132	176%
11 a.m.–12 p.m.	92	2	25	85	4	39	110	48	158	93%	110	146%
12–1 p.m.	108	2	29	101	4	37	102	45	147	86%	102	136%
3–4 p.m.	165	4	45	154	5	44	121	53	174	103%	204	272%
4–5 p.m.	200	5	54	186	5	44	121	53	174	103%	221	295%
5–6 p.m.	220	5	60	205	5	45	125	55	180	106%	235	313%

Warrant thresholds: (1b) 170 veh/h; (2b) 75 veh/h

The projected demand at St. John's Sideroad, the north/south collector and Willow Farm Lane is anticipated to reach or exceed 100% of the volume warrant thresholds for six hours, and to consistently exceed 120% of the delay warrant criteria. As such, traffic signals are anticipated to be warranted at this intersection.

6.3.2 Intersection Operations

Intersection operations were assessed under traffic signal control, recognizing that traffic signals are anticipated to be warranted. The intersection was assumed to be semi-actuated. Basic two-phase operations were applied during the AM peak hour; during the PM peak hour, an eastbound advance left turn phase was added. ***Table 22*** presents the anticipated total future intersection operations under traffic signal control.

Table 22: Total Future Intersection Operations, St. John's Sideroad at North/South Collector / Willow Farm Lane

Scenario:	Movement	AM peak hour v/c	AM peak hour LOS	AM peak hour Delay (s/veh)	AM peak hour 95th %ile queue (m)	PM peak hour v/c	PM peak hour LOS	PM peak hour Delay (s/veh)	PM peak hour 95th %ile queue (m)
Total future Signalized	EB left	0.19	B	10.6	9	0.98	E	73.0	74
	EB through	0.63	B	11.4	78	0.41	A	6.8	52
	WB left	0.13	B	10.5	5	0.24	B	13.9	15
	WB through	0.55	B	10.2	61	0.81	C	20.2	140
	NB approach	0.16	A	8.2	9	0.16	A	3.6	4
	SB left	0.61	C	27.2	36	0.60	D	40.1	37
	SB right	0.43	B	14.1	24	0.14	A	0.7	0
	Overall	—	**B**	**12.2**	—	—	**C**	**20.2**	—

Under total future traffic volumes, and with traffic signals installed, this intersection is anticipated to operate at a reasonable overall level of service (LOS B to C). During the AM peak hour, no critical movements are anticipated, and all individual movements are anticipated to operate at LOS C or better. During the PM peak hour, the eastbound left turn is anticipated to be critical (v/c = 0.98) but would still offer sufficient capacity for projected volumes. The projected westbound queues would not affect operations at the upstream intersection with Yonge Street.

6.4 Property Access

Most development blocks are located internal to the site and would be accessed from collector or local streets. This would include the service commercial and residential block on the southeast corner of Bathurst Street and Bennington Road and the residential block on the southwest corner of Yonge Street and Bennington Road, all of which should have access from Bennington Road rather than the adjacent arterial road.

A residential block is proposed on the west side of Yonge Street, north of St. John's Sideroad. This block has frontage on Yonge Street only and therefore would rely on access from Yonge Street. The block is located directly opposite Hadley Grange, a block of seniors apartments, with a full-movement access 180 metres north of St. John's Sideroad. Normally it would be desirable to align the access of the proposed new block with an existing access on the opposite side of the street. In this case, however, left turn access and egress to/from the new block is complicated by southbound left turn queues at St. John's Sideroad that are expected to extend beyond this point. Further review and discussions with York Region staff are recommended to identify means of providing access to this block.

7.0 Non-Auto Travel Modes

This section reviews conditions for non-auto travel modes (public transit; walking and cycling) and identifies measures for improving the attractiveness of those modes for trips made to, from and within the Phase 3 lands.

7.1 Transit Considerations

Increasing the accessibility of more areas of the site to a variety of transit routes serving a variety of areas, and making those services more attractive, would help make transit more useful for more residents within the site and for a wider range of trips, which would potentially impact the non-auto modal split within the site and reduce the number of single-occupant vehicle trips made by residents.

The existing transit service in the study area was reviewed to identify how much of the development would be transit accessible given the existing route structure, and what alternatives might be available to improve the transit accessibility of the development. The review was undertaken from a quantitative perspective (meeting YRT's guidelines related to walking distance from a transit stop) and a qualitative perspective (the level of transit service that is provided, and attractiveness to potential riders).

7.1.1 Existing Accessibility to Transit Service

YRT has a target that 90% of residents in urban areas should reside within a 500-metre walk of a transit stop. (The target does not specify the level of service provided at that stop — frequency, span, etc. — only the presence of some level of transit service.) This target was compared against the concept plan assuming the existing network is in place. Transit service currently operates on Yonge Street; the following stops were assumed:

- Joe Persechini Drive / Savage Road (existing; VIVA and local service)
- Bennington Road (future; local service only)
- St. John's Sideroad (existing; local service only)

Approximately 1,720 units in Phase 3 would be within a 500-metre walking distance of these three stops (the blocks southwest of Yonge Street and Bennington Road and northwest of Yonge Street and St. John's Sideroad). A small number of units at the southernmost end of the north/south collector road would also be within 500 metres of Yonge Street and St. John's Sideroad. In total, approximately 50% of the units in the concept plan would be within a 500-metre walking distance of a transit stop.

The remaining units would fall outside the 500-metre walking distance. A new or modified bus route would be required for the units in the central part of the development to be within a five-minute walk.

7.1.2 New VIVA Stop

Approximately half of the residents in Phase 3 would be within walking distance of a transit stop, but for most residents this transit stop would be a local stop on Yonge Street offering relatively infrequent service. There is no VIVA stop at St. John's Sideroad because the surrounding area is predominantly rural and low-density suburban with few transit trip generators within walking distance of that intersection, and because there are no intersecting transit routes that could generate transferring activity. There is a gap of nearly 2 kilometres between the stops at Savage Road in Newmarket and at Orchard Heights Boulevard in Aurora.

With a substantial increase in development in the currently undeveloped area between Newmarket and Aurora, it would be appropriate to consider an additional VIVA stop in the vicinity of Phase 3. St. John's Sideroad would be appropriate from the perspective of stop spacing to the north and south. However, Bennington Road might result in more accessible service in terms of number of residents within walking distance of the stop. Stop location could also be influenced by the ultimate route for local transit service (if any) within the Phase 3 lands, so that transfer activity between the two routes can be accommodated.

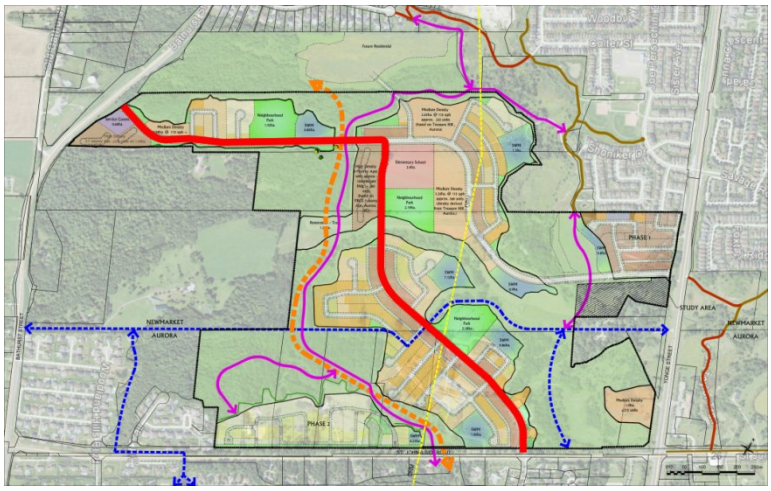
This measure would not increase the number of residents within walking distance of transit, but would increase the number of residents within walking distance of higher-order transit.

7.1.3 Potential Service Expansion to Phase 3

Figure 11 illustrates three potential alternative routings within the site that would result in at least 90% of residents being within a 500-metre walk of transit service:

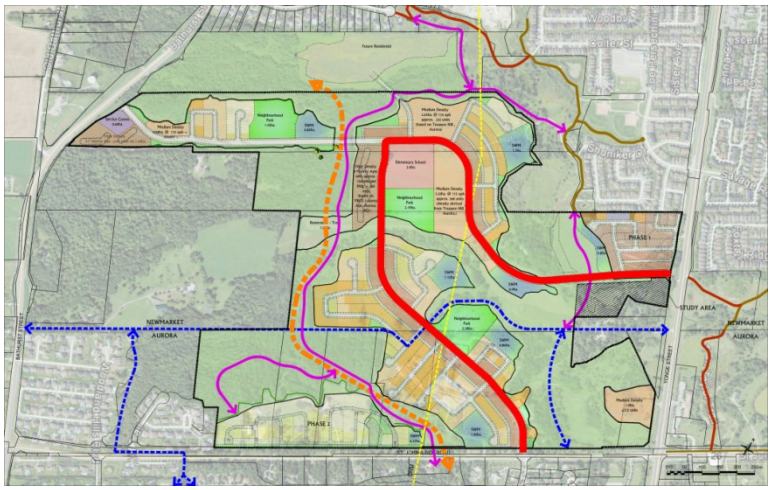
- The ***west-oriented alternative*** would provide two-way service along the full extent of the route (more direct for riders) and would provide coverage to the entire site, but would require an off-street loop at Bathurst Street. (Alternately, the route could be extended farther to the north, although this would be less practical given the limited development that would be served.)
- The ***east-oriented alternatives*** would result in a shorter travel distance for buses and could be accommodated fully on-street, but would involve one-way loops that would result in less direct travel for riders. These alternatives would cover all units other than approximately 290 apartment and townhouse units at the west end of Bennington Road, or approximately 92% of the units in Phase 3.

Figure 11: Potential Internal Bus Routes



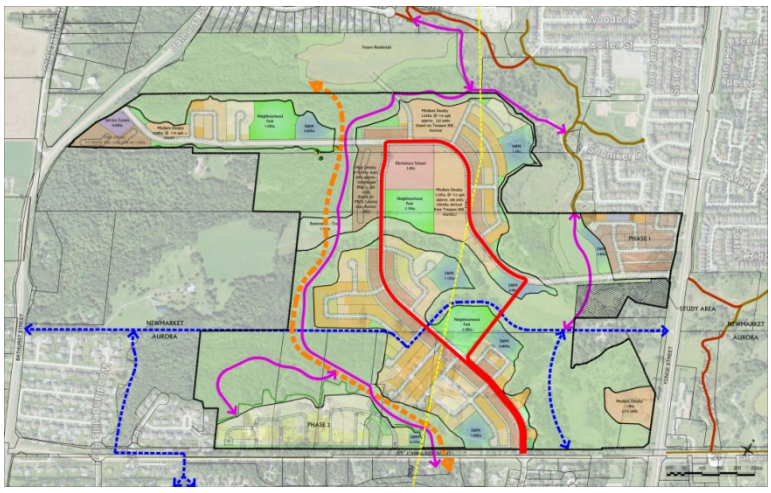
West-oriented route

- Approx. 100% of units within 500-metre walk of bus stop (including Yonge service)
- Two-way service throughout
- Requires off-street loop at Bathurst Street or further extension northerly
- Walking distances from eastern part of central area would improve with additional pedestrian or roadway connection



East-oriented route (base network)

- Approx. 92% of Phase 3 within 500-metre walk of bus stop
- Likely would form part of one-way loop at end of route



East-oriented route (with additional link)

- Approx. 92% of Phase 3 within 500-metre walk of bus stop
- One-way loop at end of route (more direct service within site)

The routing alternatives shown in ***Figure 11*** would form part of a longer route providing service elsewhere in Newmarket or Aurora. This could be through a reconfiguration of an existing route or the creation of a new route.

One alternative could be through the extension of Route 31 (Aurora North), which currently operates on a one-way clockwise loop through northern and central Aurora. It travels through the Yonge Street and St. John's Sideroad intersection via a northbound right turn. This route could be extended so that it travels through the Phase 3 lands via the east-oriented route, as shown in ***Figure 12***.

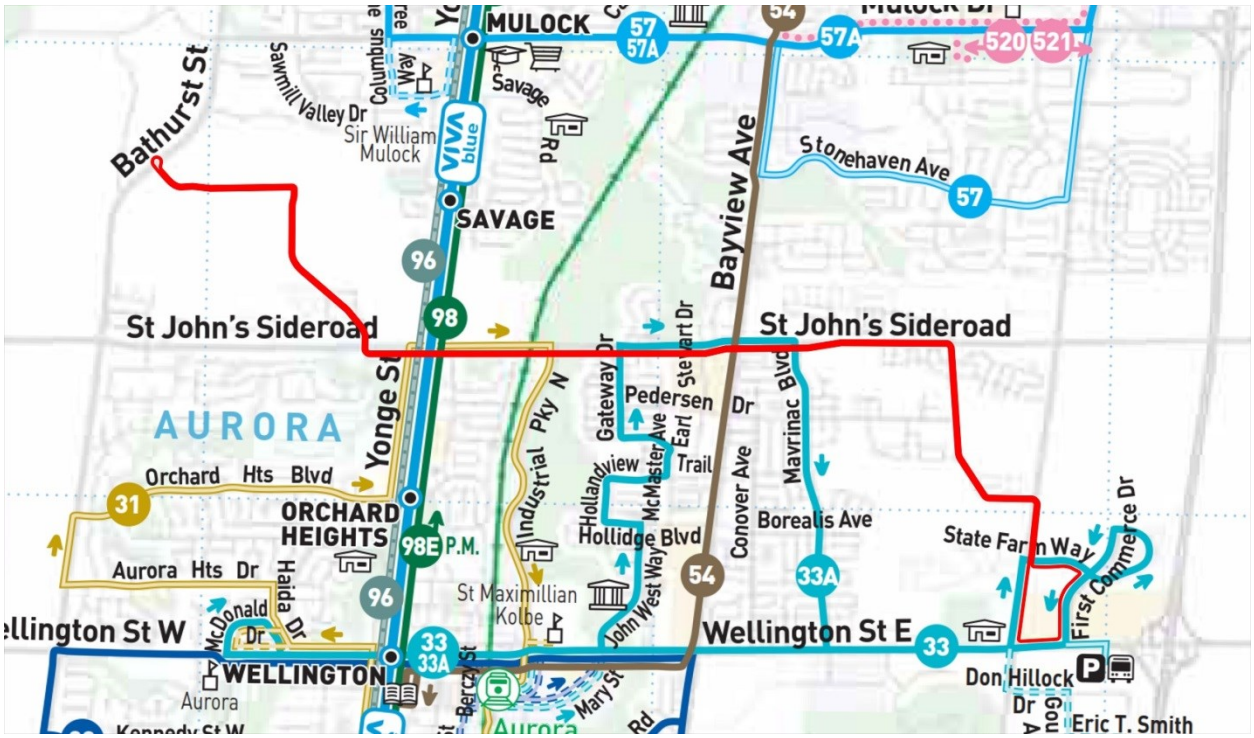
This alternative would be relatively straightforward to implement in that it does not require the creation of a new route. However, the level of service would be poor due to the long headways and limited span of service (AM and PM peak periods only), and due to the circuitous and indirect one-way routing. The additional travel time would also affect the ability to maintain the existing schedule, meaning that headways would need to increase, or an additional bus would need to be allocated to maintain the existing schedule.

Figure 12: Potential Extension of YRT Route 31

If instead a new route is created, this could also be used to extend service to other areas currently outside walking distance to transit. The development area southwest of St. John's Sideroad and Leslie Street is not currently served by transit. Much of the subdivision on the east side of Leslie Street, between Mulock Drive and St. John's Sideroad, also is beyond walking distance of transit, and is unserved by transit outside of weekday peak periods. One of the route alternatives shown in ***Figure 11***

could form the west end of a new east-west grid route extending east along St. John's Sideroad and either extending northerly or southerly to provide service to these currently unserved areas, as illustrated schematically in ***Figure 13***. The southerly alternative may have higher ridership potential because it would serve multiple trip types (i.e., it would serve as a feeder route from residential areas to VIVA service on Yonge Street, but would also provide access to commercial and employment areas in east Aurora). It could also offer flexibility for scheduling by introducing the potential for interlining with Route 33.

Figure 13: Potential New YRT Route on St. John's Sideroad



The travel time was estimated based on an average speed of 24 km/h (400 metres per minute, or 2.5 minutes per kilometre). By comparison, 33 Wellington has a scheduled average speed of approximately 25 km/h eastbound and 27 km/h westbound; 56 Gorham-Eagle has a scheduled average speed of 25 km/h eastbound and 22 km/h westbound. A trip from Bathurst Street and Bennington Road to State Farm Way / First Commerce Drive would be approximately 9 km long per direction, leading to a round trip time of approximately 45 minutes (not including layover time). As an example, three buses could operate a 15- to 20-minute headway.

This alternative would require the creation of a new route and the associated allocation of funding / buses. However, it would offer the opportunity to expand service to areas that are currently unserved by transit. The attractiveness of this route would depend on the level of service (frequency; span) provided.

Further discussion with YRT staff would be required to determine preferred measures for serving the site via transit, as well as the staging of service as development is built out.

7.1.4 Service Levels

Because other local service in Newmarket and Aurora is also relatively infrequent (and, in many cases, with uncoordinated, non-clockface frequencies), connections to/from Yonge Street service can be unattractive and therefore transit is primarily useful for trips starting and ending along the Yonge Street corridor. The design of local transit service within the Phase 3 lands should consider measures to improve the integration between routes and the ability to make transfers more reasonably feasible. A primary factor in making service more attractive and making transfers more feasible is related to frequency of service: operating buses more frequently to reduce waiting times, operating buses at clockface headways to make schedules more memorable, and coordinating schedules for key transfer movements to reduce delays experienced when transferring.

7.1.5 Access to GO Stations

A key potential market for local transit service is for travel to and from GO rail stations. YRT currently operates eight GO shuttle routes, including one to the Aurora GO station. A shuttle route from Phase 3 to the Aurora or Mulock GO stations could reduce travel demand on constrained intersection turning movements leading to and from the east.

7.2 Active Transportation

7.2.1 External Active Transportation Facilities

As part of Phase 1, a sidewalk is being constructed on the west side of Yonge Street from Bennington Road northerly to Joe Persechini Drive. However, there are no sidewalks along Yonge Street between Bennington Road and St. John's Sideroad (other than a 150-metre section on the east side extending from St. John's Sideroad to the Hadley Grange driveway). It is recommended that sidewalk on the west side of Yonge Street be extended southerly to St. John's Sideroad, providing pedestrian access to new development blocks on the west side and providing a walking route to YRT stops at St. John's Sideroad.

The Nokiidaa Trail system ends at Yonge Street approximately opposite from Bennington Road. As part of planning for Phase 1, the Town identified the desire to provide a controlled or protected crossing of Yonge Street for pedestrians and cyclists. Although traffic signals at Bennington Road (either a full signalized intersection or an intersection pedestrian signal) would provide that opportunity, traffic signals were not anticipated to be warranted from a volume perspective. However, traffic signals expected to be warranted for Phase 3 traffic, which would also accommodate pedestrians and cyclists wishing to access the trail from the west side of Yonge Street.

St. John's Sideroad currently has a rural cross-section with no pedestrian or cycling facilities. The bridge crossing Tannery Creek immediately west of Yonge Street has a sidewalk on the south side, but not on

the north side. The planned widening of St. John's Sideroad would also include the urbanization of the cross-section and provision of active transportation facilities. The type, configuration and location of active transportation facilities would be determined as part of the development of alternative roadway cross-sections as part of a future environmental assessment.

Bathurst Street currently has no active transportation facilities. The surrounding area is predominantly rural and as such limited active transportation demand is anticipated along Bathurst Street, and no additional facilities are proposed.

7.2.2 Internal Active Transportation Facilities

The surrounding neighbourhoods in Newmarket and Aurora both feature an extensive off-street trail network. A trail network is also proposed as part of the Phase 3 development, with connections to existing trails to the north and east. The concept plan (see ***Appendix A***) shows existing trails to the north and east of the subject lands, as well as conceptual off-street trails within Phase 3 and their potential relationship with existing trails. In addition, alternative collector road cross-sections have been recommended (see ***Section 8.3***) that could include provision for off-street cycle paths within the right-of-way, which would offer more direct routes for utilitarian cycling.

Sidewalks will also be provided on both sides of all collector roads, and are recommended on both sides of local streets. Given that the Phase 3 plan is conceptual in nature, it is subject to change; any changes to the street network, along with internal private streets that have yet to be configured within townhouse and apartment blocks, should aim for permeability and directness of pedestrian routings.

As the plan develops, pedestrian and cyclist crossing opportunities should be identified along the north-south collector and Bennington Road at regularly spaced intervals and/or strategic crossing locations within built-up areas, as well as at locations where off-street trails meet those streets. These crossings could be in a variety of forms:

- All-way stop controlled intersection (if warranted);
- Pedestrian crossover;
- Pedestrian refuge island (see ***Section 8.4***); and
- Provision of narrower pavement with curb extensions (see ***Section 8.3***).

7.2.3 Complementary Walking Trip Destinations

Although the street, sidewalk and pathway network can be designed to be "walkable", the generation of pedestrian trips depends largely on having complementary land uses within walking distance of each other. The school will generate walking trips from students traveling to and from school, but the majority of the remaining lands are either residential or open space, parkland, natural heritage etc. As the plan evolves, consideration should be given to whether complementary non-residential land uses can (or should) be encouraged within the site in areas of residential concentration to make it more feasible for residents to go about everyday activities without a car (on foot or by bicycle). Even trips

made by vehicle to amenities within the site would have a positive effect on the study area road network, because having those amenities more locally would reduce trip lengths (fewer vehicle-km) and would reduce the number of trips leaving the site and traveling on the external arterial road network.

8.0 Internal Traffic Management

This section documents measures to manage traffic conditions within the site, to be considered as the concept plan is refined and as engineering designs are prepared for the road network.

Although the development area falls within both the Towns of Newmarket and Aurora, the majority of the Phase 3 road network would be in the Town of Newmarket, and as such this section focuses primarily on Newmarket design criteria.

8.1 Town of Newmarket Policies and Design Standards

The Town of Newmarket Official Plan defines different functional classifications to be applied to roadways within the Town — specifically:

- Arterial roads;
- Primary collector roads;
- Minor collector roads; and
- Local roads.

The Official Plan defines the intended function, access characteristics, right-of-way width and other regulations for each classification. ***Table 23*** presents the intended characteristics for local roads and for primary and minor collector roads, which are the likely classifications that may apply to roads within Phase 3.

The characteristics outlined in ***Table 23*** are generally similar to traditional characteristics defined in general industry guidelines, such as the *Geometric Design Guidelines for Canadian Roads* published by the Transportation Association of Canada (TAC).

The Town's Engineering Design Standards and Criteria also document typical geometric design elements for local, minor collector and primary collector roads, along with typical cross-sections. The Town's typical design criteria are presented in ***Table 24***.

Table 23: Characteristics of Roadway Functional Classifications

	Primary Collector	Minor Collector	Local
Function	Designed to carry medium volumes of traffic between Arterial Roads, Minor Collector Roads and Local Roads.	Perform a collector function that do not meet the standards of a Primary Collector Road and would not be economically feasible to reconstruct to a higher standard.	Carry low volumes of traffic at low speed from abutting properties to Collector Roads and Arterial Roads.
Access	Access from abutting properties shall be permitted where access does not result in traffic hazards.	Access to Minor Collector Roads from abutting properties shall be permitted.	Access to Local Roads from abutting properties shall be permitted.
Right-of-way width	Minimum right-of-way widths shall generally be 26 metres and shall not be less than 20 metres.	Minimum width of 23 metres.	Minimum width of 18 metres.
Other regulations	Primary Collector Roads shall be designed to discourage through traffic onto Local Roads. No long-term parking shall be permitted. Sidewalks shall be permitted on both sides of Primary Collector Roads.	No long term parking shall be permitted. Sidewalks shall be provided on both sides of Minor Collector Roads.	Sidewalks shall be provided on at least one side of new Local Roads and shall be added to existing Local Roads where necessary subject to financial constraints.

Source: Town of Newmarket Official Plan

Table 24: Town of Newmarket Design Criteria

Geometric detail	Primary Collector	Minor Collector	Local
Road allowance width *(m)*	26	21	18
Design speed *(km/h)*	60	50	50
Pavement width *(m)* (curb to curb)	14.0	9.0	8.0
Typical AADT	3,000–6,000	1,500–5,000	<1,500
Curb return radius *(m)*	9.0 or 17.0*	9.0	8.0

Source: Town of Newmarket Engineering Design Standards and Criteria
**17.0 m curb return applies at intersection of two streets with 14.0 m pavement width.*

8.2 Identification of Roadway Classification

There are two main roadways within the Phase 3 lands that would be considered to be collector roads (Bennington Road and the north/south collector road). They were reviewed to determine whether they would be likely to be considered as minor or primary collector roads. In particular, the traffic volumes were reviewed at different locations along each street. Town standards refer to 24-hour (AADT) volumes. The traffic forecasts documented in ***Section 4.0*** are for AM and PM peak hour conditions. AADTs were estimated by assuming that the two-way PM peak hour volumes represent 10% of daily

traffic (i.e., AADTs are 10 times greater than PM peak hour volumes). The following AADTs are estimated based on the assumptions above.

- Bennington Road:
  - 4,000 vehicles per day (vpd) east of Bathurst Street
  - 3,000 vpd west of the north-south collector
  - 5,500 vpd east of the north-south collector
  - 4,250 vpd west of Phase 1
  - 6,750 vpd west of Yonge Street
- North-south collector:
  - 4,500 vpd south of Bennington Road
  - 6,000 vpd north of St. John's Sideroad

The Town recommends that minor collectors have AADTs between 1,500 and 5,000 vpd, and that primary collectors have AADTs between 3,000 and 6,000 vpd. The western part of Bennington Road would be consistent with either a minor or primary collector; the other roadway sections would be more consistent with a primary collector.

8.3 Use of Alternative Roadway Cross-Sections

Recent experience in the Town has seen residents in new subdivisions identify concerns with traffic speeds. These concerns tend to be raised on streets with generous dimensions — a combination of wide rights-of-way, wide optical width (e.g., distance between building faces; lack of street trees), wide pavement, and/or long, straight vistas. Some of these factors may relate to urban design elements, while others relate to roadway design criteria and standards. For example, the Town's design standards for primary collector roads dictate a 26-metre right-of-way and 14-metre pavement width (sufficient for four lanes of traffic). Although the function of a collector road is typically considered to have a balance between traffic movement and property access, a 26-metre right-of-way and four-lane cross-section are more consistent with prioritizing traffic movement and are less compatible with a roadway traveling through the centre of a residential neighbourhood.

While most residential streets in the Town are typically signed with a 40 km/h speed limit, the primary collector road standards tend to encourage higher speeds. This appears to have been the case on other primary collector roads in the Town that have been designed to that standard (e.g., speed complaints on Veterans Way in the Copper Hills subdivision; a subsequent reconfiguration of the pavement markings and designation of community safety zones on Woodspring Avenue). Meanwhile, other primary collector roads in the Town (and other municipalities) function adequately with geometry that is more in keeping with the surrounding residential context and that is more likely to encourage lower travel speeds.

The Town's local street standard specifies a narrower pavement width of 8.0 metres that accommodates a parking lane on one side. These streets have also been the subject of speeding concerns in cases

where the parking lane is unused, and the remaining 8 metres is wide open with little side friction in the form of parked vehicles or opposing traffic (given the relatively low volumes on local streets). In some cases the parking lane may be underused because all parking requirements are satisfied off-street. In other cases the parking lane may be unusable or underused because of limited distances between driveways, presence of hydrants, or other policy-based parking restrictions.

Other design elements can also contribute to speeding concerns. In particular, 17-metre corner radii are specified for the intersection of two primary collector roads. These radii are broader than those on many arterial roads, encourage high turning speeds and low stop compliance, and increase pedestrian crossing distances.

An alternative set of policies and design principles are proposed for the design of collector and local streets within Phase 3 as a proactive traffic management measure. It is intended that the roadway cross-section and surrounding urban form (e.g., distance between building faces; landscaping) be compact in nature so that the streets in the neighbourhood are designed to encourage low driving speeds and so that the major internal roadways are not perceived as being barriers. While the recommended measures may deviate from typical Town standards, the principles and standards are intended to be consistent with recent industry guidelines (e.g., "complete street" guidelines; NACTO publications addressing urban streets and bikeways; City of Toronto lane width and corner radii) that aim to rebalance the use of streets in urban areas. In addition to serving as a traffic management measure, narrower cross-sections will also reduce roadway footprint and would be more compatible with crossings of environmentally sensitive areas.

The following policies and standards are proposed for application when preparing roadway designs within Phase 3:

- Collector roads will be designed with a pavement width of 7.0 metres, measured from curb to curb. This width accommodates one 3.5-metre travel lane in each direction, which is adequate to accommodate projected traffic volumes and is wide enough to accommodate the vehicles expected to use these streets (including buses, emergency vehicles and single-unit trucks).
- Local streets will be designed with a pavement width of 6.0 metres, measured from curb to curb. This width accommodates one 3.0-metre travel lane in each direction, which is sufficient for low traffic volumes and is consistent with driveway widths specified in the Ontario Building Code for fire routes on private property.
- Where a parking lane is provided, the pavement width will be increased by 2.0 metres. Parking lanes will be defined by curb extensions such that they are only provided where a relatively continuous parking lane can be provided, and will be terminated with curb extensions where parking is not or cannot be provided (including at approaches to intersections), and where parking is not reasonably anticipated to be used.
- Additional pavement width will not be provided for bicycle lanes. Instead, bicycle facilities will be provided off-street within the right-of-way.

- Opportunities should be considered for cross-sections and building forms that reduce the right-of-way width and/or the optical width of the street by bringing building faces closer to the sidewalk and through placement of street trees. This would apply both to local streets and to collector roads.
- Traffic capacity will not be a governing consideration, other than to ensure that traffic entering from Regional roads does not affect operations of through traffic on those roads. To the extent that traffic volumes increase friction , they have a positive impact on reducing travel speeds.
- Additional pavement width will not be provided for auxiliary turn lanes or two-way left turn lanes (other than auxiliary lanes that may be provided at intersections with arterial roads).
- To reduce vehicle turning speeds and reduce pedestrian crossing distances, intersection corner radii will be the minimum that will accommodate the largest vehicle that would typically be expected within the subdivision (e.g., a single-unit truck).
- The corner radii will assume that these occasional large vehicles will be able to use as much of the roadway as necessary when completing a turn, subject to the likelihood that that part of the roadway would not normally be expected to be occupied by a vehicle for extended periods (e.g., parked cars; higher-volume stop or signal controlled intersection approaches).
- Sidewalks will be provided on both sides of all collector roads and both sides of all local streets. Sidewalks on local streets may be positioned directly adjacent to the curb (or formed with monolithic curb and gutter) to reduce the perceived width of the street.
- Bicycle paths will be provided adjacent to all collector roads in the form of separate dedicated or multi-use paths generally adjacent to the road and within the right-of-way. Bicycle travel elsewhere will be in mixed traffic on local streets, or on off-street trails and paths.
- Pedestrian crossings will be provided at regular intervals and strategic locations along collector roads (e.g., trail crossings). These may be in the form of all-way stop controlled intersections (if warranted), pedestrian crossovers, pedestrian refuge islands or reduced roadway width with curb extensions.

8.4 Traffic Calming

The roadway design elements identified above are intended to apply broadly throughout the site to serve a traffic calming function. Other measures that may be considered include the following:

- ***Raised crosswalks:***

  Speed humps are commonly identified as potential measures to reduce traffic speeds, although they are often discouraged on collector roads that may be intended as transit routes or emergency access routes. As an alternative, consideration may be given to providing raised pedestrian crossings with vertical profiles designed to match the intended travel speed on the road (typically 40 km/h). As noted above, regular pedestrian crossings are recommended within the built-up area of the site. Providing raised crosswalks at these locations would introduce a vertical traffic calming component.
- ***Gateway or pedestrian refuge islands:***

  Short median islands should be considered as gateway treatments at the transition between natural heritage and built-up areas, and/or as pedestrian refuge islands at crossings with off-street

trails. The geometry of the deflection of through traffic should be consistent with the intended travel speed on the road (typically 40 km/h) after undertaking a "fastest path" analysis of a passenger vehicle traveling through the area of deflection.

9.0 Summary

This Transportation Mobility Plan has been prepared as part of the Official Plan amendment for Phase 3 of the Shining Hills Estates development within the Towns of Newmarket and Aurora. The site is located north of St. John's Sideroad, and extends between Bathurst Street and Yonge Street. A concept plan has been developed by Malone Given Parsons Inc. (MGP) that envisions approximately 3,500 residential units, in addition to a school, a small service commercial block, and an extensive natural heritage / open space network with an associated trail system. Two collector roads would provide access from the surrounding arterial roads: an east-west collector (Bennington Road) extending between Bathurst Street and Yonge Street, and a north-south collector extending between Bennington Road and St. John's Sideroad.

It is anticipated that Phase 3 will be built out incrementally over a number of years, with full built-out not occurring for 15 to 20 years. Given the long-term nature of development and the preliminary nature of the concept plan prepared by MGP, this study is intended to form an initial overall assessment of anticipated transportation conditions, constraints and opportunities that would then inform any future iterations or modifications of the concept plan.

At full build-out, the Phase 3 development concept is anticipated to generate approximately 1,570 vehicle trips during the AM peak hour and 1,925 vehicle trips during the PM peak hour.

The intersections between the arterial roads surrounding the site are anticipated to experience capacity constraints on several movements under future background conditions (i.e., without development on the subject lands). These constraints can be partially mitigated through the widening of St. John's Sideroad to four lanes between Bathurst Street and Yonge Street; this widening has been identified by the Region in their latest Transportation Master Plan and is reflected in their long-range transportation model, but is not part of the 10-year capital plan and is not funded or scheduled, and an EA would need to be undertaken to confirm the need and identify a preferred cross-section and alignment. For other capacity constraints, some level of mitigation may be achieved through signal timing and phasing adjustments, although in most cases the effects would be minor.

Development of the site is not anticipated to result in additional movements being identified as being critical, but would contribute to some movements that are already identified as being critical under background conditions:

- The westbound left turn at Yonge Street and Mulock Drive;
- Westbound movements at Bathurst Street and St. John's Sideroad during the AM peak hour, and eastbound movements during the PM peak hour; and
- The southbound left turn and westbound right turn at Yonge Street and St. John's Sideroad.

To mitigate conditions on the surrounding arterial network from a design perspective, the following measures are recommended:

- An examination of opportunities to maximize capacity on the southbound left turn and westbound right turn at Yonge Street and St. John's Sideroad as part of the St. John's Sideroad EA, including consideration of dual left turn lanes and alternative, unconventional design treatments, but also accounting for other considerations and factors unrelated to traffic capacity.
- Consideration of shifting the transition from four to two lanes on St. John's Sideroad so that it occurs west of the Bathurst Street intersection rather than immediately at the intersection.

To access the site from the adjacent arterial roads, the following is recommended:

- At Yonge Street and Bennington Road, the unsignalized right-in / right-out intersection (being constructed for Phase 1) is expected to warrant traffic signals and should be reconstructed as a signalized, full-movement intersection.
- Bathurst Street and Bennington Road will be a new intersection; the proposed intersection location is anticipated to provide adequate turning sight distance for traffic turning onto Bathurst Street. The projected volumes at this intersection are not currently expected to reach signal warrant thresholds; however, the intersection should be constructed so that signals can be installed if volumes are higher than projected and warrant the installation of signals.
- At St. John's Sideroad and the north-south collector / Willow Farm Lane, traffic signals are anticipated to be warranted.
- Most development blocks will be accessible from the collector road network. One block has frontage on Yonge Street only and would therefore need to be accessed from Yonge Street directly; further investigation and discussions are required to identify access strategies that mitigate conflicts with southbound left turn queues at St. John's Sideroad.

To improve transit accessibility and level of service, the following measures are recommended:

- Construction of an additional VIVA stop on Yonge Street at a location to be determined (e.g., Bennington Road; St. John's Sideroad).
- Introduction of additional roadway and/or pedestrian linkages within the site to increase the directness of walking trips to bus stops on Yonge Street and/or new bus stops within the site.
- Introduction of a local YRT route traveling through the site and extending elsewhere within Newmarket or Aurora, providing connections to service along Yonge Street.
- Consideration of an additional GO shuttle connecting the site to the Mulock or Aurora GO stations.
- Introduction of more frequent service to reduce waiting times and other measures to improve connectivity with intersecting routes.

To improve conditions for cycling and encourage cycling activity by residents that may not be comfortable riding around traffic, the following measures are recommended:

- Continuing to plan for a network of off-street trails and bicycle routes through the subject lands, and maximizing connections to existing facilities outside the site (both in terms of locations and crossing treatment).
- Providing off-street bicycle paths within the rights-of-way of the proposed collector roads.

To improve walkability and encourage walking trips, the following measures are recommended:

- Construction of a sidewalk along the west side of Yonge Street between Bennington Road and St John's Sideroad.
- Planning for the provision of active transportation facilities along St. John's Sideroad as part of the development of alternatives in the St. John's Sideroad EA, and construction of those facilities when the road is widened.
- Provision of sidewalks on both sides of all collector roads within the site, and consideration of providing sidewalks on both sides of local streets as well.
- Addition of a roadway, or if not feasible or if undesirable for other reasons, an active transportation facility, linking Bennington Road and the north-south collector in the east end of the site to allow for more direct pedestrian routing. In addition, directness and permeability of pedestrian routes should be kept in consideration as local streets in the concept plan are refined and as larger blocks are designed in more detail.
- Provision of pedestrian crossings at regular intervals along collector roads within built-up areas, and at other strategic locations (trail crossings), with possible treatments including:
  - All-way stop controlled intersection (if warranted);
  - Pedestrian crossover;
  - Pedestrian refuge island; and/or
  - Provision of narrower pavement with curb extensions.
- Identification of potential complementary land uses that would generate walking trips within the subdivision and allow residents to go about daily activities without having to drive on the surrounding arterial roads.

Both Bennington Road and the north-south collector road are anticipated to be designated as primary collector roads. ***The following policies are recommended as proactive traffic management measures*** to encourage lower traffic speeds and to make the collector roads more compatible with the surrounding residential context:

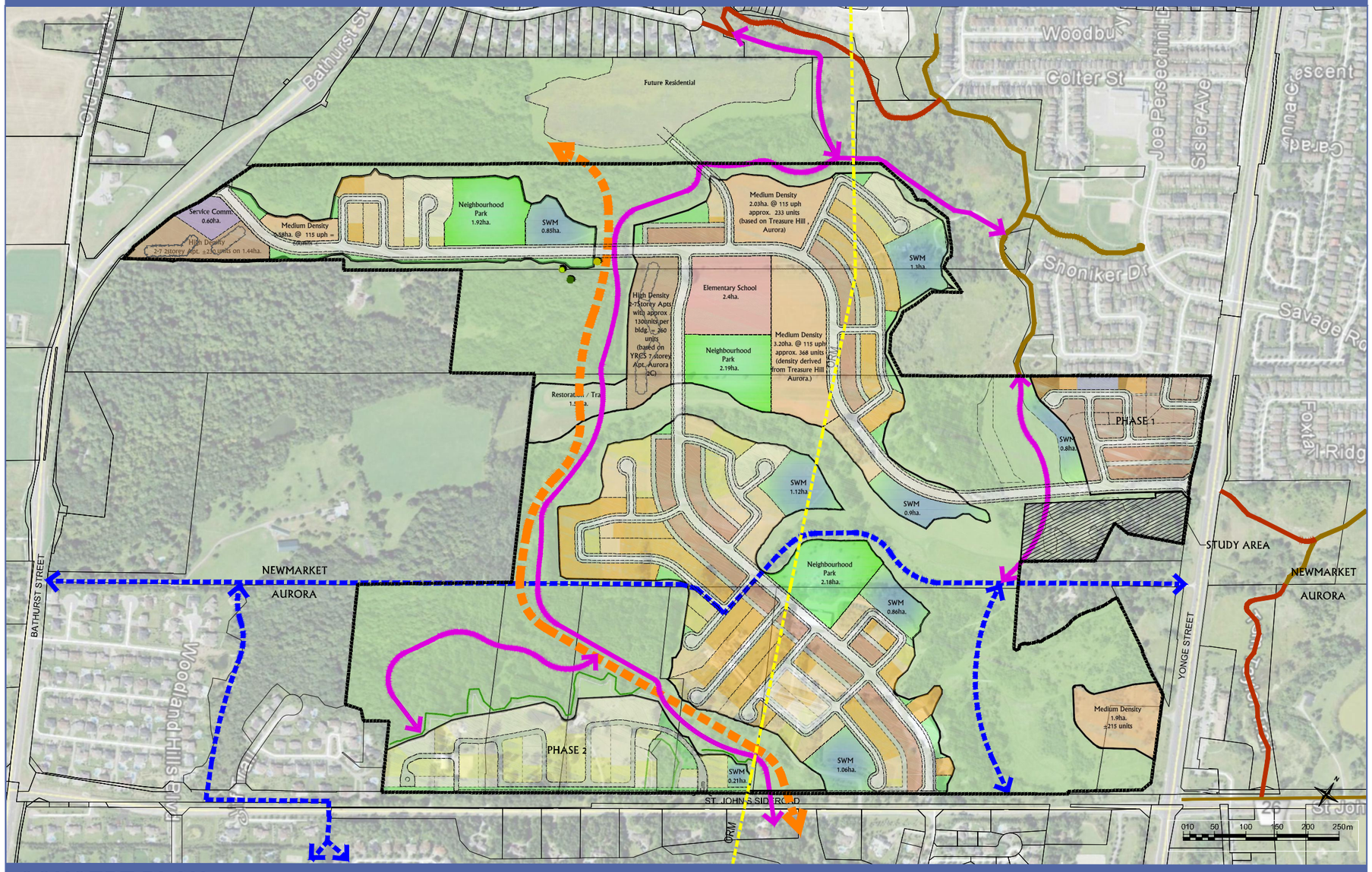
- Traffic capacity will not be a primary determinant of collector road requirements, other than to ensure that traffic entering from Regional roads does not affect operations of through traffic on those roads.
- Collector roads and local streets will be designed with road widths of 7.0 metres and 6.0 metres in sections where parking lanes are not provided, and increased by 2.0 metres per parking lane. Parking lanes will be defined by curb extensions.
- Bicycle facilities will be provided off-street within the right-of-way rather than adding to the roadway width.

- Opportunities should be considered for cross-sections and building forms that reduce the optical width of the street by bringing building faces closer to the sidewalk and through placement of street trees.
- Corner radii will be designed to encourage lower turning speeds and reduced pedestrian crossing distance by assuming that occasional larger vehicles can make as much use of the available roadway (i.e., not including stopped or parked vehicles) as is necessary when completing their turn.
- Other traffic calming elements may be considered, including raised pedestrian crossings and gateway / pedestrian refuge islands that are designed to accommodate traffic at a maximum of 40 km/h.

Appendix A

Phase 3 Development Concept Plan

SHINING HILL ESTATE COLLECTION INC.



CONCEPT PLAN

DRAFT - FOR DISCUSSION ONLY

LAND USE AREAS	AREA	UNITS	% OF OWNERSHIP
Low Density	32.3 ha.	889 units	20.8%
Medium Density	7.7 ha.	±875 units	5.0%
High Density	3.7 ha.	±490 units	2.4%
Service Commercial	0.6 ha.		0.4%
School	2.4 ha.		1.6%
Neighbourhood Park	6.1 ha.		3.9%
SWM	7.0 ha.		4.5%
Vista's	2.3 ha.		1.5%
Restoration/Trail	1.5 ha.		1.0%
Roads	18.6 ha.		12.0%
Laneways	3.0 ha.		1.9%
Total Net Developable Area	**85.3 ha.**	**±2,254 UNITS**	**54.5%**
NHS	70.1 ha.		45.1%
TOTAL OWNERSHIP	**155.4 ha.**		

LOW DENSITY RESIDENTIAL	Units	Frontage	
Single Family Detached 18.3m	75	1,373m	4,503'
Single Family Detached 15.24m	48	732m	2,400'
Single Family Detached 13.7m	42	575m	1,888'
Single Family Detached 12.2m	123	1,501m	4,923'
Single Family Detached 11.0m	224	2,464.0m	8,084'
Single Family Detached 11.3	5	57m	185'
Single Family Detached 7.6	8	61m	200'
Semi-Detached 15.85m	10	79m	260'
Street Access Townhouses 6.1m	105	641m	2,101
Lane Access Townhouses 6.1m	254	1,549m	5,083'
TOTAL	**889**	**9,031m**	**29,628'**

Lot depths are 30m

TRAIL SYSTEM
- Existing Paved Trail
- Existing Mixed Surface Trail
- Planned / Proposed Trail System
- Potential Trail Linkages through Site
- Potential Wildlife Corridor
- Oak Ridges Moraine Boundary

Development limits are preliminary

Air Photography: Google Earth 2015
Date: November 6, 2017

MALONE GIVEN PARSONS LTD.

Prepared for:
SHINING HILL ESTATE COLLECTION INC.

Appendix B

Traffic Volume Data

Horizon Data Services Ltd

318 Simonston Blvd
Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Bathurst St at Mulock Dr
Site Code : 00000000
Start Date : 7/31/2019
Page No : 1

Groups Printed- Cars - Trucks - Heavys - Cyclists

	Bathurst St From North					Mulock Dr From East					Bathurst St From South					Mulock Dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	5	169	90	0	264	54	9	59	0	122	24	65	1	0	90	0	2	0	0	2	478
07:15 AM	5	223	115	0	343	61	7	65	0	133	33	77	0	0	110	0	6	2	0	8	594
07:30 AM	3	200	101	0	304	61	11	76	0	148	49	74	0	0	123	0	6	0	0	6	581
07:45 AM	1	256	115	0	372	60	13	67	0	140	64	81	1	0	146	2	10	2	0	14	672
Total	14	848	421	0	1283	236	40	267	0	543	170	297	2	0	469	2	24	4	0	30	2325
08:00 AM	7	199	107	0	313	78	16	81	1	176	69	81	0	0	150	3	6	1	0	10	649
08:15 AM	0	228	99	0	327	63	12	74	0	149	75	112	0	0	187	0	3	2	0	5	668
08:30 AM	1	157	93	0	251	70	24	77	0	171	67	111	1	0	179	0	9	3	0	12	613
08:45 AM	2	238	97	0	337	88	15	56	0	159	65	119	1	0	185	1	5	1	0	7	688
Total	10	822	396	0	1228	299	67	288	1	655	276	423	2	0	701	4	23	7	0	34	2618
04:00 PM	5	134	85	0	224	125	13	56	0	194	84	207	1	0	292	2	19	10	0	31	741
04:15 PM	4	152	73	0	229	114	13	61	0	188	71	255	0	0	326	1	19	6	0	26	769
04:30 PM	3	140	64	1	208	161	16	81	0	258	75	232	1	0	308	2	20	12	0	34	808
04:45 PM	15	167	80	0	262	142	13	85	0	240	91	297	1	0	389	2	28	6	0	36	927
Total	27	593	302	1	923	542	55	283	0	880	321	991	3	0	1315	7	86	34	0	127	3245
05:00 PM	7	152	62	0	221	178	19	86	0	283	96	276	0	0	372	0	24	14	0	38	914
05:15 PM	10	181	72	0	263	128	16	80	0	224	93	316	2	0	411	2	28	13	0	43	941
05:30 PM	11	125	76	0	212	163	19	62	0	244	93	252	0	0	345	2	30	11	0	43	844
05:45 PM	7	140	94	0	241	123	9	54	0	186	76	242	0	0	318	0	14	8	0	22	767
Total	35	598	304	0	937	592	63	282	0	937	358	1086	2	0	1446	4	96	46	0	146	3466
Grand Total	86	2861	1423	1	4371	1669	225	1120	1	3015	1125	2797	9	0	3931	17	229	91	0	337	11654
Apprch %	2	65.5	32.6	0		55.4	7.5	37.1	0		28.6	71.2	0.2	0		5	68	27	0		
Total %	0.7	24.5	12.2	0	37.5	14.3	1.9	9.6	0	25.9	9.7	24	0.1	0	33.7	0.1	2	0.8	0	2.9	
Cars	85	2790	1364	1	4240	1593	225	1106	1	2925	1105	2723	9	0	3837	17	228	89	0	334	11336
% Cars	98.8	97.5	95.9	100	97	95.4	100	98.8	100	97	98.2	97.4	100	0	97.6	100	99.6	97.8	0	99.1	97.3
Trucks	0	23	14	0	37	32	0	7	0	39	8	12	0	0	20	0	0	0	0	0	96
% Trucks	0	0.8	1	0	0.8	1.9	0	0.6	0	1.3	0.7	0.4	0	0	0.5	0	0	0	0	0	0.8
Heavys	1	46	45	0	92	44	0	7	0	51	12	61	0	0	73	0	0	2	0	2	218
% Heavys	1.2	1.6	3.2	0	2.1	2.6	0	0.6	0	1.7	1.1	2.2	0	0	1.9	0	0	2.2	0	0.6	1.9
Cyclists	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	4
% Cyclists	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4	0	0	0.3	0

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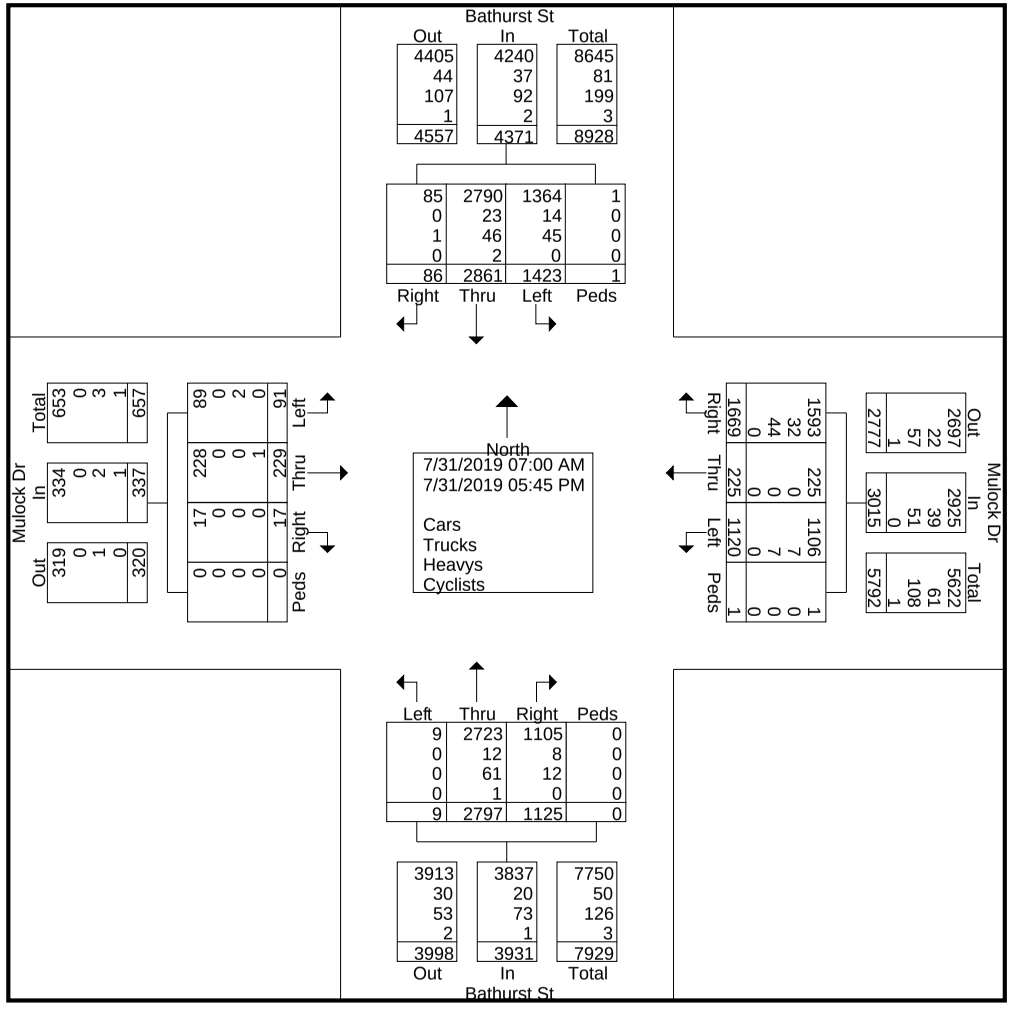
File Name : Bathurst St at Mulock Dr
Site Code : 00000000
Start Date : 7/31/2019
Page No : 2



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File Name : Bathurst St at Mulock Dr
Site Code : 00000000
Start Date : 7/31/2019

	Bathurst St From North					Mulock Dr From East					Bathurst St From South					Mulock Dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	**7**	199	**107**	0	313	78	16	**81**	**1**	**176**	69	81	0	0	150	**3**	6	1	0	10	649
08:15 AM	0	228	99	0	327	63	12	74	0	149	**75**	112	0	0	**187**	0	3	2	0	5	668
08:30 AM	1	157	93	0	251	70	**24**	77	0	171	67	111	**1**	0	179	0	**9**	**3**	0	**12**	613
08:45 AM	2	**238**	97	0	**337**	**88**	15	56	0	159	65	**119**	1	0	185	1	5	1	0	7	**688**
Total Volume	10	822	396	0	1228	299	67	288	1	655	276	423	2	0	701	4	23	7	0	34	2618
% App. Total	0.8	66.9	32.2	0		45.6	10.2	44	0.2		39.4	60.3	0.3	0		11.8	67.6	20.6	0		
PHF	.357	.863	.925	.000	.911	.849	.698	.889	.250	.930	.920	.889	.500	.000	.937	.333	.639	.583	.000	.708	.951
Cars	9	800	377	0	1186	281	67	285	1	634	273	398	2	0	673	4	23	6	0	33	2526
% Cars	90.0	97.3	95.2	0	96.6	94.0	100	99.0	100	96.8	98.9	94.1	100	0	96.0	100	100	85.7	0	97.1	96.5
Trucks	0	6	5	0	11	9	0	2	0	11	1	1	0	0	2	0	0	0	0	0	24
% Trucks	0	0.7	1.3	0	0.9	3.0	0	0.7	0	1.7	0.4	0.2	0	0	0.3	0	0	0	0	0	0.9
Heavys	1	16	14	0	31	9	0	1	0	10	2	23	0	0	25	0	0	1	0	1	67
% Heavys	10.0	1.9	3.5	0	2.5	3.0	0	0.3	0	1.5	0.7	5.4	0	0	3.6	0	0	14.3	0	2.9	2.6
Cyclists	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0.1	0	0	0	0	0	0.0

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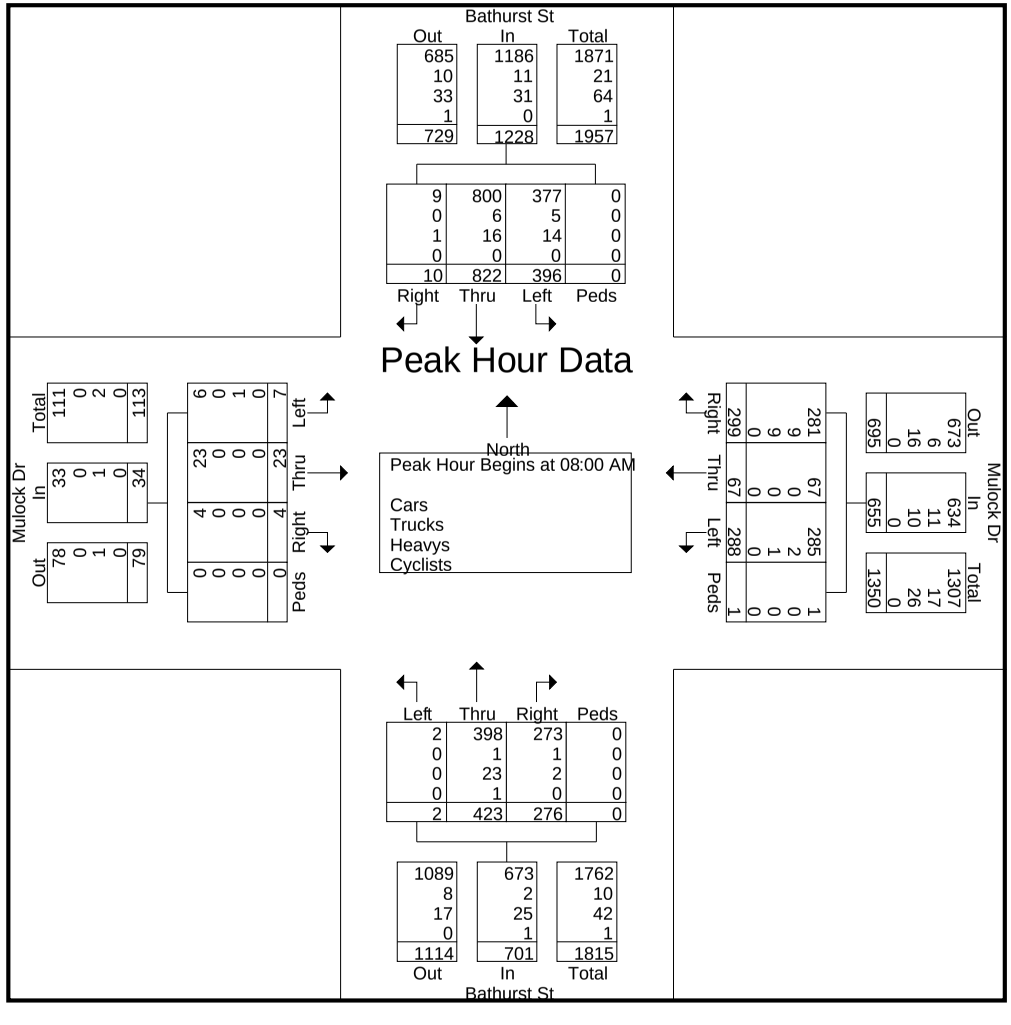
File Name : Bathurst St at Mulock Dr
Site Code : 00000000
Start Date : 7/31/2019
Page No : 4



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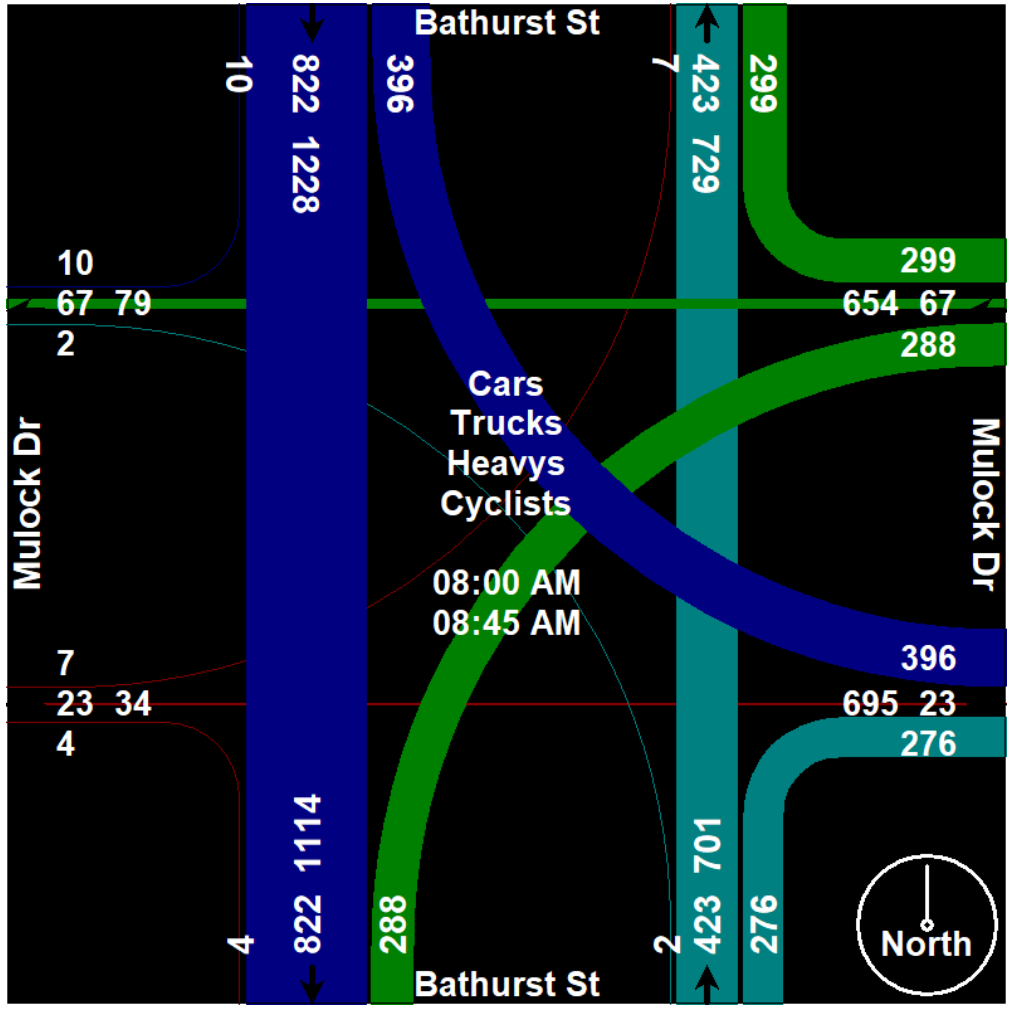
File Name : Bathurst St at Mulock Dr
Site Code : 00000000
Start Date : 7/31/2019
Page No : 5



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File Name : Bathurst St at Mulock Dr
Site Code : 00000000
Start Date : 7/31/2019

	Bathurst St From North					Mulock Dr From East					Bathurst St From South					Mulock Dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**15**	167	**80**	0	262	142	13	85	0	240	91	297	1	0	389	**2**	28	6	0	36	927
05:00 PM	7	152	62	0	221	**178**	**19**	**86**	0	**283**	**96**	276	0	0	372	0	24	**14**	0	38	914
05:15 PM	10	**181**	72	0	**263**	128	16	80	0	224	93	**316**	**2**	0	**411**	2	28	13	0	**43**	**941**
05:30 PM	11	125	76	0	212	163	19	62	0	244	93	252	0	0	345	2	**30**	11	0	43	844
Total Volume	43	625	290	0	958	611	67	313	0	991	373	1141	3	0	1517	6	110	44	0	160	3626
% App. Total	4.5	65.2	30.3	0		61.7	6.8	31.6	0		24.6	75.2	0.2	0		3.8	68.8	27.5	0		
PHF	.717	.863	.906	.000	.911	.858	.882	.910	.000	.875	.971	.903	.375	.000	.923	.750	.917	.786	.000	.930	.963
Cars	43	611	273	0	927	589	67	310	0	966	370	1129	3	0	1502	6	110	43	0	159	3554
% Cars	100	97.8	94.1	0	96.8	96.4	100	99.0	0	97.5	99.2	98.9	100	0	99.0	100	100	97.7	0	99.4	98.0
Trucks	0	7	3	0	10	7	0	1	0	8	0	4	0	0	4	0	0	0	0	0	22
% Trucks	0	1.1	1.0	0	1.0	1.1	0	0.3	0	0.8	0	0.4	0	0	0.3	0	0	0	0	0	0.6
Heavys	0	6	14	0	20	15	0	2	0	17	3	8	0	0	11	0	0	1	0	1	49
% Heavys	0	1.0	4.8	0	2.1	2.5	0	0.6	0	1.7	0.8	0.7	0	0	0.7	0	0	2.3	0	0.6	1.4
Cyclists	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Cyclists	0	0.2	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0

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318 Simonston Blvd
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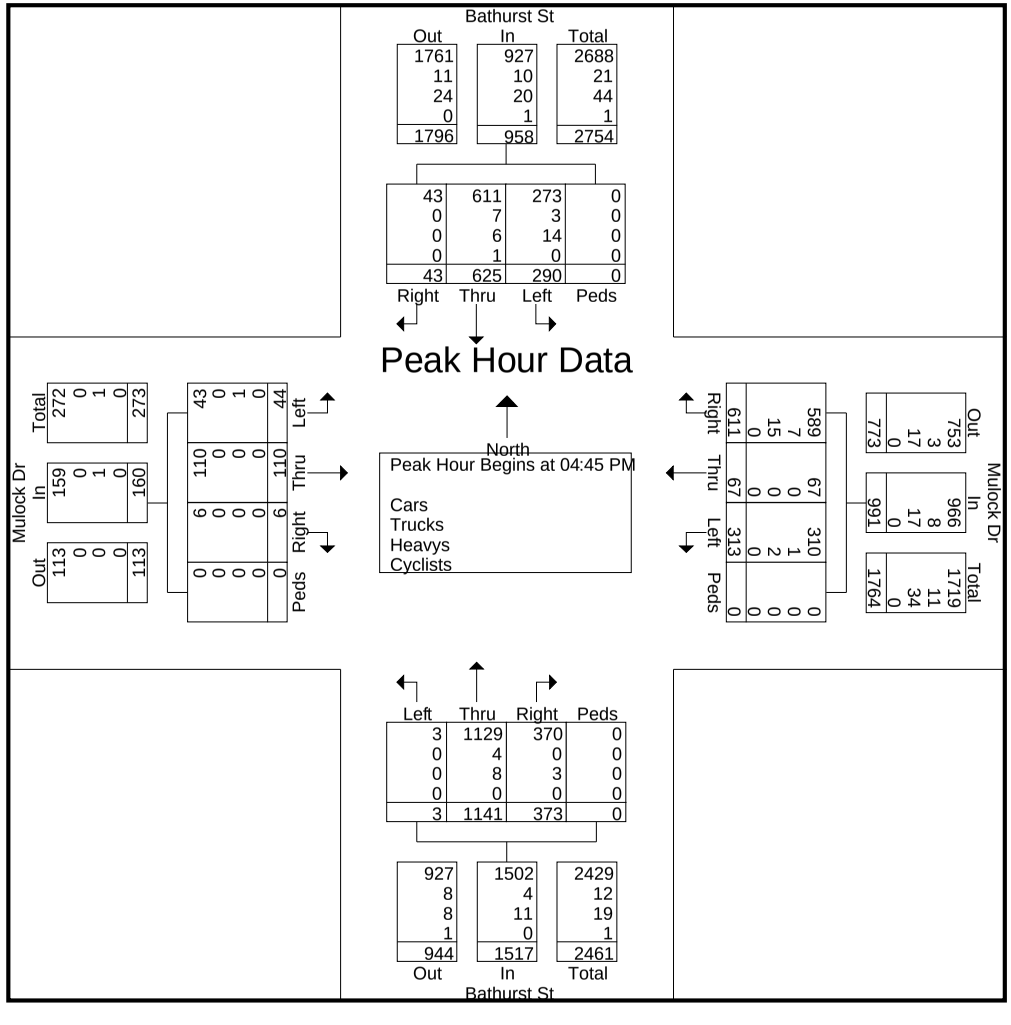
File Name : Bathurst St at Mulock Dr
Site Code : 00000000
Start Date : 7/31/2019
Page No : 7



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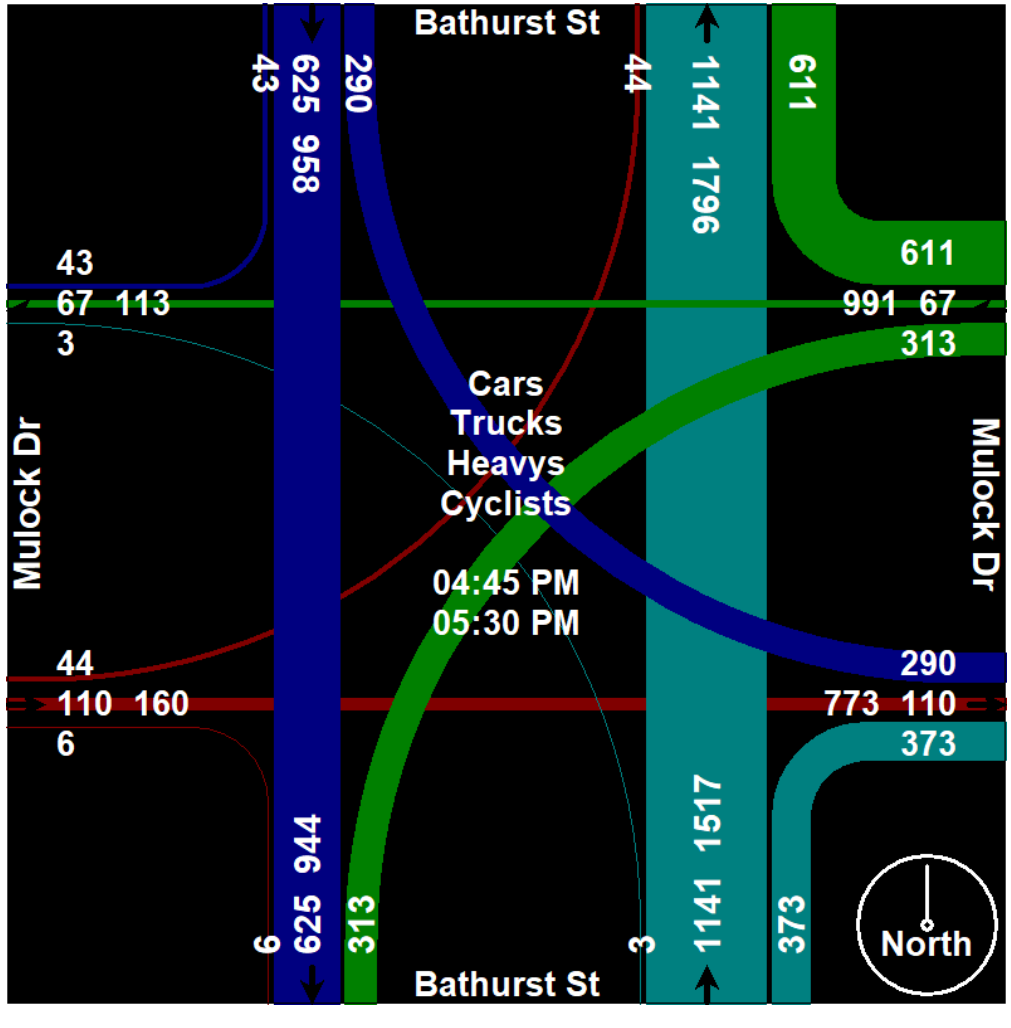

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File Name : Yonge St at Mulock Dr
Site Code : 00000000
Start Date : 7/31/2019
Page No : 1

Groups Printed- Cars - Trucks - Heavys - Cyclists

	Yonge St From North					Mulock Dr From East					Yonge St From South					Mulock Dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	21	112	39	0	172	19	100	10	10	139	13	38	8	0	59	9	169	6	0	184	554
07:15 AM	18	126	56	0	200	19	82	12	3	116	18	55	4	0	77	15	145	13	4	177	570
07:30 AM	16	138	46	0	200	31	106	19	7	163	20	59	4	0	83	9	162	19	4	194	640
07:45 AM	13	128	44	0	185	46	102	26	3	177	20	79	7	0	106	24	179	22	7	232	700
Total	68	504	185	0	757	115	390	67	23	595	71	231	23	0	325	57	655	60	15	787	2464
08:00 AM	26	105	53	0	184	43	125	17	4	189	21	70	5	0	96	13	174	26	2	215	684
08:15 AM	12	124	56	0	192	36	102	25	7	170	23	81	8	1	113	8	178	26	2	214	689
08:30 AM	20	118	54	0	192	55	110	19	8	192	20	76	8	1	105	9	165	31	3	208	697
08:45 AM	25	130	54	0	209	57	135	21	3	216	38	105	14	2	159	21	161	24	2	208	792
Total	83	477	217	0	777	191	472	82	22	767	102	332	35	4	473	51	678	107	9	845	2862
04:00 PM	24	148	56	0	228	73	191	37	8	309	23	161	20	6	210	20	152	18	6	196	943
04:15 PM	24	133	61	0	218	67	201	32	3	303	38	177	17	5	237	10	139	18	9	176	934
04:30 PM	28	113	55	0	196	72	218	45	6	341	37	168	19	4	228	13	125	17	8	163	928
04:45 PM	21	148	63	0	232	60	198	25	1	284	43	189	30	5	267	10	152	20	18	200	983
Total	97	542	235	0	874	272	808	139	18	1237	141	695	86	20	942	53	568	73	41	735	3788
05:00 PM	37	131	59	0	227	69	219	58	6	352	35	196	26	10	267	11	118	21	8	158	1004
05:15 PM	47	189	65	0	301	64	218	48	4	334	33	218	25	5	281	10	149	19	3	181	1097
05:30 PM	21	137	60	0	218	65	180	35	8	288	28	198	35	4	265	17	142	20	3	182	953
05:45 PM	21	144	49	0	214	68	187	40	10	305	25	180	26	11	242	19	139	26	12	196	957
Total	126	601	233	0	960	266	804	181	28	1279	121	792	112	30	1055	57	548	86	26	717	4011
Grand Total	374	2124	870	0	3368	844	2474	469	91	3878	435	2050	256	54	2795	218	2449	326	91	3084	13125
Apprch %	11.1	63.1	25.8	0		21.8	63.8	12.1	2.3		15.6	73.3	9.2	1.9		7.1	79.4	10.6	3		
Total %	2.8	16.2	6.6	0	25.7	6.4	18.8	3.6	0.7	29.5	3.3	15.6	2	0.4	21.3	1.7	18.7	2.5	0.7	23.5	
Cars	368	2049	857	0	3274	822	2384	453	91	3750	432	1984	246	54	2716	214	2355	320	91	2980	12720
% Cars	98.4	96.5	98.5	0	97.2	97.4	96.4	96.6	100	96.7	99.3	96.8	96.1	100	97.2	98.2	96.2	98.2	100	96.6	96.9
Trucks	4	16	7	0	27	8	30	6	0	44	2	20	5	0	27	2	31	2	0	35	133
% Trucks	1.1	0.8	0.8	0	0.8	0.9	1.2	1.3	0	1.1	0.5	1	2	0	1	0.9	1.3	0.6	0	1.1	1
Heavys	2	59	6	0	67	14	60	9	0	83	1	46	5	0	52	2	63	4	0	69	271
% Heavys	0.5	2.8	0.7	0	2	1.7	2.4	1.9	0	2.1	0.2	2.2	2	0	1.9	0.9	2.6	1.2	0	2.2	2.1
Cyclists	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
% Cyclists	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : Yonge St at Mulock Dr
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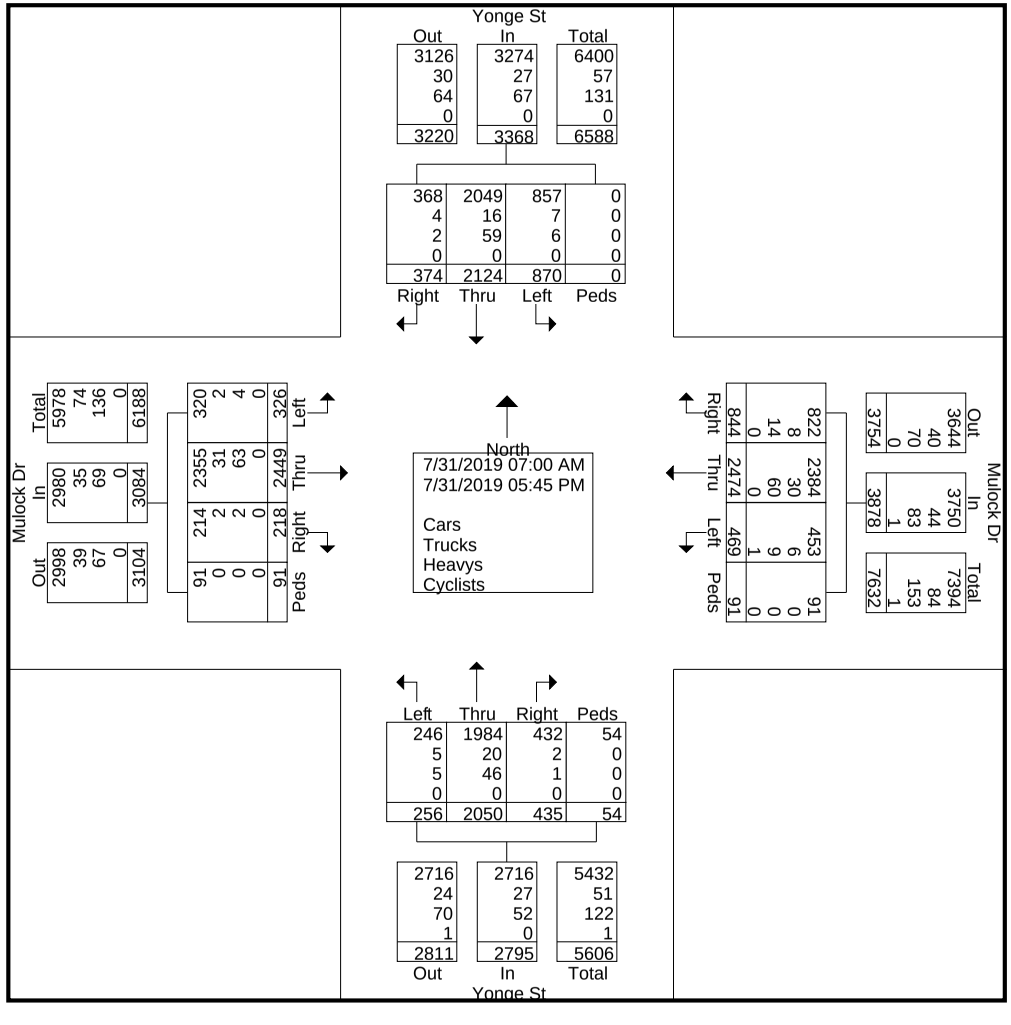
Start Date : 7/31/2019



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File Name : Yonge St at Mulock Dr
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	Yonge St From North					Mulock Dr From East					Yonge St From South					Mulock Dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	**26**	105	53	0	184	43	125	17	4	189	21	70	5	0	96	13	174	26	2	**215**	684
08:15 AM	12	124	**56**	0	192	36	102	**25**	7	170	23	81	8	1	113	8	**178**	26	2	214	689
08:30 AM	20	118	54	0	192	55	110	19	**8**	192	20	76	8	1	105	9	165	**31**	**3**	208	697
08:45 AM	25	**130**	54	0	**209**	**57**	**135**	21	3	**216**	**38**	**105**	**14**	**2**	**159**	**21**	161	24	2	208	**792**
Total Volume	83	477	217	0	777	191	472	82	22	767	102	332	35	4	473	51	678	107	9	845	2862
% App. Total	10.7	61.4	27.9	0		24.9	61.5	10.7	2.9		21.6	70.2	7.4	0.8		6	80.2	12.7	1.1		
PHF	.798	.917	.969	.000	.929	.838	.874	.820	.688	.888	.671	.790	.625	.500	.744	.607	.952	.863	.750	.983	.903
Cars	81	456	213	0	750	187	450	74	22	733	101	307	32	4	444	50	653	105	9	817	2744
% Cars	97.6	95.6	98.2	0	96.5	97.9	95.3	90.2	100	95.6	99.0	92.5	91.4	100	93.9	98.0	96.3	98.1	100	96.7	95.9
Trucks	2	5	3	0	10	1	9	4	0	14	0	10	1	0	11	1	10	0	0	11	46
% Trucks	2.4	1.0	1.4	0	1.3	0.5	1.9	4.9	0	1.8	0	3.0	2.9	0	2.3	2.0	1.5	0	0	1.3	1.6
Heavys	0	16	1	0	17	3	13	4	0	20	1	15	2	0	18	0	15	2	0	17	72
% Heavys	0	3.4	0.5	0	2.2	1.6	2.8	4.9	0	2.6	1.0	4.5	5.7	0	3.8	0	2.2	1.9	0	2.0	2.5
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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318 Simonston Blvd
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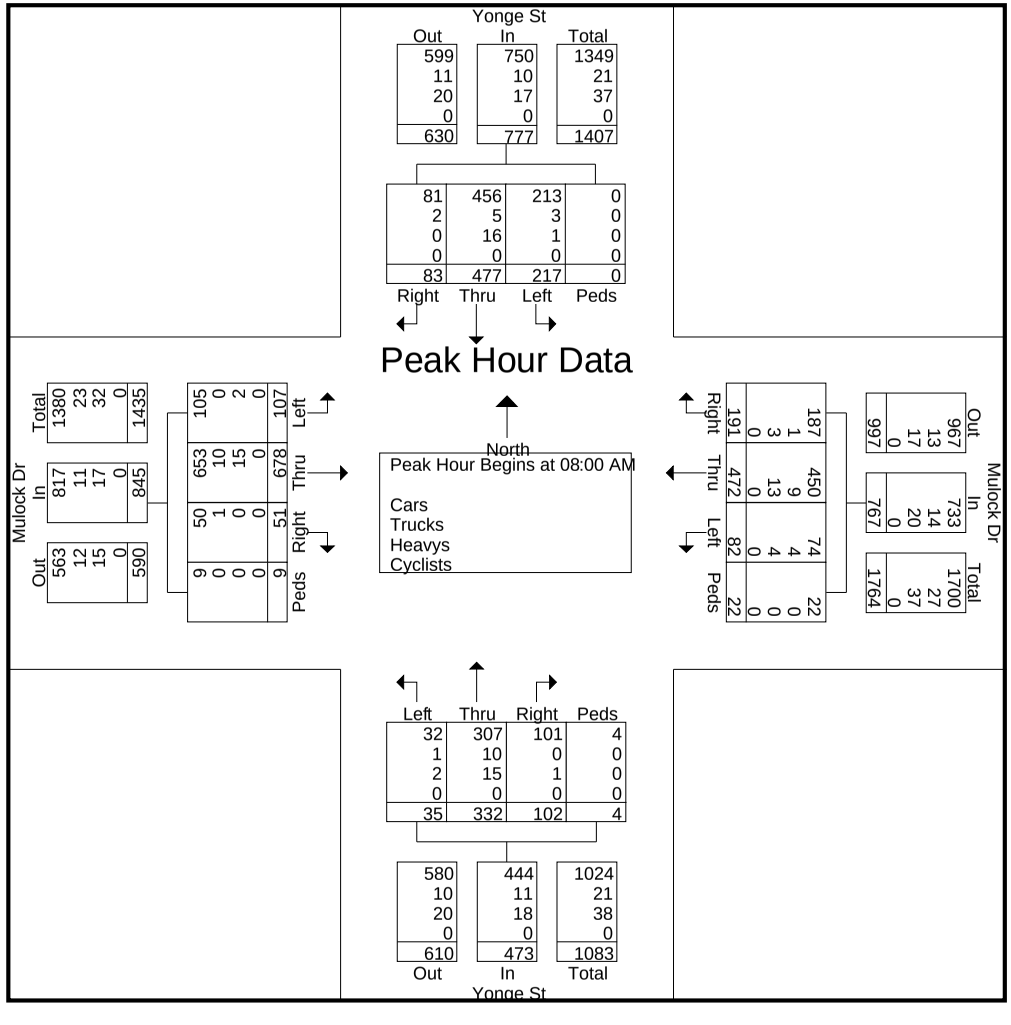
Site Code : 00000000
Start Date : 7/31/2019
Page No : 4



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318 Simonston Blvd
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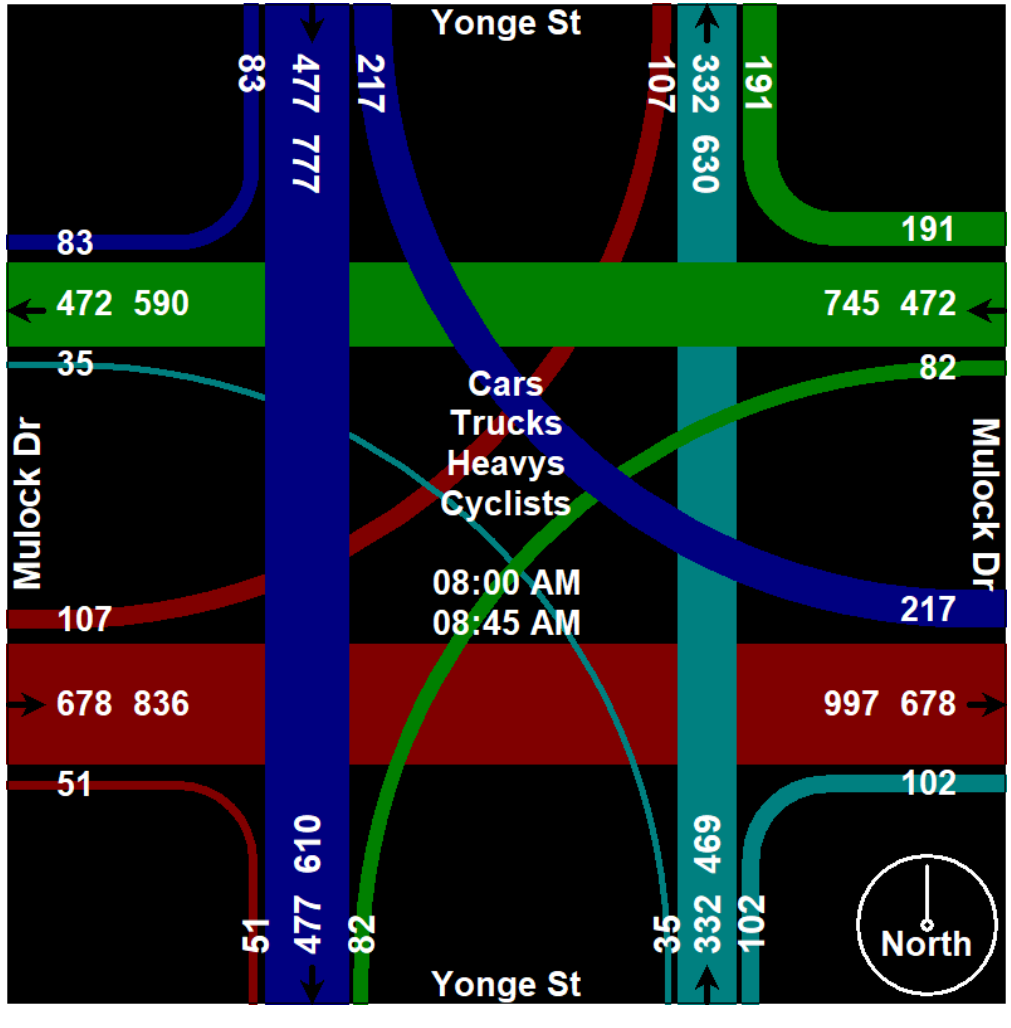
Page No : 5



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Site Code : 00000000
Start Date : 7/31/2019
Page No : 6

	Yonge St From North					Mulock Dr From East					Yonge St From South					Mulock Dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	21	148	63	0	232	60	198	25	1	284	**43**	189	30	5	267	10	**152**	20	**18**	**200**	983
05:00 PM	37	131	59	0	227	**69**	**219**	**58**	6	**352**	35	196	26	**10**	267	11	118	**21**	8	158	1004
05:15 PM	**47**	**189**	**65**	0	**301**	64	218	48	4	334	33	**218**	25	5	**281**	10	149	19	3	181	**1097**
05:30 PM	21	137	60	0	218	65	180	35	**8**	288	28	198	**35**	4	265	**17**	142	20	3	182	953
Total Volume	126	605	247	0	978	258	815	166	19	1258	139	801	116	24	1080	48	561	80	32	721	4037
% App. Total	12.9	61.9	25.3	0		20.5	64.8	13.2	1.5		12.9	74.2	10.7	2.2		6.7	77.8	11.1	4.4		
PHF	.670	.800	.950	.000	.812	.935	.930	.716	.594	.893	.808	.919	.829	.600	.961	.706	.923	.952	.444	.901	.920
Cars	125	589	242	0	956	257	787	164	19	1227	138	790	114	24	1066	48	536	79	32	695	3944
% Cars	99.2	97.4	98.0	0	97.8	99.6	96.6	98.8	100	97.5	99.3	98.6	98.3	100	98.7	100	95.5	98.8	100	96.4	97.7
Trucks	1	4	2	0	7	1	7	1	0	9	1	1	0	0	2	0	6	1	0	7	25
% Trucks	0.8	0.7	0.8	0	0.7	0.4	0.9	0.6	0	0.7	0.7	0.1	0	0	0.2	0	1.1	1.3	0	1.0	0.6
Heavys	0	12	3	0	15	0	21	1	0	22	0	10	2	0	12	0	19	0	0	19	68
% Heavys	0	2.0	1.2	0	1.5	0	2.6	0.6	0	1.7	0	1.2	1.7	0	1.1	0	3.4	0	0	2.6	1.7
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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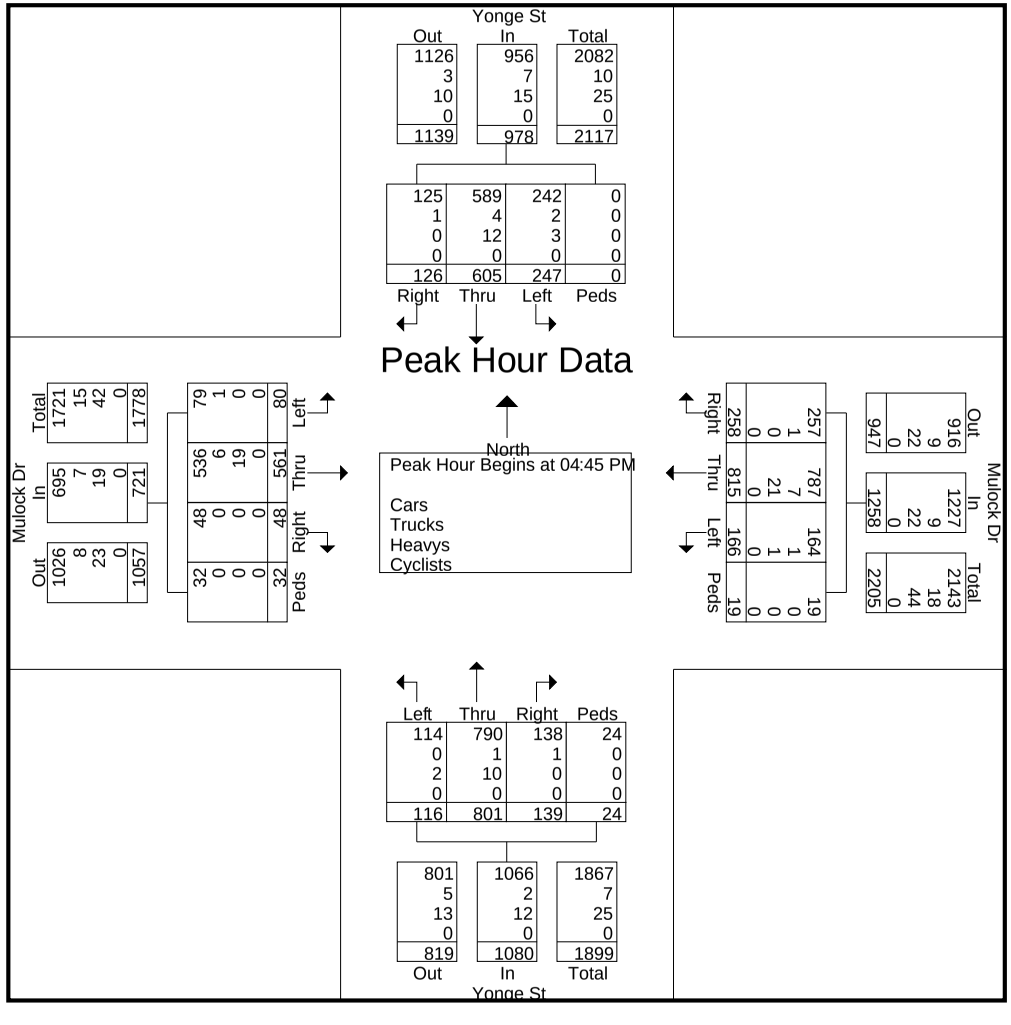
Start Date : 7/31/2019
Page No : 7



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Thornhill, ON L3T 4T5

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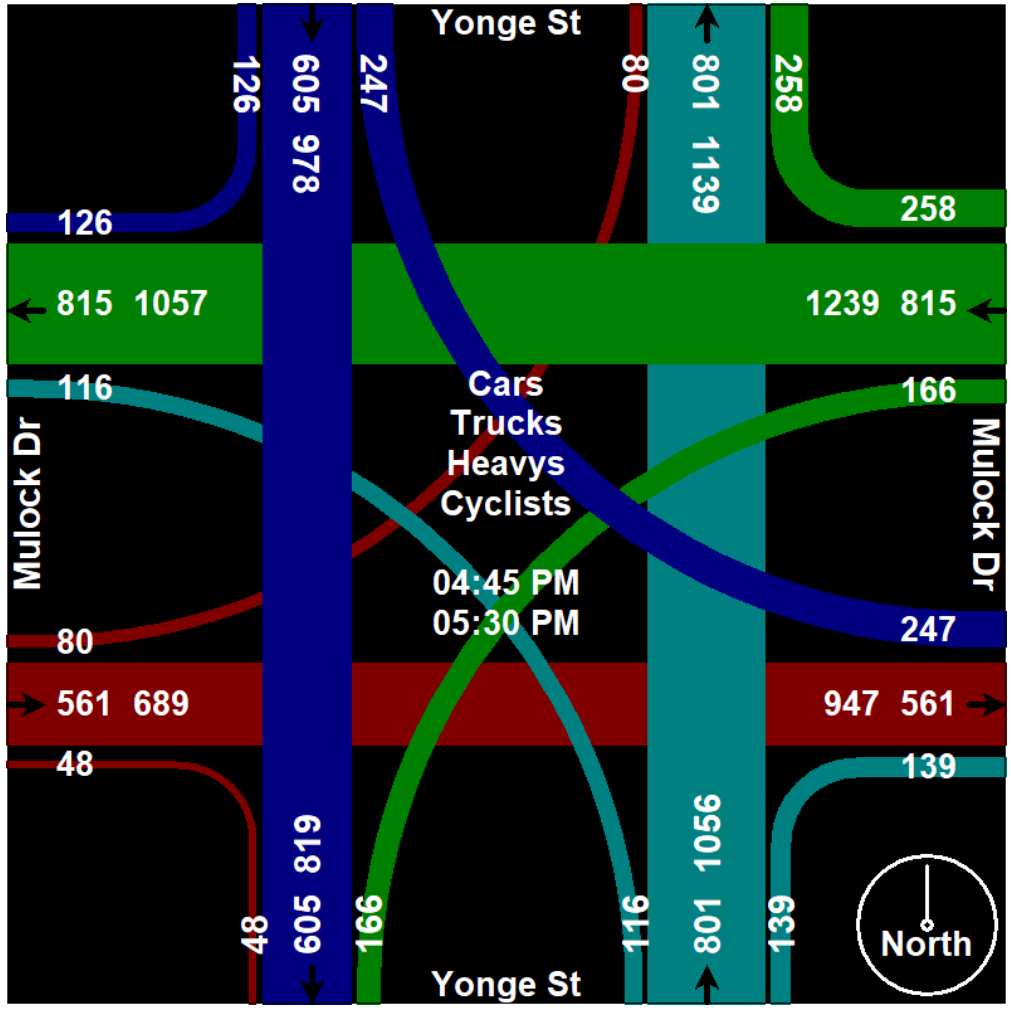
File Name : Yonge St at Mulock Dr
Site Code : 00000000
Start Date : 7/31/2019
Page No : 8



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File Name : Bathurst St at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019

Groups Printed- Cars - Trucks - Heavys - Cyclists

	Bathurst St From North					St John`s SdRd From East					Bathurst St From South					St John`s SdRd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	61	186	19	0	266	17	99	31	0	147	10	56	7	0	73	9	54	13	0	76	562
07:15 AM	58	184	31	0	273	12	103	21	0	136	9	81	11	0	101	8	67	11	0	86	596
07:30 AM	63	195	49	0	307	10	89	25	0	124	21	100	9	0	130	9	66	12	0	87	648
07:45 AM	55	212	51	0	318	14	96	25	0	135	33	132	7	0	172	10	91	9	0	110	735
Total	237	777	150	0	1164	53	387	102	0	542	73	369	34	0	476	36	278	45	0	359	2541
08:00 AM	59	194	30	0	283	15	102	28	0	145	28	118	12	0	158	15	94	9	0	118	704
08:15 AM	49	205	52	0	306	15	108	23	0	146	29	125	10	0	164	10	95	12	0	117	733
08:30 AM	51	166	33	0	250	18	75	25	0	118	36	157	7	0	200	22	90	19	0	131	699
08:45 AM	36	215	45	0	296	18	87	26	0	131	45	144	11	0	200	14	102	19	0	135	762
Total	195	780	160	0	1135	66	372	102	0	540	138	544	40	0	722	61	381	59	0	501	2898
04:00 PM	20	154	21	0	195	56	74	23	0	153	28	218	7	0	253	10	92	38	0	140	741
04:15 PM	22	160	26	0	208	41	106	27	0	174	37	208	15	0	260	8	105	43	0	156	798
04:30 PM	28	159	28	0	215	58	108	25	0	191	40	254	15	0	309	10	74	41	0	125	840
04:45 PM	25	193	33	0	251	53	102	32	0	187	41	255	10	0	306	12	138	57	0	207	951
Total	95	666	108	0	869	208	390	107	0	705	146	935	47	0	1128	40	409	179	0	628	3330
05:00 PM	22	176	28	0	226	51	107	20	0	178	39	274	20	0	333	15	123	50	0	188	925
05:15 PM	27	195	35	0	257	64	99	30	0	193	30	288	26	0	344	7	108	51	0	166	960
05:30 PM	27	131	25	0	183	38	106	25	0	169	50	241	19	0	310	9	140	56	0	205	867
05:45 PM	10	135	30	0	175	41	66	27	0	134	31	240	20	0	291	5	137	49	0	191	791
Total	86	637	118	0	841	194	378	102	0	674	150	1043	85	0	1278	36	508	206	0	750	3543
Grand Total	613	2860	536	0	4009	521	1527	413	0	2461	507	2891	206	0	3604	173	1576	489	0	2238	12312
Apprch %	15.3	71.3	13.4	0		21.2	62	16.8	0		14.1	80.2	5.7	0		7.7	70.4	21.8	0		
Total %	5	23.2	4.4	0	32.6	4.2	12.4	3.4	0	20	4.1	23.5	1.7	0	29.3	1.4	12.8	4	0	18.2	
Cars	607	2789	529	0	3925	513	1490	407	0	2410	495	2809	200	0	3504	170	1542	482	0	2194	12033
% Cars	99	97.5	98.7	0	97.9	98.5	97.6	98.5	0	97.9	97.6	97.2	97.1	0	97.2	98.3	97.8	98.6	0	98	97.7
Trucks	5	21	4	0	30	1	18	4	0	23	5	18	5	0	28	1	18	3	0	22	103
% Trucks	0.8	0.7	0.7	0	0.7	0.2	1.2	1	0	0.9	1	0.6	2.4	0	0.8	0.6	1.1	0.6	0	1	0.8
Heavys	1	46	3	0	50	7	18	2	0	27	6	63	1	0	70	2	16	4	0	22	169
% Heavys	0.2	1.6	0.6	0	1.2	1.3	1.2	0.5	0	1.1	1.2	2.2	0.5	0	1.9	1.2	1	0.8	0	1	1.4
Cyclists	0	4	0	0	4	0	1	0	0	1	1	1	0	0	2	0	0	0	0	0	7
% Cyclists	0	0.1	0	0	0.1	0	0.1	0	0	0	0.2	0	0	0	0.1	0	0	0	0	0	0.1

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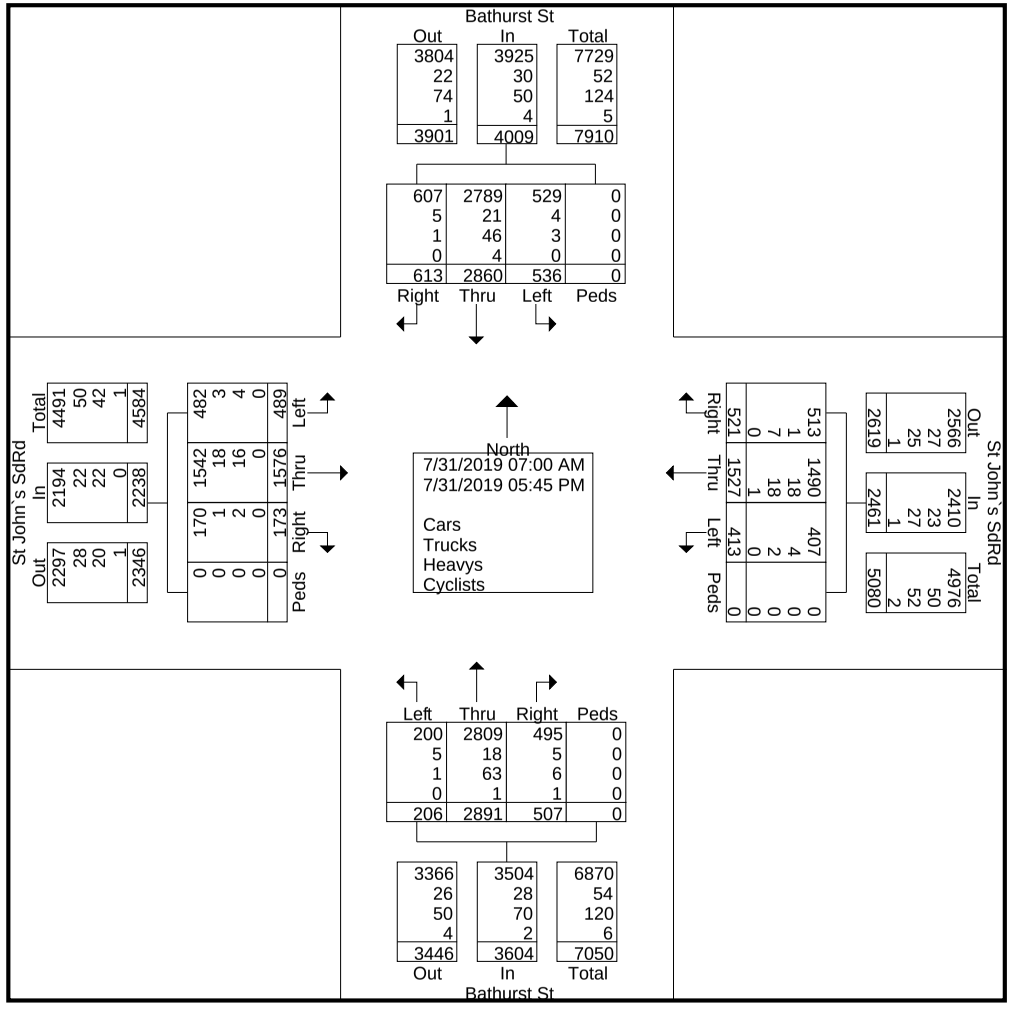
File Name : Bathurst St at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019



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Thornhill, ON L3T 4T5

"we always count...never estimated"

File Name : Bathurst St at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019

	Bathurst St From North					St John`s SdRd From East					Bathurst St From South					St John`s SdRd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	**59**	194	30	0	283	15	102	**28**	0	145	28	118	**12**	0	158	15	94	9	0	118	704
08:15 AM	49	205	**52**	0	**306**	15	**108**	23	0	**146**	29	125	10	0	164	10	95	12	0	117	733
08:30 AM	51	166	33	0	250	**18**	75	25	0	118	36	**157**	7	0	**200**	**22**	90	**19**	0	131	699
08:45 AM	36	**215**	45	0	296	18	87	26	0	131	**45**	144	11	0	200	14	**102**	19	0	**135**	**762**
Total Volume	195	780	160	0	1135	66	372	102	0	540	138	544	40	0	722	61	381	59	0	501	2898
% App. Total	17.2	68.7	14.1	0		12.2	68.9	18.9	0		19.1	75.3	5.5	0		12.2	76	11.8	0		
PHF	.826	.907	.769	.000	.927	.917	.861	.911	.000	.925	.767	.866	.833	.000	.903	.693	.934	.776	.000	.928	.951
Cars	194	757	159	0	1110	65	358	101	0	524	133	519	39	0	691	60	365	56	0	481	2806
% Cars	99.5	97.1	99.4	0	97.8	98.5	96.2	99.0	0	97.0	96.4	95.4	97.5	0	95.7	98.4	95.8	94.9	0	96.0	96.8
Trucks	1	7	0	0	8	0	6	1	0	7	4	1	1	0	6	0	11	1	0	12	33
% Trucks	0.5	0.9	0	0	0.7	0	1.6	1.0	0	1.3	2.9	0.2	2.5	0	0.8	0	2.9	1.7	0	2.4	1.1
Heavys	0	16	1	0	17	1	8	0	0	9	1	23	0	0	24	1	5	2	0	8	58
% Heavys	0	2.1	0.6	0	1.5	1.5	2.2	0	0	1.7	0.7	4.2	0	0	3.3	1.6	1.3	3.4	0	1.6	2.0
Cyclists	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0.1	0	0	0	0	0	0.0

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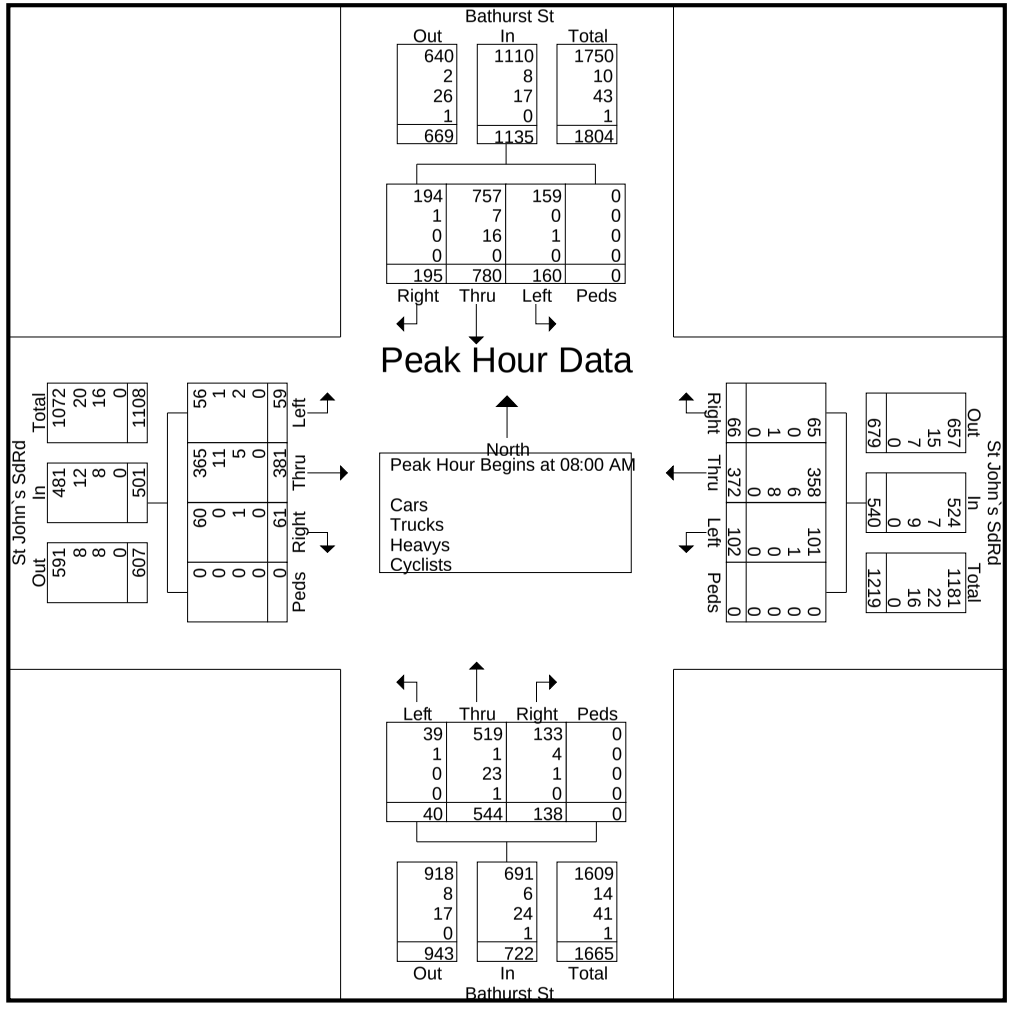
File Name : Bathurst St at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019
Page No : 4



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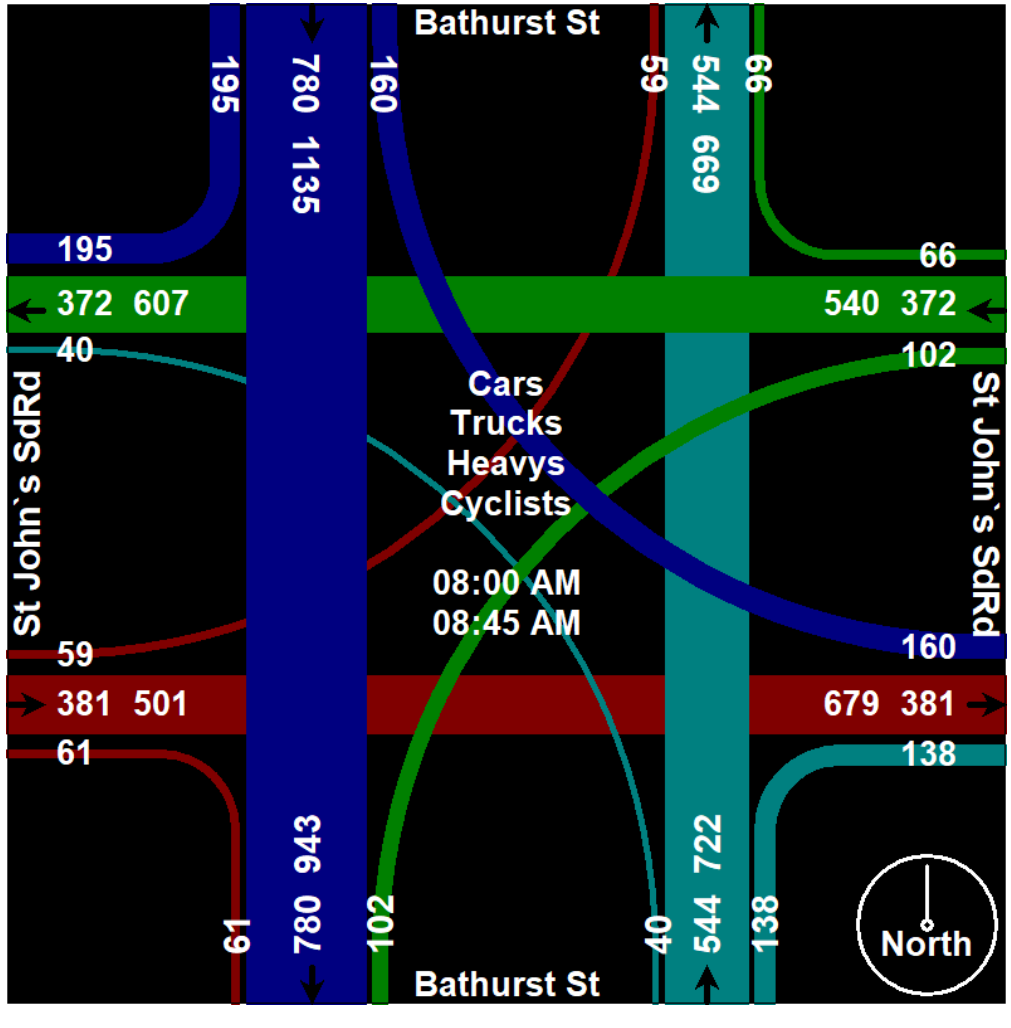
File Name : Bathurst St at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019
Page No : 5



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File Name : Bathurst St at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019

	Bathurst St From North					St John`s SdRd From East					Bathurst St From South					St John`s SdRd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	25	193	33	0	251	53	102	**32**	0	187	41	255	10	0	306	12	138	**57**	0	**207**	951
05:00 PM	22	176	28	0	226	51	**107**	20	0	178	39	274	20	0	333	**15**	123	50	0	188	925
05:15 PM	**27**	**195**	**35**	0	**257**	**64**	99	30	0	**193**	30	**288**	**26**	0	**344**	7	108	51	0	166	**960**
05:30 PM	27	131	25	0	183	38	106	25	0	169	**50**	241	19	0	310	9	**140**	56	0	205	867
Total Volume	101	695	121	0	917	206	414	107	0	727	160	1058	75	0	1293	43	509	214	0	766	3703
% App. Total	11	75.8	13.2	0		28.3	56.9	14.7	0		12.4	81.8	5.8	0		5.6	66.4	27.9	0		
PHF	.935	.891	.864	.000	.892	.805	.967	.836	.000	.942	.800	.918	.721	.000	.940	.717	.909	.939	.000	.925	.964
Cars	100	682	118	0	900	206	404	104	0	714	158	1043	74	0	1275	42	504	213	0	759	3648
% Cars	99.0	98.1	97.5	0	98.1	100	97.6	97.2	0	98.2	98.8	98.6	98.7	0	98.6	97.7	99.0	99.5	0	99.1	98.5
Trucks	1	4	2	0	7	0	6	2	0	8	0	6	1	0	7	1	2	0	0	3	25
% Trucks	1.0	0.6	1.7	0	0.8	0	1.4	1.9	0	1.1	0	0.6	1.3	0	0.5	2.3	0.4	0	0	0.4	0.7
Heavys	0	8	1	0	9	0	4	1	0	5	2	9	0	0	11	0	3	1	0	4	29
% Heavys	0	1.2	0.8	0	1.0	0	1.0	0.9	0	0.7	1.3	0.9	0	0	0.9	0	0.6	0.5	0	0.5	0.8
Cyclists	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Cyclists	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0

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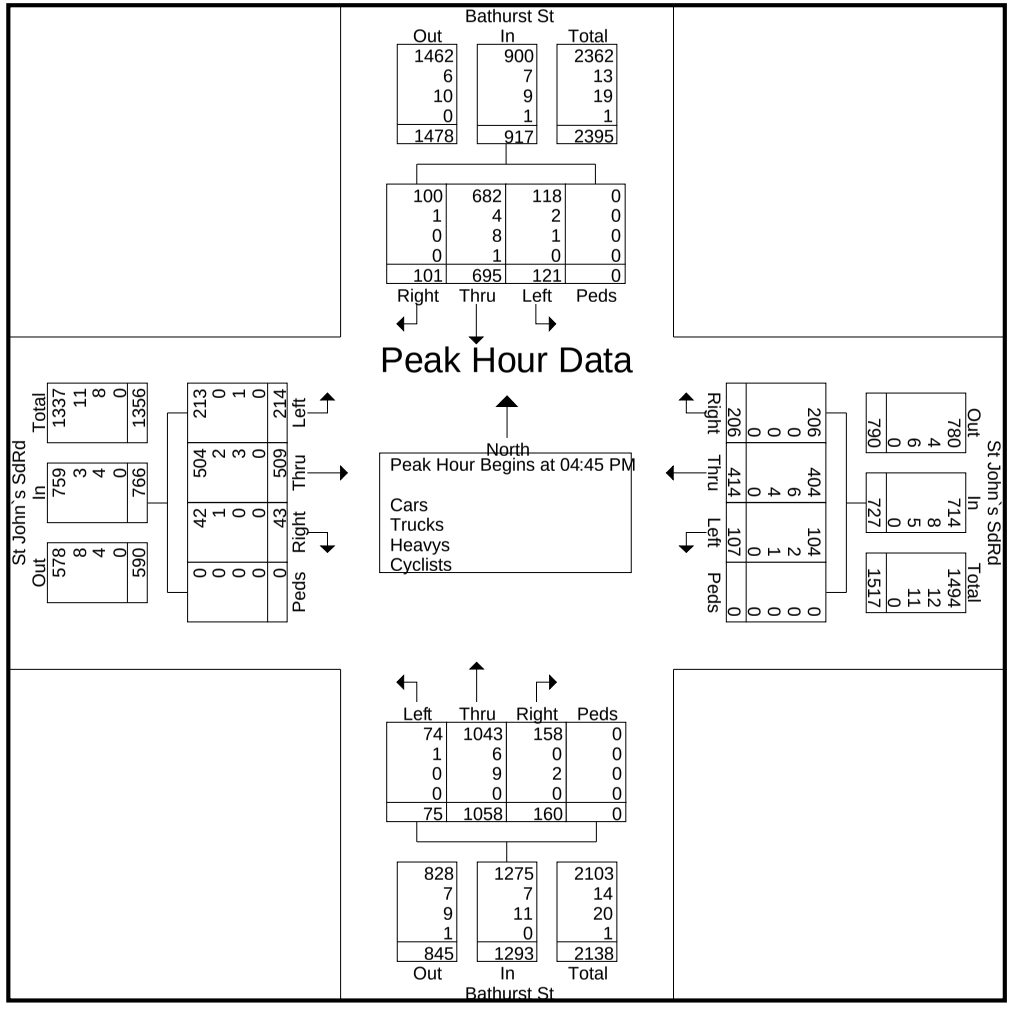
File Name : Bathurst St at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019
Page No : 7



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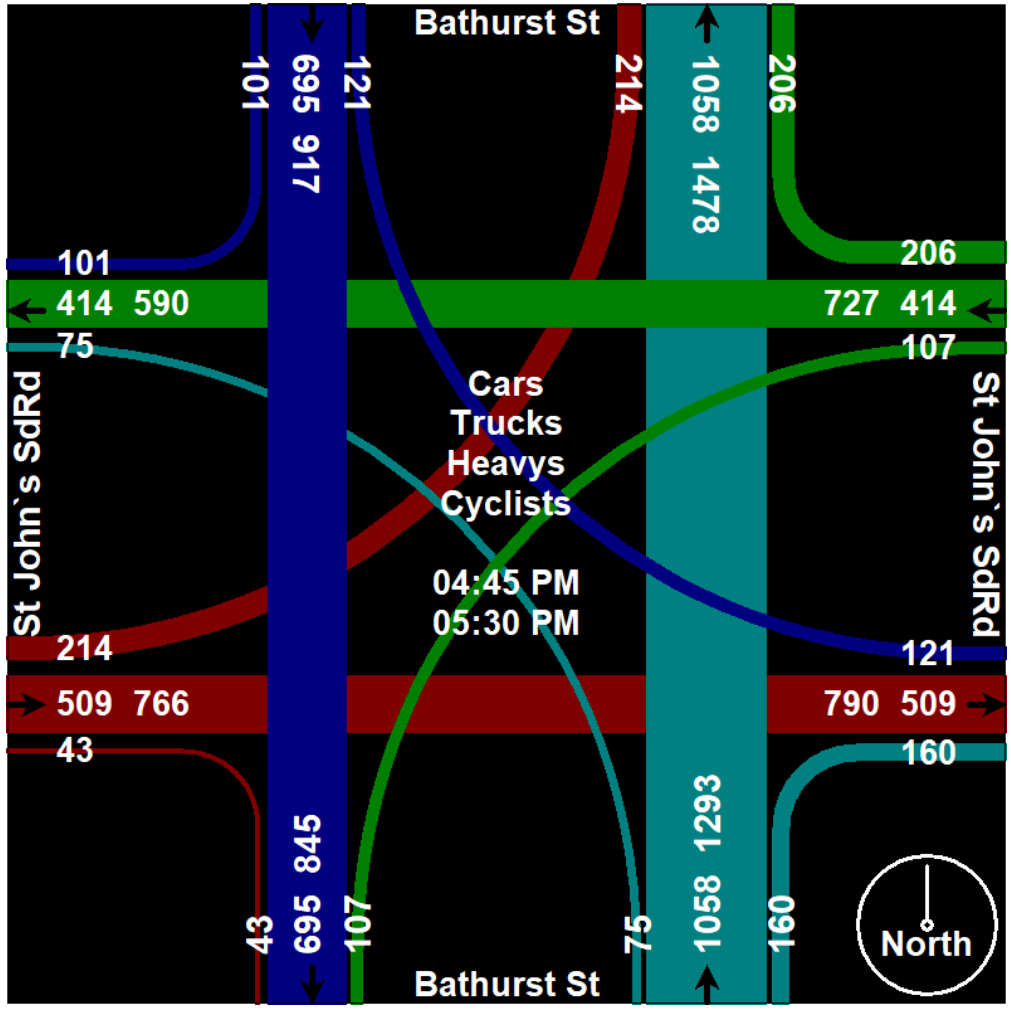
File Name : Bathurst St at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019



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File Name : Willow Farm Ln at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019
Page No : 1

Groups Printed- Cars - Trucks - Heavys - Cyclists

	From North					St John`s SdRd From East					Willow Farm Ln From South					St John`s SdRd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	3	0	0	4	0	6	0	0	6	0	1	0	0	1	0	4	0	0	4	15
07:15 AM	2	1	0	0	3	1	5	0	0	6	0	1	0	0	1	0	3	0	0	3	13
07:30 AM	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	4	1	0	5	10
07:45 AM	0	1	1	0	2	0	2	1	0	3	0	3	0	0	3	0	4	0	0	4	12
Total	3	8	1	0	12	1	13	1	0	15	0	7	0	0	7	0	15	1	0	16	50
08:00 AM	0	0	0	0	0	0	7	0	0	7	2	0	1	0	3	0	6	1	0	7	17
08:15 AM	1	3	0	0	4	0	2	0	0	2	1	0	0	0	1	0	6	0	0	6	13
08:30 AM	0	2	0	0	2	0	5	2	0	7	2	1	0	0	3	0	9	0	0	9	21
08:45 AM	0	2	0	0	2	0	6	0	0	6	1	0	0	0	1	0	7	0	0	7	16
Total	1	7	0	0	8	0	20	2	0	22	6	1	1	0	8	0	28	1	0	29	67
04:00 PM	0	1	0	0	1	0	3	0	0	3	0	2	0	0	2	0	4	0	0	4	10
04:15 PM	1	0	0	0	1	0	5	0	0	5	0	0	2	0	2	0	2	1	0	3	11
04:30 PM	0	0	1	0	1	0	3	0	0	3	1	1	0	0	2	0	5	0	0	5	11
04:45 PM	0	1	0	0	1	0	3	1	0	4	0	1	0	0	1	1	0	0	0	1	7
Total	1	2	1	0	4	0	14	1	0	15	1	4	2	0	7	1	11	1	0	13	39
05:00 PM	1	2	0	0	3	0	7	1	0	8	0	2	0	0	2	0	1	0	0	1	14
05:15 PM	0	0	2	0	2	0	5	0	0	5	0	3	1	0	4	0	5	0	0	5	16
05:30 PM	0	1	0	0	1	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	10
05:45 PM	0	1	0	0	1	0	4	0	0	4	0	1	1	0	2	0	1	0	0	1	8
Total	1	4	2	0	7	0	20	1	0	21	0	6	2	0	8	0	12	0	0	12	48
Grand Total	6	21	4	0	31	1	67	5	0	73	7	18	5	0	30	1	66	3	0	70	204
Apprch %	19.4	67.7	12.9	0		1.4	91.8	6.8	0		23.3	60	16.7	0		1.4	94.3	4.3	0		
Total %	2.9	10.3	2	0	15.2	0.5	32.8	2.5	0	35.8	3.4	8.8	2.5	0	14.7	0.5	32.4	1.5	0	34.3	
Cars	0	0	0	0	0	0	22	1	0	23	2	0	0	0	2	0	25	0	0	25	50
% Cars	0	0	0	0	0	0	32.8	20	0	31.5	28.6	0	0	0	6.7	0	37.9	0	0	35.7	24.5
Trucks	5	21	4	0	30	1	18	4	0	23	5	18	5	0	28	1	18	3	0	22	103
% Trucks	83.3	100	100	0	96.8	100	26.9	80	0	31.5	71.4	100	100	0	93.3	100	27.3	100	0	31.4	50.5
Heavys	1	0	0	0	1	0	26	0	0	26	0	0	0	0	0	0	23	0	0	23	50
% Heavys	16.7	0	0	0	3.2	0	38.8	0	0	35.6	0	0	0	0	0	0	34.8	0	0	32.9	24.5
Cyclists	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Cyclists	0	0	0	0	0	0	1.5	0	0	1.4	0	0	0	0	0	0	0	0	0	0	0.5

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Thornhill, ON L3T 4T5

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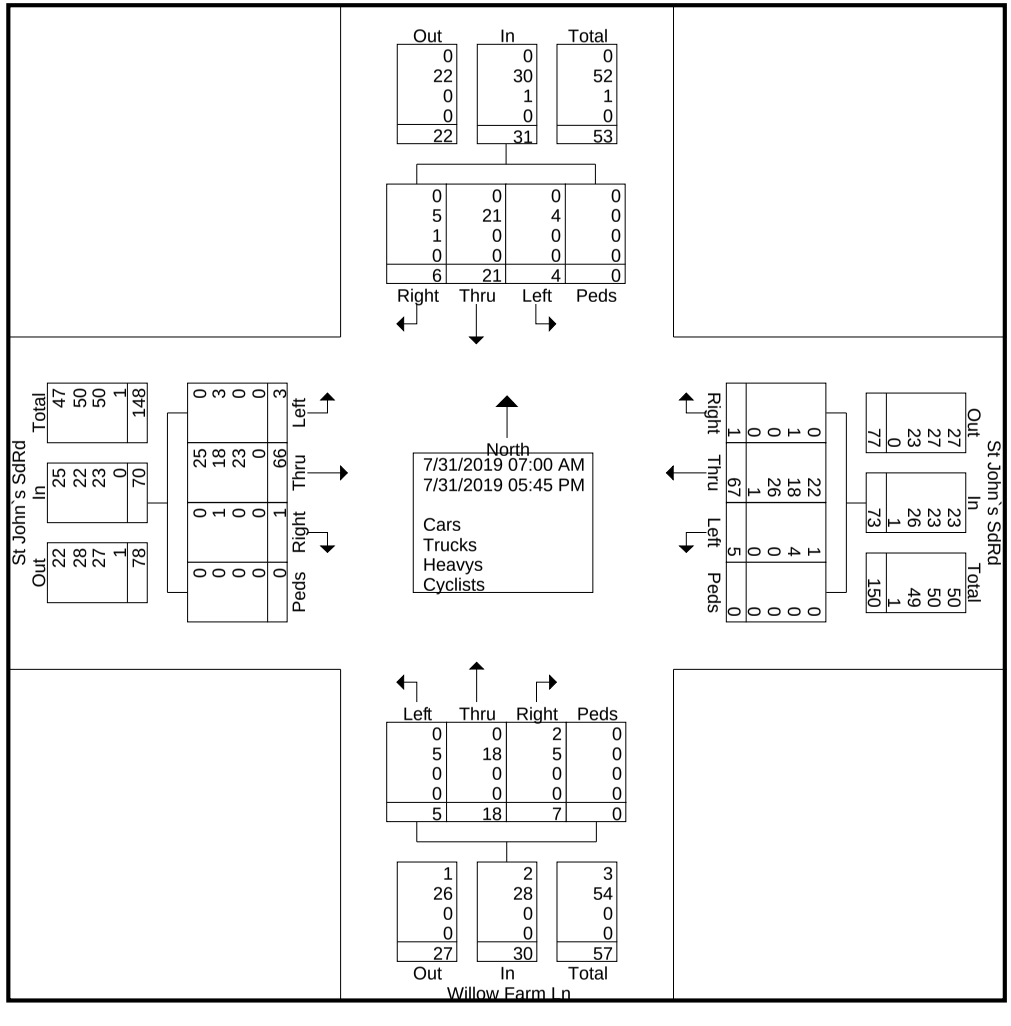
File Name : Willow Farm Ln at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019



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File Name : Willow Farm Ln at St John`s Sideroad
Site Code : 00000000
Start Date : 7/31/2019

	From North					St John`s SdRd From East					Willow Farm Ln From South					St John`s SdRd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	**7**	0	0	**7**	**2**	0	**1**	0	**3**	0	6	**1**	0	7	17
08:15 AM	**1**	**3**	0	0	**4**	0	2	0	0	2	1	0	0	0	1	0	6	0	0	6	13
08:30 AM	0	2	0	0	2	0	5	**2**	0	7	2	**1**	0	0	3	0	**9**	0	0	**9**	**21**
08:45 AM	0	2	0	0	2	0	6	0	0	6	1	0	0	0	1	0	7	0	0	7	16
Total Volume	1	7	0	0	8	0	20	2	0	22	6	1	1	0	8	0	28	1	0	29	67
% App. Total	12.5	87.5	0	0		0	90.9	9.1	0		75	12.5	12.5	0		0	96.6	3.4	0		
PHF	.250	.583	.000	.000	.500	.000	.714	.250	.000	.786	.750	.250	.250	.000	.667	.000	.778	.250	.000	.806	.798
Cars	0	0	0	0	0	0	7	1	0	8	2	0	0	0	2	0	11	0	0	11	21
% Cars	0	0	0	0	0	0	35.0	50.0	0	36.4	33.3	0	0	0	25.0	0	39.3	0	0	37.9	31.3
Trucks	1	7	0	0	8	0	6	1	0	7	4	1	1	0	6	0	11	1	0	12	33
% Trucks	100	100	0	0	100	0	30.0	50.0	0	31.8	66.7	100	100	0	75.0	0	39.3	100	0	41.4	49.3
Heavys	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	6	0	0	6	13
% Heavys	0	0	0	0	0	0	35.0	0	0	31.8	0	0	0	0	0	0	21.4	0	0	20.7	19.4
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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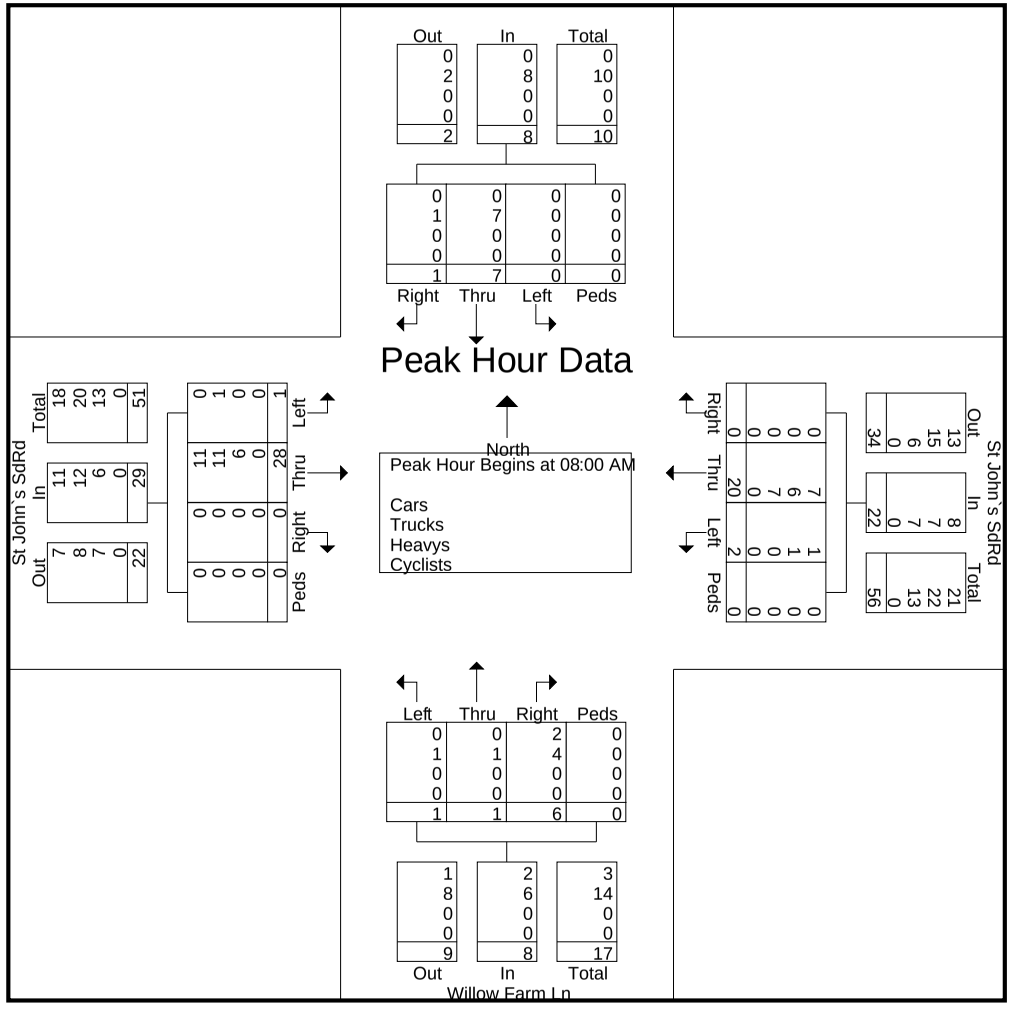

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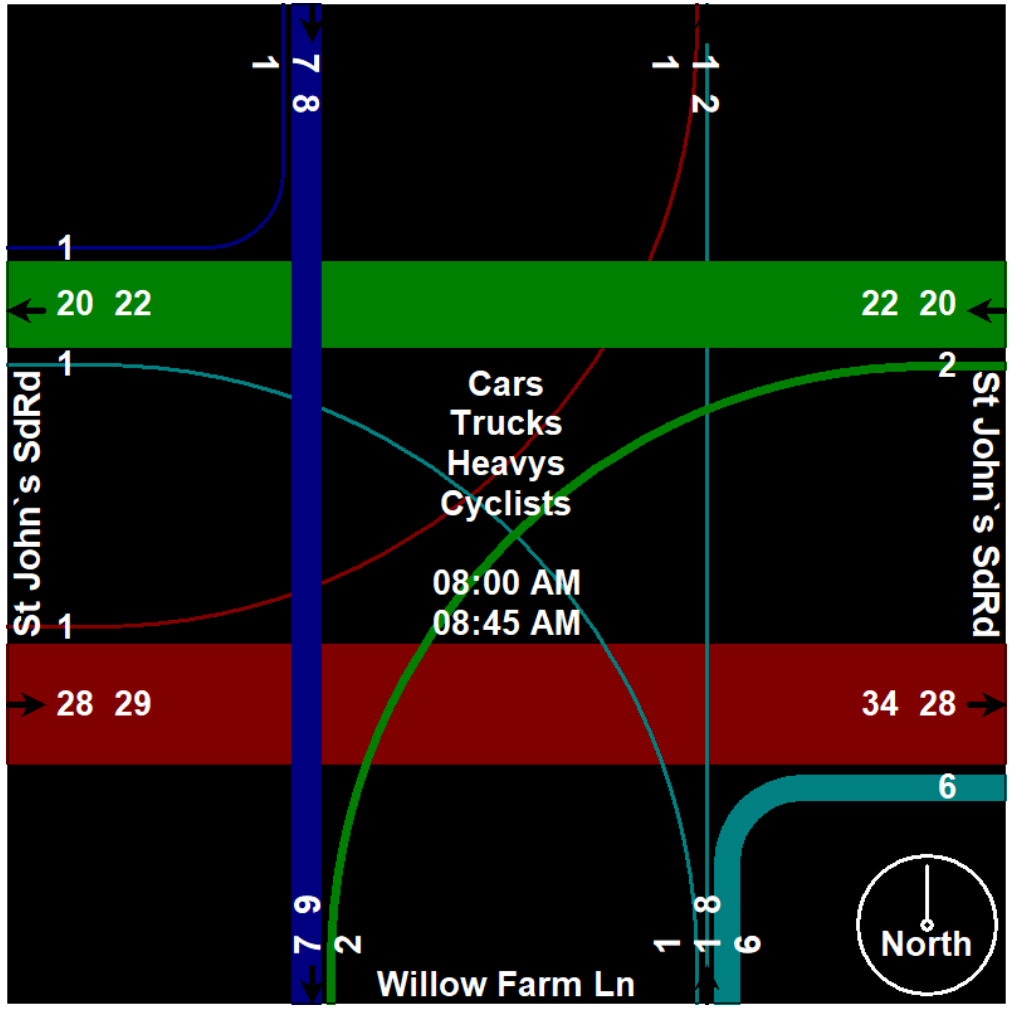

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	From North					St John`s SdRd From East					Willow Farm Ln From South					St John`s SdRd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	1	0	1	0	3	0	0	3	**1**	1	0	0	2	0	**5**	0	0	**5**	11
04:45 PM	0	1	0	0	1	0	3	**1**	0	4	0	1	0	0	1	**1**	0	0	0	1	7
05:00 PM	**1**	**2**	0	0	**3**	0	**7**	1	0	**8**	0	2	0	0	2	0	1	0	0	1	14
05:15 PM	0	0	**2**	0	2	0	5	0	0	5	0	**3**	**1**	0	**4**	0	5	0	0	5	**16**
Total Volume	1	3	3	0	7	0	18	2	0	20	1	7	1	0	9	1	11	0	0	12	48
% App. Total	14.3	42.9	42.9	0		0	90	10	0		11.1	77.8	11.1	0		8.3	91.7	0	0		
PHF	.250	.375	.375	.000	.583	.000	.643	.500	.000	.625	.250	.583	.250	.000	.563	.250	.550	.000	.000	.600	.750
Cars	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	5	0	0	5	11
% Cars	0	0	0	0	0	0	33.3	0	0	30.0	0	0	0	0	0	0	45.5	0	0	41.7	22.9
Trucks	1	3	3	0	7	0	7	2	0	9	1	7	1	0	9	1	2	0	0	3	28
% Trucks	100	100	100	0	100	0	38.9	100	0	45.0	100	100	100	0	100	100	18.2	0	0	25.0	58.3
Heavys	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	9
% Heavys	0	0	0	0	0	0	27.8	0	0	25.0	0	0	0	0	0	0	36.4	0	0	33.3	18.8
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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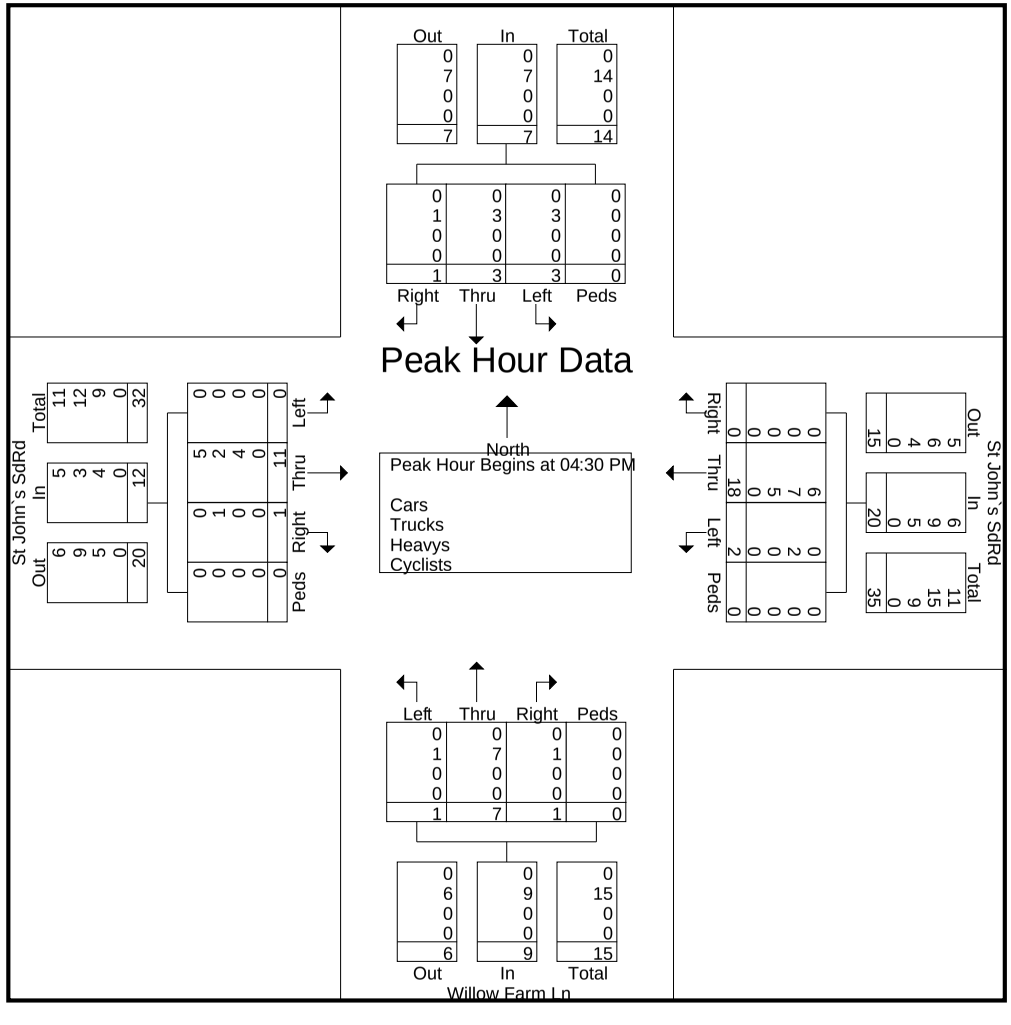

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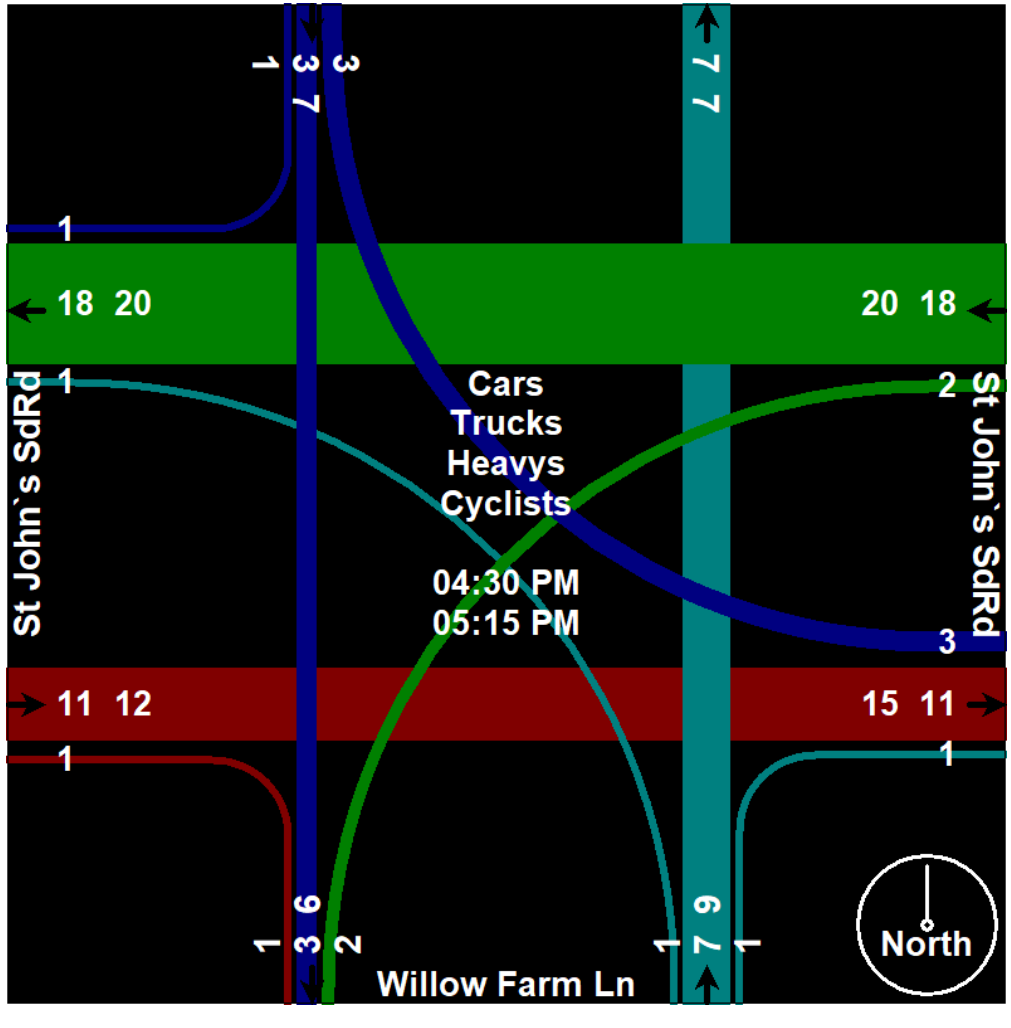

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Site Code : 00000000
Start Date : 7/31/2019

Groups Printed- Cars - Trucks - Heavys - Cyclists

	Yonge St From North					St John`s SdRd From East					Yonge St From South					St John`s SdRd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	38	95	89	1	223	23	114	16	0	153	10	42	3	0	55	14	80	10	0	104	535
07:15 AM	37	86	83	0	206	25	98	14	0	137	19	39	7	0	65	11	107	2	0	120	528
07:30 AM	36	94	78	0	208	30	88	29	0	147	36	51	10	0	97	20	105	11	0	136	588
07:45 AM	17	125	107	0	249	35	113	44	0	192	32	64	7	0	103	23	159	31	0	213	757
Total	128	400	357	1	886	113	413	103	0	629	97	196	27	0	320	68	451	54	0	573	2408
08:00 AM	19	93	101	0	213	44	115	44	0	203	43	56	14	0	113	16	135	20	3	174	703
08:15 AM	23	106	113	0	242	49	103	48	0	200	45	58	8	0	111	12	143	8	1	164	717
08:30 AM	24	100	83	0	207	53	87	51	0	191	55	89	20	0	164	44	133	13	0	190	752
08:45 AM	22	107	107	0	236	71	99	61	0	231	77	78	13	2	170	46	150	16	0	212	849
Total	88	406	404	0	898	217	404	204	0	825	220	281	55	2	558	118	561	57	4	740	3021
04:00 PM	13	110	73	0	196	99	156	72	0	327	106	123	35	0	264	23	107	28	0	158	945
04:15 PM	21	111	73	0	205	126	143	62	0	331	86	119	23	0	228	23	122	37	1	183	947
04:30 PM	23	105	74	2	204	135	170	56	1	362	67	144	41	1	253	21	119	22	3	165	984
04:45 PM	27	112	84	0	223	140	160	54	0	354	62	130	27	0	219	10	177	37	0	224	1020
Total	84	438	304	2	828	500	629	244	1	1374	321	516	126	1	964	77	525	124	4	730	3896
05:00 PM	26	111	77	0	214	122	133	56	0	311	85	158	33	0	276	13	143	47	2	205	1006
05:15 PM	22	134	85	0	241	156	178	58	0	392	79	153	31	2	265	17	137	30	0	184	1082
05:30 PM	14	98	77	0	189	133	108	51	0	292	60	146	26	0	232	28	146	44	0	218	931
05:45 PM	21	95	85	0	201	140	124	48	0	312	57	130	21	1	209	15	176	35	0	226	948
Total	83	438	324	0	845	551	543	213	0	1307	281	587	111	3	982	73	602	156	2	833	3967
Grand Total	383	1682	1389	3	3457	1381	1989	764	1	4135	919	1580	319	6	2824	336	2139	391	10	2876	13292
Apprch %	11.1	48.7	40.2	0.1		33.4	48.1	18.5	0		32.5	55.9	11.3	0.2		11.7	74.4	13.6	0.3		
Total %	2.9	12.7	10.4	0	26	10.4	15	5.7	0	31.1	6.9	11.9	2.4	0	21.2	2.5	16.1	2.9	0.1	21.6	
Cars	376	1617	1364	3	3360	1357	1950	751	1	4059	904	1526	314	6	2750	331	2096	384	10	2821	12990
% Cars	98.2	96.1	98.2	100	97.2	98.3	98	98.3	100	98.2	98.4	96.6	98.4	100	97.4	98.5	98	98.2	100	98.1	97.7
Trucks	4	12	9	0	25	5	17	7	0	29	7	17	1	0	25	3	23	5	0	31	110
% Trucks	1	0.7	0.6	0	0.7	0.4	0.9	0.9	0	0.7	0.8	1.1	0.3	0	0.9	0.9	1.1	1.3	0	1.1	0.8
Heavys	3	50	16	0	69	19	22	6	0	47	8	37	4	0	49	2	19	2	0	23	188
% Heavys	0.8	3	1.2	0	2	1.4	1.1	0.8	0	1.1	0.9	2.3	1.3	0	1.7	0.6	0.9	0.5	0	0.8	1.4
Cyclists	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4
% Cyclists	0	0.2	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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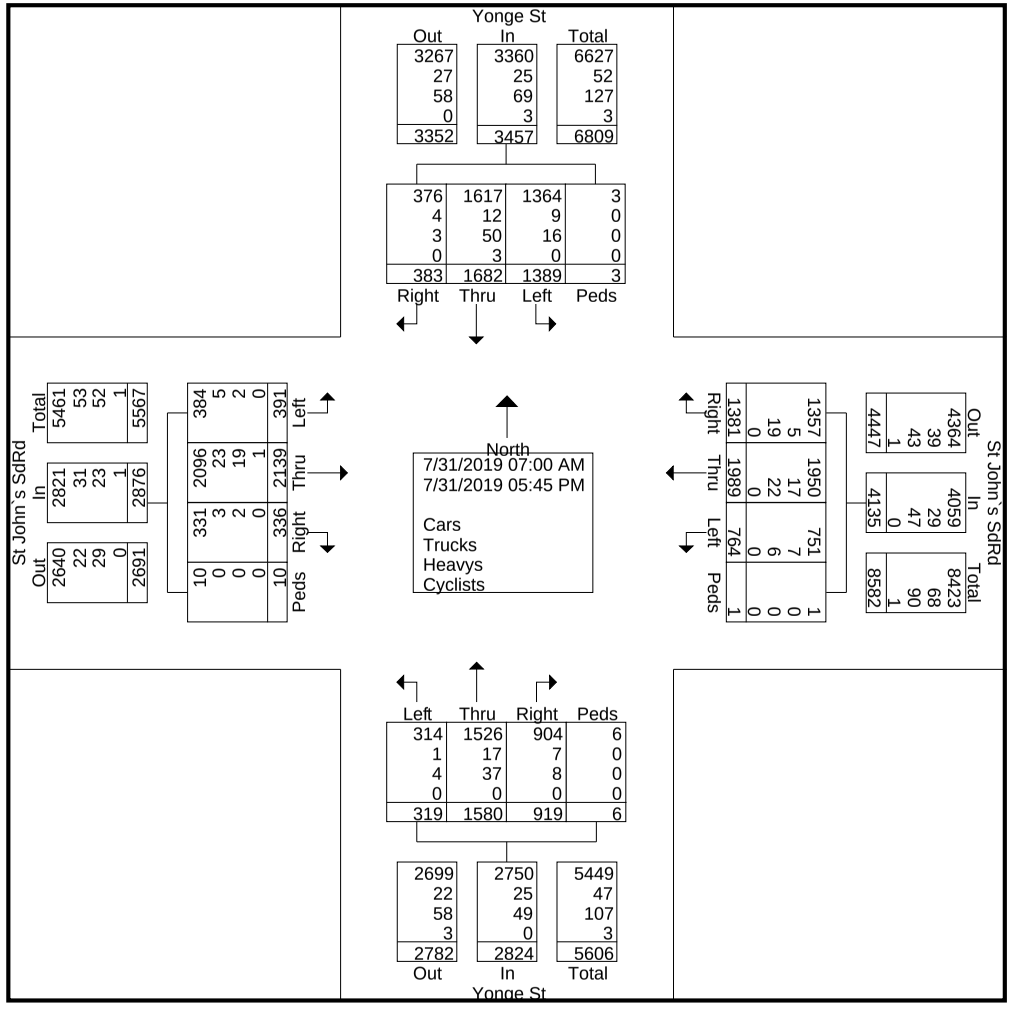

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	Yonge St From North					St John`s SdRd From East					Yonge St From South					St John`s SdRd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	19	93	101	0	213	44	**115**	44	0	203	43	56	14	0	113	16	135	**20**	**3**	174	703
08:15 AM	23	106	**113**	0	**242**	49	103	48	0	200	45	58	8	0	111	12	143	8	1	164	717
08:30 AM	**24**	100	83	0	207	53	87	51	0	191	55	**89**	**20**	0	164	44	133	13	0	190	752
08:45 AM	22	**107**	107	0	236	**71**	99	**61**	0	**231**	**77**	78	13	**2**	**170**	**46**	**150**	16	0	**212**	**849**
Total Volume	88	406	404	0	898	217	404	204	0	825	220	281	55	2	558	118	561	57	4	740	3021
% App. Total	9.8	45.2	45	0		26.3	49	24.7	0		39.4	50.4	9.9	0.4		15.9	75.8	7.7	0.5		
PHF	.917	.949	.894	.000	.928	.764	.878	.836	.000	.893	.714	.789	.688	.250	.821	.641	.935	.713	.333	.873	.890
Cars	85	380	390	0	855	200	393	202	0	795	217	265	54	2	538	116	548	53	4	721	2909
% Cars	96.6	93.6	96.5	0	95.2	92.2	97.3	99.0	0	96.4	98.6	94.3	98.2	100	96.4	98.3	97.7	93.0	100	97.4	96.3
Trucks	2	6	4	0	12	3	6	1	0	10	2	5	0	0	7	2	7	4	0	13	42
% Trucks	2.3	1.5	1.0	0	1.3	1.4	1.5	0.5	0	1.2	0.9	1.8	0	0	1.3	1.7	1.2	7.0	0	1.8	1.4
Heavys	1	20	10	0	31	14	5	1	0	20	1	11	1	0	13	0	6	0	0	6	70
% Heavys	1.1	4.9	2.5	0	3.5	6.5	1.2	0.5	0	2.4	0.5	3.9	1.8	0	2.3	0	1.1	0	0	0.8	2.3
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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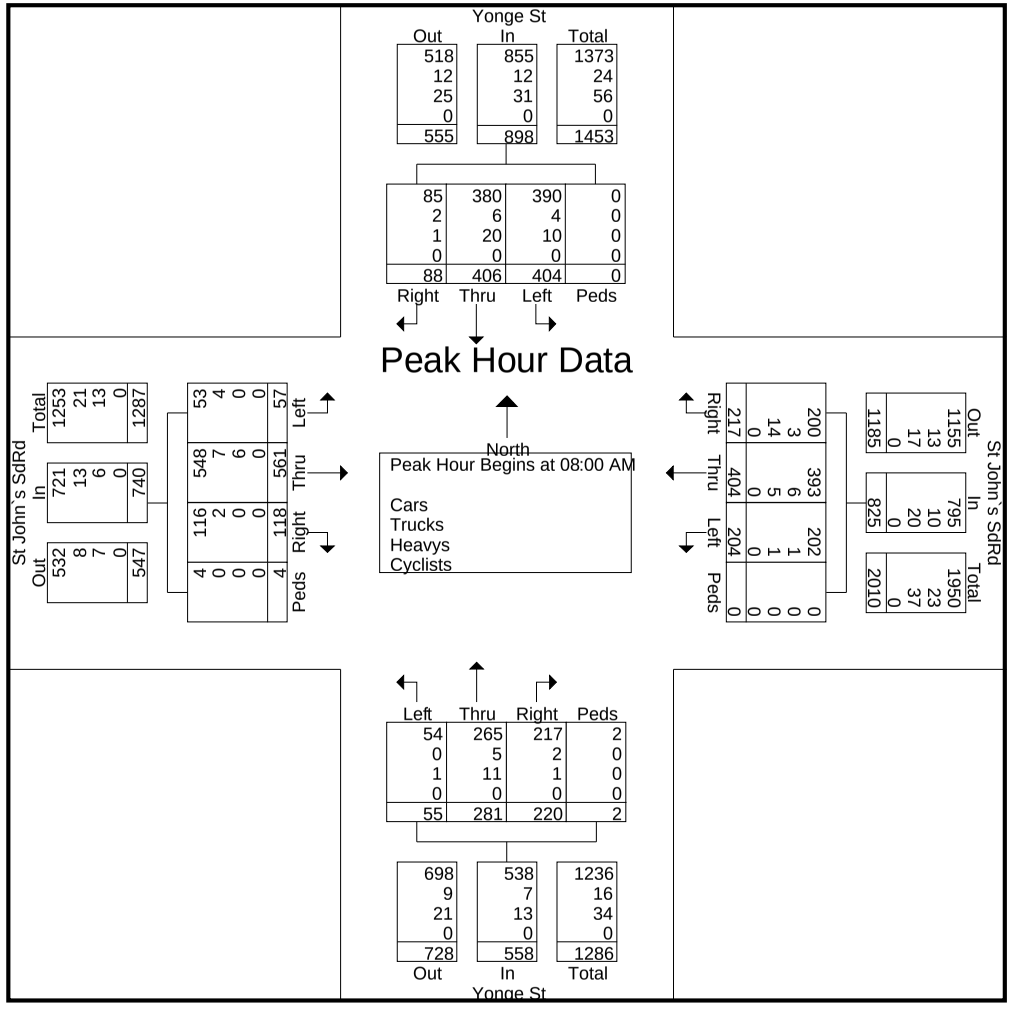

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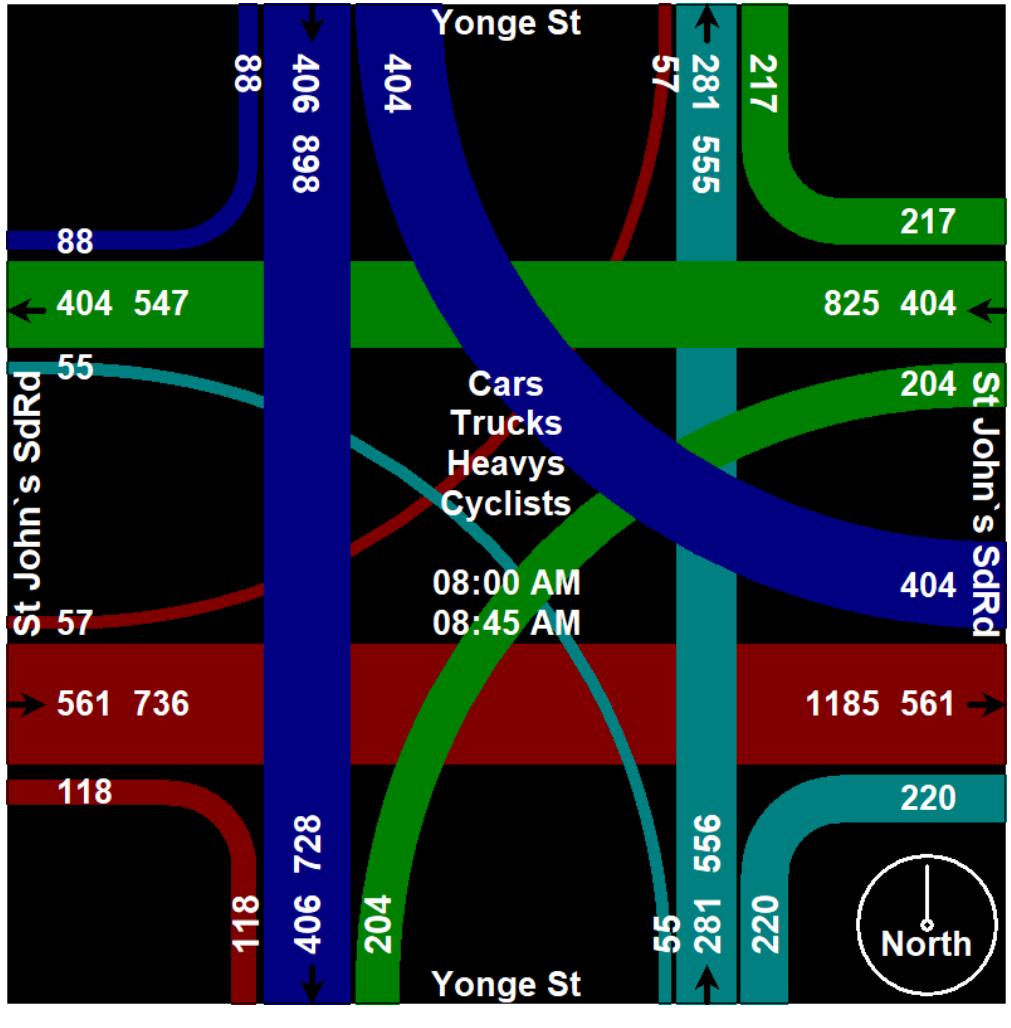

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	Yonge St From North					St John`s SdRd From East					Yonge St From South					St John`s SdRd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	23	105	74	**2**	204	135	170	56	**1**	362	67	144	**41**	1	253	**21**	119	22	**3**	165	984
04:45 PM	**27**	112	84	0	223	140	160	54	0	354	62	130	27	0	219	10	**177**	37	0	**224**	1020
05:00 PM	26	111	77	0	214	122	133	56	0	311	**85**	**158**	33	0	**276**	13	143	**47**	2	205	1006
05:15 PM	22	**134**	**85**	0	**241**	**156**	**178**	**58**	0	**392**	79	153	31	**2**	265	17	137	30	0	184	**1082**
Total Volume	98	462	320	2	882	553	641	224	1	1419	293	585	132	3	1013	61	576	136	5	778	4092
% App. Total	11.1	52.4	36.3	0.2		39	45.2	15.8	0.1		28.9	57.7	13	0.3		7.8	74	17.5	0.6		
PHF	.907	.862	.941	.250	.915	.886	.900	.966	.250	.905	.862	.926	.805	.375	.918	.726	.814	.723	.417	.868	.945
Cars	95	446	315	2	858	553	632	221	1	1407	290	571	132	3	996	61	563	136	5	765	4026
% Cars	96.9	96.5	98.4	100	97.3	100	98.6	98.7	100	99.2	99.0	97.6	100	100	98.3	100	97.7	100	100	98.3	98.4
Trucks	2	2	1	0	5	0	3	3	0	6	0	6	0	0	6	0	8	0	0	8	25
% Trucks	2.0	0.4	0.3	0	0.6	0	0.5	1.3	0	0.4	0	1.0	0	0	0.6	0	1.4	0	0	1.0	0.6
Heavys	1	12	4	0	17	0	6	0	0	6	3	8	0	0	11	0	4	0	0	4	38
% Heavys	1.0	2.6	1.3	0	1.9	0	0.9	0	0	0.4	1.0	1.4	0	0	1.1	0	0.7	0	0	0.5	0.9
Cyclists	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3
% Cyclists	0	0.4	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0.1	0.1

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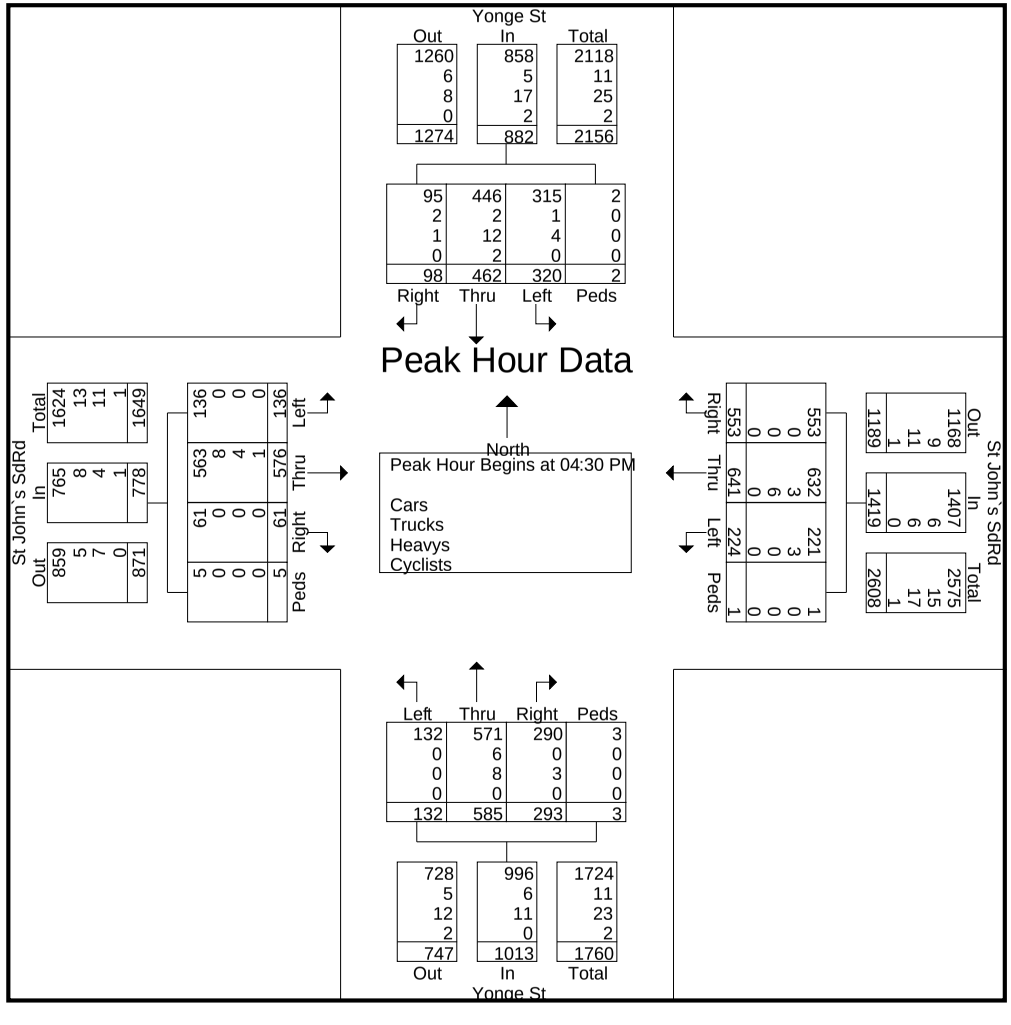

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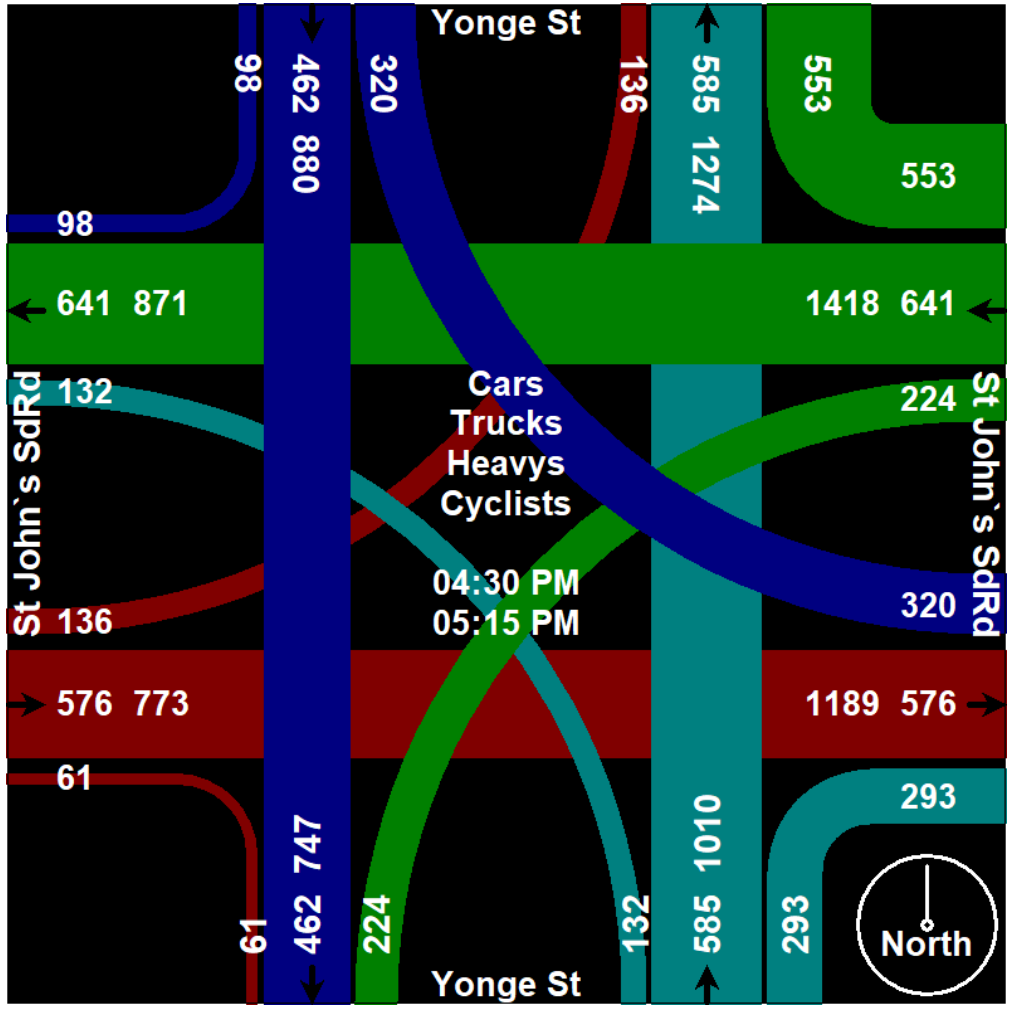
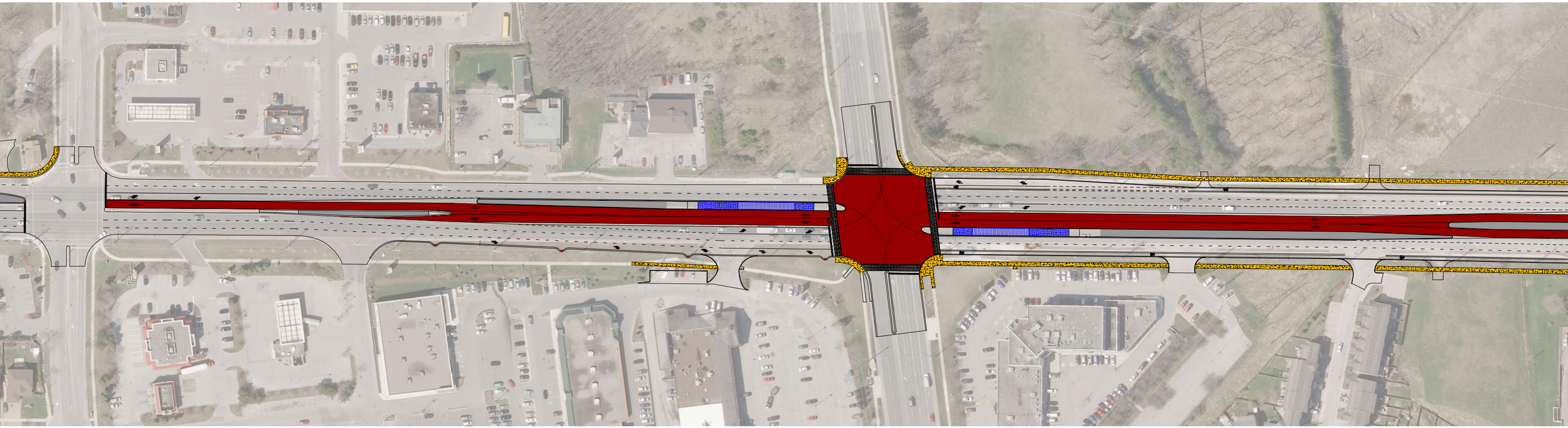


Appendix C

Yonge Street and Mulock Drive Intersection Modifications



Appendix D

Level of Service Definitions

LEVEL OF SERVICE[1]

Level of Service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. This concept was introduced in the 1965 *Highway Capacity Manual* as a criteria for interrupted flow conditions. The 2000 *Highway Capacity Manual* changed the basis for measuring Level of Service at intersections to control delay[2].

Six Levels of Service are defined with LOS A representing the best operating conditions, and LOS F the worst (briefly described below). It should be noted that there is often significant variability in the amount of delay experienced by individual drivers.

LOS A: This Level of Service describes the highest quality of traffic flow and is referred to as free flow. The approach appears open, turning movements are easily made and drivers have freedom of operation. Control delay is less than 10 seconds/vehicle.

LOS B: This Level of Service is referred to as a stable flow. Drivers feel somewhat restricted and occasionally may have to wait to complete the minor movement. Control delay is 10-15 seconds/vehicle for unsignalized intersections and 10-20 seconds/vehicle for signalized intersections.

LOS C: At this level, the operation is stable. Drivers feel more restricted and may have to wait, with queues developing for short periods. Control delay is 15-25 seconds/vehicle at unsignalized intersections and 20-35 seconds/vehicle at signalized intersections.

LOS D: At this level, traffic is approaching unstable flow. The motorist experiences increasing restriction and instability of flow. There are substantial delays to approaching vehicles during short peaks within the peak period, but there are enough gaps to lower demand to permit occasional clearance of developing queues and prevent excessive back-ups. Control delay is 25-35 seconds/vehicle at unsignalized intersections and 35-55 seconds/vehicle at signalized intersections.

LOS E: At this level capacity occurs. Long queues of vehicles exist and delays to vehicles may extend. Control delay is 35-50 seconds/vehicle at unsignalized intersections and 55-80 seconds/vehicle at signalized intersections.

LOS F: At this Level of Service, the intersection has failed. Capacity of the intersection has been exceeded. Control delay exceeds 50 seconds/vehicle at unsignalized intersections and exceeds 80 seconds/vehicle at signalized intersections.

---

[1] *Transportation Research Board: Highway Capacity Manual 1965, 2000*

[2] *Control delay is defined as the component of delay that results when a control signal causes a lane group to reduce speed or to stop; it is measured by comparison with the uncontrolled condition.*

Appendix E

Synchro Analysis Worksheets

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	745	65	105	520	250	45	500	135	280	715	110
Future Volume (vph)	140	745	65	105	520	250	45	500	135	280	715	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.2	3.7	3.0	3.2	3.7	3.0	3.3	3.7	3.3	3.4	3.7
Storage Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	70.0		85.0
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	1.00			1.00		0.96	0.99		0.98
Frt			0.850		0.951				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	3317	1601	1532	3154	0	1546	3231	1617	1711	3394	1601
Flt Permitted	0.107			0.113			0.950			0.950		
Satd. Flow (perm)	186	3317	1575	182	3154	0	1540	3231	1552	1688	3394	1563
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			183		56				183			136
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		1699.2			430.7			2054.7			314.9	
Travel Time (s)		102.0			25.8			123.3			18.9	
Confl. Peds. (#/hr)			4	4			9		22	22		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	4%	2%	10%	5%	2%	9%	8%	1%	2%	4%	2%
Adj. Flow (vph)	156	828	72	117	578	278	50	556	150	311	794	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	828	72	117	856	0	50	556	150	311	794	122
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	1.06	0.99	1.09	1.06	0.99	1.09	1.04	0.99	1.04	1.03	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4		4	8					6			2
Detector Phase	7	4	4	3	8		1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0		7.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	14.0	44.5	44.5	14.0	44.5		13.0	39.5	39.5	13.0	39.5	39.5
Total Split (s)	18.0	44.5	44.5	18.0	44.5		16.0	51.5	51.5	26.0	61.5	61.5
Total Split (%)	12.9%	31.8%	31.8%	12.9%	31.8%		11.4%	36.8%	36.8%	18.6%	43.9%	43.9%
Maximum Green (s)	11.0	37.0	37.0	11.0	37.0		10.0	44.0	44.0	20.0	54.0	54.0
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	4.0	3.0	3.0	4.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5	7.0	7.5		6.0	7.5	7.5	6.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0	30.0		30.0			25.0	25.0		25.0	25.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	49.0	37.5	37.5	48.0	37.0		9.0	44.0	44.0	20.0	57.6	57.6
Actuated g/C Ratio	0.35	0.27	0.27	0.34	0.26		0.06	0.31	0.31	0.14	0.41	0.41
v/c Ratio	0.87	0.93	0.13	0.71	0.98		0.51	0.55	0.24	1.27	0.57	0.17
Control Delay	73.4	67.9	0.5	53.9	73.4		80.6	42.2	3.1	198.4	34.6	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	67.9	0.5	53.9	73.4		80.6	42.2	3.1	198.4	34.6	3.8
LOS	E	E	A	D	E		F	D	A	F	C	A
Approach Delay		64.1			71.0			37.0			73.0	
Approach LOS		E			E			D			E	
Queue Length 50th (m)	30.1	125.1	0.0	22.1	124.0		14.3	70.7	0.0	~114.2	96.8	0.0
Queue Length 95th (m)	#72.2	#166.3	0.0	#46.3	#169.6		28.8	90.3	9.1	#175.2	119.2	10.5
Internal Link Dist (m)		1675.2			406.7			2030.7			290.9	
Turn Bay Length (m)	85.0		70.0	55.0			75.0		300.0	70.0		85.0
Base Capacity (vph)	180	887	555	169	874		110	1015	613	244	1396	722
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.93	0.13	0.69	0.98		0.45	0.55	0.24	1.27	0.57	0.17

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 125			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay: 63.4		Intersection LOS: E	
Intersection Capacity Utilization 95.6%		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: 110: Yonge Street & Mulock Drive

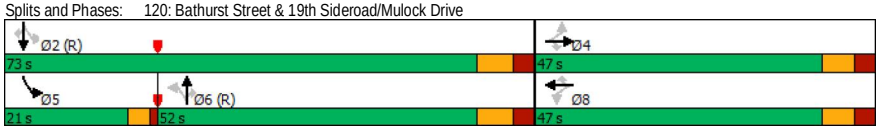
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	25	5	340	75	315	0	425	290	465	1030	10
Future Volume (vph)	5	25	5	340	75	315	0	425	290	465	1030	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.7	3.7	3.2	3.2	3.2	3.6	3.6	3.6	3.0	3.7	4.0
Storage Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99						0.99	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1478	1921	1633	1708	3450	1456	1900	3406	1599	1604	3544	1533
Flt Permitted	0.703			0.740						0.428		
Satd. Flow (perm)	1094	1921	1612	1330	3450	1456	1900	3406	1578	722	3544	1533
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			332			305			41
Link Speed (k/h)		60			60			60			70	
Link Distance (m)		142.9			1699.2			469.9			237.1	
Travel Time (s)		8.6			102.0			28.2			12.2	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	14%	0%	0%	1%	0%	6%	0%	6%	1%	5%	3%	10%
Adj. Flow (vph)	5	26	5	358	79	332	0	447	305	489	1084	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	26	5	358	79	332	0	447	305	489	1084	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	0.99	0.99	1.06	1.06	1.06	1.00	1.00	1.00	1.09	0.99	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	4	4	4	8	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	43.5	43.5	43.5	43.5	43.5	43.5	43.0	43.0	43.0	11.0	43.0	43.0
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	52.0	52.0	52.0	21.0	73.0	73.0
Total Split (%)	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%	43.3%	43.3%	43.3%	17.5%	60.8%	60.8%
Maximum Green (s)	39.5	39.5	39.5	39.5	39.5	39.5	44.0	44.0	44.0	17.0	65.0	65.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	8.0	8.0	8.0	4.0	8.0	8.0

Lanes, Volumes, Timings
120: Bathurst Street & 19th Sideroad/Mulock Drive
AM Peak Hour
Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	29.0	29.0	29.0	29.0	29.0	29.0	28.0	28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0		0	0
Act Effct Green (s)	35.7	35.7	35.7	35.7	35.7	35.7		47.8	47.8	72.8	68.8	68.8
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30		0.40	0.40	0.61	0.57	0.57
v/c Ratio	0.02	0.05	0.01	0.91	0.08	0.50		0.33	0.38	0.87	0.53	0.01
Control Delay	27.6	28.2	0.0	67.5	29.0	5.9		26.7	4.3	34.2	17.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	28.2	0.0	67.5	29.0	5.9		26.7	4.3	34.2	17.6	0.0
LOS	C	C	A	E	C	A		C	A	C	B	A
Approach Delay		24.2			37.0			17.6			22.6	
Approach LOS		C			D			B			C	
Queue Length 50th (m)	0.9	4.4	0.0	82.4	7.1	0.0		41.3	0.0	68.5	87.4	0.0
Queue Length 95th (m)	3.9	11.2	0.0	#132.1	13.0	20.8		56.4	18.6	#131.0	109.8	0.0
Internal Link Dist (m)		118.9			1675.2			445.9			213.1	
Turn Bay Length (m)	30.0		5.0	60.0		60.0			85.0	65.0		50.0
Base Capacity (vph)	360	632	585	437	1135	665		1357	812	563	2033	897
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.01	0.04	0.01	0.82	0.07	0.50		0.33	0.38	0.87	0.53	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 109 (91%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 24.9		Intersection LOS: C	
Intersection Capacity Utilization 96.7%		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: 120: Bathurst Street & 19th Sideroad/Mulock Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	605	150	175	425	265	70	470	240	490	705	140
Future Volume (vph)	105	605	150	175	425	265	70	470	240	490	705	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.6	3.7	3.2	3.6	3.7	3.0	3.4	4.0	3.0	3.7	3.3
Storage Length (m)	65.0		50.0	70.0		0.0	35.0		100.0	115.0		230.0
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	*0.75	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00		1.00			1.00					0.97
Frt		0.970				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1612	2703	0	1708	1845	1512	1652	3330	1670	*2068	3444	1516
Flt Permitted	0.228			0.095			0.352			0.284		
Satd. Flow (perm)	387	2703	0	171	1845	1512	610	3330	1670	484	3444	1473
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				281			186			157
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		448.3			341.9			505.9			2054.7	
Travel Time (s)		26.9			20.5			30.4			123.3	
Confl. Peds. (#/hr)			2	2			4					4
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	7%	2%	2%	1%	3%	8%	2%	6%	1%	4%	6%	3%
Adj. Flow (vph)	118	680	169	197	478	298	79	528	270	551	792	157
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	849	0	197	478	298	79	528	270	551	792	157
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.4			3.4			3.0			3.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.00	0.99	1.06	1.00	0.99	1.09	1.03	0.94	1.09	0.99	1.04
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		3	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	45.0		11.0	45.0	45.0	39.5	39.5	39.5	11.0	39.5	39.5
Total Split (s)	13.0	48.0		15.0	50.0	50.0	41.0	41.0	41.0	26.0	67.0	67.0
Total Split (%)	10.0%	36.9%		11.5%	38.5%	38.5%	31.5%	31.5%	31.5%	20.0%	51.5%	51.5%
Maximum Green (s)	9.0	40.0		11.0	42.0	42.0	33.5	33.5	33.5	22.0	59.5	59.5
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	4.5	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	3.5		1.0	3.5	3.5	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.0		4.0	8.0	8.0	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		

Lanes, Volumes, Timings
210: Yonge Street & St. John's Sideroad
AM Peak Hour
Existing Conditions

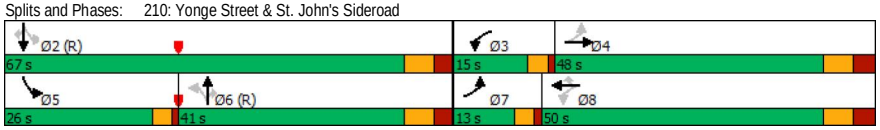
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0			7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0			30.0	30.0	25.0	25.0	25.0		25.0	25.0
Pedestrian Calls (#/hr)		0			0	0	5	5	5		5	5
Act Effct Green (s)	52.7	40.0		57.3	42.3	42.3	33.5	33.5	33.5	63.0	59.5	59.5
Actuated g/C Ratio	0.41	0.31		0.44	0.33	0.33	0.26	0.26	0.26	0.48	0.46	0.46
v/c Ratio	0.50	1.01		0.96	0.80	0.44	0.50	0.62	0.48	1.10	0.50	0.21
Control Delay	28.8	76.6		84.0	51.3	6.7	54.1	46.2	16.0	95.2	26.2	3.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	76.6		84.0	51.3	6.7	54.1	46.2	16.0	95.2	26.2	3.7
LOS	C	E		F	D	A	D	D	B	F	C	A
Approach Delay		70.8			44.3			37.6			49.2	
Approach LOS		E			D			D			D	
Queue Length 50th (m)	18.4	~152.4		36.2	117.6	3.1	18.2	66.4	17.8	~124.2	77.5	0.0
Queue Length 95th (m)	30.9	#207.0		#84.9	159.7	23.9	36.2	85.0	43.5	#192.5	94.9	12.0
Internal Link Dist (m)		424.3			317.9			481.9			2030.7	
Turn Bay Length (m)	65.0			70.0			35.0		100.0	115.0		230.0
Base Capacity (vph)	242	843		205	600	681	157	858	568	502	1576	759
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	1.01		0.96	0.80	0.44	0.50	0.62	0.48	1.10	0.50	0.21

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 35 (27%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 50.6 Intersection LOS: D
Intersection Capacity Utilization 91.6% ICU Level of Service F
Analysis Period (min) 15

* User Entered Value
~ 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: 210: Yonge Street & St. John's Sideroad



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	385	45	130	415	40	50	585	50	140	1020	265
Future Volume (vph)	85	385	45	130	415	40	50	585	50	140	1020	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.0	3.5	3.7	3.2	3.7	4.0	3.1	3.3	3.7
Storage Length (m)	30.0		0.0	50.0		50.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00										
Frt		0.984				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1819	0	1668	1807	1601	1675	3510	1622	1688	3388	1617
Flt Permitted	0.212			0.500			0.215			0.287		
Satd. Flow (perm)	388	1819	0	878	1807	1601	379	3510	1622	510	3388	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				122			122			248
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		129.9			1758.6			451.2			794.7	
Travel Time (s)		7.8			105.5			23.2			40.9	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	2%	1%	4%	2%	3%	4%	4%	1%	3%	1%
Adj. Flow (vph)	89	405	47	137	437	42	53	616	53	147	1074	279
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	452	0	137	437	42	53	616	53	147	1074	279
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.2			3.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.09	1.01	0.99	1.06	0.99	0.94	1.08	1.04	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0	10.0	20.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	17.5		38.5	38.5	38.5	36.5	36.5	36.5	11.0	36.5	36.5
Total Split (s)	16.0	37.5		37.5	37.5	37.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (%)	14.3%	33.5%		33.5%	33.5%	33.5%	42.4%	42.4%	42.4%	9.8%	42.4%	42.4%
Maximum Green (s)	12.0	30.0		30.0	30.0	30.0	40.0	40.0	40.0	7.0	40.0	40.0
Yellow Time (s)	3.0	4.5		4.5	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0		3.0	3.0	3.0	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.5		7.5	7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		

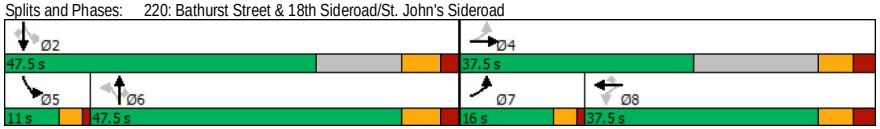
Lanes, Volumes, Timings
220: Bathurst Street & 18th Sideroad/St. John's Sideroad
AM Peak Hour
Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None		None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)				7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)				24.0	24.0	24.0	22.0	22.0	22.0		22.0	22.0
Pedestrian Calls (#/hr)				0	0	0	0	0	0		0	0
Act Effct Green (s)	41.2	37.6		27.2	27.2	27.2	29.9	29.9	29.9	44.9	41.3	41.3
Actuated g/C Ratio	0.44	0.40		0.29	0.29	0.29	0.32	0.32	0.32	0.48	0.44	0.44
v/c Ratio	0.29	0.62		0.54	0.84	0.08	0.44	0.55	0.09	0.44	0.72	0.33
Control Delay	19.0	26.9		40.8	49.3	0.3	41.4	29.7	0.3	20.6	26.4	4.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	26.9		40.8	49.3	0.3	41.4	29.7	0.3	20.6	26.4	4.7
LOS	B	C		D	D	A	D	C	A	C	C	A
Approach Delay		25.6			44.0			28.4			21.8	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	9.5	64.6		22.5	79.7	0.0	8.7	55.2	0.0	17.4	96.1	3.7
Queue Length 95th (m)	22.0	113.7		49.9	#157.0	0.0	22.4	75.1	0.0	31.1	126.3	19.3
Internal Link Dist (m)		105.9			1734.6			427.2			770.7	
Turn Bay Length (m)	30.0			50.0		50.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	347	921		289	594	608	166	1540	780	332	1895	1013
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.49		0.47	0.74	0.07	0.32	0.40	0.07	0.44	0.57	0.28

Intersection Summary

Area Type: Other
Cycle Length: 112
Actuated Cycle Length: 94.4
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 27.9 Intersection LOS: C
Intersection Capacity Utilization 101.2% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 220: Bathurst Street & 18th Sideroad/St. John's Sideroad



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	560	55	185	815	285	125	960	155	270	725	140
Future Volume (vph)	90	560	55	185	815	285	125	960	155	270	725	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.2	3.7	3.0	3.2	3.7	3.0	3.3	3.7	3.3	3.4	3.7
Storage Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	70.0		85.0
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850		0.961				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3317	1633	1668	3220	0	1652	3455	1633	1711	3427	1617
Flt Permitted	0.108			0.223			0.950			0.950		
Satd. Flow (perm)	190	3317	1633	392	3220	0	1652	3455	1633	1711	3427	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			171		31				171			152
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		1699.2			430.7			2054.7			314.9	
Travel Time (s)		102.0			25.8			123.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	4%	0%	1%	4%	0%	2%	1%	0%	2%	3%	1%
Adj. Flow (vph)	98	609	60	201	886	310	136	1043	168	293	788	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	609	60	201	1196	0	136	1043	168	293	788	152
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	1.06	0.99	1.09	1.06	0.99	1.09	1.04	0.99	1.04	1.03	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4		4	8					6			2
Detector Phase	7	4	4	3	8		1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0		7.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	14.0	44.5	44.5	14.0	44.5		13.0	39.5	39.5	13.0	39.5	39.5
Total Split (s)	18.0	44.5	44.5	18.0	44.5		16.0	61.5	61.5	26.0	71.5	71.5
Total Split (%)	12.0%	29.7%	29.7%	12.0%	29.7%		10.7%	41.0%	41.0%	17.3%	47.7%	47.7%
Maximum Green (s)	11.0	37.0	37.0	11.0	37.0		10.0	54.0	54.0	20.0	64.0	64.0
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5		3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	4.0	3.0	3.0	4.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5	7.0	7.5		6.0	7.5	7.5	6.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0

Lanes, Volumes, Timings
110: Yonge Street & Mulock Drive
PM Peak Hour
Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None	None	None	None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0	30.0		30.0			25.0	25.0		25.0	25.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effct Green (s)	47.7	37.0	37.0	49.3	37.8		10.0	54.0	54.0	20.0	64.0	64.0
Actuated g/C Ratio	0.32	0.25	0.25	0.33	0.25		0.07	0.36	0.36	0.13	0.43	0.43
v/c Ratio	0.61	0.74	0.11	0.91	1.43		1.24	0.84	0.24	1.29	0.54	0.20
Control Delay	48.8	58.7	0.4	78.5	241.1		216.7	51.4	4.9	206.7	33.7	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	58.7	0.4	78.5	241.1		216.7	51.4	4.9	206.7	33.7	4.3
LOS	D	E	A	E	F		F	D	A	F	C	A
Approach Delay		52.8			217.7			62.3			71.2	
Approach LOS		D			F			E			E	
Queue Length 50th (m)	20.5	93.4	0.0	45.0	~266.5		~52.6	157.3	0.0	~116.2	95.7	0.0
Queue Length 95th (m)	34.8	116.5	0.0	#80.1	#312.3		#98.6	186.9	15.5	#177.8	116.4	13.8
Internal Link Dist (m)		1675.2			406.7			2030.7			290.9	
Turn Bay Length (m)	85.0		70.0	55.0			75.0		300.0	70.0		85.0
Base Capacity (vph)	169	818	531	222	834		110	1243	697	228	1462	777
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.74	0.11	0.91	1.43		1.24	0.84	0.24	1.29	0.54	0.20

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.43
Intersection Signal Delay: 108.8 Intersection LOS: F
Intersection Capacity Utilization 102.3% ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

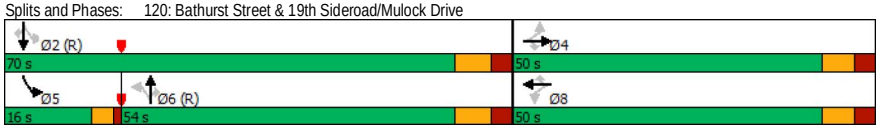
Splits and Phases: 110: Yonge Street & Mulock Drive

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	110	5	315	70	610	5	1140	375	290	625	45
Future Volume (vph)	45	110	5	315	70	610	5	1140	375	290	625	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.7	3.7	3.2	3.2	3.2	3.6	3.6	3.6	3.0	3.7	4.0
Storage Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.99						
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	1921	1633	1708	3450	1484	1805	3574	1599	1589	3579	1687
Flt Permitted	0.707			0.683			0.404			0.102		
Satd. Flow (perm)	1229	1921	1633	1228	3450	1465	768	3574	1599	171	3579	1687
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			238			354			47
Link Speed (k/h)		60			60			60			70	
Link Distance (m)		142.9			1699.2			469.9			237.1	
Travel Time (s)		8.6			102.0			28.2			12.2	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	1%	0%	4%	0%	1%	1%	6%	2%	0%
Adj. Flow (vph)	47	115	5	328	73	635	5	1188	391	302	651	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	115	5	328	73	635	5	1188	391	302	651	47
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	0.99	0.99	1.06	1.06	1.06	1.00	1.00	1.00	1.09	0.99	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	4	4	4	8	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	43.5	43.5	43.5	43.5	43.5	43.5	43.0	43.0	43.0	11.0	43.0	43.0
Total Split (s)	50.0	50.0	50.0	50.0	50.0	50.0	54.0	54.0	54.0	16.0	70.0	70.0
Total Split (%)	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	45.0%	45.0%	45.0%	13.3%	58.3%	58.3%
Maximum Green (s)	42.5	42.5	42.5	42.5	42.5	42.5	46.0	46.0	46.0	12.0	62.0	62.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	8.0	8.0	8.0	4.0	8.0	8.0
Lead/Lag							Lag	Lag	Lag	Lead		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	29.0	29.0	29.0	29.0	29.0	29.0	28.0	28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0		0	0
Act Effct Green (s)	36.3	36.3	36.3	36.3	36.3	36.3	52.2	52.2	52.2	72.2	68.2	68.2
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.44	0.44	0.44	0.60	0.57	0.57
v/c Ratio	0.13	0.20	0.01	0.88	0.07	1.04	0.02	0.76	0.44	1.24	0.32	0.05
Control Delay	28.6	30.2	0.0	64.4	27.8	73.7	23.0	34.0	5.5	162.1	15.1	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.6	30.2	0.0	64.4	27.8	73.7	23.0	34.0	5.5	162.1	15.1	4.2
LOS	C	C	A	E	C	E	C	C	A	F	B	A
Approach Delay		28.9			67.5			26.9			59.0	
Approach LOS		C			E			C			E	
Queue Length 50th (m)	8.3	20.7	0.0	75.7	6.6	~117.5	0.7	131.9	5.4	~71.5	44.1	0.0
Queue Length 95th (m)	16.9	33.7	0.0	#112.5	11.7	#186.7	3.6	172.3	28.2	#133.2	62.0	6.1
Internal Link Dist (m)		118.9			1675.2			445.9			213.1	
Turn Bay Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Base Capacity (vph)	435	680	631	434	1221	609	333	1554	895	244	2033	978
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.17	0.01	0.76	0.06	1.04	0.02	0.76	0.44	1.24	0.32	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 87 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.24			
Intersection Signal Delay: 46.6		Intersection LOS: D	
Intersection Capacity Utilization 94.3%		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: 120: Bathurst Street & 19th Sideroad/Mulock Drive



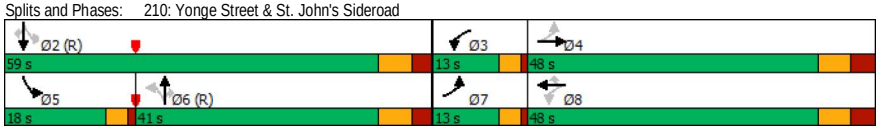
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	475	75	245	550	630	130	830	255	310	605	120
Future Volume (vph)	145	475	75	245	550	630	130	830	255	310	605	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.6	3.7	3.2	3.6	3.7	3.0	3.4	4.0	3.0	3.7	3.3
Storage Length (m)	65.0		50.0	70.0		0.0	35.0		100.0	115.0		230.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	*0.75	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00		0.98	1.00		0.99	1.00		0.97
Frt		0.980				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1725	2740	0	1708	1881	1633	1685	3461	1670	*2068	3544	1516
Flt Permitted	0.103			0.238			0.410			0.107		
Satd. Flow (perm)	187	2740	0	427	1881	1608	724	3461	1648	186	3544	1470
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12				309			262			126
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		448.3			341.9			505.9			2054.7	
Travel Time (s)		26.9			20.5			30.4			123.3	
Confl. Peds. (#/hr)	2		3	3		2	5		1	1		5
Confl. Bikes (#/hr)						2						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	2%	1%	2%	3%	3%
Adj. Flow (vph)	153	500	79	258	579	663	137	874	268	326	637	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	153	579	0	258	579	663	137	874	268	326	637	126
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.4			3.4			3.0			3.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.00	0.99	1.06	1.00	0.99	1.09	1.03	0.94	1.09	0.99	1.04
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		3	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	45.0		11.0	45.0	45.0	39.5	39.5	39.5	11.0	39.5	39.5
Total Split (s)	13.0	48.0		13.0	48.0	48.0	41.0	41.0	41.0	18.0	59.0	59.0
Total Split (%)	10.8%	40.0%		10.8%	40.0%	40.0%	34.2%	34.2%	34.2%	15.0%	49.2%	49.2%
Maximum Green (s)	9.0	40.0		9.0	40.0	40.0	33.5	33.5	33.5	14.0	51.5	51.5
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	4.5	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	3.5		1.0	3.5	3.5	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.0		4.0	8.0	8.0	7.5	7.5	7.5	4.0	7.5	7.5

Lanes, Volumes, Timings
210: Yonge Street & St. John's Sideroad
PM Peak Hour
Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0			7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0			30.0	30.0	25.0	25.0	25.0		25.0	25.0
Pedestrian Calls (#/hr)		5			5	5	5	5	5		5	5
Act Effct Green (s)	52.0	39.0		52.0	39.0	39.0	34.5	34.5	34.5	56.0	52.5	52.5
Actuated g/C Ratio	0.43	0.32		0.43	0.32	0.32	0.29	0.29	0.29	0.47	0.44	0.44
v/c Ratio	0.78	0.64		0.92	0.95	0.91	0.66	0.88	0.41	1.07	0.41	0.18
Control Delay	49.5	37.5		61.9	65.2	37.8	55.2	52.5	6.4	103.4	24.4	4.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.5	37.5		61.9	65.2	37.8	55.2	52.5	6.4	103.4	24.4	4.2
LOS	D	D		E	E	D	E	D	A	F	C	A
Approach Delay		40.0			52.5			43.1			45.7	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	21.3	78.6		38.5	137.5	92.1	30.2	110.1	1.1	~72.8	56.8	0.0
Queue Length 95th (m)	#53.8	104.4		#82.5	#207.6	#170.0	#60.3	#147.3	21.5	#132.6	72.8	11.5
Internal Link Dist (m)		424.3			317.9			481.9			2030.7	
Turn Bay Length (m)	65.0			70.0			35.0		100.0	115.0		230.0
Base Capacity (vph)	196	921		281	627	742	208	994	659	306	1548	713
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.63		0.92	0.92	0.89	0.66	0.88	0.41	1.07	0.41	0.18

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 39 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 110		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.07		
Intersection Signal Delay: 46.3	Intersection LOS: D	
Intersection Capacity Utilization 100.5%	ICU Level of Service G	
Analysis Period (min) 15		
* User Entered Value		
~ 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: 210: Yonge Street & St. John's Sideroad



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	445	35	120	385	150	80	1025	165	75	660	75
Future Volume (vph)	235	445	35	120	385	150	80	1025	165	75	660	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.0	3.5	3.7	3.2	3.7	4.0	3.1	3.3	3.7
Storage Length (m)	30.0		0.0	50.0		50.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.99						
Frt		0.989				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	1880	0	1636	1842	1633	1708	3579	1670	1655	3421	1617
Flt Permitted	0.198			0.470			0.390			0.098		
Satd. Flow (perm)	377	1880	0	809	1842	1612	701	3579	1670	171	3421	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				124			130			83
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		129.9			1758.6			451.2			794.7	
Travel Time (s)		7.8			105.5			23.2			40.9	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	2%	3%	2%	0%	1%	2%	1%	3%	2%	1%
Adj. Flow (vph)	245	464	36	125	401	156	83	1068	172	78	688	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	500	0	125	401	156	83	1068	172	78	688	78
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.2			3.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.09	1.01	0.99	1.06	0.99	0.94	1.08	1.04	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0	10.0	20.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	17.5		38.5	38.5	38.5	36.5	36.5	36.5	11.0	36.5	36.5
Total Split (s)	16.0	37.5		37.5	37.5	37.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (%)	14.3%	33.5%		33.5%	33.5%	33.5%	42.4%	42.4%	42.4%	9.8%	42.4%	42.4%
Maximum Green (s)	12.0	30.0		30.0	30.0	30.0	40.0	40.0	40.0	7.0	40.0	40.0
Yellow Time (s)	3.0	4.5		4.5	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0		3.0	3.0	3.0	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.5		7.5	7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		

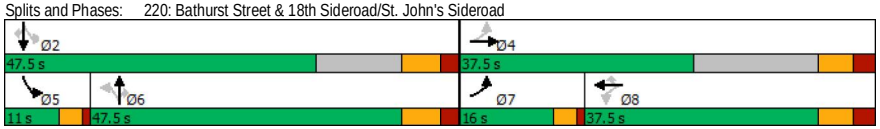
Lanes, Volumes, Timings
220: Bathurst Street & 18th Sideroad/St. John's Sideroad
PM Peak Hour
Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None		None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)				7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)				24.0	24.0	24.0	22.0	22.0	22.0		22.0	22.0
Pedestrian Calls (#/hr)				0	0	0	0	0	0		0	0
Act Effct Green (s)	46.1	42.5		26.4	26.4	26.4	38.2	38.2	38.2	50.1	46.5	46.5
Actuated g/C Ratio	0.44	0.41		0.25	0.25	0.25	0.37	0.37	0.37	0.48	0.45	0.45
v/c Ratio	0.74	0.65		0.61	0.86	0.31	0.32	0.81	0.25	0.43	0.45	0.10
Control Delay	35.5	30.4		49.9	57.0	11.0	30.5	36.9	8.6	22.6	21.3	3.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	30.4		49.9	57.0	11.0	30.5	36.9	8.6	22.6	21.3	3.9
LOS	D	C		D	E	B	C	D	A	C	C	A
Approach Delay		32.0			45.2			32.9			19.8	
Approach LOS		C			D			C			B	
Queue Length 50th (m)	35.7	90.0		25.0	86.6	5.5	13.8	117.6	6.3	9.4	55.4	0.0
Queue Length 95th (m)	#60.8	127.8		46.7	#135.6	22.1	28.3	145.7	21.6	18.0	71.6	7.8
Internal Link Dist (m)		105.9			1734.6			427.2			770.7	
Turn Bay Length (m)	30.0			50.0		50.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	334	849		237	541	561	274	1401	733	183	1708	849
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.59		0.53	0.74	0.28	0.30	0.76	0.23	0.43	0.40	0.09

Intersection Summary

Area Type: Other
Cycle Length: 112
Actuated Cycle Length: 104.3
Natural Cycle: 100
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 32.0 Intersection LOS: C
Intersection Capacity Utilization 93.8% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 220: Bathurst Street & 18th Sideroad/St. John's Sideroad



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	820	75	120	575	275	50	560	165	320	860	125
Future Volume (vph)	155	820	75	120	575	275	50	560	165	320	860	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.2	3.7	3.0	3.2	3.7	3.3	3.3	3.2	3.3	3.3	3.2
Storage Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	1.00			1.00		0.96	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	3317	1601	1532	3285	1601	1601	3231	1528	1711	3355	1513
Flt Permitted	0.265			0.104			0.950			0.950		
Satd. Flow (perm)	461	3317	1575	168	3285	1601	1597	3231	1473	1693	3355	1480
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			306			153			147
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		1699.2			430.7			2054.7			314.9	
Travel Time (s)		102.0			25.8			123.3			18.9	
Confl. Peds. (#/hr)			4	4			9		22	22		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	4%	2%	10%	5%	2%	9%	8%	1%	2%	4%	2%
Adj. Flow (vph)	172	911	83	133	639	306	56	622	183	356	956	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	172	911	83	133	639	306	56	622	183	356	956	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	1.06	0.99	1.09	1.06	0.99	1.04	1.04	1.06	1.04	1.04	1.06
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	14.0	45.5	45.5	14.0	45.5	45.5	13.0	42.5	42.5	13.0	42.5	42.5
Total Split (s)	15.0	47.0	47.0	15.0	47.0	47.0	24.0	44.0	44.0	24.0	44.0	44.0
Total Split (%)	11.5%	36.2%	36.2%	11.5%	36.2%	36.2%	18.5%	33.8%	33.8%	18.5%	33.8%	33.8%
Maximum Green (s)	8.0	39.5	39.5	8.0	39.5	39.5	18.0	36.5	36.5	18.0	36.5	36.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	4.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5	7.0	7.5	7.5	6.0	7.5	7.5	6.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag

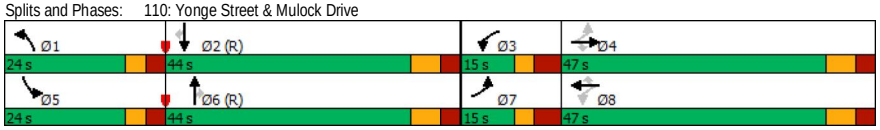
Lanes, Volumes, Timings
110: Yonge Street & Mulock Drive
AM Peak Hour
2039 Future Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		31.0	31.0		31.0	31.0		28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	47.0	38.5	38.5	47.0	38.5	38.5	10.1	37.5	37.5	18.0	48.0	48.0
Actuated g/C Ratio	0.36	0.30	0.30	0.36	0.30	0.30	0.08	0.29	0.29	0.14	0.37	0.37
v/c Ratio	0.72	0.93	0.15	0.92	0.66	0.44	0.45	0.67	0.34	1.51	0.77	0.22
Control Delay	45.2	60.3	0.5	86.5	43.6	5.8	85.2	30.5	4.6	287.5	42.9	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	60.3	0.5	86.5	43.6	5.8	85.2	30.5	4.6	287.5	42.9	5.2
LOS	D	E	A	F	D	A	F	C	A	F	D	A
Approach Delay		53.8			38.1			28.6			99.3	
Approach LOS		D			D			C			F	
Queue Length 50th (m)	29.5	124.2	0.0	22.3	78.4	0.0	15.9	59.4	0.4	~133.1	124.1	0.0
Queue Length 95th (m)	#51.0	#162.4	0.0	#62.4	99.8	21.1	m24.9	m79.5	m8.1	#195.3	#170.4	13.6
Internal Link Dist (m)		1675.2			406.7			2030.7			290.9	
Turn Bay Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Base Capacity (vph)	240	1007	580	144	998	699	221	931	533	236	1237	638
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.90	0.14	0.92	0.64	0.44	0.25	0.67	0.34	1.51	0.77	0.22

Intersection Summary		
Area Type:	Other	
Cycle Length: 130		
Actuated Cycle Length: 130		
Offset: 28 (22%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 135		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.51		
Intersection Signal Delay: 59.8	Intersection LOS: E	
Intersection Capacity Utilization 100.7%	ICU Level of Service G	
Analysis Period (min) 15		

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 110: Yonge Street & Mulock Drive



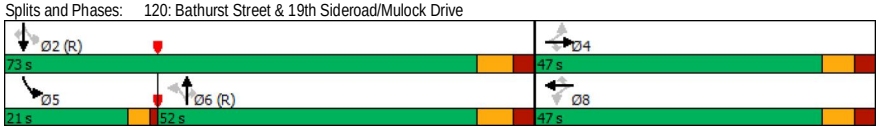
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	30	5	425	85	345	0	470	320	580	1445	15
Future Volume (vph)	5	30	5	425	85	345	0	470	320	580	1445	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.7	3.7	3.2	3.2	3.2	3.6	3.6	3.6	3.0	3.7	4.0
Storage Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99						0.99	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1478	1921	1633	1708	3450	1456	1900	3406	1599	1604	3544	1533
Flt Permitted	0.696			0.736						0.384		
Satd. Flow (perm)	1083	1921	1612	1323	3450	1456	1900	3406	1578	648	3544	1533
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			363			337			41
Link Speed (k/h)		60			60			60			70	
Link Distance (m)		142.9			1699.2			469.9			237.1	
Travel Time (s)		8.6			102.0			28.2			12.2	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	14%	0%	0%	1%	0%	6%	0%	6%	1%	5%	3%	10%
Adj. Flow (vph)	5	32	5	447	89	363	0	495	337	611	1521	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	32	5	447	89	363	0	495	337	611	1521	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	0.99	0.99	1.06	1.06	1.06	1.00	1.00	1.00	1.09	0.99	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	4	4	4	8	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	43.5	43.5	43.5	43.5	43.5	43.5	43.0	43.0	43.0	11.0	43.0	43.0
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	52.0	52.0	52.0	21.0	73.0	73.0
Total Split (%)	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%	43.3%	43.3%	43.3%	17.5%	60.8%	60.8%
Maximum Green (s)	39.5	39.5	39.5	39.5	39.5	39.5	44.0	44.0	44.0	17.0	65.0	65.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	8.0	8.0	8.0	4.0	8.0	8.0

Lanes, Volumes, Timings
120: Bathurst Street & 19th Sideroad/Mulock Drive
AM Peak Hour
2039 Future Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	29.0	29.0	29.0	29.0	29.0	29.0	28.0	28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0		0	0
Act Effct Green (s)	39.5	39.5	39.5	39.5	39.5	39.5		44.0	44.0	69.0	65.0	65.0
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33		0.37	0.37	0.58	0.54	0.54
v/c Ratio	0.01	0.05	0.01	1.03	0.08	0.50		0.40	0.43	1.20	0.79	0.02
Control Delay	27.4	27.9	0.0	90.6	28.0	5.6		29.4	4.5	130.5	26.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	27.4	27.9	0.0	90.6	28.0	5.6		29.4	4.5	130.5	26.0	0.5
LOS	C	C	A	F	C	A		C	A	F	C	A
Approach Delay		24.5			50.1			19.3			55.5	
Approach LOS		C			D			B			E	
Queue Length 50th (m)	0.9	5.4	0.0	~118.2	7.9	0.0		47.4	0.0	~138.0	152.7	0.0
Queue Length 95th (m)	3.9	12.9	0.0	#183.2	14.3	22.3		62.8	19.3	#256.3	184.1	0.7
Internal Link Dist (m)		118.9			1675.2			445.9			213.1	
Turn Bay Length (m)	30.0		5.0	60.0		60.0			85.0	65.0		50.0
Base Capacity (vph)	356	632	585	435	1135	722		1248	792	508	1919	849
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.01	1.03	0.08	0.50		0.40	0.43	1.20	0.79	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 109 (91%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 46.2		Intersection LOS: D	
Intersection Capacity Utilization 107.8%		ICU Level of Service G	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 120: Bathurst Street & 19th Sideroad/Mulock Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	870	205	210	515	310	85	525	300	655	855	170
Future Volume (vph)	130	870	205	210	515	310	85	525	300	655	855	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.6	3.7	3.2	3.6	3.7	3.0	3.4	4.0	3.0	3.7	3.3
Storage Length (m)	65.0		50.0	70.0		0.0	35.0		100.0	115.0		230.0
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	*0.75	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00					1.00					0.97
Frt		0.971				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1612	2706	0	1708	1845	1512	1652	3330	1670	*2068	3444	1516
Flt Permitted	0.100			0.095			0.298			0.239		
Satd. Flow (perm)	170	2706	0	171	1845	1512	517	3330	1670	408	3444	1473
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				270			150			191
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		448.3			341.9			505.9			2054.7	
Travel Time (s)		26.9			20.5			30.4			123.3	
Confl. Peds. (#/hr)			2	2			4					4
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	7%	2%	2%	1%	3%	8%	2%	6%	1%	4%	6%	3%
Adj. Flow (vph)	146	978	230	236	579	348	96	590	337	736	961	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	146	1208	0	236	579	348	96	590	337	736	961	191
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.4			3.4			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.00	0.99	1.06	1.00	0.99	1.09	1.03	0.94	1.09	0.99	1.04
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		3	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	45.0		11.0	45.0	45.0	39.5	39.5	39.5	11.0	39.5	39.5
Total Split (s)	13.0	48.0		15.0	50.0	50.0	41.0	41.0	41.0	26.0	67.0	67.0
Total Split (%)	10.0%	36.9%		11.5%	38.5%	38.5%	31.5%	31.5%	31.5%	20.0%	51.5%	51.5%
Maximum Green (s)	9.0	40.0		11.0	42.0	42.0	33.5	33.5	33.5	22.0	59.5	59.5
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	4.5	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	3.5		1.0	3.5	3.5	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.0		4.0	8.0	8.0	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		

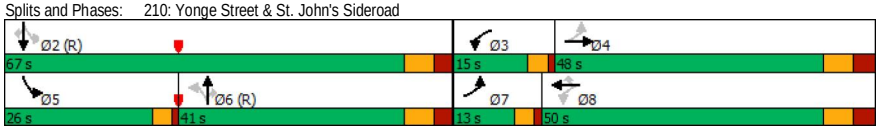
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0			7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0			30.0	30.0	25.0	25.0	25.0		25.0	25.0
Pedestrian Calls (#/hr)		0			0	0	5	5	5		5	5
Act Effct Green (s)	53.0	40.0		57.0	42.0	42.0	33.5	33.5	33.5	63.0	59.5	59.5
Actuated g/C Ratio	0.41	0.31		0.44	0.32	0.32	0.26	0.26	0.26	0.48	0.46	0.46
v/c Ratio	0.86	1.43		1.15	0.97	0.52	0.72	0.69	0.62	1.54	0.61	0.25
Control Delay	68.5	235.8		139.8	74.1	11.4	74.7	48.4	28.7	277.8	15.6	0.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.5	235.8		139.8	74.1	11.4	74.7	48.4	28.7	277.8	15.6	0.8
LOS	E	F		F	E	B	E	D	C	F	B	A
Approach Delay		217.8			68.7			44.4			116.3	
Approach LOS		F			E			D			F	
Queue Length 50th (m)	23.2	~293.6		~57.6	153.8	15.0	23.7	75.8	44.6	~235.5	45.9	0.0
Queue Length 95th (m)	#61.4	#344.8		#109.9	#225.2	42.6	#52.9	95.8	76.9	m#306.7	m50.3	m0.0
Internal Link Dist (m)		424.3			317.9			481.9			2030.7	
Turn Bay Length (m)	65.0			70.0			35.0		100.0	115.0		230.0
Base Capacity (vph)	169	843		205	596	671	133	858	541	478	1576	777
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	1.43		1.15	0.97	0.52	0.72	0.69	0.62	1.54	0.61	0.25

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 35 (27%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.54
Intersection Signal Delay: 117.9 Intersection LOS: F
Intersection Capacity Utilization 112.7% ICU Level of Service H
Analysis Period (min) 15

* User Entered Value
~ 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: 210: Yonge Street & St. John's Sideroad



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	545	65	190	515	50	60	645	70	195	1430	345
Future Volume (vph)	105	545	65	190	515	50	60	645	70	195	1430	345
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.0	3.5	3.7	3.2	3.7	4.0	3.1	3.3	3.7
Storage Length (m)	30.0		0.0	50.0		50.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00										
Frt		0.984				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1819	0	1668	1807	1601	1675	3510	1622	1688	3388	1617
Flt Permitted	0.118			0.211			0.100			0.269		
Satd. Flow (perm)	216	1819	0	370	1807	1601	176	3510	1622	478	3388	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				122			122			230
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		129.9			1758.6			451.2			794.7	
Travel Time (s)		7.8			105.5			23.2			40.9	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	2%	1%	4%	2%	3%	4%	4%	1%	3%	1%
Adj. Flow (vph)	111	574	68	200	542	53	63	679	74	205	1505	363
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	642	0	200	542	53	63	679	74	205	1505	363
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.2			3.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.09	1.01	0.99	1.06	0.99	0.94	1.08	1.04	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0	10.0	20.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	17.5		38.5	38.5	38.5	36.5	36.5	36.5	11.0	36.5	36.5
Total Split (s)	16.0	37.5		37.5	37.5	37.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (%)	14.3%	33.5%		33.5%	33.5%	33.5%	42.4%	42.4%	42.4%	9.8%	42.4%	42.4%
Maximum Green (s)	12.0	30.0		30.0	30.0	30.0	40.0	40.0	40.0	7.0	40.0	40.0
Yellow Time (s)	3.0	4.5		4.5	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0		3.0	3.0	3.0	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.5		7.5	7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		

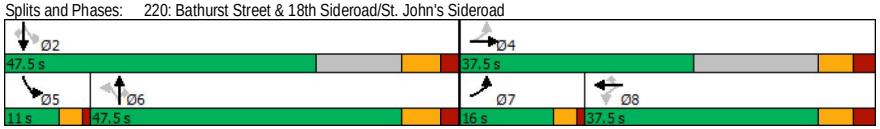
Lanes, Volumes, Timings
220: Bathurst Street & 18th Sideroad/St. John's Sideroad
AM Peak Hour
2039 Future Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None		None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)				7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)				24.0	24.0	24.0	22.0	22.0	22.0		22.0	22.0
Pedestrian Calls (#/hr)				0	0	0	0	0	0		0	0
Act Effct Green (s)	47.6	44.1		30.0	30.0	30.0	40.0	40.0	40.0	54.5	51.0	51.0
Actuated g/C Ratio	0.43	0.40		0.27	0.27	0.27	0.36	0.36	0.36	0.50	0.46	0.46
v/c Ratio	0.48	0.88		2.00	1.10	0.10	1.00	0.53	0.11	0.65	0.96	0.42
Control Delay	25.9	45.0		505.0	109.8	0.4	153.3	29.8	1.3	28.6	44.3	8.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	45.0		505.0	109.8	0.4	153.3	29.8	1.3	28.6	44.3	8.6
LOS	C	D		F	F	A	F	C	A	C	D	A
Approach Delay		42.2			201.9			36.7			36.5	
Approach LOS		D			F			D			D	
Queue Length 50th (m)	14.9	131.0		~71.0	~140.8	0.0	14.1	63.6	0.0	26.0	169.9	17.3
Queue Length 95th (m)	26.5	#198.6		#119.8	#211.8	0.0	#44.0	83.9	2.5	42.6	#229.6	40.5
Internal Link Dist (m)		105.9			1734.6			427.2			770.7	
Turn Bay Length (m)	30.0			50.0		50.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	259	763		100	492	525	63	1275	666	313	1569	872
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.84		2.00	1.10	0.10	1.00	0.53	0.11	0.65	0.96	0.42

Intersection Summary	
Area Type:	Other
Cycle Length: 112	
Actuated Cycle Length: 110.1	
Natural Cycle: 140	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 2.00	
Intersection Signal Delay: 67.2	Intersection LOS: E
Intersection Capacity Utilization 124.3%	ICU Level of Service H
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 220: Bathurst Street & 18th Sideroad/St. John's Sideroad



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	615	60	215	900	330	145	1160	195	295	810	155
Future Volume (vph)	105	615	60	215	900	330	145	1160	195	295	810	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.2	3.7	3.0	3.2	3.7	3.3	3.3	3.2	3.3	3.3	3.2
Storage Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3317	1633	1668	3317	1633	1711	3455	1543	1711	3388	1528
Flt Permitted	0.101			0.228			0.950			0.950		
Satd. Flow (perm)	177	3317	1633	400	3317	1633	1711	3455	1543	1711	3388	1528
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			243			177			136
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		1699.2			430.7			2054.7			314.9	
Travel Time (s)		102.0			25.8			123.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	4%	0%	1%	4%	0%	2%	1%	0%	2%	3%	1%
Adj. Flow (vph)	114	668	65	234	978	359	158	1261	212	321	880	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	668	65	234	978	359	158	1261	212	321	880	168
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	1.06	0.99	1.09	1.06	0.99	1.04	1.04	1.06	1.04	1.04	1.06
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	14.0	45.5	45.5	14.0	45.5	45.5	13.0	42.5	42.5	13.0	42.5	42.5
Total Split (s)	15.0	47.0	47.0	15.0	47.0	47.0	30.0	48.0	48.0	30.0	48.0	48.0
Total Split (%)	10.7%	33.6%	33.6%	10.7%	33.6%	33.6%	21.4%	34.3%	34.3%	21.4%	34.3%	34.3%
Maximum Green (s)	8.0	39.5	39.5	8.0	39.5	39.5	24.0	40.5	40.5	24.0	40.5	40.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	4.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5	7.0	7.5	7.5	6.0	7.5	7.5	6.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Lanes, Volumes, Timings
110: Yonge Street & Mulock Drive
PM Peak Hour
2039 Future Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		31.0	31.0		31.0	31.0		28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	48.0	39.5	39.5	48.0	39.5	39.5	18.0	40.5	40.5	24.0	46.5	46.5
Actuated g/C Ratio	0.34	0.28	0.28	0.34	0.28	0.28	0.13	0.29	0.29	0.17	0.33	0.33
v/c Ratio	0.79	0.71	0.12	1.12	1.05	0.57	0.72	1.26	0.37	1.10	0.78	0.28
Control Delay	64.4	50.2	0.4	132.9	90.4	17.1	76.1	167.2	10.4	133.3	48.7	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	50.2	0.4	132.9	90.4	17.1	76.1	167.2	10.4	133.3	48.7	10.5
LOS	E	D	A	F	F	B	E	F	B	F	D	B
Approach Delay		48.3			80.0			138.0			63.8	
Approach LOS		D			E			F			E	
Queue Length 50th (m)	21.5	92.4	0.0	~56.0	~162.3	27.1	44.8	~242.2	7.5	~105.4	121.8	6.4
Queue Length 95th (m)	#51.1	115.7	0.0	#113.0	#205.9	60.7	67.2	#286.8	28.8	#167.1	#166.7	25.7
Internal Link Dist (m)		1675.2			406.7			2030.7			290.9	
Turn Bay Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Base Capacity (vph)	145	935	558	209	935	635	293	999	572	293	1124	598
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.71	0.12	1.12	1.05	0.57	0.54	1.26	0.37	1.10	0.78	0.28

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 68 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.26
Intersection Signal Delay: 88.4 Intersection LOS: F
Intersection Capacity Utilization 102.5% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 110: Yonge Street & Mulock Drive

Synchro 10 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	120	5	345	75	765	5	1605	470	320	700	50
Future Volume (vph)	55	120	5	345	75	765	5	1605	470	320	700	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.7	3.7	3.2	3.2	3.2	3.6	3.6	3.6	3.0	3.7	4.0
Storage Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.99						
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	1921	1633	1708	3450	1484	1805	3574	1599	1589	3579	1687
Flt Permitted	0.704			0.677			0.375			0.074		
Satd. Flow (perm)	1224	1921	1633	1217	3450	1465	712	3574	1599	124	3579	1687
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			228			315			52
Link Speed (k/h)		60			60			60			70	
Link Distance (m)		142.9			1699.2			469.9			237.1	
Travel Time (s)		8.6			102.0			28.2			12.2	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	1%	0%	4%	0%	1%	1%	6%	2%	0%
Adj. Flow (vph)	57	125	5	359	78	797	5	1672	490	333	729	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	125	5	359	78	797	5	1672	490	333	729	52
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	0.99	0.99	1.06	1.06	1.06	1.00	1.00	1.00	1.09	0.99	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	4	4	4	8	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	43.5	43.5	43.5	43.5	43.5	43.5	43.0	43.0	43.0	11.0	43.0	43.0
Total Split (s)	50.0	50.0	50.0	50.0	50.0	50.0	54.0	54.0	54.0	16.0	70.0	70.0
Total Split (%)	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	45.0%	45.0%	45.0%	13.3%	58.3%	58.3%
Maximum Green (s)	42.5	42.5	42.5	42.5	42.5	42.5	46.0	46.0	46.0	12.0	62.0	62.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	8.0	8.0	8.0	4.0	8.0	8.0
Lead/Lag							Lag	Lag	Lag	Lead		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	29.0	29.0	29.0	29.0	29.0	29.0	28.0	28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0		0	0
Act Effct Green (s)	38.6	38.6	38.6	38.6	38.6	38.6	49.9	49.9	49.9	69.9	65.9	65.9
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.42	0.42	0.42	0.58	0.55	0.55
v/c Ratio	0.15	0.20	0.01	0.92	0.07	1.27	0.02	1.13	0.58	1.53	0.37	0.05
Control Delay	28.3	29.3	0.0	67.9	26.9	161.4	23.4	99.5	12.7	285.4	16.7	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.3	29.3	0.0	67.9	26.9	161.4	23.4	99.5	12.7	285.4	16.7	4.1
LOS	C	C	A	E	C	F	C	F	B	F	B	A
Approach Delay		28.2			125.7			79.7			96.4	
Approach LOS		C			F			E			F	
Queue Length 50th (m)	9.6	21.5	0.0	82.0	6.7	~203.2	0.8	~264.3	31.7	~102.1	54.7	0.0
Queue Length 95th (m)	19.8	36.1	0.0	#134.9	12.3	#279.3	3.6	#312.4	68.6	#162.4	70.4	6.3
Internal Link Dist (m)		118.9			1675.2			445.9			213.1	
Turn Bay Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Base Capacity (vph)	433	680	631	431	1221	626	295	1486	849	218	1965	949
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.18	0.01	0.83	0.06	1.27	0.02	1.13	0.58	1.53	0.37	0.05

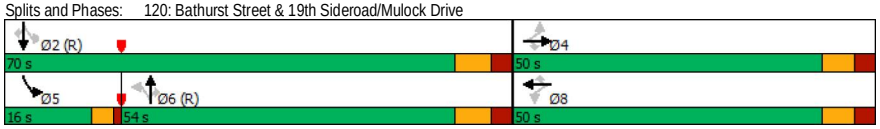
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 87 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.53
Intersection Signal Delay: 93.7 Intersection LOS: F
Intersection Capacity Utilization 116.7% ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 120: Bathurst Street & 19th Sideroad/Mulock Drive



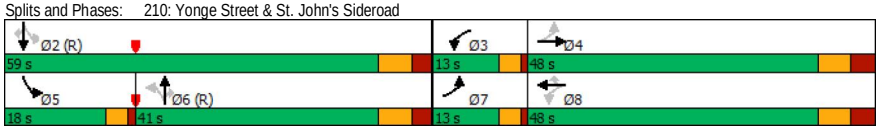
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	580	95	305	790	845	185	1005	305	375	680	155
Future Volume (vph)	175	580	95	305	790	845	185	1005	305	375	680	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.6	3.7	3.2	3.6	3.7	3.0	3.4	4.0	3.0	3.7	3.3
Storage Length (m)	65.0		50.0	70.0		0.0	35.0		100.0	115.0		230.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	*0.75	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00		1.00		0.98	1.00		0.99			0.97
Frt		0.979				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1725	2737	0	1708	1881	1633	1685	3461	1670	*2068	3544	1516
Flt Permitted	0.100			0.153			0.379			0.107		
Satd. Flow (perm)	182	2737	0	275	1881	1608	670	3461	1648	186	3544	1470
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12				294			222			163
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		448.3			341.9			505.9			2054.7	
Travel Time (s)		26.9			20.5			30.4			123.3	
Confl. Peds. (#/hr)	2		3	3		2	5		1	1		5
Confl. Bikes (#/hr)						2						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	2%	1%	2%	3%	3%
Adj. Flow (vph)	184	611	100	321	832	889	195	1058	321	395	716	163
Shared Lane Traffic (%)												
Lane Group Flow (vph)	184	711	0	321	832	889	195	1058	321	395	716	163
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.4			3.4			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.00	0.99	1.06	1.00	0.99	1.09	1.03	0.94	1.09	0.99	1.04
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		3	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	45.0		11.0	45.0	45.0	39.5	39.5	39.5	11.0	39.5	39.5
Total Split (s)	13.0	48.0		13.0	48.0	48.0	41.0	41.0	41.0	18.0	59.0	59.0
Total Split (%)	10.8%	40.0%		10.8%	40.0%	40.0%	34.2%	34.2%	34.2%	15.0%	49.2%	49.2%
Maximum Green (s)	9.0	40.0		9.0	40.0	40.0	33.5	33.5	33.5	14.0	51.5	51.5
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	4.5	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	3.5		1.0	3.5	3.5	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.0		4.0	8.0	8.0	7.5	7.5	7.5	4.0	7.5	7.5

Lanes, Volumes, Timings
210: Yonge Street & St. John's Sideroad
PM Peak Hour
2039 Future Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0			7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0			30.0	30.0	25.0	25.0	25.0		25.0	25.0
Pedestrian Calls (#/hr)		5			5	5	5	5	5		5	5
Act Effct Green (s)	53.0	40.0		53.0	40.0	40.0	33.5	33.5	33.5	55.0	51.5	51.5
Actuated g/C Ratio	0.44	0.33		0.44	0.33	0.33	0.28	0.28	0.28	0.46	0.43	0.43
v/c Ratio	0.94	0.77		1.41	1.33	1.21	1.04	1.10	0.52	1.30	0.47	0.23
Control Delay	77.0	42.1		230.9	191.8	133.8	120.6	99.4	14.6	187.4	25.8	3.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.0	42.1		230.9	191.8	133.8	120.6	99.4	14.6	187.4	25.8	3.9
LOS	E	D		F	F	F	F	F	B	F	C	A
Approach Delay		49.3			172.7			84.7			73.1	
Approach LOS		D			F			F			E	
Queue Length 50th (m)	28.2	103.4		~80.5	~267.4	~218.9	~52.3	~156.0	18.9	~109.0	65.6	0.0
Queue Length 95th (m)	#74.2	134.4		#139.7	#345.3	#299.1	#100.8	#198.9	47.6	#173.0	83.1	12.9
Internal Link Dist (m)		424.3			317.9			481.9			2030.7	
Turn Bay Length (m)	65.0			70.0			35.0		100.0	115.0		230.0
Base Capacity (vph)	196	920		228	627	732	187	966	620	304	1520	723
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.77		1.41	1.33	1.21	1.04	1.10	0.52	1.30	0.47	0.23

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 39 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.41		
Intersection Signal Delay: 107.7	Intersection LOS: F	
Intersection Capacity Utilization 119.4%	ICU Level of Service H	
Analysis Period (min) 15		
* User Entered Value		
~ 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: 210: Yonge Street & St. John's Sideroad



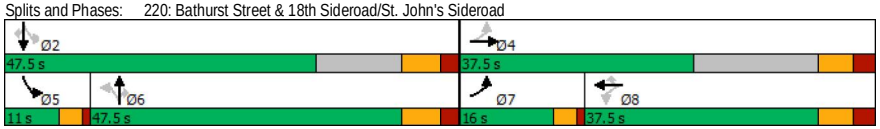
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	555	40	160	550	215	110	1435	240	90	725	145
Future Volume (vph)	305	555	40	160	550	215	110	1435	240	90	725	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.0	3.5	3.7	3.2	3.7	4.0	3.1	3.3	3.7
Storage Length (m)	30.0		0.0	50.0		50.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.99						
Frt		0.990				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	1882	0	1636	1842	1633	1708	3579	1670	1655	3421	1617
Flt Permitted	0.118			0.270			0.365			0.091		
Satd. Flow (perm)	224	1882	0	465	1842	1612	656	3579	1670	159	3421	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				124			135			151
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		129.9			1758.6			451.2			794.7	
Travel Time (s)		7.8			105.5			23.2			40.9	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	2%	3%	2%	0%	1%	2%	1%	3%	2%	1%
Adj. Flow (vph)	318	578	42	167	573	224	115	1495	250	94	755	151
Shared Lane Traffic (%)												
Lane Group Flow (vph)	318	620	0	167	573	224	115	1495	250	94	755	151
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.2			3.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.09	1.01	0.99	1.06	0.99	0.94	1.08	1.04	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4			8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0		10.0	10.0	10.0	20.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	17.5		38.5	38.5	38.5	36.5	36.5	36.5	11.0	36.5	36.5
Total Split (s)	16.0	37.5		37.5	37.5	37.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (%)	14.3%	33.5%		33.5%	33.5%	33.5%	42.4%	42.4%	42.4%	9.8%	42.4%	42.4%
Maximum Green (s)	12.0	30.0		30.0	30.0	30.0	40.0	40.0	40.0	7.0	40.0	40.0
Yellow Time (s)	3.0	4.5		4.5	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0		3.0	3.0	3.0	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.5		7.5	7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag	Lag	Lead		

Lanes, Volumes, Timings
220: Bathurst Street & 18th Sideroad/St. John's Sideroad
PM Peak Hour
2039 Future Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None		None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)				7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)				24.0	24.0	24.0	22.0	22.0	22.0		22.0	22.0
Pedestrian Calls (#/hr)				0	0	0	0	0	0		0	0
Act Effct Green (s)	49.5	46.0		30.0	30.0	30.0	40.0	40.0	40.0	54.5	51.0	51.0
Actuated g/C Ratio	0.44	0.41		0.27	0.27	0.27	0.36	0.36	0.36	0.49	0.46	0.46
v/c Ratio	1.19	0.80		1.35	1.16	0.43	0.49	1.17	0.37	0.55	0.48	0.18
Control Delay	142.1	38.1		234.6	131.2	17.8	36.8	118.9	13.5	28.6	22.6	3.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.1	38.1		234.6	131.2	17.8	36.8	118.9	13.5	28.6	22.6	3.4
LOS	F	D		F	F	B	D	F	B	C	C	A
Approach Delay		73.4			122.8			99.6			20.3	
Approach LOS		E			F			F			C	
Queue Length 50th (m)	~70.0	122.5		~50.3	~156.7	18.0	20.5	~216.3	18.1	11.4	62.3	0.0
Queue Length 95th (m)	#127.7	171.7		#94.5	#225.4	41.2	40.4	#260.5	39.1	21.9	79.7	11.4
Internal Link Dist (m)		105.9			1734.6			427.2			770.7	
Turn Bay Length (m)	30.0			50.0		50.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	268	775		124	493	522	234	1278	683	170	1557	818
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.80		1.35	1.16	0.43	0.49	1.17	0.37	0.55	0.48	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 112			
Actuated Cycle Length: 112			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.35			
Intersection Signal Delay: 82.5		Intersection LOS: F	
Intersection Capacity Utilization 110.5%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 220: Bathurst Street & 18th Sideroad/St. John's Sideroad



Synchro 10 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	820	75	120	575	275	50	560	160	320	860	125
Future Volume (vph)	155	820	75	120	575	275	50	560	160	320	860	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.2	3.7	3.0	3.2	3.7	3.3	3.3	3.2	3.3	3.3	3.2
Storage Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	1.00			1.00		0.96	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	3317	1601	1532	3285	1601	1601	3231	1528	1711	3355	1513
Flt Permitted	0.265			0.104			0.950			0.950		
Satd. Flow (perm)	461	3317	1575	168	3285	1601	1597	3231	1473	1693	3355	1480
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			306			155			147
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		1699.2			430.7			2054.7			314.9	
Travel Time (s)		102.0			25.8			123.3			18.9	
Confl. Peds. (#/hr)			4	4			9		22	22		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	4%	2%	10%	5%	2%	9%	8%	1%	2%	4%	2%
Adj. Flow (vph)	172	911	83	133	639	306	56	622	178	356	956	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	172	911	83	133	639	306	56	622	178	356	956	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	1.06	0.99	1.09	1.06	0.99	1.04	1.04	1.06	1.04	1.04	1.06
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	14.0	45.5	45.5	14.0	45.5	45.5	13.0	42.5	42.5	13.0	42.5	42.5
Total Split (s)	15.0	47.0	47.0	15.0	47.0	47.0	24.0	43.0	43.0	25.0	44.0	44.0
Total Split (%)	11.5%	36.2%	36.2%	11.5%	36.2%	36.2%	18.5%	33.1%	33.1%	19.2%	33.8%	33.8%
Maximum Green (s)	8.0	39.5	39.5	8.0	39.5	39.5	18.0	35.5	35.5	19.0	36.5	36.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	4.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5	7.0	7.5	7.5	6.0	7.5	7.5	6.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag

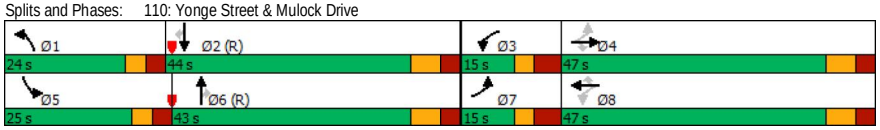
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		31.0	31.0		31.0	31.0		28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	47.0	38.5	38.5	47.0	38.5	38.5	10.1	36.5	36.5	19.0	48.0	48.0
Actuated g/C Ratio	0.36	0.30	0.30	0.36	0.30	0.30	0.08	0.28	0.28	0.15	0.37	0.37
v/c Ratio	0.72	0.93	0.15	0.92	0.66	0.44	0.45	0.69	0.34	1.42	0.77	0.22
Control Delay	45.2	60.3	0.5	86.5	43.6	5.8	82.8	33.9	4.7	252.4	42.9	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	60.3	0.5	86.5	43.6	5.8	82.8	33.9	4.7	252.4	42.9	5.2
LOS	D	E	A	F	D	A	F	C	A	F	D	A
Approach Delay		53.8			38.1			31.0			90.7	
Approach LOS		D			D			C			F	
Queue Length 50th (m)	29.5	124.2	0.0	22.3	78.4	0.0	15.7	66.6	2.0	~129.4	124.1	0.0
Queue Length 95th (m)	#51.0	#162.4	0.0	#62.4	99.8	21.1	m26.3	85.6	m7.9	#191.6	#170.4	13.6
Internal Link Dist (m)		1675.2			406.7			2030.7			290.9	
Turn Bay Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Base Capacity (vph)	240	1007	580	144	998	699	221	906	524	250	1237	638
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.90	0.14	0.92	0.64	0.44	0.25	0.69	0.34	1.42	0.77	0.22

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 28 (22%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.42
Intersection Signal Delay: 57.6 Intersection LOS: E
Intersection Capacity Utilization 100.7% ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 110: Yonge Street & Mulock Drive



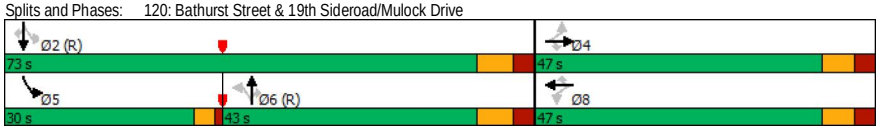
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	30	5	425	85	345	0	470	320	580	1445	15
Future Volume (vph)	5	30	5	425	85	345	0	470	320	580	1445	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.7	3.7	3.2	3.2	3.2	3.6	3.6	3.6	3.0	3.7	4.0
Storage Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99						0.99	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1478	1921	1633	1708	3450	1456	1900	3406	1599	1604	3544	1533
Flt Permitted	0.696			*0.950						0.366		
Satd. Flow (perm)	1083	1921	1612	1708	3450	1456	1900	3406	1578	618	3544	1533
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			363			337			41
Link Speed (k/h)		60			60			60			70	
Link Distance (m)		142.9			1699.2			469.9			237.1	
Travel Time (s)		8.6			102.0			28.2			12.2	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	14%	0%	0%	1%	0%	6%	0%	6%	1%	5%	3%	10%
Adj. Flow (vph)	5	32	5	447	89	363	0	495	337	611	1521	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	32	5	447	89	363	0	495	337	611	1521	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	0.99	0.99	1.06	1.06	1.06	1.00	1.00	1.00	1.09	0.99	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	4	4	4	8	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	43.5	43.5	43.5	43.5	43.5	43.5	43.0	43.0	43.0	11.0	43.0	43.0
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	43.0	43.0	43.0	30.0	73.0	73.0
Total Split (%)	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%	35.8%	35.8%	35.8%	25.0%	60.8%	60.8%
Maximum Green (s)	39.5	39.5	39.5	39.5	39.5	39.5	35.0	35.0	35.0	26.0	65.0	65.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	8.0	8.0	8.0	4.0	8.0	8.0

Lanes, Volumes, Timings
120: Bathurst Street & 19th Sideroad/Mulock Drive
AM Peak Hour
2039 Future Background (Mitigated)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	29.0	29.0	29.0	29.0	29.0	29.0	28.0	28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0		0	0
Act Effct Green (s)	35.2	35.2	35.2	35.2	35.2	35.2		39.3	39.3	73.3	69.3	69.3
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29		0.33	0.33	0.61	0.58	0.58
v/c Ratio	0.02	0.06	0.01	0.89	0.09	0.53		0.44	0.45	1.04	0.74	0.02
Control Delay	27.8	28.7	0.0	61.1	29.5	6.1		34.3	5.6	65.8	22.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	28.7	0.0	61.1	29.5	6.1		34.3	5.6	65.8	22.5	0.5
LOS	C	C	A	E	C	A		C	A	E	C	A
Approach Delay		25.2			35.8			22.7			34.7	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	0.9	5.6	0.0	103.7	8.2	0.0		51.8	0.0	~104.2	144.8	0.0
Queue Length 95th (m)	3.9	12.9	0.0	#150.6	14.3	22.3		70.8	22.0	#223.4	184.1	0.7
Internal Link Dist (m)		118.9			1675.2			445.9			213.1	
Turn Bay Length (m)	30.0		5.0	60.0		60.0			85.0	65.0		50.0
Base Capacity (vph)	356	632	585	562	1135	683		1114	742	590	2045	902
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.01	0.80	0.08	0.53		0.44	0.45	1.04	0.74	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 109 (91%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 32.3		Intersection LOS: C	
Intersection Capacity Utilization 107.8%		ICU Level of Service G	
Analysis Period (min) 15			
* User Entered Value			
~ 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: 120: Bathurst Street & 19th Sideroad/Mulock Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	870	205	210	515	310	85	525	300	655	855	170
Future Volume (vph)	130	870	205	210	515	310	85	525	300	655	855	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.6	3.7	3.2	3.6	3.7	3.0	3.4	4.0	3.0	3.7	3.3
Storage Length (m)	65.0		50.0	70.0		0.0	35.0		100.0	115.0		230.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99	1.00			1.00					0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1612	3539	1601	1708	3505	1512	1652	3330	1670	*2068	3444	1516
Flt Permitted	0.345			0.097			0.298			0.239		
Satd. Flow (perm)	585	3539	1578	174	3505	1512	517	3330	1670	408	3444	1473
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			105			124			149			191
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		448.3			341.9			505.9			2054.7	
Travel Time (s)		26.9			20.5			30.4			123.3	
Confl. Peds. (#/hr)			2	2			4					4
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	7%	2%	2%	1%	3%	8%	2%	6%	1%	4%	6%	3%
Adj. Flow (vph)	146	978	230	236	579	348	96	590	337	736	961	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	146	978	230	236	579	348	96	590	337	736	961	191
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.4			3.4			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.00	0.99	1.06	1.00	0.99	1.09	1.03	0.94	1.09	0.99	1.04
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5		6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	45.0	45.0	11.0	45.0	11.0	39.5	39.5	39.5	11.0	39.5	39.5
Total Split (s)	13.0	48.0	48.0	15.0	50.0	27.0	40.0	40.0	40.0	27.0	67.0	67.0
Total Split (%)	10.0%	36.9%	36.9%	11.5%	38.5%	20.8%	30.8%	30.8%	30.8%	20.8%	51.5%	51.5%
Maximum Green (s)	9.0	40.0	40.0	11.0	42.0	23.0	32.5	32.5	32.5	23.0	59.5	59.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	3.0	4.5	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	3.5	3.5	1.0	3.5	1.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.0	8.0	4.0	8.0	4.0	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead		

Lanes, Volumes, Timings
210: Yonge Street & St. John's Sideroad
AM Peak Hour
2039 Future Background (Mitigated)

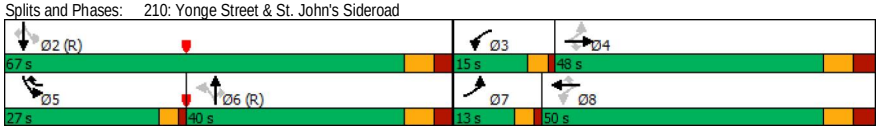
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0	30.0		30.0		25.0	25.0	25.0		25.0	25.0
Pedestrian Calls (#/hr)		0	0		0		5	5	5		5	5
Act Effct Green (s)	51.9	39.0	39.0	56.1	41.1	72.1	33.5	33.5	33.5	64.0	60.5	60.5
Actuated g/C Ratio	0.40	0.30	0.30	0.43	0.32	0.55	0.26	0.26	0.26	0.49	0.47	0.47
v/c Ratio	0.48	0.92	0.42	1.15	0.52	0.39	0.72	0.69	0.62	1.49	0.60	0.24
Control Delay	28.0	58.3	21.5	140.6	38.3	11.3	75.5	48.7	29.2	255.7	14.9	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	58.3	21.5	140.6	38.3	11.3	75.5	48.7	29.2	255.7	14.9	0.8
LOS	C	E	C	F	D	B	E	D	C	F	B	A
Approach Delay		48.8			51.0			44.8			107.4	
Approach LOS		D			D			D			F	
Queue Length 50th (m)	23.2	132.7	25.7	~57.0	66.5	30.8	24.0	76.6	45.4	~232.7	45.9	0.0
Queue Length 95th (m)	37.4	#167.3	48.9	#109.3	83.8	51.0	#54.0	97.0	78.0	m#303.9	m50.3	m0.0
Internal Link Dist (m)		424.3			317.9			481.9			2030.7	
Turn Bay Length (m)	65.0		50.0	70.0			35.0		100.0	115.0		230.0
Base Capacity (vph)	305	1088	558	205	1132	893	133	858	541	494	1602	787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.90	0.41	1.15	0.51	0.39	0.72	0.69	0.62	1.49	0.60	0.24

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 35 (27%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.49
Intersection Signal Delay: 68.9 Intersection LOS: E
Intersection Capacity Utilization 106.5% ICU Level of Service G
Analysis Period (min) 15

* User Entered Value
~ 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: 210: Yonge Street & St. John's Sideroad



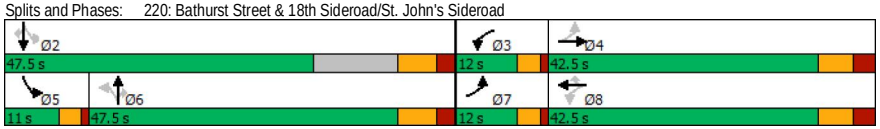
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	545	65	190	515	50	60	645	70	195	1430	345
Future Volume (vph)	105	545	65	190	515	50	60	645	70	195	1430	345
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.0	3.5	3.7	3.2	3.7	4.0	3.1	3.3	3.7
Storage Length (m)	30.0		0.0	50.0		50.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00										
Frt		0.984				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1819	0	1668	1807	1601	1675	3510	1622	1688	3388	1617
Flt Permitted	0.121			0.114			0.100			0.263		
Satd. Flow (perm)	221	1819	0	200	1807	1601	176	3510	1622	467	3388	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				121			121			226
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		129.9			1758.6			451.2			794.7	
Travel Time (s)		7.8			105.5			23.2			40.9	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	2%	1%	4%	2%	3%	4%	4%	1%	3%	1%
Adj. Flow (vph)	111	574	68	200	542	53	63	679	74	205	1505	363
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	642	0	200	542	53	63	679	74	205	1505	363
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.2			3.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.09	1.01	0.99	1.06	0.99	0.94	1.08	1.04	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		3	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	20.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	17.5		11.0	38.5	38.5	36.5	36.5	36.5	11.0	36.5	36.5
Total Split (s)	12.0	42.5		12.0	42.5	42.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (%)	10.6%	37.6%		10.6%	37.6%	37.6%	42.0%	42.0%	42.0%	9.7%	42.0%	42.0%
Maximum Green (s)	8.0	35.0		8.0	35.0	35.0	40.0	40.0	40.0	7.0	40.0	40.0
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0		1.0	3.0	3.0	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.5		4.0	7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None		None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)					7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)					24.0	24.0	22.0	22.0	22.0		22.0	22.0
Pedestrian Calls (#/hr)					0	0	0	0	0		0	0
Act Effct Green (s)	46.3	35.0		46.7	35.2	35.2	40.0	40.0	40.0	54.5	51.0	51.0
Actuated g/C Ratio	0.41	0.31		0.41	0.31	0.31	0.35	0.35	0.35	0.48	0.45	0.45
v/c Ratio	0.57	1.13		1.08	0.96	0.09	1.02	0.55	0.11	0.68	0.98	0.43
Control Delay	30.6	117.1		112.5	69.2	0.3	159.9	31.3	1.3	31.6	50.7	9.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	117.1		112.5	69.2	0.3	159.9	31.3	1.3	31.6	50.7	9.1
LOS	C	F		F	E	A	F	C	A	C	D	A
Approach Delay		104.3			75.5			38.5			41.5	
Approach LOS		F			E			D			D	
Queue Length 50th (m)	14.9	~173.6		~34.8	124.0	0.0	~14.9	66.0	0.0	27.2	177.5	18.6
Queue Length 95th (m)	26.5	#246.1		#83.2	#194.9	0.0	#44.5	85.1	2.7	#44.2	#233.2	41.9
Internal Link Dist (m)		105.9			1734.6			427.2			770.7	
Turn Bay Length (m)	30.0			50.0		50.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	198	566		186	562	582	62	1242	652	300	1529	853
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.13		1.08	0.96	0.09	1.02	0.55	0.11	0.68	0.98	0.43

Intersection Summary

Area Type: Other
Cycle Length: 113
Actuated Cycle Length: 113
Natural Cycle: 110
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 57.7 Intersection LOS: E
Intersection Capacity Utilization 121.4% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 220: Bathurst Street & 18th Sideroad/St. John's Sideroad



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	615	60	215	900	330	145	1160	195	295	810	155
Future Volume (vph)	105	615	60	215	900	330	145	1160	195	295	810	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.2	3.7	3.0	3.2	3.7	3.3	3.3	3.2	3.3	3.3	3.2
Storage Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3317	1633	1668	3317	1633	1711	3455	1543	1711	3388	1528
Flt Permitted	0.101			0.228			0.950			0.950		
Satd. Flow (perm)	177	3317	1633	400	3317	1633	1711	3455	1543	1711	3388	1528
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			243			177			136
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		1699.2			430.7			2054.7			314.9	
Travel Time (s)		102.0			25.8			123.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	4%	0%	1%	4%	0%	2%	1%	0%	2%	3%	1%
Adj. Flow (vph)	114	668	65	234	978	359	158	1261	212	321	880	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	668	65	234	978	359	158	1261	212	321	880	168
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	1.06	0.99	1.09	1.06	0.99	1.04	1.04	1.06	1.04	1.04	1.06
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	14.0	45.5	45.5	14.0	45.5	45.5	13.0	42.5	42.5	13.0	42.5	42.5
Total Split (s)	15.0	47.0	47.0	15.0	47.0	47.0	30.0	48.0	48.0	30.0	48.0	48.0
Total Split (%)	10.7%	33.6%	33.6%	10.7%	33.6%	33.6%	21.4%	34.3%	34.3%	21.4%	34.3%	34.3%
Maximum Green (s)	8.0	39.5	39.5	8.0	39.5	39.5	24.0	40.5	40.5	24.0	40.5	40.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	4.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5	7.0	7.5	7.5	6.0	7.5	7.5	6.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Lanes, Volumes, Timings
110: Yonge Street & Mulock Drive
PM Peak Hour
2039 Future Background (Mitigated)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		31.0	31.0		31.0	31.0		28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	48.0	39.5	39.5	48.0	39.5	39.5	18.0	40.5	40.5	24.0	46.5	46.5
Actuated g/C Ratio	0.34	0.28	0.28	0.34	0.28	0.28	0.13	0.29	0.29	0.17	0.33	0.33
v/c Ratio	0.79	0.71	0.12	1.12	1.05	0.57	0.72	1.26	0.37	1.10	0.78	0.28
Control Delay	64.4	50.2	0.4	132.9	90.4	17.1	76.1	167.2	10.4	133.3	48.7	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	50.2	0.4	132.9	90.4	17.1	76.1	167.2	10.4	133.3	48.7	10.5
LOS	E	D	A	F	F	B	E	F	B	F	D	B
Approach Delay		48.3			80.0			138.0			63.8	
Approach LOS		D			E			F			E	
Queue Length 50th (m)	21.5	92.4	0.0	~56.0	~162.3	27.1	44.8	~242.2	7.5	~105.4	121.8	6.4
Queue Length 95th (m)	#51.1	115.7	0.0	#113.0	#205.9	60.7	67.2	#286.8	28.8	#167.1	#166.7	25.7
Internal Link Dist (m)		1675.2			406.7			2030.7			290.9	
Turn Bay Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Base Capacity (vph)	145	935	558	209	935	635	293	999	572	293	1124	598
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.71	0.12	1.12	1.05	0.57	0.54	1.26	0.37	1.10	0.78	0.28

Intersection Summary		
Area Type:	Other	
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 68 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 135		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.26		
Intersection Signal Delay: 88.4	Intersection LOS: F	
Intersection Capacity Utilization 102.5%	ICU Level of Service G	
Analysis Period (min) 15		

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 110: Yonge Street & Mulock Drive

Synchro 10 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	120	5	345	75	765	5	1605	470	320	700	50
Future Volume (vph)	55	120	5	345	75	765	5	1605	470	320	700	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.7	3.7	3.2	3.2	3.2	3.6	3.6	3.6	3.0	3.7	4.0
Storage Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.99						
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	1921	1633	1708	3450	1484	1805	3574	1599	1589	3579	1687
Flt Permitted	0.704			0.677			0.375			0.083		
Satd. Flow (perm)	1224	1921	1633	1217	3450	1465	712	3574	1599	139	3579	1687
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			45			307			52
Link Speed (k/h)		60			60			60			70	
Link Distance (m)		142.9			1699.2			469.9			237.1	
Travel Time (s)		8.6			102.0			28.2			12.2	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	1%	0%	4%	0%	1%	1%	6%	2%	0%
Adj. Flow (vph)	57	125	5	359	78	797	5	1672	490	333	729	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	125	5	359	78	797	5	1672	490	333	729	52
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	0.99	0.99	1.06	1.06	1.06	1.00	1.00	1.00	1.09	0.99	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8	5		6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	4	4	4	8	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	43.5	43.5	43.5	43.5	43.5	11.0	43.0	43.0	43.0	11.0	43.0	43.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	24.0	52.0	52.0	52.0	24.0	76.0	76.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	20.0%	43.3%	43.3%	43.3%	20.0%	63.3%	63.3%
Maximum Green (s)	36.5	36.5	36.5	36.5	36.5	20.0	44.0	44.0	44.0	20.0	68.0	68.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	3.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	8.0	8.0	8.0	4.0	8.0	8.0
Lead/Lag						Lead	Lag	Lag	Lag	Lead		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	29.0	29.0	29.0	29.0	29.0		28.0	28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0	0		0	0
Act Effct Green (s)	36.4	36.4	36.4	36.4	36.4	59.9	44.1	44.1	44.1	72.1	68.1	68.1
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.50	0.37	0.37	0.37	0.60	0.57	0.57
v/c Ratio	0.15	0.21	0.01	0.97	0.07	1.05	0.02	1.27	0.63	1.02	0.36	0.05
Control Delay	32.0	32.4	0.0	82.6	30.1	74.2	24.8	162.6	14.9	91.0	14.7	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	32.4	0.0	82.6	30.1	74.2	24.8	162.6	14.9	91.0	14.7	3.3
LOS	C	C	A	F	C	E	C	F	B	F	B	A
Approach Delay		31.4			73.9			128.9			37.0	
Approach LOS		C			E			F			D	
Queue Length 50th (m)	10.3	23.0	0.0	87.7	7.2	~201.8	0.8	~276.0	35.2	~71.9	49.3	0.0
Queue Length 95th (m)	21.4	39.1	0.0	#150.6	13.4	#222.1	3.7	#320.5	72.9	#131.7	62.3	5.6
Internal Link Dist (m)		118.9			1675.2			445.9			213.1	
Turn Bay Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Base Capacity (vph)	372	584	553	370	1049	757	262	1313	781	325	2031	979
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.21	0.01	0.97	0.07	1.05	0.02	1.27	0.63	1.02	0.36	0.05

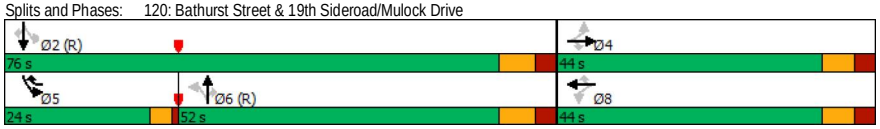
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 87 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.27
Intersection Signal Delay: 88.8 Intersection LOS: F
Intersection Capacity Utilization 113.8% ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 120: Bathurst Street & 19th Sideroad/Mulock Drive



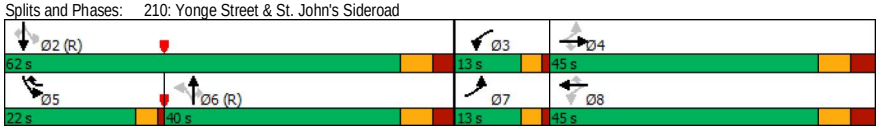
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	580	95	305	790	845	185	1005	305	375	680	155
Future Volume (vph)	175	580	95	305	790	845	185	1005	305	375	680	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.6	3.7	3.2	3.6	3.7	3.0	3.4	4.0	3.0	3.7	3.3
Storage Length (m)	65.0		50.0	70.0		0.0	35.0		100.0	115.0		230.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99	1.00		0.99	1.00		0.99			0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1725	3539	1633	1708	3574	1633	1685	3461	1670	*2068	3544	1516
Flt Permitted	0.134			0.281			0.379			0.099		
Satd. Flow (perm)	243	3539	1609	505	3574	1609	670	3461	1648	172	3544	1470
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			114			77			213			163
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		448.3			341.9			505.9			2054.7	
Travel Time (s)		26.9			20.5			30.4			123.3	
Confl. Peds. (#/hr)	2		3	3		2	5		1	1		5
Confl. Bikes (#/hr)						2						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	2%	1%	2%	3%	3%
Adj. Flow (vph)	184	611	100	321	832	889	195	1058	321	395	716	163
Shared Lane Traffic (%)												
Lane Group Flow (vph)	184	611	100	321	832	889	195	1058	321	395	716	163
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.4			3.4			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.00	0.99	1.06	1.00	0.99	1.09	1.03	0.94	1.09	0.99	1.04
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5		6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	45.0	45.0	11.0	45.0	11.0	39.5	39.5	39.5	11.0	39.5	39.5
Total Split (s)	13.0	45.0	45.0	13.0	45.0	22.0	40.0	40.0	40.0	22.0	62.0	62.0
Total Split (%)	10.8%	37.5%	37.5%	10.8%	37.5%	18.3%	33.3%	33.3%	33.3%	18.3%	51.7%	51.7%
Maximum Green (s)	9.0	37.0	37.0	9.0	37.0	18.0	32.5	32.5	32.5	18.0	54.5	54.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	3.0	4.5	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	3.5	3.5	1.0	3.5	1.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.0	8.0	4.0	8.0	4.0	7.5	7.5	7.5	4.0	7.5	7.5

Lanes, Volumes, Timings
210: Yonge Street & St. John's Sideroad
PM Peak Hour
2039 Future Background (Mitigated)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0	30.0		30.0		25.0	25.0	25.0		25.0	25.0
Pedestrian Calls (#/hr)		5	5		5		5	5	5		5	5
Act Effct Green (s)	46.0	33.0	33.0	46.0	33.0	55.0	36.5	36.5	36.5	62.0	58.5	58.5
Actuated g/C Ratio	0.38	0.28	0.28	0.38	0.28	0.46	0.30	0.30	0.30	0.52	0.49	0.49
v/c Ratio	0.90	0.63	0.19	1.13	0.85	1.14	0.96	1.00	0.49	1.06	0.41	0.20
Control Delay	68.1	40.9	5.0	123.7	49.9	104.1	96.5	71.1	14.9	98.7	21.3	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	40.9	5.0	123.7	49.9	104.1	96.5	71.1	14.9	98.7	21.3	3.5
LOS	E	D	A	F	D	F	F	E	B	F	C	A
Approach Delay		42.5			85.1			62.8			43.0	
Approach LOS		D			F			E			D	
Queue Length 50th (m)	28.9	69.3	0.0	~65.7	101.7	~178.6	47.9	~147.4	20.1	~91.5	59.1	0.0
Queue Length 95th (m)	#65.5	85.8	10.1	#120.9	122.1	#248.5	#102.3	#202.8	50.5	#157.9	79.2	12.2
Internal Link Dist (m)		424.3			317.9			481.9			2030.7	
Turn Bay Length (m)	65.0		50.0	70.0			35.0		100.0	115.0		230.0
Base Capacity (vph)	204	1091	574	283	1101	782	203	1053	649	373	1728	800
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.56	0.17	1.13	0.76	1.14	0.96	1.00	0.49	1.06	0.41	0.20

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 39 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 120		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.14		
Intersection Signal Delay: 63.2	Intersection LOS: E	
Intersection Capacity Utilization 102.9%	ICU Level of Service G	
Analysis Period (min) 15		
* User Entered Value		
~ 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: 210: Yonge Street & St. John's Sideroad



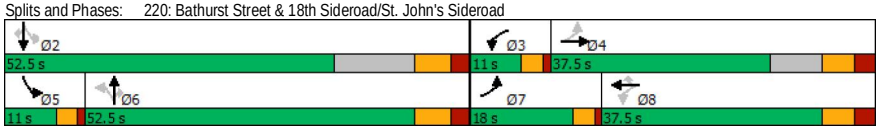
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	555	40	160	550	215	110	1435	240	90	725	145
Future Volume (vph)	305	555	40	160	550	215	110	1435	240	90	725	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.0	3.5	3.7	3.2	3.7	4.0	3.1	3.3	3.7
Storage Length (m)	30.0		0.0	50.0		50.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.99						
Frt		0.990				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	1882	0	1636	1842	1633	1708	3579	1670	1655	3421	1617
Flt Permitted	0.118			0.133			0.365			0.082		
Satd. Flow (perm)	224	1882	0	229	1842	1612	656	3579	1670	143	3421	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				151			151			151
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		129.9			1758.6			451.2			794.7	
Travel Time (s)		7.8			105.5			23.2			40.9	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	2%	3%	2%	0%	1%	2%	1%	3%	2%	1%
Adj. Flow (vph)	318	578	42	167	573	224	115	1495	250	94	755	151
Shared Lane Traffic (%)												
Lane Group Flow (vph)	318	620	0	167	573	224	115	1495	250	94	755	151
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.2			3.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.09	1.01	0.99	1.06	0.99	0.94	1.08	1.04	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		3	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	20.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	17.5		11.0	38.5	38.5	36.5	36.5	36.5	11.0	36.5	36.5
Total Split (s)	18.0	37.5		11.0	37.5	37.5	52.5	52.5	52.5	11.0	52.5	52.5
Total Split (%)	15.1%	31.5%		9.2%	31.5%	31.5%	44.1%	44.1%	44.1%	9.2%	44.1%	44.1%
Maximum Green (s)	14.0	30.0		7.0	30.0	30.0	45.0	45.0	45.0	7.0	45.0	45.0
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0		1.0	3.0	3.0	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.5		4.0	7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		

Lanes, Volumes, Timings
220: Bathurst Street & 18th Sideroad/St. John's Sideroad
PM Peak Hour
2039 Future Background (Mitigated)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None		None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)					7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)					24.0	24.0	22.0	22.0	22.0		22.0	22.0
Pedestrian Calls (#/hr)					0	0	0	0	0		0	0
Act Effct Green (s)	51.5	37.0		40.5	30.0	30.0	45.0	45.0	45.0	59.5	56.0	56.0
Actuated g/C Ratio	0.43	0.31		0.34	0.25	0.25	0.38	0.38	0.38	0.50	0.47	0.47
v/c Ratio	1.12	1.06		1.04	1.23	0.43	0.46	1.10	0.34	0.59	0.47	0.18
Control Delay	120.8	92.7		111.7	161.7	15.6	35.5	94.0	11.7	32.5	22.6	3.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	120.8	92.7		111.7	161.7	15.6	35.5	94.0	11.7	32.5	22.6	3.3
LOS	F	F		F	F	B	D	F	B	C	C	A
Approach Delay		102.2			119.1			79.3			20.6	
Approach LOS		F			F			E			C	
Queue Length 50th (m)	~71.9	~166.7		~27.3	~174.3	14.1	21.1	~220.2	15.9	11.9	64.5	0.0
Queue Length 95th (m)	#130.6	#240.0		#73.6	#244.8	37.2	40.7	#264.8	36.4	#26.2	82.0	11.4
Internal Link Dist (m)		105.9			1734.6			427.2			770.7	
Turn Bay Length (m)	30.0			50.0		50.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	283	587		160	464	519	248	1353	725	160	1609	840
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	1.06		1.04	1.23	0.43	0.46	1.10	0.34	0.59	0.47	0.18

Intersection Summary			
Area Type:	Other		
Cycle Length: 119			
Actuated Cycle Length: 119			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 79.6		Intersection LOS: E	
Intersection Capacity Utilization 110.5%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 220: Bathurst Street & 18th Sideroad/St. John's Sideroad



Synchro 10 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	820	75	150	575	275	50	630	345	320	910	125
Future Volume (vph)	155	820	75	150	575	275	50	630	345	320	910	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.2	3.7	3.0	3.2	3.7	3.3	3.3	3.2	3.3	3.3	3.2
Storage Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98	1.00			1.00		0.96	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	3317	1601	1532	3285	1601	1601	3231	1528	1711	3355	1513
Flt Permitted	0.275			0.103			0.950			0.950		
Satd. Flow (perm)	478	3317	1575	166	3285	1601	1597	3231	1473	1695	3355	1480
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			306			156			147
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		1699.2			430.7			1445.9			314.9	
Travel Time (s)		102.0			25.8			86.8			18.9	
Confl. Peds. (#/hr)			4	4			9		22	22		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	4%	2%	10%	5%	2%	9%	8%	1%	2%	4%	2%
Adj. Flow (vph)	172	911	83	167	639	306	56	700	383	356	1011	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	172	911	83	167	639	306	56	700	383	356	1011	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	1.06	0.99	1.09	1.06	0.99	1.04	1.04	1.06	1.04	1.04	1.06
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	14.0	45.5	45.5	14.0	45.5	45.5	13.0	42.5	42.5	13.0	42.5	42.5
Total Split (s)	15.0	46.0	46.0	16.0	47.0	47.0	24.0	43.0	43.0	25.0	44.0	44.0
Total Split (%)	11.5%	35.4%	35.4%	12.3%	36.2%	36.2%	18.5%	33.1%	33.1%	19.2%	33.8%	33.8%
Maximum Green (s)	8.0	38.5	38.5	9.0	39.5	39.5	18.0	35.5	35.5	19.0	36.5	36.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	4.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5	7.0	7.5	7.5	6.0	7.5	7.5	6.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag

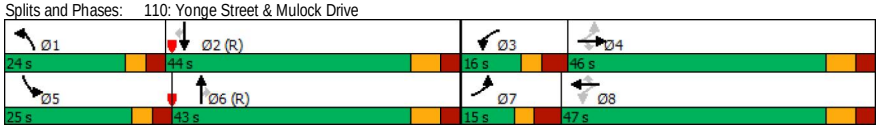
Lanes, Volumes, Timings
110: Yonge Street & Mulock Drive
AM Peak Hour
2039 Total Future (Mitigated)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		31.0	31.0		31.0	31.0		28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	46.4	37.9	37.9	48.4	38.9	38.9	10.1	36.1	36.1	19.0	47.6	47.6
Actuated g/C Ratio	0.36	0.29	0.29	0.37	0.30	0.30	0.08	0.28	0.28	0.15	0.37	0.37
v/c Ratio	0.71	0.94	0.15	1.07	0.65	0.44	0.45	0.78	0.74	1.42	0.82	0.22
Control Delay	44.4	63.1	0.5	122.5	43.2	5.7	68.0	50.6	34.4	252.4	45.5	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	63.1	0.5	122.5	43.2	5.7	68.0	50.6	34.4	252.4	45.5	5.2
LOS	D	E	A	F	D	A	E	D	C	F	D	A
Approach Delay		55.9			44.8			46.0			90.7	
Approach LOS		E			D			D			F	
Queue Length 50th (m)	29.5	125.6	0.0	~34.9	78.4	0.0	14.7	92.5	57.5	~129.4	134.3	0.0
Queue Length 95th (m)	#50.4	#166.2	0.0	#82.7	99.8	21.1	28.6	116.6	98.2	#191.6	#186.6	13.6
Internal Link Dist (m)		1675.2			406.7			1421.9			290.9	
Turn Bay Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Base Capacity (vph)	243	982	569	156	998	699	221	897	521	250	1227	634
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.93	0.15	1.07	0.64	0.44	0.25	0.78	0.74	1.42	0.82	0.22

Intersection Summary		
Area Type:	Other	
Cycle Length: 130		
Actuated Cycle Length: 130		
Offset: 28 (22%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 135		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.42		
Intersection Signal Delay: 61.7	Intersection LOS: E	
Intersection Capacity Utilization 102.3%	ICU Level of Service G	
Analysis Period (min) 15		

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 110: Yonge Street & Mulock Drive



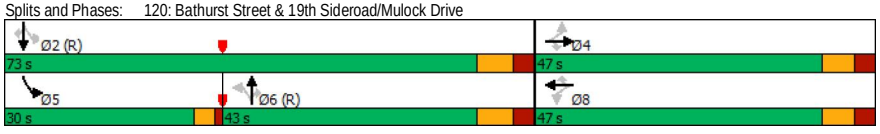
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	30	5	425	85	345	0	550	320	580	1500	15
Future Volume (vph)	5	30	5	425	85	345	0	550	320	580	1500	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.7	3.7	3.2	3.2	3.2	3.6	3.6	3.6	3.0	3.7	4.0
Storage Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99						0.99	1.00		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1478	1921	1633	1708	3450	1456	1900	3406	1599	1604	3544	1533
Flt Permitted	0.696			*0.950						0.309		
Satd. Flow (perm)	1083	1921	1612	1708	3450	1456	1900	3406	1578	522	3544	1533
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			363			337			41
Link Speed (k/h)		60			60			60			70	
Link Distance (m)		142.9			1699.2			469.9			237.1	
Travel Time (s)		8.6			102.0			28.2			12.2	
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	14%	0%	0%	1%	0%	6%	0%	6%	1%	5%	3%	10%
Adj. Flow (vph)	5	32	5	447	89	363	0	579	337	611	1579	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	32	5	447	89	363	0	579	337	611	1579	16
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	0.99	0.99	1.06	1.06	1.06	1.00	1.00	1.00	1.09	0.99	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	4	4	4	8	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	43.5	43.5	43.5	43.5	43.5	43.5	43.0	43.0	43.0	11.0	43.0	43.0
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	43.0	43.0	43.0	30.0	73.0	73.0
Total Split (%)	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%	35.8%	35.8%	35.8%	25.0%	60.8%	60.8%
Maximum Green (s)	39.5	39.5	39.5	39.5	39.5	39.5	35.0	35.0	35.0	26.0	65.0	65.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	8.0	8.0	8.0	4.0	8.0	8.0

Lanes, Volumes, Timings
120: Bathurst Street & 19th Sideroad/Mulock Drive
AM Peak Hour
2039 Total Future (Mitigated)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	29.0	29.0	29.0	29.0	29.0	29.0	28.0	28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0		0	0
Act Effct Green (s)	35.2	35.2	35.2	35.2	35.2	35.2		39.3	39.3	73.3	69.3	69.3
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29		0.33	0.33	0.61	0.58	0.58
v/c Ratio	0.02	0.06	0.01	0.89	0.09	0.53		0.52	0.45	1.10	0.77	0.02
Control Delay	27.8	28.7	0.0	61.1	29.5	6.1		35.7	5.6	90.1	23.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	28.7	0.0	61.1	29.5	6.1		35.7	5.6	90.1	23.5	0.5
LOS	C	C	A	E	C	A		D	A	F	C	A
Approach Delay		25.2			35.8			24.6			41.8	
Approach LOS		C			D			C			D	
Queue Length 50th (m)	0.9	5.6	0.0	103.7	8.2	0.0		62.4	0.0	~122.3	155.0	0.0
Queue Length 95th (m)	3.9	12.9	0.0	#150.6	14.3	22.3		83.7	22.0	#201.5	196.6	0.7
Internal Link Dist (m)		118.9			1675.2			445.9			213.1	
Turn Bay Length (m)	30.0		5.0	60.0		60.0			85.0	65.0		50.0
Base Capacity (vph)	356	632	585	562	1135	683		1114	742	553	2045	902
Starvation Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.01	0.05	0.01	0.80	0.08	0.53		0.52	0.45	1.10	0.77	0.02

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 109 (91%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 120		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.10		
Intersection Signal Delay: 36.4	Intersection LOS: D	
Intersection Capacity Utilization 107.8%	ICU Level of Service G	
Analysis Period (min) 15		
* User Entered Value		
~ 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: 120: Bathurst Street & 19th Sideroad/Mulock Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	970	270	210	550	345	105	545	300	780	930	320
Future Volume (vph)	165	970	270	210	550	345	105	545	300	780	930	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.6	3.7	3.2	3.6	3.7	3.0	3.4	4.0	3.0	3.7	3.3
Storage Length (m)	65.0		50.0	70.0		0.0	35.0		100.0	115.0		230.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99				1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1612	3539	1601	1708	3505	1512	1652	3330	1670	*2068	3444	1516
Flt Permitted	0.345			0.091			0.274			0.216		
Satd. Flow (perm)	585	3539	1578	164	3505	1512	476	3330	1670	368	3444	1490
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			105			83			116			245
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		448.3			341.9			505.9			608.7	
Travel Time (s)		26.9			20.5			30.4			36.5	
Confl. Peds. (#/hr)			2	2			4					4
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	7%	2%	2%	1%	3%	8%	2%	6%	1%	4%	6%	3%
Adj. Flow (vph)	185	1090	303	236	618	388	118	612	337	876	1045	360
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	1090	303	236	618	388	118	612	337	876	1045	360
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.4			3.4			3.0			3.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.00	0.99	1.06	1.00	0.99	1.09	1.03	0.94	1.09	0.99	1.04
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5		6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	45.0	45.0	11.0	45.0	11.0	39.5	39.5	39.5	11.0	39.5	39.5
Total Split (s)	11.0	48.0	48.0	15.0	52.0	27.0	40.0	40.0	40.0	27.0	67.0	67.0
Total Split (%)	8.5%	36.9%	36.9%	11.5%	40.0%	20.8%	30.8%	30.8%	30.8%	20.8%	51.5%	51.5%
Maximum Green (s)	7.0	40.0	40.0	11.0	44.0	23.0	32.5	32.5	32.5	23.0	59.5	59.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	3.0	4.5	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	3.5	3.5	1.0	3.5	1.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.0	8.0	4.0	8.0	4.0	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead		

Lanes, Volumes, Timings
210: Yonge Street & St. John's Sideroad
AM Peak Hour
2039 Total Future (Mitigated)

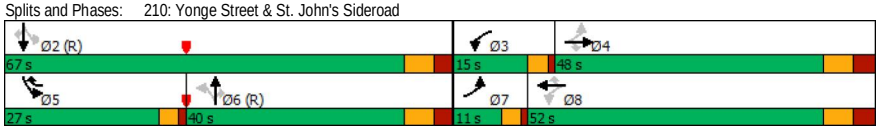
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0	30.0		30.0		25.0	25.0	25.0		25.0	25.0
Pedestrian Calls (#/hr)		0	0		0		5	5	5		5	5
Act Effct Green (s)	51.0	40.0	40.0	59.0	44.0	75.0	32.5	32.5	32.5	63.0	59.5	59.5
Actuated g/C Ratio	0.39	0.31	0.31	0.45	0.34	0.58	0.25	0.25	0.25	0.48	0.46	0.46
v/c Ratio	0.65	1.00	0.54	1.15	0.52	0.43	0.99	0.74	0.67	1.83	0.66	0.44
Control Delay	37.5	72.6	28.0	139.6	36.5	13.5	129.7	50.9	35.6	405.0	30.0	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	72.6	28.0	139.6	36.5	13.5	129.7	50.9	35.6	405.0	30.0	9.0
LOS	D	E	C	F	D	B	F	D	D	F	C	A
Approach Delay		59.9			48.9			54.8			170.7	
Approach LOS		E			D			D			F	
Queue Length 50th (m)	30.2	~155.1	44.0	~57.6	70.2	43.3	31.9	80.2	54.4	~327.3	113.2	17.9
Queue Length 95th (m)	46.8	#200.6	73.1	#109.9	87.9	65.8	#72.6	100.9	87.7	#401.9	135.2	41.4
Internal Link Dist (m)		424.3			317.9			481.9			584.7	
Turn Bay Length (m)	65.0		50.0	70.0			35.0		100.0	115.0		230.0
Base Capacity (vph)	284	1088	558	205	1186	907	119	832	504	479	1576	814
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	1.00	0.54	1.15	0.52	0.43	0.99	0.74	0.67	1.83	0.66	0.44

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 35 (27%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.83
Intersection Signal Delay: 97.8 Intersection LOS: F
Intersection Capacity Utilization 116.6% ICU Level of Service H
Analysis Period (min) 15

* User Entered Value
~ 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: 210: Yonge Street & St. John's Sideroad



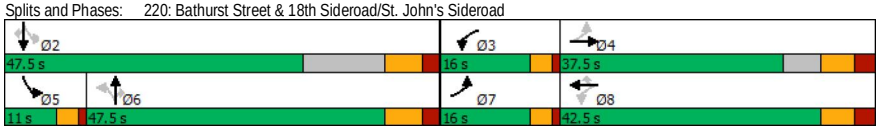
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	565	65	305	695	50	60	665	95	200	1475	385
Future Volume (vph)	110	565	65	305	695	50	60	665	95	200	1475	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.0	3.5	3.7	3.2	3.7	4.0	3.1	3.3	3.7
Storage Length (m)	30.0		0.0	50.0		50.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00										
Frt		0.985				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1738	1821	0	1668	1807	1601	1675	3510	1622	1688	3388	1617
Flt Permitted	0.122			0.114			0.100			0.247		
Satd. Flow (perm)	223	1821	0	200	1807	1601	176	3510	1622	439	3388	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				117			117			230
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		129.9			1758.6			451.2			794.7	
Travel Time (s)		7.8			105.5			23.2			40.9	
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	4%	2%	1%	4%	2%	3%	4%	4%	1%	3%	1%
Adj. Flow (vph)	116	595	68	321	732	53	63	700	100	211	1553	405
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	663	0	321	732	53	63	700	100	211	1553	405
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.2			3.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.09	1.01	0.99	1.06	0.99	0.94	1.08	1.04	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		3	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	20.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	17.5		11.0	38.5	38.5	36.5	36.5	36.5	11.0	36.5	36.5
Total Split (s)	16.0	37.5		16.0	42.5	42.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (%)	13.7%	32.1%		13.7%	36.3%	36.3%	40.6%	40.6%	40.6%	9.4%	40.6%	40.6%
Maximum Green (s)	12.0	30.0		12.0	35.0	35.0	40.0	40.0	40.0	7.0	40.0	40.0
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0		1.0	3.0	3.0	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.5		4.0	7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None		None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)					7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)					24.0	24.0	22.0	22.0	22.0		22.0	22.0
Pedestrian Calls (#/hr)					0	0	0	0	0		0	0
Act Effct Green (s)	46.3	32.9		50.3	35.0	35.0	40.0	40.0	40.0	54.5	51.0	51.0
Actuated g/C Ratio	0.40	0.29		0.44	0.30	0.30	0.35	0.35	0.35	0.47	0.44	0.44
v/c Ratio	0.53	1.27		1.34	1.33	0.09	1.03	0.57	0.16	0.74	1.03	0.48
Control Delay	27.6	169.1		203.6	194.8	0.3	167.4	33.0	4.0	38.0	64.3	11.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	169.1		203.6	194.8	0.3	167.4	33.0	4.0	38.0	64.3	11.4
LOS	C	F		F	F	A	F	C	A	D	E	B
Approach Delay		148.0			188.0			39.4			51.9	
Approach LOS		F			F			D			D	
Queue Length 50th (m)	15.6	~197.6		~82.7	~225.9	0.0	~16.0	70.6	0.0	29.3	~208.6	26.1
Queue Length 95th (m)	27.3	#269.6		#144.2	#306.9	0.0	#46.2	92.6	9.0	#56.5	#260.1	55.0
Internal Link Dist (m)		105.9			1734.6			427.2			770.7	
Turn Bay Length (m)	30.0			50.0		50.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	252	558		240	550	569	61	1222	641	284	1504	845
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	1.19		1.34	1.33	0.09	1.03	0.57	0.16	0.74	1.03	0.48

Intersection Summary

Area Type: Other
Cycle Length: 117
Actuated Cycle Length: 114.9
Natural Cycle: 120
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.34
Intersection Signal Delay: 95.5 Intersection LOS: F
Intersection Capacity Utilization 130.1% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 220: Bathurst Street & 18th Sideroad/St. John's Sideroad



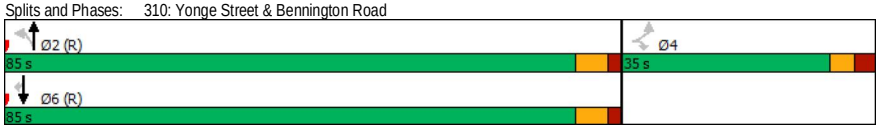
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	200	245	50	965	1665	65
Future Volume (vph)	200	245	50	965	1665	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.0	3.2	3.2	3.2
Storage Length (m)	0.0	0.0	60.0			60.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1789	1601	1652	3382	3382	1513
Flt Permitted	0.950		0.076			
Satd. Flow (perm)	1789	1601	132	3382	3382	1513
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		26				55
Link Speed (k/h)	50			60	60	
Link Distance (m)	181.9			608.7	1445.9	
Travel Time (s)	13.1			36.5	86.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	266	54	1049	1810	71
Shared Lane Traffic (%)						
Lane Group Flow (vph)	217	266	54	1049	1810	71
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	1.09	1.06	1.06	1.06
Turning Speed (k/h)	25	15	25			15
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	35.0	35.0	25.5	25.5	25.5	25.5
Total Split (s)	35.0	35.0	85.0	85.0	85.0	85.0
Total Split (%)	29.2%	29.2%	70.8%	70.8%	70.8%	70.8%
Maximum Green (s)	28.5	28.5	78.5	78.5	78.5	78.5
Yellow Time (s)	3.5	3.5	4.5	4.5	4.5	4.5
All-Red Time (s)	3.0	3.0	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)	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max

Lanes, Volumes, Timings
310: Yonge Street & Bennington Road
AM Peak Hour
2039 Total Future (Mitigated)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	20.0	20.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	22.7	22.7	84.3	84.3	84.3	84.3
Actuated g/C Ratio	0.19	0.19	0.70	0.70	0.70	0.70
v/c Ratio	0.64	0.82	0.59	0.44	0.76	0.07
Control Delay	53.0	61.7	42.3	9.0	15.2	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.0	61.7	42.3	9.0	15.2	2.7
LOS	D	E	D	A	B	A
Approach Delay	57.8			10.6	14.7	
Approach LOS	E			B	B	
Queue Length 50th (m)	49.7	57.5	6.2	54.3	139.0	1.1
Queue Length 95th (m)	72.6	85.2	#33.4	78.0	197.0	6.4
Internal Link Dist (m)	157.9			584.7	1421.9	
Turn Bay Length (m)			60.0			60.0
Base Capacity (vph)	424	400	92	2374	2374	1078
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	0.51	0.67	0.59	0.44	0.76	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 19.4		Intersection LOS: B	
Intersection Capacity Utilization 72.0%		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: 310: Yonge Street & Bennington Road



HCM Unsignalized Intersection Capacity Analysis
320: Bathurst Street & Bennington Road

AM Peak Hour
2039 Total Future (Mitigated)

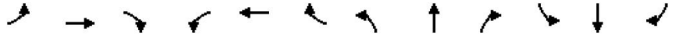
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	85	80	790	30	60	1875
Future Volume (Veh/h)	85	80	790	30	60	1875
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	87	859	33	65	2038
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	2008	430			892	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2008	430			892	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	85			91	
cM capacity (veh/h)	47	574			756	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	92	87	430	430	33	65	1019	1019
Volume Left	92	0	0	0	0	65	0	0
Volume Right	0	87	0	0	33	0	0	0
cSH	47	574	1700	1700	1700	756	1700	1700
Volume to Capacity	1.96	0.15	0.25	0.25	0.02	0.09	0.60	0.60
Queue Length 95th (m)	74.6	4.3	0.0	0.0	0.0	2.3	0.0	0.0
Control Delay (s)	633.6	12.4	0.0	0.0	0.0	10.2	0.0	0.0
Lane LOS	F	B				B		
Approach Delay (s)	331.7		0.0			0.3		
Approach LOS	F							

Intersection Summary			
Average Delay	18.9		
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
330: Willow Farm Lane/Collector Road & St. John's Sideroad

AM Peak Hour
2039 Total Future (Mitigated)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	1155	5	20	890	65	0	0	65	185	0	180
Future Volume (Veh/h)	40	1155	5	20	890	65	0	0	65	185	0	180
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	43	1229	5	21	947	69	0	0	69	197	0	191
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1016			1234			2024	2376	617	1793	2344	508
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1016			1234			2024	2376	617	1793	2344	508
tC, single (s)	4.1			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			96			100	100	84	0	100	63
cM capacity (veh/h)	691			544			20	32	433	40	33	515

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	43	819	415	21	631	385	69	197	191
Volume Left	43	0	0	21	0	0	0	197	0
Volume Right	0	0	5	0	0	69	69	0	191
cSH	691	1700	1700	544	1700	1700	433	40	515
Volume to Capacity	0.06	0.48	0.24	0.04	0.37	0.23	0.16	4.89	0.37
Queue Length 95th (m)	1.6	0.0	0.0	1.0	0.0	0.0	4.5	Err	13.6
Control Delay (s)	10.6	0.0	0.0	11.9	0.0	0.0	14.9	Err	16.0
Lane LOS	B			B			B	F	C
Approach Delay (s)	0.4			0.2			14.9	5084.7	
Approach LOS							B	F	

Intersection Summary			
Average Delay	712.6		
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	85	80	790	30	60	1875
Future Volume (vph)	85	80	790	30	60	1875
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Storage Length (m)	0.0	0.0		60.0	60.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3579	1601	1789	3579
Flt Permitted	0.950				0.328	
Satd. Flow (perm)	1789	1601	3579	1601	618	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		87		33		
Link Speed (k/h)	50		50			50
Link Distance (m)	146.2		337.4			666.4
Travel Time (s)	10.5		24.3			48.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	87	859	33	65	2038
Shared Lane Traffic (%)						
Lane Group Flow (vph)	92	87	859	33	65	2038
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Turn Type	Perm	Perm	NA	Perm	Perm	NA
Protected Phases			2			6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	40.0	40.0	40.0	40.0
Minimum Split (s)	29.0	29.0	47.0	47.0	47.0	47.0
Total Split (s)	29.0	29.0	47.0	47.0	47.0	47.0
Total Split (%)	38.2%	38.2%	61.8%	61.8%	61.8%	61.8%
Maximum Green (s)	22.0	22.0	40.0	40.0	40.0	40.0
Yellow Time (s)	3.5	3.5	5.0	5.0	5.0	5.0
All-Red Time (s)	3.5	3.5	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)	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	8.9	8.9	46.2	46.2	46.2	46.2
Actuated g/C Ratio	0.14	0.14	0.71	0.71	0.71	0.71
v/c Ratio	0.37	0.29	0.34	0.03	0.15	0.80
Control Delay	29.4	9.3	5.5	2.1	6.2	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	9.3	5.5	2.1	6.2	12.8
LOS	C	A	A	A	A	B
Approach Delay	19.6		5.4			12.6
Approach LOS	B		A			B
Queue Length 50th (m)	10.4	0.0	21.8	0.0	2.7	91.4
Queue Length 95th (m)	22.4	10.7	36.4	2.7	8.5	#179.0
Internal Link Dist (m)	122.2		313.4			642.4
Turn Bay Length (m)				60.0	60.0	
Base Capacity (vph)	608	601	2553	1151	441	2553
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	0.15	0.14	0.34	0.03	0.15	0.80

Intersection Summary

Area Type: Other
Cycle Length: 76
Actuated Cycle Length: 64.8
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 11.0 Intersection LOS: B
Intersection Capacity Utilization 78.3% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 320: Bathurst Street & Bennington Road

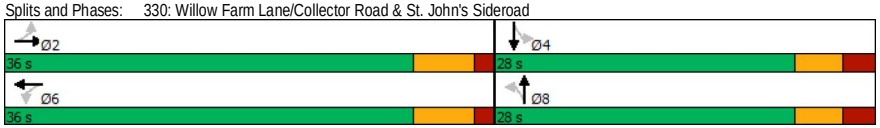
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1155	5	20	890	65	0	0	65	185	0	180
Future Volume (vph)	40	1155	5	20	890	65	0	0	65	185	0	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.7	3.7	3.4	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
Storage Length (m)	15.0		15.0	30.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.990			0.865			0.850	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1685	3575	0	1681	3392	0	0	1629	0	1825	1633	0
Flt Permitted	0.239			0.166						0.712		
Satd. Flow (perm)	424	3575	0	294	3392	0	0	1629	0	1368	1633	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			16			51			74	
Link Speed (k/h)		60			60			40			50	
Link Distance (m)		1758.6			448.3			195.4			116.6	
Travel Time (s)		105.5			26.9			17.6			8.4	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	0%	5%	2%	0%	0%	0%	2%	0%	0%	0%
Adj. Flow (vph)	43	1229	5	21	947	69	0	0	69	197	0	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	1234	0	21	1016	0	0	69	0	197	191	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.4			3.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	0.99	0.99	1.03	1.04	1.04	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA			NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	30.0	30.0		30.0	30.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	36.0	36.0		36.0	36.0		28.0	28.0		28.0	28.0	
Total Split (s)	36.0	36.0		36.0	36.0		28.0	28.0		28.0	28.0	
Total Split (%)	56.3%	56.3%		56.3%	56.3%		43.8%	43.8%		43.8%	43.8%	
Maximum Green (s)	30.0	30.0		30.0	30.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	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	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lanes, Volumes, Timings
330: Willow Farm Lane/Collector Road & St. John's Sideroad
AM Peak Hour
2039 Total Future (Mitigated Site Accesses)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	Min	Min		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	30.2	30.2		30.2	30.2			13.0		13.0	13.0	
Actuated g/C Ratio	0.55	0.55		0.55	0.55			0.24		0.24	0.24	
v/c Ratio	0.19	0.63		0.13	0.55			0.16		0.61	0.43	
Control Delay	10.6	11.4		10.5	10.2			8.2		27.2	14.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	10.6	11.4		10.5	10.2			8.2		27.2	14.1	
LOS	B	B		B	B			A		C	B	
Approach Delay		11.4			10.2			8.2			20.8	
Approach LOS		B			B			A			C	
Queue Length 50th (m)	2.0	41.7		1.0	31.4			1.5		18.4	10.1	
Queue Length 95th (m)	8.8	78.3		5.4	60.6			9.0		35.7	24.3	
Internal Link Dist (m)		1734.6			424.3			171.4			92.6	
Turn Bay Length (m)	15.0			30.0								
Base Capacity (vph)	231	1952		160	1858			682		547	698	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.19	0.63		0.13	0.55			0.10		0.36	0.27	

Intersection Summary			
Area Type:	Other		
Cycle Length: 64			
Actuated Cycle Length: 55.3			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 60.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 330: Willow Farm Lane/Collector Road & St. John's Sideroad



Synchro 10 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	615	60	310	900	330	145	1220	330	295	925	155
Future Volume (vph)	105	615	60	310	900	330	145	1220	330	295	925	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.2	3.7	3.0	3.2	3.7	3.3	3.3	3.2	3.3	3.3	3.2
Storage Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3317	1633	1668	3317	1633	1711	3455	1543	1711	3388	1528
Flt Permitted	0.104			0.210			0.950			0.950		
Satd. Flow (perm)	183	3317	1633	369	3317	1633	1711	3455	1543	1711	3388	1528
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			136			246			164			136
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		1699.2			430.7			1445.9			314.9	
Travel Time (s)		102.0			25.8			86.8			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	4%	0%	1%	4%	0%	2%	1%	0%	2%	3%	1%
Adj. Flow (vph)	114	668	65	337	978	359	158	1326	359	321	1005	168
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	668	65	337	978	359	158	1326	359	321	1005	168
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	1.06	0.99	1.09	1.06	0.99	1.04	1.04	1.06	1.04	1.04	1.06
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4		4	8		8			6			2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	14.0	45.5	45.5	14.0	45.5	45.5	13.0	42.5	42.5	13.0	42.5	42.5
Total Split (s)	14.0	46.0	46.0	16.0	48.0	48.0	30.0	48.0	48.0	30.0	48.0	48.0
Total Split (%)	10.0%	32.9%	32.9%	11.4%	34.3%	34.3%	21.4%	34.3%	34.3%	21.4%	34.3%	34.3%
Maximum Green (s)	7.0	38.5	38.5	9.0	40.5	40.5	24.0	40.5	40.5	24.0	40.5	40.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	4.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.5	7.5	7.0	7.5	7.5	6.0	7.5	7.5	6.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Lanes, Volumes, Timings
110: Yonge Street & Mulock Drive
PM Peak Hour
2039 Total Future (Mitigated)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		31.0	31.0		31.0	31.0		28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	46.0	38.5	38.5	50.0	40.5	40.5	18.0	40.5	40.5	24.0	46.5	46.5
Actuated g/C Ratio	0.33	0.28	0.28	0.36	0.29	0.29	0.13	0.29	0.29	0.17	0.33	0.33
v/c Ratio	0.85	0.73	0.12	1.57	1.02	0.55	0.72	1.33	0.64	1.10	0.89	0.28
Control Delay	78.0	51.7	0.5	304.6	82.8	16.4	76.1	193.6	28.6	133.3	55.9	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.0	51.7	0.5	304.6	82.8	16.4	76.1	193.6	28.6	133.3	55.9	10.5
LOS	E	D	A	F	F	B	E	F	C	F	E	B
Approach Delay		51.3			113.2			151.4			67.4	
Approach LOS		D			F			F			E	
Queue Length 50th (m)	21.5	93.4	0.0	~118.3	~158.5	25.9	44.8	~262.9	49.9	~105.4	146.6	6.4
Queue Length 95th (m)	#54.6	117.0	0.0	#195.1	#202.1	59.0	67.2	#307.8	86.4	#167.1	#207.4	25.7
Internal Link Dist (m)		1675.2			406.7			1421.9			290.9	
Turn Bay Length (m)	85.0		70.0	55.0		70.0	75.0		300.0	225.0		70.0
Base Capacity (vph)	134	912	547	215	959	647	293	999	562	293	1124	598
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.73	0.12	1.57	1.02	0.55	0.54	1.33	0.64	1.10	0.89	0.28

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 68 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.57
Intersection Signal Delay: 104.6 Intersection LOS: F
Intersection Capacity Utilization 107.6% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 110: Yonge Street & Mulock Drive

Synchro 10 Report

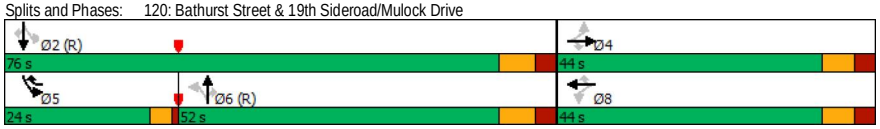
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	120	5	345	75	765	5	1690	470	320	795	50
Future Volume (vph)	55	120	5	345	75	765	5	1690	470	320	795	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.7	3.7	3.2	3.2	3.2	3.6	3.6	3.6	3.0	3.7	4.0
Storage Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.99						
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1652	1921	1633	1708	3450	1484	1805	3574	1599	1589	3579	1687
Flt Permitted	0.704			0.677			0.340			0.083		
Satd. Flow (perm)	1224	1921	1633	1217	3450	1465	646	3574	1599	139	3579	1687
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			45			291			52
Link Speed (k/h)		60			60			60			70	
Link Distance (m)		142.9			1699.2			469.9			237.1	
Travel Time (s)		8.6			102.0			28.2			12.2	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	0%	0%	1%	0%	4%	0%	1%	1%	6%	2%	0%
Adj. Flow (vph)	57	125	5	359	78	797	5	1760	490	333	828	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	125	5	359	78	797	5	1760	490	333	828	52
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	0.99	0.99	1.06	1.06	1.06	1.00	1.00	1.00	1.09	0.99	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8	5		6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	4	4	4	8	8		6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	43.5	43.5	43.5	43.5	43.5	11.0	43.0	43.0	43.0	11.0	43.0	43.0
Total Split (s)	44.0	44.0	44.0	44.0	44.0	24.0	52.0	52.0	52.0	24.0	76.0	76.0
Total Split (%)	36.7%	36.7%	36.7%	36.7%	36.7%	20.0%	43.3%	43.3%	43.3%	20.0%	63.3%	63.3%
Maximum Green (s)	36.5	36.5	36.5	36.5	36.5	20.0	44.0	44.0	44.0	20.0	68.0	68.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	3.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	4.0	8.0	8.0	8.0	4.0	8.0	8.0
Lead/Lag						Lead	Lag	Lag	Lag	Lead		

Lanes, Volumes, Timings
120: Bathurst Street & 19th Sideroad/Mulock Drive
PM Peak Hour
2039 Total Future (Mitigated)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	29.0	29.0	29.0	29.0	29.0		28.0	28.0	28.0		28.0	28.0
Pedestrian Calls (#/hr)	0	0	0	0	0		0	0	0		0	0
Act Effct Green (s)	36.4	36.4	36.4	36.4	36.4	59.9	44.1	44.1	44.1	72.1	68.1	68.1
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.50	0.37	0.37	0.37	0.60	0.57	0.57
v/c Ratio	0.15	0.21	0.01	0.97	0.07	1.05	0.02	1.34	0.64	1.02	0.41	0.05
Control Delay	32.0	32.4	0.0	82.6	30.1	74.2	24.8	190.9	16.2	91.0	15.4	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	32.4	0.0	82.6	30.1	74.2	24.8	190.9	16.2	91.0	15.4	3.3
LOS	C	C	A	F	C	E	C	F	B	F	B	A
Approach Delay		31.4			73.9			152.6			35.6	
Approach LOS		C			E			F			D	
Queue Length 50th (m)	10.3	23.0	0.0	87.7	7.2	~201.8	0.8	~299.8	39.1	~71.9	57.9	0.0
Queue Length 95th (m)	21.4	39.1	0.0	#150.6	13.4	#222.1	3.7	#344.4	77.4	#131.7	72.4	5.6
Internal Link Dist (m)		118.9			1675.2			445.9			213.1	
Turn Bay Length (m)	30.0		5.0	60.0		60.0	50.0		85.0	65.0		50.0
Base Capacity (vph)	372	584	553	370	1049	757	237	1313	771	325	2031	979
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.21	0.01	0.97	0.07	1.05	0.02	1.34	0.64	1.02	0.41	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 87 (73%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.34			
Intersection Signal Delay: 99.0		Intersection LOS: F	
Intersection Capacity Utilization 116.2%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 120: Bathurst Street & 19th Sideroad/Mulock Drive



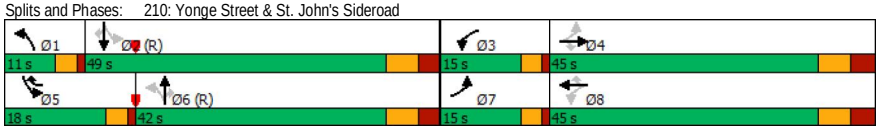
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	655	125	305	925	1005	225	1060	305	460	725	215
Future Volume (vph)	270	655	125	305	925	1005	225	1060	305	460	725	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.6	3.7	3.2	3.6	3.7	3.0	3.4	4.0	3.0	3.7	3.3
Storage Length (m)	65.0		50.0	70.0		0.0	35.0		100.0	115.0		230.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99	1.00		0.99	1.00		0.99			0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1725	3539	1633	1708	3574	1633	1685	3461	1670	*2068	3544	1516
Flt Permitted	0.112			0.246			0.269			0.101		
Satd. Flow (perm)	203	3539	1609	442	3574	1609	476	3461	1648	176	3544	1488
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			77			243			226
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		448.3			341.9			505.9			608.7	
Travel Time (s)		26.9			20.5			30.4			36.5	
Confl. Peds. (#/hr)	2		3	3		2	5		1	1		5
Confl. Bikes (#/hr)						2						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	2%	1%	2%	3%	3%
Adj. Flow (vph)	284	689	132	321	974	1058	237	1116	321	484	763	226
Shared Lane Traffic (%)												
Lane Group Flow (vph)	284	689	132	321	974	1058	237	1116	321	484	763	226
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.4			3.4			3.0			3.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.00	0.99	1.06	1.00	0.99	1.09	1.03	0.94	1.09	0.99	1.04
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8		1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	11.0	45.0	45.0	11.0	45.0	11.0	11.0	39.5	39.5	11.0	39.5	39.5
Total Split (s)	15.0	45.0	45.0	15.0	45.0	18.0	11.0	42.0	42.0	18.0	49.0	49.0
Total Split (%)	12.5%	37.5%	37.5%	12.5%	37.5%	15.0%	9.2%	35.0%	35.0%	15.0%	40.8%	40.8%
Maximum Green (s)	11.0	37.0	37.0	11.0	37.0	14.0	7.0	34.5	34.5	14.0	41.5	41.5
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	3.5	3.5	1.0	3.5	1.0	1.0	3.0	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.0	8.0	4.0	8.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5

Lanes, Volumes, Timings
210: Yonge Street & St. John's Sideroad
PM Peak Hour
2039 Total Future (Mitigated)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		30.0	30.0		30.0			25.0	25.0		25.0	25.0
Pedestrian Calls (#/hr)		5	5		5			5	5		5	5
Act Effct Green (s)	50.8	35.8	35.8	50.8	35.8	53.8	47.4	35.7	35.7	56.8	41.5	41.5
Actuated g/C Ratio	0.42	0.30	0.30	0.42	0.30	0.45	0.40	0.30	0.30	0.47	0.35	0.35
v/c Ratio	1.26	0.65	0.23	1.06	0.91	1.38	0.88	1.08	0.49	1.60	0.62	0.34
Control Delay	176.0	39.9	4.4	95.5	54.0	205.7	58.9	94.3	11.9	311.2	29.2	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	176.0	39.9	4.4	95.5	54.0	205.7	58.9	94.3	11.9	311.2	29.2	8.1
LOS	F	D	A	F	D	F	E	F	B	F	C	A
Approach Delay		70.6			127.9			73.5			118.6	
Approach LOS		E			F			E			F	
Queue Length 50th (m)	~69.8	77.1	0.0	~55.0	120.5	~284.5	35.6	~167.8	14.5	~151.1	56.3	0.3
Queue Length 95th (m)	#126.5	98.1	11.0	#103.4	#157.1	#428.7	#81.4	#211.0	41.5	#229.8	80.4	27.9
Internal Link Dist (m)		424.3			317.9			481.9			584.7	
Turn Bay Length (m)	65.0		50.0	70.0			35.0		100.0	115.0		230.0
Base Capacity (vph)	225	1091	599	303	1101	766	270	1029	660	303	1225	662
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.26	0.63	0.22	1.06	0.88	1.38	0.88	1.08	0.49	1.60	0.62	0.34

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 39 (33%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.60		
Intersection Signal Delay: 102.5		Intersection LOS: F
Intersection Capacity Utilization 119.6%		ICU Level of Service H
Analysis Period (min) 15		
* User Entered Value		
~ 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: 210: Yonge Street & St. John's Sideroad



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	710	40	180	615	215	110	1525	355	95	750	150
Future Volume (vph)	360	710	40	180	615	215	110	1525	355	95	750	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.0	3.5	3.7	3.2	3.7	4.0	3.1	3.3	3.7
Storage Length (m)	30.0		0.0	50.0		50.0	60.0		60.0	60.0		60.0
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor						0.99						
Frt		0.992				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1807	1886	0	1636	1842	1633	1708	3579	1670	1655	3421	1617
Flt Permitted	0.110			0.123			0.354			0.082		
Satd. Flow (perm)	209	1886	0	212	1842	1612	636	3579	1670	143	3421	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				151			182			156
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		129.9			1758.6			451.2			794.7	
Travel Time (s)		7.8			105.5			23.2			40.9	
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	1%	2%	3%	2%	0%	1%	2%	1%	3%	2%	1%
Adj. Flow (vph)	375	740	42	188	641	224	115	1589	370	99	781	156
Shared Lane Traffic (%)												
Lane Group Flow (vph)	375	782	0	188	641	224	115	1589	370	99	781	156
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.2			3.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.09	1.01	0.99	1.06	0.99	0.94	1.08	1.04	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	7	4		3	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	20.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	17.5		11.0	38.5	38.5	36.5	36.5	36.5	11.0	36.5	36.5
Total Split (s)	16.0	40.0		11.0	40.0	40.0	52.0	52.0	52.0	11.0	52.0	52.0
Total Split (%)	13.4%	33.6%		9.2%	33.6%	33.6%	43.7%	43.7%	43.7%	9.2%	43.7%	43.7%
Maximum Green (s)	12.0	32.5		7.0	32.5	32.5	44.5	44.5	44.5	7.0	44.5	44.5
Yellow Time (s)	3.0	4.5		3.0	4.5	4.5	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0		1.0	3.0	3.0	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.5		4.0	7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		

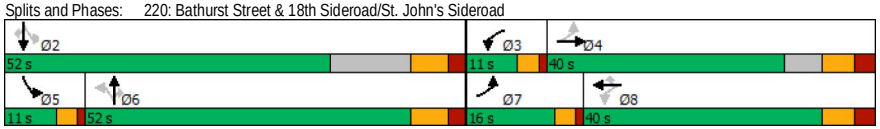
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None		None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)					7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)					24.0	24.0	22.0	22.0	22.0		22.0	22.0
Pedestrian Calls (#/hr)					0	0	0	0	0		0	0
Act Effct Green (s)	52.0	37.5		43.0	32.5	32.5	44.5	44.5	44.5	59.0	55.5	55.5
Actuated g/C Ratio	0.44	0.32		0.36	0.27	0.27	0.37	0.37	0.37	0.50	0.47	0.47
v/c Ratio	1.49	1.31		1.18	1.27	0.41	0.49	1.19	0.50	0.62	0.49	0.19
Control Delay	265.3	186.6		152.6	175.1	14.5	37.0	126.6	16.5	35.5	23.3	3.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	265.3	186.6		152.6	175.1	14.5	37.0	126.6	16.5	35.5	23.3	3.3
LOS	F	F		F	F	B	D	F	B	D	C	A
Approach Delay		212.1			136.9			102.0			21.4	
Approach LOS		F			F			F			C	
Queue Length 50th (m)	~109.7	~248.5		~37.9	~199.2	13.7	21.4	~247.5	33.6	12.7	68.1	0.0
Queue Length 95th (m)	#172.1	#326.5		#86.8	#271.8	36.0	41.6	#292.2	62.9	#29.6	86.1	11.6
Internal Link Dist (m)		105.9			1734.6			427.2			770.7	
Turn Bay Length (m)	30.0			50.0		50.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	252	596		160	503	550	237	1338	738	159	1595	837
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.49	1.31		1.18	1.27	0.41	0.49	1.19	0.50	0.62	0.49	0.19

Intersection Summary

Area Type: Other
Cycle Length: 119
Actuated Cycle Length: 119
Natural Cycle: 150
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.49
Intersection Signal Delay: 117.2 Intersection LOS: F
Intersection Capacity Utilization 119.5% ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 220: Bathurst Street & 18th Sideroad/St. John's Sideroad



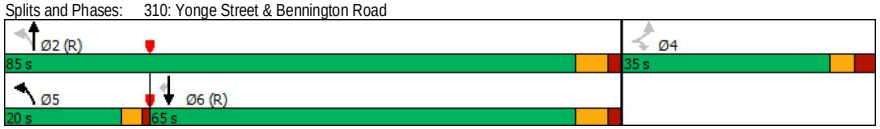
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	160	150	195	1650	1225	180
Future Volume (vph)	160	150	195	1650	1225	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.0	3.2	3.2	3.2
Storage Length (m)	0.0	0.0	60.0			60.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1789	1601	1652	3382	3382	1513
Flt Permitted	0.950		0.133			
Satd. Flow (perm)	1789	1601	231	3382	3382	1513
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		163				139
Link Speed (k/h)	50			60	60	
Link Distance (m)	181.9			608.7	1445.9	
Travel Time (s)	13.1			36.5	86.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	163	212	1793	1332	196
Shared Lane Traffic (%)						
Lane Group Flow (vph)	174	163	212	1793	1332	196
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.3	3.3	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	0.99	1.09	1.06	1.06	1.06
Turning Speed (k/h)	25	15	25			15
Turn Type	Perm	Perm	pm+pt	NA	NA	Perm
Protected Phases			5	2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	35.0	35.0	11.0	25.5	25.5	25.5
Total Split (s)	35.0	35.0	20.0	85.0	65.0	65.0
Total Split (%)	29.2%	29.2%	16.7%	70.8%	54.2%	54.2%
Maximum Green (s)	28.5	28.5	16.0	78.5	58.5	58.5
Yellow Time (s)	3.5	3.5	3.0	4.5	4.5	4.5
All-Red Time (s)	3.0	3.0	1.0	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)	6.5	6.5	4.0	6.5	6.5	6.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Min	C-Min	C-Min

Lanes, Volumes, Timings
310: Yonge Street & Bennington Road
PM Peak Hour
2039 Total Future (Mitigated)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	20.0	20.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	17.0	17.0	92.5	90.0	73.5	73.5
Actuated g/C Ratio	0.14	0.14	0.77	0.75	0.61	0.61
v/c Ratio	0.69	0.45	0.65	0.71	0.64	0.20
Control Delay	62.6	10.5	9.4	12.6	18.1	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	10.5	9.4	12.6	18.1	4.7
LOS	E	B	A	B	B	A
Approach Delay	37.4			12.2	16.4	
Approach LOS	D			B	B	
Queue Length 50th (m)	41.6	0.0	13.9	147.5	106.4	5.5
Queue Length 95th (m)	62.6	18.6	m18.9	m115.3	157.1	18.7
Internal Link Dist (m)	157.9			584.7	1421.9	
Turn Bay Length (m)			60.0			60.0
Base Capacity (vph)	424	504	367	2537	2072	981
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	0.41	0.32	0.58	0.71	0.64	0.20

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 20 (17%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 67.7%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 310: Yonge Street & Bennington Road



Synchro 10 Report

HCM Unsignalized Intersection Capacity Analysis
320: Bathurst Street & Bennington Road

PM Peak Hour
2039 Total Future (Mitigated)

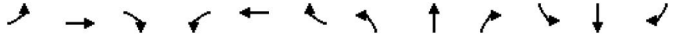
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	95	2070	150	105	1040
Future Volume (Veh/h)	35	95	2070	150	105	1040
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	103	2250	163	114	1130
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	3043	1125			2413	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3043	1125			2413	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	48			41	
cM capacity (veh/h)	4	199			194	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	38	103	1125	1125	163	114	565	565
Volume Left	38	0	0	0	0	114	0	0
Volume Right	0	103	0	0	163	0	0	0
cSH	4	199	1700	1700	1700	194	1700	1700
Volume to Capacity	9.30	0.52	0.66	0.66	0.10	0.59	0.33	0.33
Queue Length 95th (m)	Err	21.1	0.0	0.0	0.0	25.8	0.0	0.0
Control Delay (s)	Err	41.0	0.0	0.0	0.0	46.9	0.0	0.0
Lane LOS	F	E				E		
Approach Delay (s)	2724.7		0.0			4.3		
Approach LOS	F							

Intersection Summary				
Average Delay	102.6			
Intersection Capacity Utilization	76.4%	ICU Level of Service		D
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
330: Willow Farm Lane/Collector Road & St. John's Sideroad

PM Peak Hour
2039 Total Future (Mitigated)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	880	5	60	1100	205	5	0	45	125	0	55
Future Volume (Veh/h)	220	880	5	60	1100	205	5	0	45	125	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	247	989	6	67	1236	230	6	0	51	140	0	62
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1466			995			2300	3086	498	2524	2974	733
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1466			995			2300	3086	498	2524	2974	733
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	47			90			38	100	90	0	100	83
cM capacity (veh/h)	467			703			10	5	524	7	6	368

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	247	659	336	67	824	642	57	140	62
Volume Left	247	0	0	67	0	0	6	140	0
Volume Right	0	0	6	0	0	230	51	0	62
cSH	467	1700	1700	703	1700	1700	79	7	368
Volume to Capacity	0.53	0.39	0.20	0.10	0.48	0.38	0.72	19.86	0.17
Queue Length 95th (m)	24.3	0.0	0.0	2.5	0.0	0.0	27.5	Err	4.8
Control Delay (s)	21.1	0.0	0.0	10.7	0.0	0.0	123.7	Err	16.8
Lane LOS	C			B			F	F	C
Approach Delay (s)	4.2			0.5			123.7	6935.1	
Approach LOS							F	F	

Intersection Summary				
Average Delay	466.0			
Intersection Capacity Utilization	72.7%	ICU Level of Service		C
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	35	95	2070	150	105	1040
Future Volume (vph)	35	95	2070	150	105	1040
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.7	3.7	3.7	3.7	3.7
Storage Length (m)	0.0	0.0		60.0	60.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1789	1601	3579	1601	1789	3579
Flt Permitted	0.950				0.085	
Satd. Flow (perm)	1789	1601	3579	1601	160	3579
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		3		120		
Link Speed (k/h)	50		50			50
Link Distance (m)	146.2		337.4			666.4
Travel Time (s)	10.5		24.3			48.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	103	2250	163	114	1130
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	103	2250	163	114	1130
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		3.7			3.7
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Turn Type	Perm	Perm	NA	Perm	Perm	NA
Protected Phases			2			6
Permitted Phases	8	8		2	6	
Detector Phase	8	8	2	2	6	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	40.0	40.0	40.0	40.0
Minimum Split (s)	28.0	28.0	47.0	47.0	47.0	47.0
Total Split (s)	28.0	28.0	47.0	47.0	47.0	47.0
Total Split (%)	37.3%	37.3%	62.7%	62.7%	62.7%	62.7%
Maximum Green (s)	22.0	22.0	40.0	40.0	40.0	40.0
Yellow Time (s)	3.5	3.5	5.0	5.0	5.0	5.0
All-Red Time (s)	2.5	2.5	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)	6.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	Max	Max	Max	Max

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	9.7	9.7	48.5	48.5	48.5	48.5
Actuated g/C Ratio	0.14	0.14	0.72	0.72	0.72	0.72
v/c Ratio	0.15	0.44	0.87	0.14	0.98	0.44
Control Delay	24.9	30.7	16.3	2.1	106.3	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	30.7	16.3	2.1	106.3	6.1
LOS	C	C	B	A	F	A
Approach Delay	29.1		15.3			15.3
Approach LOS	C		B			B
Queue Length 50th (m)	4.5	12.2	117.2	1.6	~17.1	31.9
Queue Length 95th (m)	11.3	23.9	#211.2	8.2	#35.5	52.7
Internal Link Dist (m)	122.2		313.4			642.4
Turn Bay Length (m)				60.0	60.0	
Base Capacity (vph)	590	530	2591	1192	116	2591
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	0.06	0.19	0.87	0.14	0.98	0.44

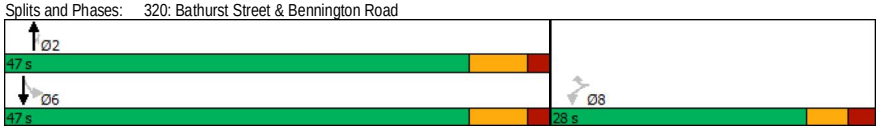
Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 67
Natural Cycle: 150
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 15.8 Intersection LOS: B
Intersection Capacity Utilization 103.9% ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 320: Bathurst Street & Bennington Road

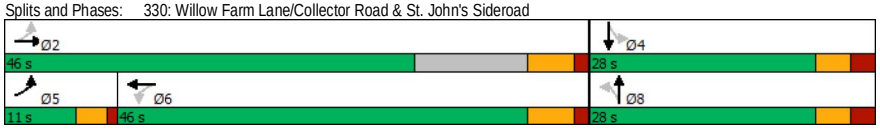


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	220	880	5	60	1100	205	5	0	45	125	0	55
Future Volume (vph)	220	880	5	60	1100	205	5	0	45	125	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.7	3.7	3.4	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7
Storage Length (m)	15.0		15.0	30.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.976			0.879			0.850	
Flt Protected	0.950			0.950				0.995		0.950		
Satd. Flow (prot)	1685	3611	0	1765	3377	0	0	1680	0	1825	1633	0
Flt Permitted	0.090			0.288				0.968		0.720		
Satd. Flow (perm)	160	3611	0	535	3377	0	0	1635	0	1383	1633	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			34			90			189	
Link Speed (k/h)		60			60			40			50	
Link Distance (m)		1758.6			448.3			195.4			116.6	
Travel Time (s)		105.5			26.9			17.6			8.4	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	247	989	6	67	1236	230	6	0	51	140	0	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	995	0	67	1466	0	0	57	0	140	62	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.4			3.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.09	0.99	0.99	1.03	1.04	1.04	0.99	0.99	0.99	0.99	0.99	0.99
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	40.0		40.0	40.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	11.0	46.0		46.0	46.0		28.0	28.0		28.0	28.0	
Total Split (s)	11.0	46.0		46.0	46.0		28.0	28.0		28.0	28.0	
Total Split (%)	12.9%	54.1%		54.1%	54.1%		32.9%	32.9%		32.9%	32.9%	
Maximum Green (s)	7.0	40.0		40.0	40.0		22.0	22.0		22.0	22.0	
Yellow Time (s)	3.0	4.5		4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0		6.0	6.0			6.0		6.0	6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None	Max		Max	Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	53.4	51.4		40.4	40.4			12.9		12.9	12.9	
Actuated g/C Ratio	0.70	0.67		0.53	0.53			0.17		0.17	0.17	
v/c Ratio	0.98	0.41		0.24	0.81			0.16		0.60	0.14	
Control Delay	73.0	6.8		13.9	20.2			3.6		40.1	0.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	73.0	6.8		13.9	20.2			3.6		40.1	0.7	
LOS	E	A		B	C			A		D	A	
Approach Delay		19.9			19.9			3.6			28.0	
Approach LOS		B			B			A			C	
Queue Length 50th (m)	21.2	30.1		5.1	87.8			0.0		19.7	0.0	
Queue Length 95th (m)	#73.6	52.3		15.1	#139.8			4.4		36.6	0.0	
Internal Link Dist (m)		1734.6			424.3			171.4			92.6	
Turn Bay Length (m)	15.0			30.0								
Base Capacity (vph)	252	2431		282	1801			536		399	606	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	0.98	0.41		0.24	0.81			0.11		0.35	0.10	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 76.3			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 20.2		Intersection LOS: C	
Intersection Capacity Utilization 95.3%		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: 330: Willow Farm Lane/Collector Road & St. John's Sideroad



Appendix F

Hourly Distribution of Residential Trips

HOURLY VARIATION IN TRIP GENERATION FOR OFFICE AND RESIDENTIAL LAND USES

By Aaron T. Zimmerman, PTP

Abstract

Following the development of *Trip Generation*, 8th Edition, a call for data was sent out to ITE members soliciting twenty-four hour trip generation data. In response, ITE members submitted hundreds of datasets for not only the land uses discussed in this article, but also for other land uses such as shopping centers, auto dealerships, golf courses, hotels, and daycare centers, among others. Due to the short time frame between completion of the initial data collection portion of this project and development of the most recent edition of *Trip Generation Manual*, twenty-four hour summaries for office and residential land uses were not included in the ninth edition.

This article presents hourly distributions of trip generation for both office and residential land uses. It is intended to supplement the information that is published in the ITE *Trip Generation Manual,* 9th Edition.

Data Collection

This article presents the results of a data collection effort of twenty-four hour trip generation data for office and residential land uses to supplement those currently published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual,* 9th Edition. The data reported is intended to assist planners and engineers seeking to project four, eight, twelve, or more than twelve hours of traffic volumes for a signal warrant analysis. Other important uses include conducting trip generation and parking demand analyses of multiple study hours as part of a traffic impact study for multiuse developments. Specifically, developments that are composed of land uses with differing peak hours for entering and exiting traffic, such as office, retail, residential, movie theaters, sports arenas, restaurants, and daycare centers for example. In addition, the hourly variations will be useful for estimating emissions associated with land use developments. The current method for determining hourly traffic distribution for a particular land use typically involves collecting field counts at a limited number of sites and then making important assumptions about adaptability to the analysis site. The primary goal of this data collection effort was to consolidate twenty-four hour data, collected and submitted for inclusion in ITE's trip generation database, with recently collected datasets. These data were then used to report the average percentage distributions in summary tables making it readily available for all transportation professionals.

Purpose

Most of the hourly datasets analyzed for this study were collected using tube counters and then submitted to ITE on spreadsheets organized in either fifteen-minute or one-hour intervals, typically for each individual driveway serving the site. These newly-collected raw datasets, as well as previously submitted twenty-four hour datasets from the ITE trip generation database, were compiled into spreadsheets in one-hour increments and assigned to the appropriate *Trip Generation Manual* land use codes with guidance from

Table 1: Office Uses Combined

Time	Average Weekday		Average Saturday		Average Sunday	
	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic
6–7 a.m.	4.6	0.7	4.1	1.4	1.8	2.4
7–8 a.m.	14.9	1.9	5.4	2.5	3.8	1.2
8–9 a.m.	20.7	3.0	9.1	1.5	6.0	2.9
9–10 a.m.	8.2	3.2	7.2	3.9	6.6	3.8
10–11 a.m.	5.0	3.9	6.8	4.6	9.7	7.5
11–12 p.m.	5.1	8.6	7.1	11.3	8.9	9.6
12–1 p.m.	8.7	10.5	8.1	14.0	6.9	9.1
1–2 p.m.	10.0	6.6	7.3	8.3	8.6	12.0
2–3 p.m.	5.9	6.3	7.6	7.7	6.6	8.2
3–4 p.m.	4.3	9.5	6.0	9.6	4.6	6.3
4–5 p.m.	3.4	15.4	3.1	7.9	5.5	7.5
5–6 p.m.	2.5	16.5	3.2	6.9	3.1	6.7
6–7 p.m.	1.4	5.5	2.5	3.2	3.5	4.1
7–8 p.m.	0.9	2.5	2.0	2.2	2.7	2.9
8–9 p.m.	0.7	1.6	2.4	2.1	3.3	4.3
9–10 p.m.	0.6	1.1	1.4	1.4	3.1	3.1
10 p.m.–6 a.m.	3.2	3.2	16.9	11.4	15.3	8.4

ITE. Once hourly traffic calculations and land use code assignments were verified for accuracy by ITE staff, the average hourly traffic volumes were then summarized into tables as a percentage of the twenty-hour total entering and exiting vehicles from 6:00 a.m. to 10:00 p.m. This range of hours not only represents an expansion of four hours beyond the range of summary data published in previous editions of *Trip Generation* but also the inclusion of the critical morning commuter peak hours. For practical purposes, information was not provided for individual hours in the middle of the night. Instead, percentages for the combined period of 10:00 p.m. to 6:00 a.m. were provided in the last line of the summary tables. Where available, datasets for Saturdays and Sundays were also tabulated and summarized.

Office Land Uses

There were a total of 38 combined site observations for average weekday data, and five sites observed for each of Saturday and Sunday. The datasets were initially analyzed for each of three office land uses separately—General Office Building (710), Corporate Headquarters (714), and Office Park (750)—but due to the similarities in hourly distributions, it was determined that a combined summary table would provide a more robust and accurate depiction of hourly variations in traffic for general office uses. As expected, ingress traffic tended to be highest in the morning commuter period as office employees arrive for work, while egress traffic tended to be highest during the evening commuter period as office employees leave work for home. There was also a noticeable spike in the middle of the day due to office workers leaving and returning from lunch. The size of office developments analyzed ranged from 10,000 to 903,000 square feet. Based on the analysis conducted, it is noted that size of the office development had no discernible impact on the hourly distribution throughout the day.

Residential Land Uses

There were a total of 40 combined site observations for average weekday data, 36 site observations for average Saturday data, and 35 site observations for average Sunday data compiled for all residential land uses. Analysis of individual residential uses indicated that the general trip generation characteristics throughout the day were noticeably different between traditional residential uses (i.e., apartment, single family home, townhomes, condominiums) and senior-oriented residential uses (i.e., senior-attached, senior-detached, continuing care). Therefore, two separate and distinct summary tables combining similar types of residential uses (senior-oriented facilities only and non-senior residential only) were developed, as shown in Tables 2 and 3. As expected, the traditional residential uses generate a large egress of traffic during the weekday morning commuter rush hours and a similarly large ingress during the evening commuter peak hours. Contrarily, the largest ingress/egress period for senior-oriented residential uses tended to occur after the morning commuter peak hours and before the evening peak hours. The sizes of traditional residential uses

Table 2: Residential Uses Combined – Excluding Senior–Oriented Facilities

Time	Average Weekday		Average Saturday		Average Sunday	
	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic
6–7 a.m.	1.6	5.7	1.1	2.1	0.9	1.9
7–8 a.m.	2.5	9.0	1.8	3.6	1.6	3.3
8–9 a.m.	3.7	9.1	2.8	5.6	2.6	4.7
9–10 a.m.	3.7	6.5	4.4	7.3	3.5	6.8
10–11 a.m.	4.1	5.5	5.6	7.7	6.3	7.5
11–12 p.m.	4.5	5.7	6.9	7.5	6.4	9.5
12–1 p.m.	5.3	5.3	6.6	7.8	6.9	7.6
1–2 p.m.	5.4	5.7	7.1	6.9	7.2	7.4
2–3 p.m.	6.5	5.9	7.1	6.7	7.2	6.6
3–4 p.m.	8.1	6.3	7.4	6.1	7.3	6.6
4–5 p.m.	9.8	6.3	8.5	5.9	8.0	6.7
5–6 p.m.	10.8	6.5	8.6	6.3	7.3	6.9
6–7 p.m.	8.5	5.1	6.4	6.0	5.8	5.1
7–8 p.m.	5.9	4.9	5.2	4.9	5.5	4.1
8–9 p.m.	5.1	3.4	4.2	3.6	4.6	3.3
9–10 p.m.	4.2	2.3	3.8	2.6	4.3	2.7
10 p.m.–6 a.m.	10.3	5.6	12.4	9.3	14.6	9.4

Table 3: Residential Uses Combined–Senior-Oriented Facilities Only

Time	Average Weekday		Average Saturday		Average Sunday	
	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic
6–7 a.m.	3.6	2.0	4.0	1.3	3.7	1.5
7–8 a.m.	5.4	4.5	3.2	3.8	2.8	3.8
8–9 a.m.	6.5	5.8	3.3	3.6	2.9	4.4
9–10 a.m.	6.0	7.5	5.0	6.1	4.1	5.6
10–11 a.m.	7.3	8.0	7.5	7.1	7.6	6.6
11–12 p.m.	8.2	6.8	8.9	8.1	8.2	5.8
12–1 p.m.	8.2	7.7	8.0	7.3	8.6	6.8
1–2 p.m.	7.7	8.0	7.5	7.3	8.2	7.6
2–3 p.m.	8.8	8.0	8.6	7.7	9.5	9.6
3–4 p.m.	9.9	9.6	11.1	11.3	10.5	11.5
4–5 p.m.	6.7	7.6	6.6	7.3	6.8	7.4
5–6 p.m.	4.7	6.5	4.8	5.1	5.6	6.1
6–7 p.m.	3.9	4.4	4.4	3.9	5.2	4.7
7–8 p.m.	4.0	5.0	5.3	6.5	5.0	6.1
8–9 p.m.	3.0	3.1	3.9	4.6	4.3	4.9
9–10 p.m.	1.7	1.6	2.0	2.7	2.0	2.5
10 p.m.–6 a.m.	4.3	3.9	5.7	6.3	4.9	5.1

ranged from 46 to 1,248 dwelling units, and the sizes of senior-oriented developments analyzed ranged from 28 to 2,238 dwelling units. As with the office land use data, smaller and larger sized residential communities generally had similar hourly distributions.

The time-of-day summary tables reported both in this article and in the ninth edition should be used only as a reference. Professional judgment should be exercised with regard to the limited number of site observations, utilizing data for the hours after 10:00 p.m., and in situations where peak hour data may not fit perfectly with the distributions provided. As explained in *Trip Generation Handbook*, 3rd Edition, time-of-day data should not be used to determine peak hour traffic volumes. Instead, peak hour volumes should be estimated by using the standard regression analysis and data plots presented for each land use code in *Trip Generation Manual*. Also note that the percentages in the summary tables do not add up to 100 percent due to rounding. **itej**

Acknowledgments

The author would like to acknowledge the following organizations for responding to the "call for data" and contributing a large number of twenty-four hour trip generation datasets for this effort: The Traffic Group, Texas A&M Transportation Institute, Stantec-Street Smarts, Horner & Cantor Associates, and the Southern New Hampshire Planning Commission. The author would like to thank ITE for being supportive of this project from its inception.

Note

The twenty-four hour distribution of trip generation for office and residential land uses presented in the summary tables contained in this article are the result of an effort to develop and provide a useful tool that can be directly applicable to the work done daily by transportation professionals. Although the summary tables provided in this article and in the ninth edition cover a large share of the land uses most regularly analyzed by transportation professionals, the author strongly encourages readers to submit time-of-day trip generation data to ITE to improve the robustness of existing twenty-four hour distribution summaries and to allow summaries for additional land use codes to be established in future editions of Trip Generation Manual. *Time-of-day trip generation data can be submitted to ITE by completing the "Data Collection Form" located at www.ite.org/tripgeneration/index.asp.*

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Appendix G

Sight Distance at Proposed Bathurst Street Intersection

Conditions of Use

Verify elevations and/or dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited.

Do not scale dimensions from drawing.

Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
1	TRAFFIC IMPACT STUDY	2019-10-10	SML

DESIGN	SML
REVIEWED BY	BJH
DRAWN	SML
CHECKED BY	BJH
DATE	2019-10-10
SCALE	1:1500

SHINING HILLS SUBDIVISION PHASE 3, TRAFFIC IMPACT STUDY
TOWN OF NEWMARKET

PROJECT NO. 19-1250

FUTURE BENNINGTON ROAD AT BATHURST STREET SIGHT DISTANCE ASSESSMENT VEHICLE POSITIONED AT STOP BAR

SHEET NO. SD-1

FILENAME: C:\USERS\JOSML\DESKTOP\PHASE 3 SHINING HILLS\SIGHT DISTANCE ASSESSMENT\SHINING HILLS PHASE 3 SIGHT DISTANCE ASSESSMENT.DWG PLOTTED BY: LORINCZ, SHAUN
PLOT DATE: 2019-10-10 @ 3:20:19 PM PLOT SCALE: 1:25.4 PLOT STYLE: DILLON-STANDARD SHINING HILLS.CTB
235 YORKLAND BOULEVARD SUITE 800, TORONTO, ON, M2J 4Y7

DILLON CONSULTING

No.	ISSUED FOR	DATE	BY
1	TRAFFIC IMPACT STUDY	2019-10-10	SML

DESIGN: SML | REVIEWED BY: BJH
DRAWN: SML | CHECKED BY: BJH
DATE: 2019-10-10
SCALE: 1:1500

SHINING HILLS SUBDIVISION PHASE 3, TRAFFIC IMPACT STUDY
TOWN OF NEWMARKET

FUTURE BENNINGTON ROAD AT BATHURST STREET SIGHT DISTANCE ASSESSMENT VEHICLE POSITIONED AS PER TAC GUIDELINES

PROJECT NO. 19-1250

SHEET NO. SD-2

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PLOT DATE: 2019-10-10 @ 3:20:23 PM PLOT SCALE: 1:25.4 PLOT STYLE: DILLON-STANDARD SHINING HILLS.CTB
235 YORKLAND BOULEVARD SUITE 800, TORONTO, ON. M2J 4Y7