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101 Main Street East

TRAFFIC IMPACT STUDY

Nivas Development Ltd.

Document Control

File:

422367

Date:




July
19, 2022

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Issue	Date	Description
1	July 19, 2022	Final report

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1 Introduction

Tatham Engineering Limited was retained by Nivas Development Ltd. to conduct a Traffic Impact Study in support of the proposed mixed-use development to be located at 101 Main Street East in the community of Markdale, Municipality of Grey Highlands. The location of the development site is illustrated in Figure 1.

1.1 STUDY PURPOSE

The purpose of this study is to address the requirements of the Municipality of Grey Highlands and County of Grey with respect to the potential transportation impacts of the development on the area road network. In particular, the following will be discussed:

- the operations of the road system through the study area prior to the proposed development.
- the growth in the traffic volumes not otherwise attributed to the development (i.e. from overall growth in the area and/or other developments);
- the number of new trips the proposed development is likely to generate;
- the operations of the study area road system upon completion of the development; and
- the resulting impacts and need for mitigating measures (if required) to ensure acceptable overall road operations.

1.2 STUDY STRUCTURE

The report is structured as follows:

- Chapter 1: introduction and study purpose;
- Chapter 2: existing conditions, detailing the road system and corresponding traffic operations;
- Chapter 3: future conditions, prior to the completion of the proposed development (referred to as future background conditions), and the expected growth in traffic levels and the resulting operating conditions;
- Chapter 4: proposed development and associated details including land use, access, traffic volumes and parking;
- Chapter 5: future conditions, with completion of the proposed development (referred to as future total conditions); and
- Chapter 6: summary of the report and key findings.



2 Existing Conditions

This chapter will discuss the road network, traffic volumes, and operations under the existing conditions.

2.1 ROAD NETWORK

The road network to be addressed by this study consists of Toronto Street, Main Street, Herbert Avenue, Victoria Avenue, Uplands Drive, Lawler Drive and the following intersections:

- Main Street & Toronto Street;
- Main Street East & Herbert Avenue;
- Main Street East & Lawler Drive;
- Toronto Street South & Victoria Avenue; and
- Toronto Street South & Uplands Drive.

For the purposes of this report, Toronto Street, Herbert Avenue, and Lawler Drive are considered oriented north-south (maintaining consistency with local road naming conventions), whereas the remaining roads are considered oriented east-west.

Aerial imagery of the study area road network and key intersections are provided in Figure 2 and Figure 3.

2.1.1 Road Sections

Toronto Street (Highway 10)

Toronto Street (Highway 10) is part of the provincial highway system; however, through Markdale the road falls under the jurisdiction of the Municipality as part of the MTO Connecting Links program. Toronto Street has a 2-lane urban cross-section (i.e. curb and gutter) providing 1 through lane per direction with on-street parking on both sides of the road near its intersection with Main Street (i.e. the downtown area of Markdale).

Main Street (Grey Road 12)

Main Street (Grey Road 12) is a County road with an urban cross-section west of Cambrai Road and a rural cross-section (i.e. gravel shoulders and open ditches) east of Cambrai Road. Main Street accommodates 1 travel lane per direction with on-street parking on both sides of the road in the vicinity of its intersection with Toronto Street (i.e. near the downtown).



Herbert Avenue

Herbert Avenue is a 2-lane local road with an urban cross section providing 1 travel lane per direction. The road has a length of approximately 200 metres, serving approximately 15 detached residential units and terminating in a T-intersection at Main Street. Herbert Avenue will be extended to the south to serve the approved Centre Point South subdivision as development occurs (see Section 3.2.2).

Victoria Avenue

Victoria Avenue is a 2-lane local road with an urban cross-section providing one travel lane per direction. The road services a residential neighbourhood to the west of Toronto Street South and a commercial development to the east of Toronto Street South, terminating at a dead-end approximately 175 metres east of Toronto Street South. Victoria Avenue will be extended farther east as the Centre Point South subdivision is developed.

Uplands Drive

Uplands Drive is a 2-lane local road with an urban cross-section providing one travel lane per direction and terminating at Toronto Street with a T-intersection. The road has a length of approximately 175 metres, serving in the order of 20 residences (including those along Clugston Drive to which it provides access). Similar to Victoria Avenue, Uplands Drive will be extended easterly to serve the Centre Point South residential development.

Lawler Drive

Lawler Drive is a 2-lane local road with a rural cross-section providing one lane of travel per direction. The road services a residential neighbourhood north of Main Street and terminates in a T-intersection at Main Street.

Speed Limits

Aside from Toronto Street and Main Street (both of which have posted speed limits of 50 km/h through the study area), the remaining roads in the network are unposted. Given the location within the built-up area of Markdale and the local function of the subject roads, a speed limit of 50 km/h and a design speed of 60 km/h have been assumed (posted speed limit + 10 km/h for lower-speed roads).

2.1.2 Key Intersections

The key intersections are illustrated in Figure 3 with additional details provided in Table 1. In most cases, the approaches to each intersection are single, shared lanes (no dedicated left and/or right turn lanes). The exceptions to this are the north and south approaches at the



intersection of Toronto Street South with Victoria Street and the north approach at the intersection of Toronto Street South with Uplands Drive, each of which provide a dedicated left turn lane.

Table 1: Key Intersection Configuration & Control

INTERSECTION	INTERSECTION APPROACH CONFIGURATION				CONTROL
	Northbound	Southbound	Eastbound	Westbound	
Main Street & Toronto Street	shared LTR	shared LTR	shared LTR	shared LTR	traffic signal
Main Street East & Herbert Avenue	shared LR	-	shared TR	shared LT	stop on Herbert Ave
Main Street East & Lawler Drive	-	shared LR	shared LT	shared TR	stop on Lawler Dr
Toronto Street South & Victoria Avenue	exclusive left shared TR	exclusive left shared TR	shared LTR	shared LTR	traffic signal
Toronto Street South & Uplands Drive	shared TR	exclusive left exclusive thru	shared LR	-	stop on Uplands Dr

LT: left-thru LTR: left-thru-right TR: thru-right LR: left-right

2.2 TRAFFIC VOLUMES

2.2.1 Traffic Counts

To determine existing traffic volumes, turning movement counts were conducted at the key intersections along Main Street and Toronto Street on Thursday March 31, 2022, from 7:00 to 10:00 and 15:00 to 18:00. The observed volumes are illustrated in Figure 4 with detailed count sheets provided in Appendix A.

2.2.2 Seasonal Adjustments - Summer

The MTO publishes annual average daily traffic (AADT) and summer average daily traffic (SADT), volumes for all provincial highways¹. Data pertaining to the sections of Highway 10 immediately north and south of Markdale for the period 2011 to 2016 (which is the latest published year) is provided in Table 2, including the ratio of summer to average daily traffic volumes.

¹ Provincial Highways Traffic Volumes 1988-2016. Ministry of Transportation of Ontario.



Table 2: Highway 10 Traffic Volumes

YEAR	NORTH OF MARKDALE			SOUTH OF MARKDALE		
	AADT	SADT	Ratio	AADT	SADT	Ratio
2011	5,400	6,450	1.19	6,300	7,500	1.19
2012	4,850	6,550	1.35	6,200	7,350	1.19
2013	4,900	6,550	1.34	6,200	8,300	1.34
2014	5,500	7,400	1.35	6,200	8,300	1.34
2015	5,500	7,350	1.34	6,900	9,250	1.34
2016	5,550	7,450	1.34	7,000	9,350	1.34
average			1.32			1.29

As indicated, the summer average daily volumes on both sections of Highway 10 ranged from 19% to 35% greater than the annual average daily volumes.

In considering the noted seasonal data, a seasonal adjustment factor of 1.3 was applied to the observed through volumes along Toronto Street and Main Street to approximate summer conditions. This is somewhat less than the noted average, however it is recognized that overall increases in daily volumes do not necessarily mean equally large increases to peak hour volumes (i.e. non-peak times experience proportionally more additional traffic than peak times). The observed volumes on the local roads were not adjusted as these roads serve local traffic and are not otherwise subject to seasonal variations.

2.2.3 Adjusted Traffic Volumes

The resulting 2022 adjusted traffic volumes are illustrated in Figure 5.

2.3 TRAFFIC OPERATIONS

The assessment of existing conditions provides the baseline from which the future traffic operations (both with and without the subject development) can be assessed from. The capacity, and hence operations, of a road system is effectively governed by its intersections. The analysis is based on the 2022 adjusted traffic volumes, the existing intersection configuration and control,



and procedures outlined in the *2000 Highway Capacity Manual*² (using Synchro v.11 software). For signalized intersections, the analysis considers:

- the average delay (measured in seconds);
- level of service (LOS); and
- volume to capacity (v/c) for each signalized movement.

For unsignalized intersections, the analysis considers the same metrics but focuses on critical movements only, namely stop controlled movements on the minor road.

With respect to the noted metrics:

- level of service 'A' corresponds to the best operating condition with minimal delays whereas level of service 'F' corresponds to poor operations resulting from high intersection delays (additional details regarding Level of Service definitions are provided in Appendix B); and
- a v/c ratio of less than 1.0 indicates the intersection movement/approach is operating at less than capacity while v/c of 1.0 indicates capacity has been reached.

A summary of operations for each intersection is provided in Table 3, with detailed worksheets provided in Appendix C. As shown, all intersections are currently providing excellent operations (LOS C or better) with significant reserve capacity remaining (v/c of 0.59 or less) and thus no improvements are required to accommodate the existing volumes.

² *Highway Capacity Manual*. Transportation Research Board, Washington DC, 2000.



Table 3: Intersection Operations – 2022 Conditions

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Main Street & Toronto Street	EB LTR	signal	24	C	0.34	25	C	0.44
	WB LTR	signal	24	C	0.34	24	C	0.31
	NB LTR	signal	9	A	0.47	12	B	0.59
	SB LTR	signal	9	A	0.34	9	A	0.46
	overall	signal	14	B	0.43	14	B	0.54
Main Street E & Herbert Avenue	WB R	stop	1	A	0.00	0	A	0.00
	NB LR	stop	9	A	0.00	0	A	0.00
Main Street E & Lawler Drive	EB L	stop	1	A	0.00	1	A	0.00
	SB LR	stop	9	A	0.01	11	B	0.01
Toronto Street S & Victoria Avenue	EB LTR	signal	26	C	0.33	22	C	0.15
	WB LTR	signal	23	C	0.09	23	C	0.34
	NB L	signal	2	A	0.02	3	A	0.02
	NB TR	signal	3	A	0.32	4	A	0.37
	SB L	signal	2	A	0.02	3	A	0.06
	SB TR	signal	3	A	0.29	4	A	0.35
	overall	signal	5	A	0.33	6	A	0.37
Toronto Street S & Uplands Drive	WB LR	stop	14	B	0.01	12	B	0.01
	SB L	stop	9	A	0.00	1	A	0.01

L: left T: thru R: right LT: left-thru LTR: left-thru-right TR: thru-right LR: left-right



3 Future Background Conditions

This chapter will describe the road network and background traffic volumes expected for the years 2027, 2032 and 2037. The 2027 horizon year has been adopted to reflect full build-out of the proposed development, while the 2032 and 2037 horizons will address the longer-term impacts of the development (5 and 10 years beyond build-out).

3.1 ROAD NETWORK

3.1.1 Upper Tier Network

Per the *Grey County Transportation Master Plan*³, no upgrades are currently planned for Main Street (Grey Road 12) through Markdale, nor does the Municipality or MTO have any planned improvements for Toronto Street (Highway 10). As such, the configurations for these roads as described in Section 2.1.1 have been maintained in the assessment.

3.1.2 Local Network

As previously noted, the development of the Centre Point South subdivision (see Section 3.2.2) will result in several new local roads, including the eastward extensions of both Victoria Avenue and Uplands Drive, and a southward extension of Herbert Avenue. The road extensions and overall road network serving the Centre Point South development will offer improved connectivity to Toronto Street from the proposed development. Construction of Phase 1 of the site (which involves the southward extension of Herbert Avenue and eastward extensions of Victoria Street and Uplands Drive to Herbert Avenue) has commenced as of July 2022. For the purposes of this study, it has been assumed that the full road network and connections will be completed by the 2027 horizon.

3.2 TRAFFIC VOLUMES

Background traffic volumes expected for the 2027, 2032, and 2037 horizon years have been determined based on the existing traffic volumes, projected growth, and additional volumes from developments in the area (other than the subject development).

3.2.1 Background Growth

According to data from the 2021 census, Markdale experienced negligible growth between 2016 and 2021, with the population declining from 1,216 persons in 2016 to 1,206 persons in 2021 (a

³ *Grey County Transportation Master Plan Final Draft Report*. Cole Engineering. September 2014.



decrease of approximately 0.2% per annum). Conversely, both the County of Grey and Municipality of Grey Highlands experienced steady growth during the same period (approximately 1.5% per annum and 1.25% per annum, respectively).

The *Update to the County of Grey Growth Management Strategy*⁴ projects Grey Highlands to experience annual population growth of approximately 0.5% for the period 2021 to 2046. As a primary settlement area, it can be expected that a significant portion of that growth will occur within Markdale.

In consideration of the above, a background growth rate of 0.5% per annum has been applied to traffic volumes on Main Street for the period 2022 through the 2027, increasing to 1.5% for the period 2027 through 2037. A lower growth rate has been applied through the 2027 horizon recognizing that the study is also considering full build-out of the Stonebrook and Centre Point South developments (over 470 residential units combined) by 2027. These developments will add significant volumes to the road network in the short term, thus a lower background growth rate has been considered to mitigate an overestimation of growth. The higher growth rate beyond 2027 provides for future development.

For Toronto Street (Highway 10), a growth rate of 2% per annum was applied, recognizing that it serves as an interregional arterial that experiences additional growth pressures from outside the immediate area.

3.2.2 Background Developments

In addition to the noted background growth, consideration has been given to other nearby developments planned within close proximity to the study area. A site visit was conducted in February 2022, to determine development progress and estimate build-out timelines. Additional details regarding each development are provided below, with locations of each site illustrated in Figure 6. Trip estimations and distributions were taken from the traffic studies associated with each development.

Loon Call Residential Development

The Loon Call Residential Development is a proposed residential development located at 775309 Highway 10, north of the subject site. The development consists of 313 single-family detached units and 156 townhome units. Based on observations made during the site visit, construction has not yet commenced on the development. As per the *Loon Call Markdale Traffic Impact Study*⁵, a 10-year timeline has been assumed. As construction has not yet started, the 10-year

⁴ *Update to the County of Grey Growth Management Study*. Hemson Consulting Ltd. July 14, 2021.

⁵ *Loon Call Markdale Traffic Impact Study*. JD Northcote Engineering Inc. November 8, 2021.



timeline will be maintained. Therefore, it is assumed the site will be 50% built-out by the 2027 horizon and fully built out by the 2032 horizon. Traffic distribution through the study area is illustrated in Figure 7 and is representative of full build-out volumes, as per the corresponding traffic impact study.

Stonebrook Residential Development

The Stonebrook Residential Development is a residential development located north of the subject site. It consists of 134 residential units (mix of semi-detached units and townhouse units) and is being constructed in 3 phases. Based on observations made during the site visit, the Phase 1 and Phase 2 sites (which are being constructed simultaneously and total 79 units) are estimated to be 30% complete (i.e. approximately 24 complete units), with substantial progress on all outstanding units. The Phase 3 site was cleared and under active construction. Construction of this development is assumed to be fully complete by the 2027 horizon. Trips have been estimated using rates contained within the *ITE Trip Generation Manual, 11th Edition* and considering the remaining units to be constructed (recognizing that the trips associated with the occupied units will be captured in the traffic counts) and are summarized in Table 4.

Table 4: Background Development Trip Generation - Stonebrook

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		Total	Out	Total	In	Out	Total
single-family attached (ITE 215)	units	0.15	0.33	0.48	0.32	0.25	0.57
Phase 1 & 2	55 units	8	18	26	18	13	31
Phase 3	55 units	8	18	26	18	13	31
Total	110 units	16	36	52	36	26	62

Traffic distribution through the study area is illustrated in Figure 7: Background Development Traffic – 775309 Highway 10



Figure 8 and is representative of full build-out volumes.

Centre Point South Residential Development

The Centre Point South Residential Development is a residential subdivision located at 105 Toronto Street South – immediately south of the subject site. The development consists of 239 single-family detached units and 100 townhouse units. As per the *Centre Point South Traffic Impact Study*⁶, an 8-year build-out was assumed. As construction commenced in 2022 (not 2018 as initially anticipated), the 8-year timeline has been maintained. Therefore, it is assumed the site will be approximately 60% built-out by the 2027 horizon and fully built-out by the 2032 horizon. Traffic distribution through the study area is illustrated in Figure 9 and is representative of full build-out volumes, as per the corresponding traffic impact study.

Markdale Hospital

A new hospital is currently being constructed at 220 Toronto Street to replace the existing Markdale Hospital located at 55 Isla Street. The new hospital will have a gross floor area of 7,263 m² (78,178 ft²). As per Grey-Bruce Health Services (the hospital operator), the new hospital is expected to be complete and fully operational by the end of 2023. Trip generation and distribution for the development was obtained from the *Markdale Hospital Transportation Impact Study*⁷. Traffic distribution through the study area is illustrated in Figure 10 and is representative of full build-out volumes.

3.2.3 Background Traffic Volumes

The resulting 2027, 2032, and 2037 background traffic volumes are illustrated in Figure 11 through Figure 13. The background volumes are based on the adjusted 2022 volumes, increased further to reflect the noted background growth and additional volumes associated with the identified background developments. It is noted that the resulting 2037 background volumes on Toronto Street reflect annual growth in the order of 3.5 to 3.7% when compared to the 2022 volumes, whereas the background volumes on Main Street reflect growth in the order of 2.9 to 3.5%.

3.3 TRAFFIC OPERATIONS

The operations of the key intersections were assessed again under background conditions at each future horizon. Results of the operational analyses are summarized in Table 5 through Table

⁶ *Centre Point South Traffic Impact Study*. Tatham Engineering Ltd. November 2017.

⁷ *Markdale Hospital Transportation Impact Study*. Paradigm Transportation Solutions Ltd. June 2018.



7 with detailed worksheets provided in Appendix D. Signal timings have been optimized to ensure optimal operating conditions.

As indicated, most intersections continue to provide good operations (LOS C or better) through the 2037 horizon with average delays. The exception being the intersection of Toronto Street South with Uplands Drive, which begins to experience poor operations (LOS F) on the westbound approach (Uplands Drive) in 2032 during the PM peak hour, and on both the westbound and eastbound approaches in 2037. It is noted that the volumes on the minor approaches are relatively low and thus the delays are caused by the high traffic volumes on Toronto Street. Given the proximity to the signalized intersection at Victoria Avenue (approximately 210 metres), implementing traffic signals at Uplands Drive is not recommended (the *Transportation Association of Canada Geometric Design Guide for Canadian Roads* recommends a desired spacing of 400 metres between signalized intersections to allow for signal coordination on busy corridors and consecutive turn lanes without overlap). Furthermore, the traffic volumes do not warrant the implementation of traffic signals (as per MTO traffic signal warrant criteria⁸). Detailed traffic signal warrant worksheets are provided in Appendix E. It is expected that some motorists on Uplands Drive will divert to the signalized intersection at Victoria Avenue to avoid the long delays experienced during the PM peak hour.

It is noted that the northbound approach at the intersection of Toronto Street with Main Street is nearing capacity ($v/c = 0.97$) during the PM peak hour. While the intersection continues to provide acceptable operations, delays are anticipated with additional volumes. The capacity at the intersection is reduced by the existing single shared lane configuration on each approach. Providing exclusive left turn lanes would significantly increase the capacity of the intersection by removing left turn movements from the through volumes. The existing approach widths are sufficient to accommodate the addition of left turn lanes through line painting – albeit this would have impacts to on-street parking. Regardless, short left turn lanes can be accommodated. A comparative analysis has been conducted for the 2037 horizon year (PM peak hour only, as this is the critical period) to illustrate the impact of providing left turn lanes. The results of the analysis are provided in Table 8. As indicated, the capacity of the intersection is significantly improved and delays decrease on all approaches. Therefore, it is recommended that exclusive left turn lanes be added to each approach by the 2037 horizon.

Overall, the network performs well under background conditions, with improvements limited to the addition of left turn lanes at the intersection of Toronto Street and Main Street.

⁸ *Ontario Traffic Manual Book 12: Traffic Signals*. Ontario Ministry of Transportation. March 2012.



Table 5: Intersection Operations – 2027 Background Conditions

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Main Street & Toronto Street	EB LTR	signal	25	C	0.41	28	C	0.59
	WB LTR	signal	25	C	0.44	25	C	0.38
	NB LTR	signal	12	B	0.61	17	B	0.76
	SB LTR	signal	9	A	0.44	12	B	0.60
	overall	signal	15	B	0.56	18	B	0.71
Main Street E & Herbert Avenue	WB L	free	1	A	0.00	1	A	0.01
	NB LR	stop	9	A	0.07	11	B	0.03
Main Street E & Lawler Drive	EB L	free	1	A	0.00	1	A	0.00
	SB LR	stop	9	A	0.01	11	B	0.01
Toronto Street S & Victoria Avenue	EB LTR	signal	22	C	0.14	21	B	0.11
	WB LTR	signal	22	C	0.27	22	C	0.30
	NB L	signal	3	A	0.02	3	A	0.03
	NB TR	signal	5	A	0.43	6	A	0.48
	SB L	signal	3	A	0.05	4	A	0.15
	SB TR	signal	5	A	0.39	5	A	0.44
	overall	signal	7	A	0.41	7	A	0.46
Toronto Street S & Uplands Drive	EB LTR	stop	19	C	0.05	30	D	0.16
	WB LTR	stop	21	C	0.25	36	E	0.30
	NB L	free	1	A	0.01	1	A	0.01
	SB L	free	9	A	0.01	9	A	0.04

L: left T: thru R: right LT: left-thru LTR: left-thru-right TR: thru-right LR: left-right



Table 6: Intersection Operations – 2032 Background Conditions

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Main Street & Toronto Street	EB LTR	signal	26	C	0.48	31	C	0.68
	WB LTR	signal	26	C	0.52	26	C	0.45
	NB LTR	signal	14	B	0.69	25	C	0.87
	SB LTR	signal	9	A	0.49	15	B	0.70
	overall	signal	16	B	0.63	22	C	0.81
Main Street E & Herbert Avenue	WB L	free	1	A	0.01	2	A	0.02
	NB LR	stop	10	B	0.07	11	B	0.05
Main Street E & Lawler Drive	EB L	free	1	A	0.00	1	A	0.00
	SB LR	stop	9	A	0.01	11	B	0.01
Toronto Street S & Victoria Avenue	EB LTR	signal	19	B	0.11	19	B	0.09
	WB LTR	signal	21	C	0.26	21	C	0.27
	NB L	signal	3	A	0.02	3	A	0.03
	NB TR	signal	7	A	0.51	7	A	0.57
	SB L	signal	4	A	0.07	5	A	0.24
	SB TR	signal	6	A	0.44	7	A	0.51
	overall	signal	8	A	0.46	8	A	0.52
Toronto Street S & Uplands Drive	EB LTR	stop	23	C	0.06	49	E	0.25
	WB LTR	stop	34	D	0.49	97	F	0.72
	NB L	free	1	A	0.01	1	A	0.01
	SB L	free	9	A	0.02	9	A	0.07

L: left T: thru R: right LT: left-thru LTR: left-thru-right TR: thru-right LR: left-right



Table 7: Intersection Operations – 2037 Background Conditions

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Main Street & Toronto Street	EB LTR	signal	26	C	0.52	34	C	0.76
	WB LTR	signal	28	C	0.57	27	C	0.52
	NB LTR	signal	16	B	0.75	41	D	0.97
	SB LTR	signal	11	A	0.54	17	B	0.76
	overall	signal	17	B	0.69	30	C	0.90
Main Street E & Herbert Avenue	WB L	free	1	A	0.01	2	A	0.02
	NB LR	stop	11	B	0.07	11	B	0.05
Main Street E & Lawler Drive	EB L	free	1	A	0.00	1	A	0.00
	SB LR	stop	9	A	0.01	12	B	0.01
Toronto Street S & Victoria Avenue	EB LTR	signal	19	B	0.11	19	B	0.09
	WB LTR	signal	21	C	0.26	21	C	0.27
	NB L	signal	4	A	0.03	4	A	0.03
	NB TR	signal	7	A	0.55	8	A	0.62
	SB L	signal	4	A	0.08	6	A	0.27
	SB TR	signal	6	A	0.48	7	A	0.56
	overall	signal	8	A	0.50	9	A	0.56
Toronto Street S & Uplands Drive	EB LTR	stop	27	C	0.08	72	F	0.35
	WB LTR	stop	46	D	0.59	191	F	0.99
	NB L	free	1	A	0.01	1	A	0.01
	SB L	free	9	A	0.02	9	A	0.08

L: left T: thru R: right LT: left-thru LTR: left-thru-right TR: thru-right LR: left-right



Table 8: Intersection Operations – 2037 Background (PM Peak – with left turn lanes)

INTERSECTION, APPROACH & CONTROL			WITHOUT LEFT TURN LANES			WITH LEFT TURN LANES		
			Delay	LOS	v/c	Delay	LOS	v/c
Main Street & Toronto Street	EB	signal	34	C	0.76	24	C	0.30
	WB	signal	27	C	0.52	23	C	0.29
	NB	signal	41	D	0.97	11	C	0.57
	SB	signal	17	B	0.76	12	C	0.61
	overall	signal	30	C	0.90	15	B	0.52

3.4 TURN LANE REQUIREMENTS

The existing southbound left turn lane at the intersection of Toronto Street and Uplands Drive has a storage length of 15 metres. Per recommendations contained within the *Centre Point South Traffic Impact Study*, lengthening of the turn lane to accommodate 50 metres of storage length is warranted by the 2035 horizon. In reviewing the MTO left turn lane warrants with consideration given to the background traffic volumes contained herein, a storage length of 50 metres by 2037 is confirmed.



4 Proposed Development

This chapter will provide additional details with respect to the proposed development, including the land uses and size, location, access, the projected site generated traffic volumes and the assignment of such to the adjacent road network.

4.1 SITE LOCATION

As illustrated in Figure 1, the site is located at 101 Main Street East in the community of Markdale, Municipality of Grey Highlands.

4.2 SITE LAND USE

The proposed development will consist of the following:

- 218 residential dwelling units of the following types:
 - 22 semi-detached units;
 - 182 townhouse units; and
 - 14 apartment units (located above commercial spaces); and
- 1,863 m² (20,053 ft²).of ground-floor commercial space.

A draft plan is illustrated in Figure 14.

4.3 SITE ACCESS & ON-SITE CIRCULATION

Access to the site will be provided via new municipal road connections to Main Street (opposite Lawler Drive) and Bradley Street (to the west). These internal roads will be built according to the appropriate municipal standards, allowing for two-way operations and accommodating the manoeuvring requirements of typical design vehicles (passenger vehicles, single-unit trucks, emergency vehicles, etc.).

As per the site plan, access to the commercial site will be provided by means of a right-in/right-out access to Main Street (i.e. left turns prohibited via a “pork chop” island), located approximately 100 metres east of Cambrai Road, and an internal full-moves access to Street A. The access points will be constructed to the appropriate municipal standards with the internal drive aisles satisfying requirements set forth in the Ontario Building Code regarding minimum dimensions for a fire access route (6.0 metre minimum clear width and 12.0 metre minimum centerline radius on curves).



4.4 SITE PARKING

Parking requirements for the site will be detailed as part of site plan approval and will be informed by the parking requirements as set out in the *Municipality of Grey Highlands Comprehensive Zoning By-law*⁹. With respect to the proposed uses, the following parking rates will apply:

- townhouse or semi-detached – 2 spaces per dwelling unit;
- apartment – 1.75 spaces per dwelling unit (including 0.5 visitor spaces per unit); and
- retail establishments/service shops – 1 space per 20 m² gross floor area (GFA).

4.5 SITE TRAFFIC

4.5.1 Trip Generation

The number of vehicle trips expected to be generated by the proposed development for the weekday AM and weekday PM peak hours has been determined based on type of use, development size and trip generation rates per the *ITE Trip Generation Manual, 11th Edition*¹⁰. The corresponding trip generation rates are provided in Table 9 with associated trip generation provided in Table 10.

Table 9: Trip Generation Rates

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		Total	Out	Total	In	Out	Total
single-family detached (ITE 210)	units	0.18	0.52	0.70	0.59	0.35	0.94
single-family attached (ITE 215)	units	0.15	0.33	0.48	0.32	0.25	0.57
multifamily housing – low-rise (ITE 220)	units	0.10	0.30	0.40	0.32	0.19	0.51
strip retail plaza (ITE 822)	1000ft ² GLA	1.42	0.94	2.36	3.30	3.30	6.59

⁹ *Municipality of Grey Highlands Comprehensive Zoning By-law 2004-50*. Jones Consulting Group Ltd. October 2005.

¹⁰ *Trip Generation Manual, 11th Edition*. Institute of Transportation Engineers. September 2021.



Table 10: Trip Estimates

LAND USE	SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
semi-detached units	22 units	4	12	16	14	8	22
townhouse units	182 units	27	60	87	59	45	104
apartment units	14 units	2	4	6	4	3	7
commercial	20,053 ft ²	28	19	47	66	66	132
Total		61	95	156	143	122	265

As shown, the new development is expected to generate 156 gross trips during the weekday AM peak hour and 265 gross trips during the weekday PM peak hour.

Given the mixed-use nature of the development, not all of the trips generated by the site will be new trips on the road network. The commercial element will result in internal and pass-by trips, as detailed below.

- An internal trip occurs when a motorist travels to/from the subject site via internal roads without entering the adjacent road network. For instance, a resident of the development visiting the commercial area via the internal road network does not contribute a new trip to the external road network. A 10% reduction applied to account for internal trips.
- A pass-by trip occurs when a motorist is already on the road network for another purpose and chooses to stop at a different site before continuing to their primary destination. For example, a motorist on Main Street East may stop at the commercial block before continuing to their original destination. Per the ITE *Trip Generation Handbook*¹¹, pass-by rates for the *shopping center* land-use (considered the most similar use to the commercial space on-site) are estimated to be 34% of total trips during the weekday PM peak hour. Pass-by rates during the weekday AM peak hour are not measured, recognizing that retail stores are often closed during the AM peak hour.

A summary of the resulting trip estimates by type is provided in Table 11. As indicated, the development is expected to generate 112 new trips during the weekday AM peak hour and 161 new trips during the weekday PM peak hour.

¹¹ *Trip Generation Handbook, 3rd Edition*. Institute of Transportation Engineers. September 2017.



Table 11: Trip Estimates by Type

TRIP TYPE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
	In	Out	Total	In	Out	Total
Total Trips	61	95	156	143	122	265
Internal Trips (10%)	6	10	16	14	12	26
Pass-by Trips (34%)	0	0	0	22	22	44
New Trips	55	85	140	107	88	195

4.5.2 Trip Distribution & Assignment

The distribution of site-generated trips was considered from two perspectives: pass-by trips and new trips.

As previously indicated, pass-by trips are those trips already on the road network which are expected to stop at the subject site's commercial area as they travel past. The distribution of these trips is proportional to directional volumes on Main Street East during the weekday PM peak hour period. The largest approach volume past the site will generate the largest number of pass-by trips. The following distribution was realized:

- from the east – 45%; and
- from the west – 55%

The distribution of new trips generated by the entire development has been established based on observed traffic patterns on the adjacent road network in the 2022 counts and the proximity of the site to surrounding built-up areas and employment centres. The following distribution has been applied:

- to/from the north via Toronto Street – 35%;
- to/from the south via Toronto Street – 40%;
 - via Victoria Street – 15%;
 - via Uplands Drive – 25%;
- to/from the east via Main Street – 10%; and
- to/from the west via Main Street – 15%.

Trip assignment to the road network via the various access points has been established based on the above distribution with consideration given to the site layout and anticipated travel routes.



To ensure a conservative approach, no trips have been assigned to the RIRO commercial access (i.e. all trips that would use the RIRO have been assigned to the new municipal road connection on Main Street East). The RIRO is not expected to experience any operational concerns under future horizons – it will experience in the order of 25-60 inbound trips during peak periods which, as free moving right turns, will cause minimal delay to through traffic. Similarly, the 2-7 outbound trips expected during peak periods (translating to 1 outbound trip every 9 to 30 minutes) will not experience significant delays.

The resulting site-generated traffic volumes are illustrated in Figure 15 (new trips), Figure 16 (pass-by trips), and Figure 17 (total trips).



5 Future Total Conditions

This chapter will address the resulting impacts of the proposed development on the adjacent road system. Three areas will be addressed:

- operations of the key intersections;
- review of the available sight lines at the existing access points; and
- potential improvements to the study area road network, if necessary.

5.1 TRAFFIC VOLUMES

To assess the impacts of the increased traffic resulting from the proposed development, the traffic volumes generated by the site were combined with the 2027, 2032, and 2037 background volumes.

5.1.1 Center Point South Trip Re-Assignment

Build-out of the subject development will provide a new north/south link to Main Street East (opposite Lawler Drive) for trips destined to/from the Centre Point South development. To consider the impacts of this new link, a portion of the Centre Point South development traffic has been re-assigned to the new connection. The redistribution of the Centre Point South trips is illustrated in Figure 18.

5.1.2 Total Volumes

The resulting future total volumes are illustrated in Figure 19 through Figure 21.

5.2 TRAFFIC OPERATIONS

The operations of the key intersections were assessed again under total conditions at each future horizon. Results of the operations analyses are summarized in Table 12 through Table 14 with detailed worksheets provided in Appendix F. Signal timings have been optimized to ensure optimal operating conditions.



Table 12: Intersection Operations – 2027 Total Conditions

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Main Street & Toronto Street	EB LTR	signal	25	C	0.44	30	C	0.66
	WB LTR	signal	26	C	0.54	25	C	0.47
	NB LTR	signal	12	B	0.60	17	B	0.76
	SB LTR	signal	9	A	0.47	15	B	0.70
	overall	signal	15	B	0.58	19	B	0.73
Main Street E & Herbert Avenue	WB L	free	1	A	0.00	1	A	0.01
	NB LR	stop	10	B	0.05	11	B	0.03
Main Street E & Lawler Drive	EB L	free	1	A	0.00	1	A	0.00
	WB L	free	1	A	0.00	2	A	0.02
	NB LTR	stop	12	B	0.11	12	B	0.12
	SB LTR	stop	9	A	0.01	12	B	0.01
Toronto Street S & Victoria Avenue	EB LTR	signal	21	C	0.14	21	C	0.11
	WB LTR	signal	23	C	0.36	23	C	0.37
	NB L	signal	3	A	0.02	3	A	0.03
	NB TR	signal	5	A	0.43	6	A	0.49
	SB L	signal	3	A	0.04	4	A	0.13
	SB TR	signal	5	A	0.39	5	A	0.43
	overall	signal	7	A	0.42	7	A	0.48
Toronto Street S & Uplands Drive	EB LTR	stop	19	C	0.05	31	D	0.17
	WB LTR	stop	27	D	0.35	56	F	0.48
	NB L	free	1	A	0.01	1	A	0.01
	SB L	free	1	A	0.01	9	A	0.04

L: left T: thru R: right LT: left-thru LTR: left-thru-right TR: thru-right LR: left-right



Table 13: Intersection Operations – 2032 Total Conditions

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Main Street & Toronto Street	EB LTR	signal	26	C	0.50	34	C	0.76
	WB LTR	signal	29	C	0.62	27	C	0.55
	NB LTR	signal	13	B	0.66	24	C	0.85
	SB LTR	signal	11	B	0.53	21	C	0.83
	overall	signal	17	B	0.65	25	C	0.82
Main Street E & Herbert Avenue	WB L	free	1	A	0.00	1	A	0.01
	NB LR	stop	11	B	0.07	12	B	0.05
Main Street E & Lawler Drive	EB L	free	1	A	0.00	1	A	0.00
	WB L	free	1	A	0.00	2	A	0.02
	NB LTR	stop	12	B	0.14	13	B	0.14
	SB LTR	stop	9	A	0.01	12	B	0.01
Toronto Street S & Victoria Avenue	EB LTR	signal	19	B	0.11	19	B	0.09
	WB LTR	signal	22	C	0.32	21	C	0.32
	NB L	signal	4	A	0.02	4	A	0.03
	NB TR	signal	7	A	0.50	7	A	0.58
	SB L	signal	4	A	0.06	5	A	0.21
	SB TR	signal	6	A	0.44	7	A	0.51
	overall	signal	8	A	0.47	8	A	0.53
Toronto Street S & Uplands Drive	EB LTR	stop	22	C	0.06	48	E	0.25
	WB LTR	stop	46	E	0.61	179	F	1.00
	NB L	free	1	A	0.01	1	A	0.01
	SB L	free	1	A	0.01	9	A	0.06

L: left T: thru R: right LT: left-thru LTR: left-thru-right TR: thru-right LR: left-right



Table 14: Intersection Operations – 2037 Total Conditions

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Main Street & Toronto Street	EB LTR	signal	27	C	0.55	42	D	0.83
	WB LTR	signal	31	C	0.67	29	C	0.61
	NB LTR	signal	15	B	0.72	40	D	0.96
	SB LTR	signal	12	B	0.58	30	C	0.91
	overall	signal	18	B	0.70	34	C	0.92
Main Street E & Herbert Avenue	WB L	free	1	A	0.00	1	A	0.01
	NB LR	stop	11	B	0.07	12	B	0.05
Main Street E & Lawler Drive	EB L	free	1	A	0.00	1	A	0.00
	WB L	free	1	A	0.00	2	A	0.02
	NB LTR	stop	12	B	0.14	13	B	0.15
	SB LTR	stop	9	A	0.01	13	B	0.01
Toronto Street S & Victoria Avenue	EB LTR	signal	19	B	0.11	19	B	0.09
	WB LTR	signal	22	C	0.32	21	C	0.32
	NB L	signal	4	A	0.02	4	A	0.03
	NB TR	signal	7	A	0.55	8	A	0.63
	SB L	signal	4	A	0.07	6	A	0.24
	SB TR	signal	6	A	0.48	7	A	0.55
	overall	signal	8	A	0.51	9	A	0.57
Toronto Street S & Uplands Drive	EB LTR	stop	26	D	0.07	71	F	0.34
	WB LTR	stop	69	F	0.74	352	F	1.38
	NB L	free	1	A	0.01	1	A	0.01
	SB L	free	9	A	0.02	10	A	0.06

L: left T: thru R: right LT: left-thru LTR: left-thru-right TR: thru-right LR: left-right



As indicated, most intersections continue to provide acceptable operations (LOS D or better) through the 2037 horizon with average delays. Similar to the background conditions, the operations of the intersection of Toronto Street South with Uplands Drive will experience poor operations (LOS F). However, as previously noted, given the proximity of this intersection to the signalized intersection with Victoria Street, traffic signals are not recommended. Furthermore, signals are not warranted under total conditions (detailed worksheets are provided in Appendix E). It is noted that the signalized intersection at Victoria Avenue will readily accommodate additional volumes which may divert away from Uplands Drive during the PM peak if delays are lengthy.

The intersection of Toronto Street with Main Street will continue to provide adequate operations through the 2037 horizon in its current configuration; however, similar to operations under background conditions, the northbound and southbound approaches are nearing capacity ($v/c = 1.00$) during peak conditions. As noted in Section 3.3, intersection operations improve significantly over the existing configuration with the addition of left turn lanes on each approach. The comparative assessment was re-visited under 2037 total conditions to illustrate the benefit of introducing left turn lanes at the intersection, the results of which are provided in Table 15. As noted, approach delays decrease by up to 29 seconds and utilised capacity decreases by up to 0.42 compared to the existing configuration under 2037 total conditions.

Table 15: Intersection Operations – 2037 Total (PM Peak – with left turn lanes)

INTERSECTION, APPROACH & CONTROL			WITHOUT LEFT TURN LANES			WITH LEFT TURN LANES		
			Delay	LOS	v/c	Delay	LOS	v/c
Main Street & Toronto Street	EB	signal	42	D	0.83	25	C	0.41
	WB	signal	29	C	0.61	24	C	0.30
	NB	signal	40	D	0.96	11	C	0.56
	SB	signal	30	C	0.91	11	C	0.60
	overall	signal	34	C	0.92	15	B	0.54

Overall, the road network performs well through the 2037 horizon under future total conditions. As identified under background conditions, it is recommended that exclusive left turn lanes be added to the intersection of Toronto Street with Main Street by the 2037 horizon to mitigate operational concerns.



5.3 TURN LANE REQUIREMENTS

The need for exclusive left and right turn lanes (where such do not already exist) were reviewed based on future total volume projections.

5.3.1 Left Turn Lanes

For two-lane undivided highways, MTO warrants for left turn lanes at unsignalized intersections are based on design speed, advancing volume (i.e. traffic travelling in the same direction as the left-turning traffic), opposing volume (i.e. traffic travelling in the opposite direction as the left-turning traffic), and the percentage of left turning traffic in the advancing volume. The design speed for all investigated intersections is 60 km/h.

At Herbert Avenue, warrants for 10% left turns in the advancing volume were run and indicate that a westbound left turn lane is not warranted under any horizon.

At Lawler Drive, the eastbound left turning volumes are extremely low (3-4 vehicles during peak times) thus do not warrant an eastbound left turn under any horizon. Warrants for 15% left turns in the advancing volume were run and indicate that a westbound left turn lane is also not warranted under any horizon.

As noted in Section 3.4, a 50-metre southbound left turn lane is warranted at Uplands Drive under background conditions. Despite the reduction in southbound left turning volumes due to the Centre Point South trip reassignment (see Section 5.1.1), a 50-metre left turn lane is still warranted under future total conditions. A northbound left turn lane to serve the hospital access (opposite Uplands Drive) is not warranted under any horizon due to low turning volumes. It is noted that the existing southbound left turn lane does extend well south of Uplands Drive, servicing the commercial developments located south of Uplands Drive. The southbound left turn lane, south of Uplands Drive could conceivably be converted into a continuous two-way left turn lane to serve the hospital access and improve turning performance in both the northbound and southbound directions.

5.3.2 Right Turn Lanes

MTO guidelines suggest that an exclusive right turn lane be considered where right turning volumes exceed 60 vehicles per hour (vph) and/or impede the operations of through traffic. Throughout the network, a limited number of movements exceed this threshold by the 2037 horizon during one or both peak periods:

- northbound right turn at Toronto Street and Uplands Drive - (30 AM, 89 PM)
- eastbound right turn at Main Street and Street C eastbound (24 AM, 79 PM)



Despite exceeding the required threshold, right turn lanes are not considered necessary given the otherwise satisfactory operations of each of the noted movements. It is noted that the eastbound right turn movement from Main Street at Street C will be less than indicated recognizing that a portion of the right turn volumes will enter the commercial block via the RIRO access.

5.4 SIGHT LINE ASSESSMENT

A sight line assessment along Main Street East was conducted at the locations of the future commercial access and the intersection of Main Street East & Street C/Lawler Drive to verify that the available sight lines are appropriate. The sight line assessment has considered both minimum stopping sight distance and intersection sight distance, as per Transportation Association of Canada (TAC) standards and details below.

- The minimum stopping sight distance provides a sufficient distance for an approaching motorist to observe a stationary hazard in the road and bring their vehicle to a complete stop prior to the hazard.
- The intersection sight distance allows a vehicle to enter a main road from a side street (or site access) and attain the appropriate operating speed without significantly impacting the operating speed of an approaching vehicle.

The minimum stopping and intersection sight distance requirements are provided in Table 16 for a design speed of 60km/h (reflective of the 50km/h posted speed limit on Main Street East). The sight lines measured at the site are also summarized in Table 16 and illustrated in Figure 22.

Table 16: Sight Lines

LOCATION	DESIGN SPEED	STOPPING SIGHT DISTANCE	INTERSECTION SIGHT DISTANCE		AVAILABLE SIGHT LINES TO/FROM	
			Left Turn	Right Turn	East	West
Main St E & Lawler Dr	60km/h	85m	130 m	110 m	>200 m	>200 m
Commercial Access	60km/h	85m	130 m	110 m	>200 m	100 m

As shown, the available sight lines along Main Street East at Street C are excellent, with sight lines exceeding 200 metres in both directions. No improvements to the sight lines are required at this intersection.

The sight lines to/from the east at the commercial access are greater than 200 metres, although it is noted that such are not critical due to the proposed RIRO configuration of the access. The



sight lines to/from the west are approximately 100 metres, limited by the vertical curve just east of Cambrai Road. While the sight lines do not satisfy the intersection sight distance requirements, they do satisfy the more critical minimum stopping sight distance for the noted design speed. Furthermore, a sight line of 100 metres satisfies the intersection sight distance for a design speed of approximately 54 km/h, or 4 km/h above the posted speed limit,

In consideration of the above, the available sight lines are considered acceptable.



6 Summary

Proposed Development

The study has addressed the transportation impacts associated with the proposed mixed-use development to be located at 101 Main Street East in the community of Markdale, Municipality of Grey Highlands. The proposed development consists of 218 residential dwelling units (22 semi-detached units, 182 townhome units and 14 apartment units) and 1,863 m² of ground floor commercial space.

Upon completion, the site is expected to generate a total of 125 trips during the weekday AM peak hour and 208 trips during the weekday PM peak hour. When considering internal and pass-by trips, the site is expected to generate 112 new trips during the AM peak hour and 161 new trips PM peak hour.

Transportation Impacts

To assess the impact of the proposed development, the operations of the key intersections within the study area were analyzed under existing (2022) conditions and future (2027, 2032, and 2037) horizon periods.

The results of the operational analyses indicate that all but one of the key intersections will provide acceptable operations (LOS D or better) through the 2037 horizon under total conditions. The intersection of Toronto Street South with Uplands Drive will experience poor operations (LOS F during the PM peak hour) during the 2032 horizon under background conditions, with similar operations experienced under total conditions. Traffic signals are not warranted, nor are they recommended give the available spacing from the adjacent signalized intersection of Toronto Street South with Victoria Avenue. It is expected that outbound traffic at Uplands Drive will divert to the signalized intersection at Victoria Avenue should delays become onerous during the PM peak hour.

Overall, the proposed development is not expected to have a significant impact on the study area road network in terms of intersection operations.

Turn Lane Requirements

The need for exclusive left and right turn lanes was reviewed at all intersections where such did not already exist.

Left turn lanes were determined to be unwarranted at the intersections of Main Street East with Herbert Avenue and Lawler Drive/Street C.



The existing southbound left turn lane on Toronto Street South at Uplands Drive requires an overall storage length of 50 metres (from its current 15 metre length) by the 2037 horizon, as dictated by background conditions and further confirmed under total conditions. A northbound turn lane at this intersection is not warranted but may be beneficial to serve the new hospital access (such could be accommodated through conversion of the existing southbound left turn lane, south of Uplands Drive into a continuous left turn lane to serve both the hospital access and the existing commercial development along Toronto Street South.

Right turn lanes were not considered necessary at any of the key intersections.

Sight Line Assessment

Sight lines at the proposed commercial access on Main Street East and future southern leg of the intersection of Main Street East with Street c were reviewed in the context of TAC requirements for stopping sight and intersection sight distances. Based on the results of the review, sight lines were found to be appropriate.





101 Main Street East
Figure 1: Site Location

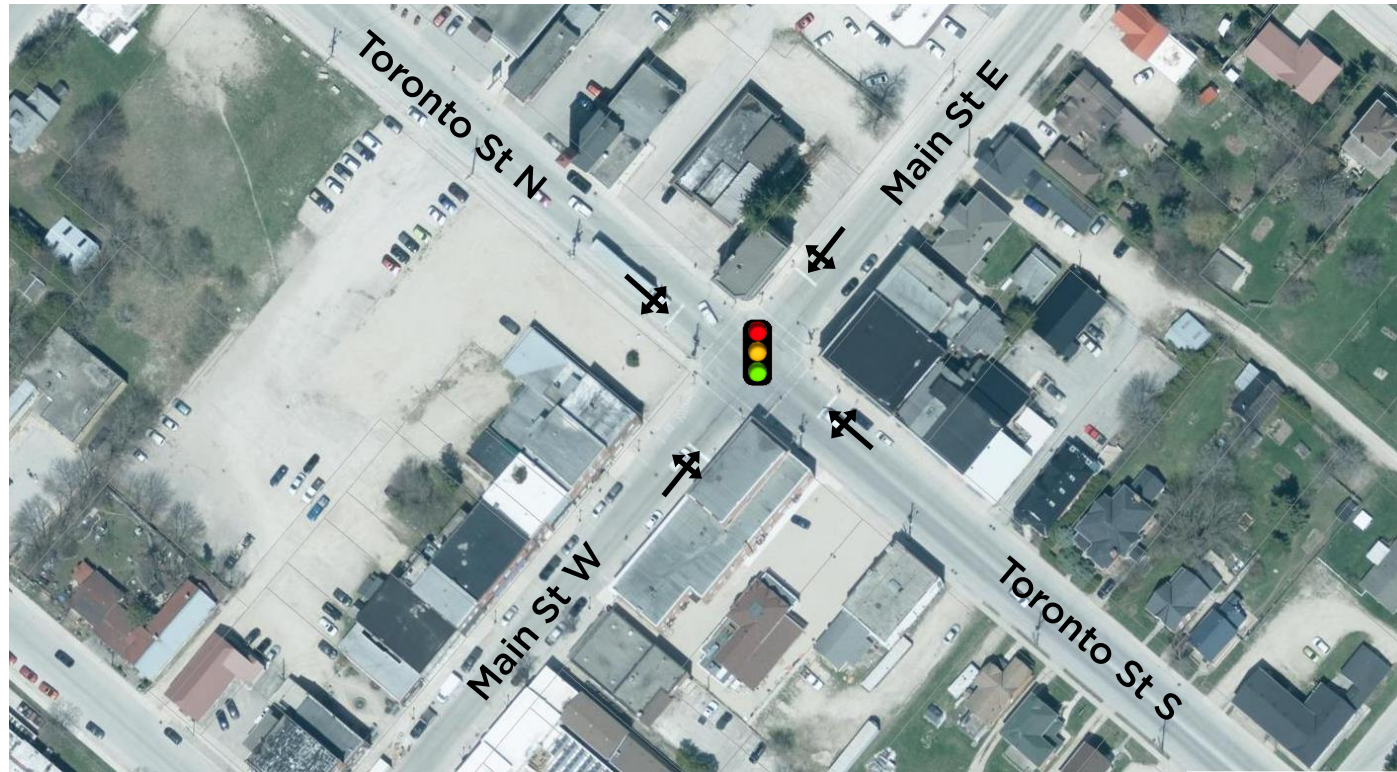




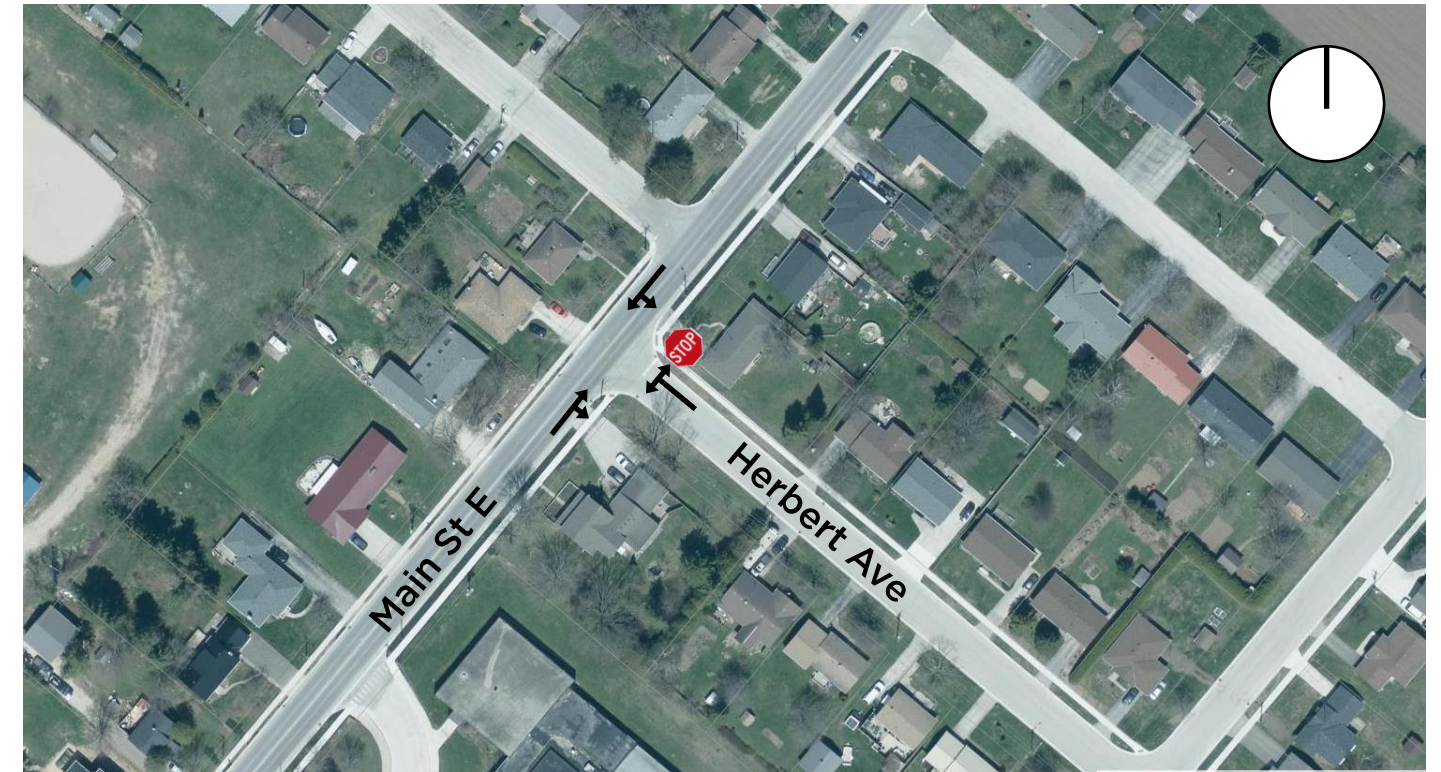
101 Main Street East

Figure 2: Area Road Network

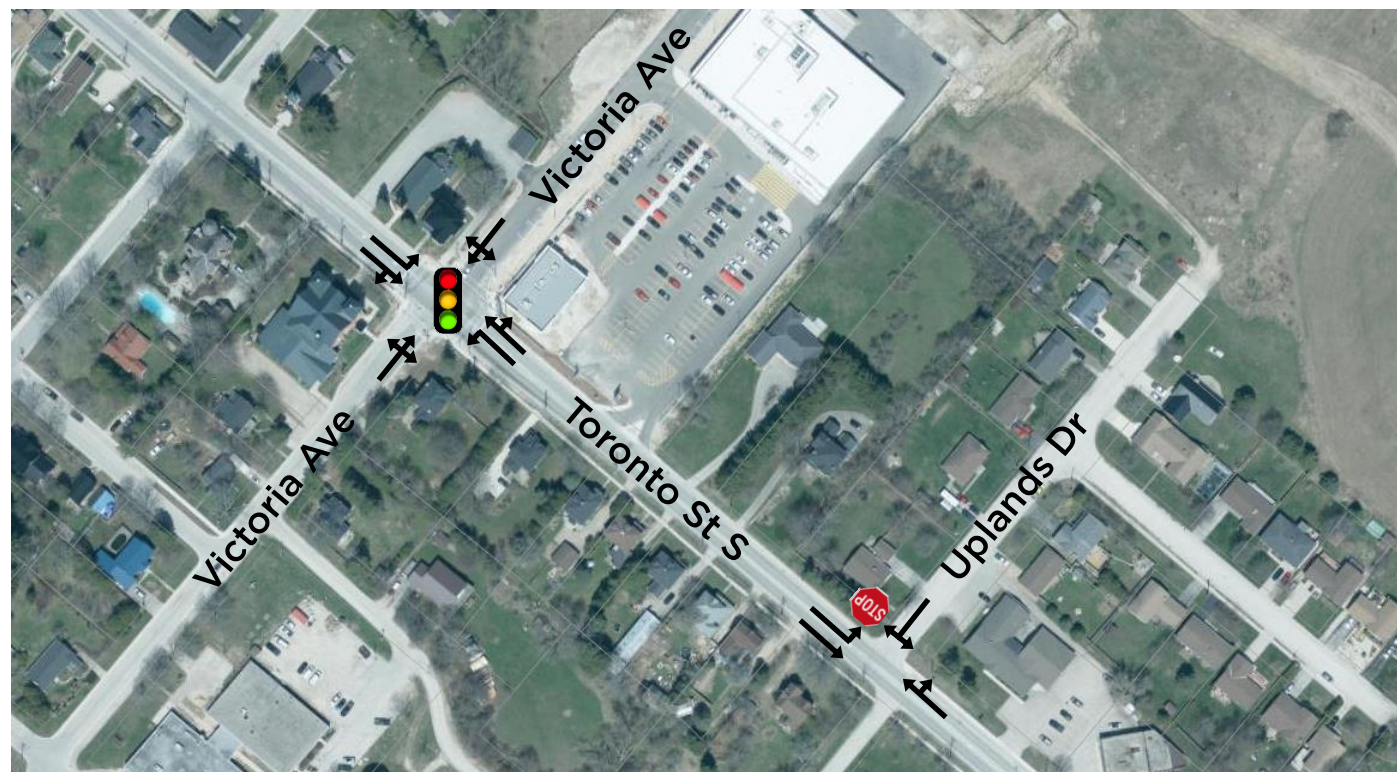




Intersection of Toronto Street with Main Street



Intersection of Main Street East with Herbert Avenue



Intersections of Toronto Street with Victoria Avenue and Uplands Drive



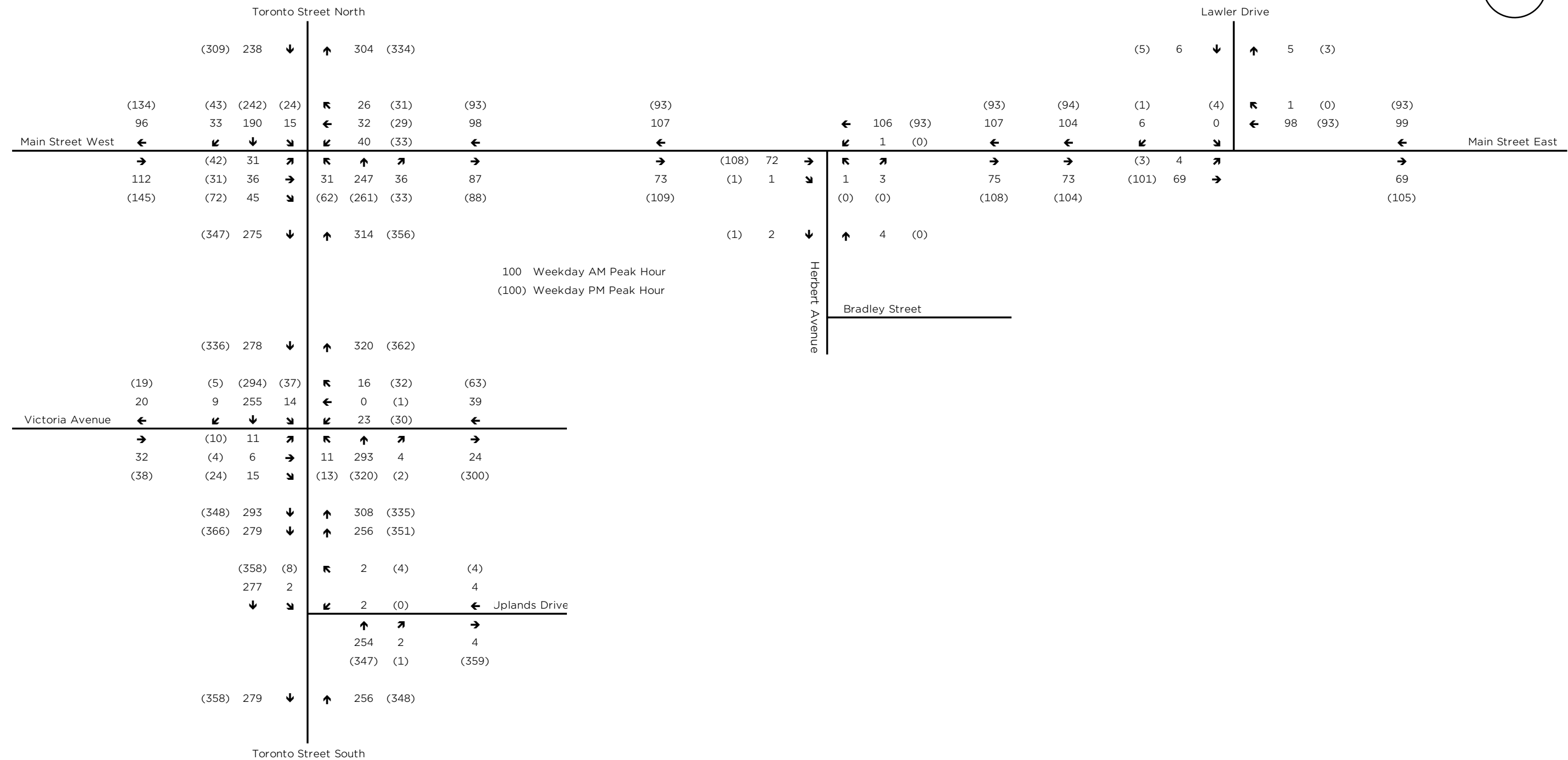
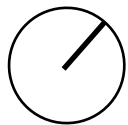
Intersection of Main Street East with Lawler Drive

Source: geo.grey.ca

101 Main Street East

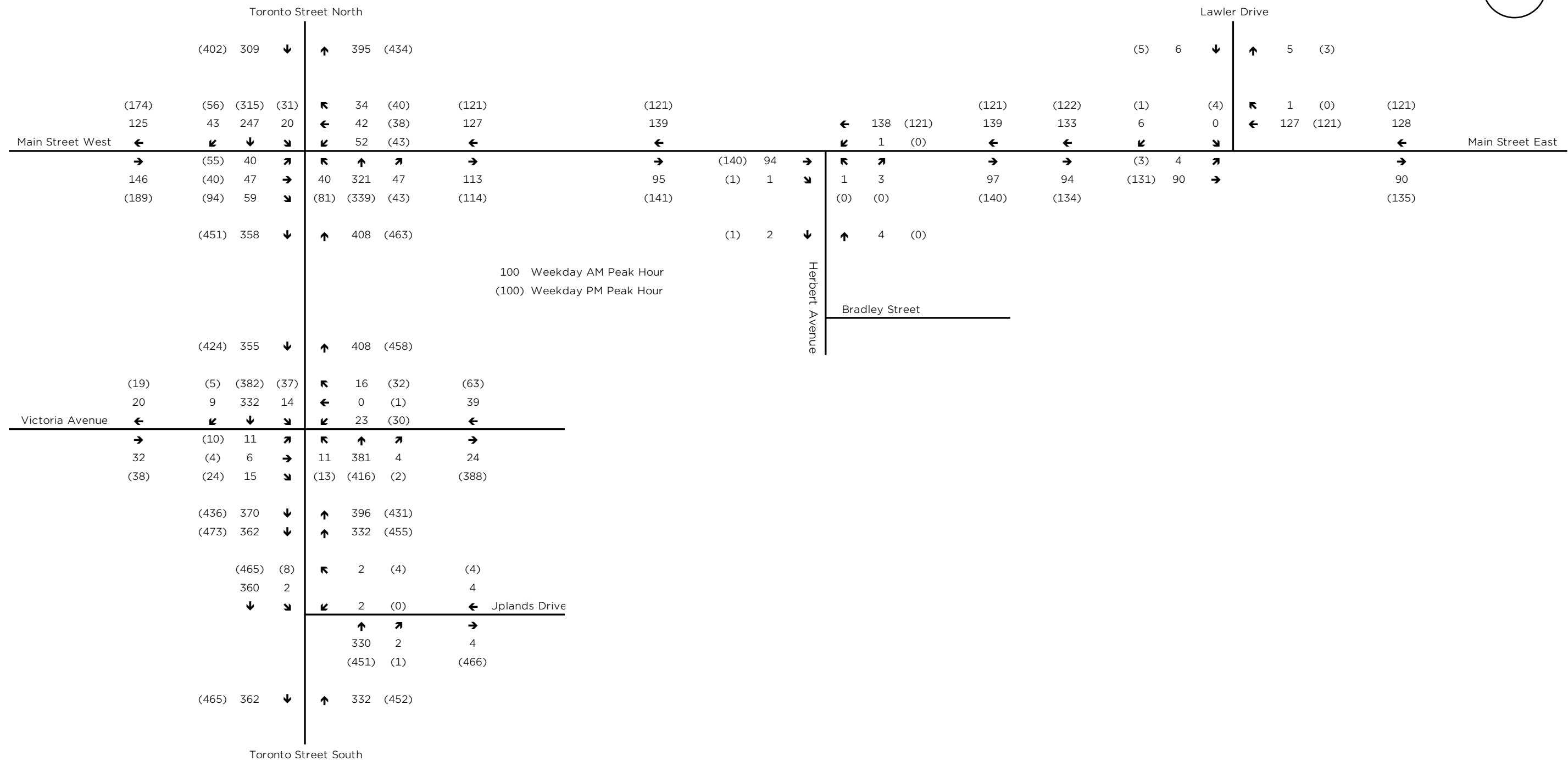
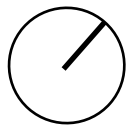
Figure 3: Key Intersections





101 Main Street East
Figure 4: 2022 Observed Traffic



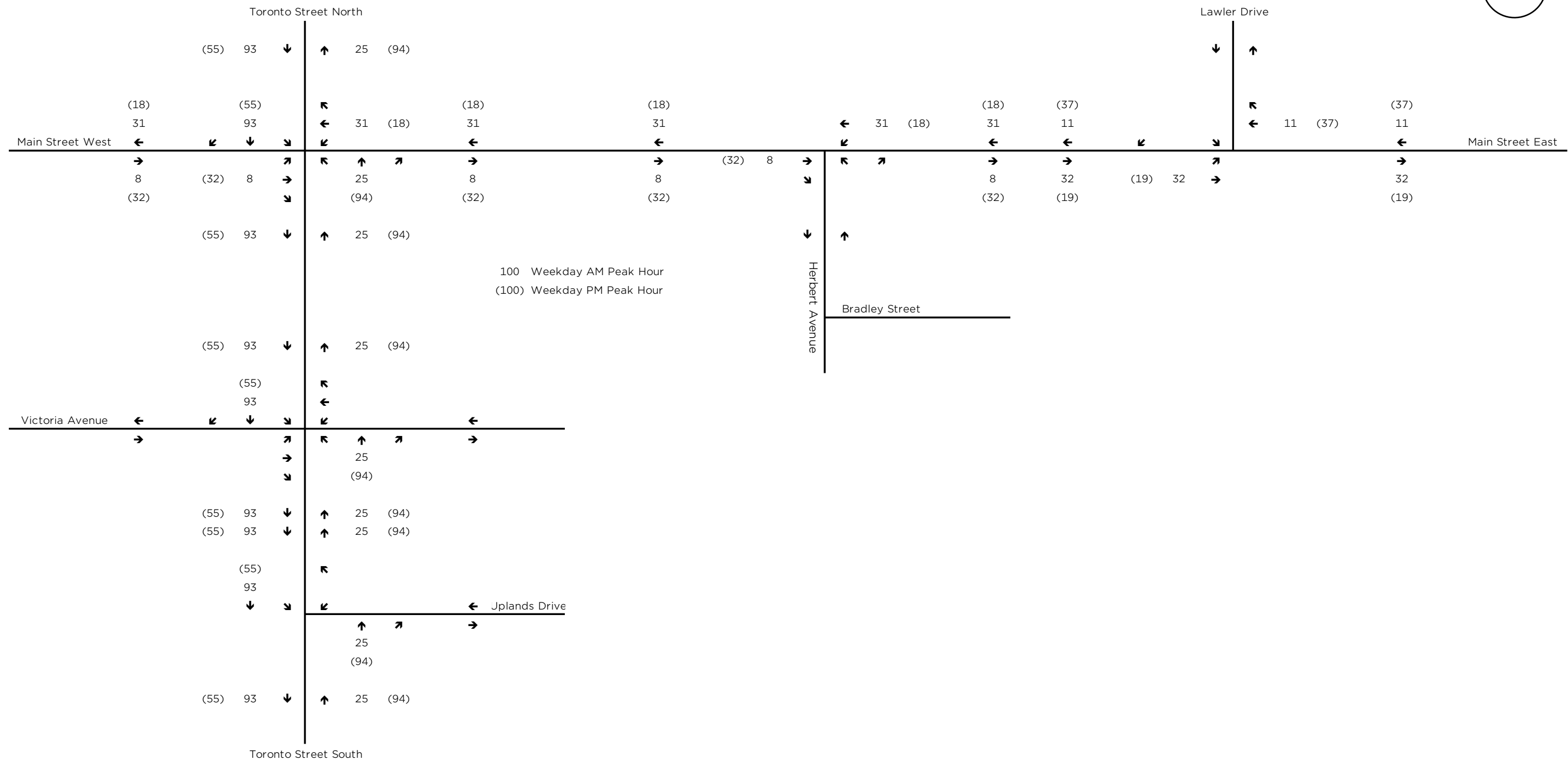
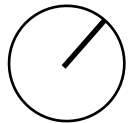




101 Main Street East

Figure 6: Background Developments

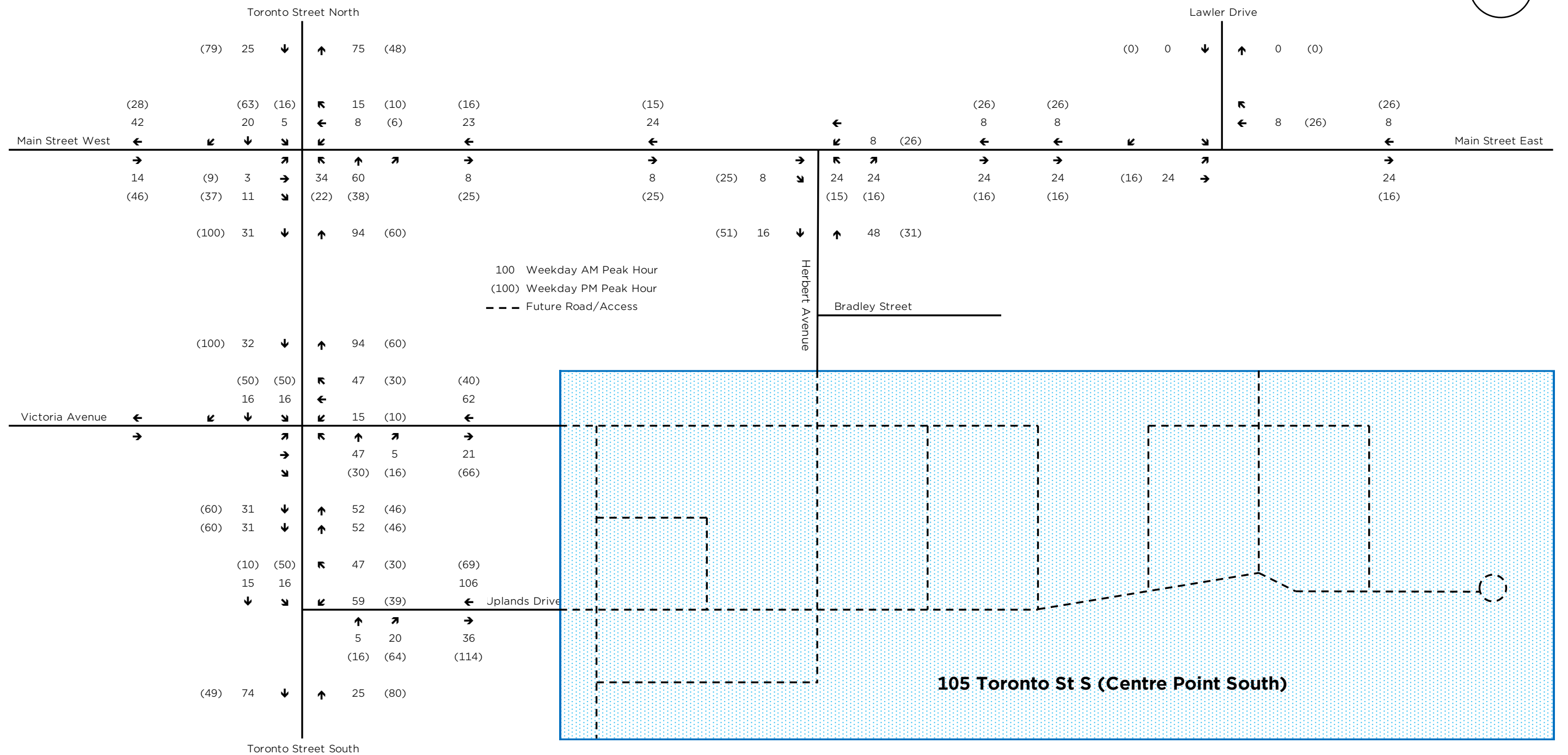
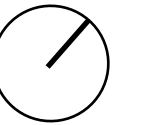




101 Main Street East

Figure 7: Background Development Traffic – 775309 Highway 10

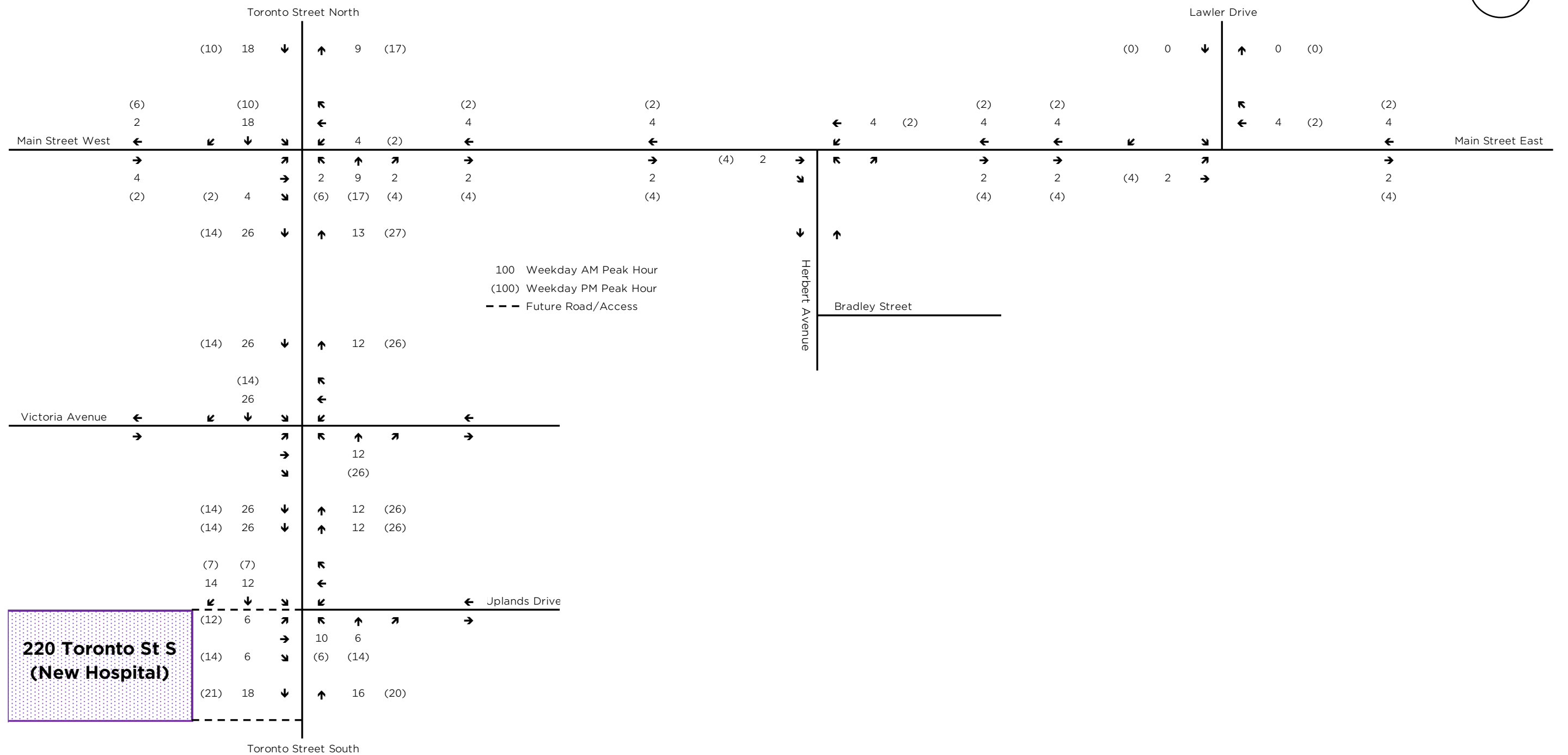
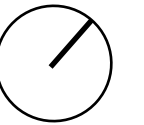




101 Main Street East

Figure 8: Background Development Traffic – 105 Toronto Street South

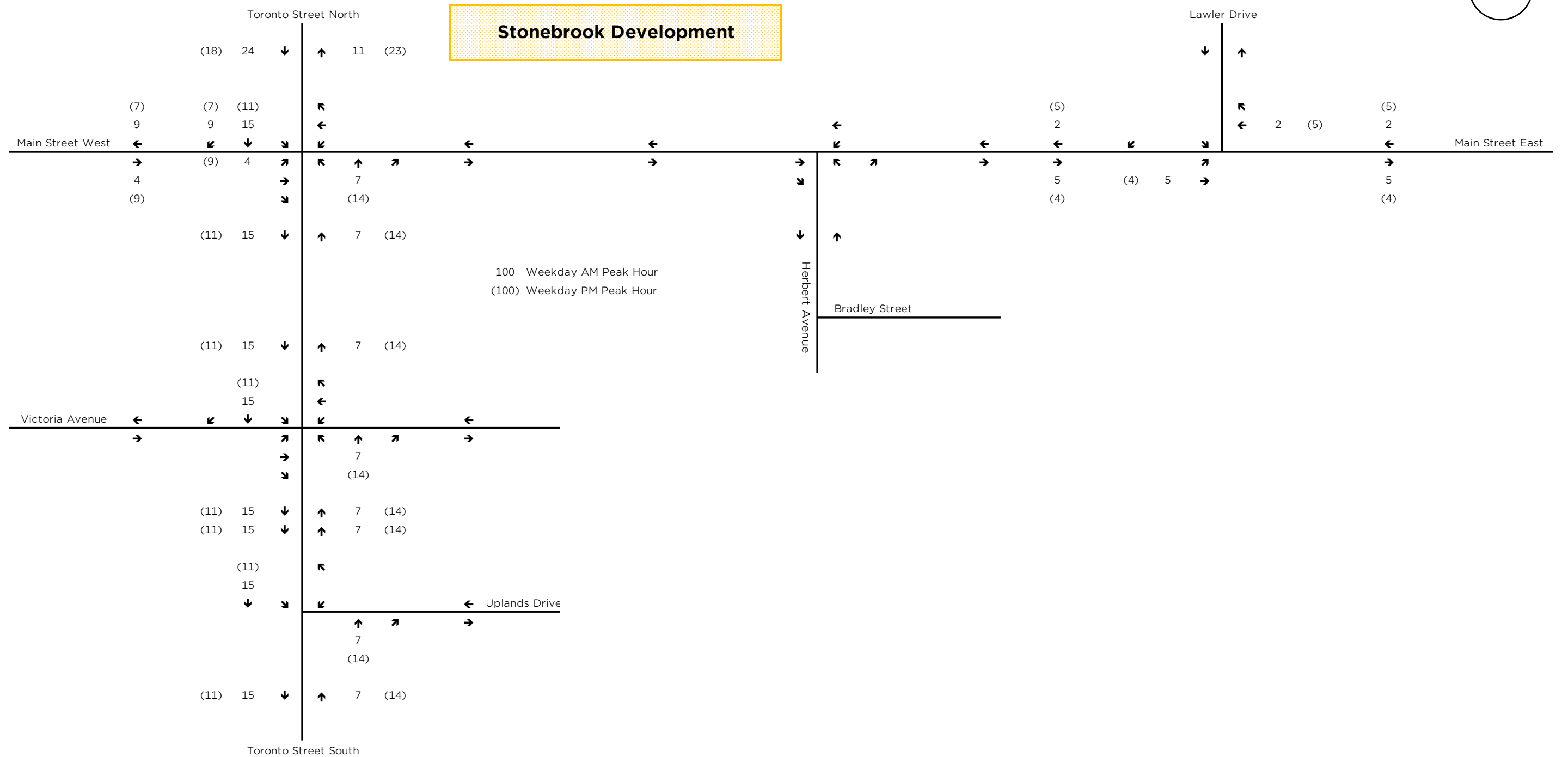
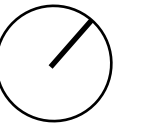




101 Main Street East

Figure 9: Background Development Traffic – 220 Toronto Street

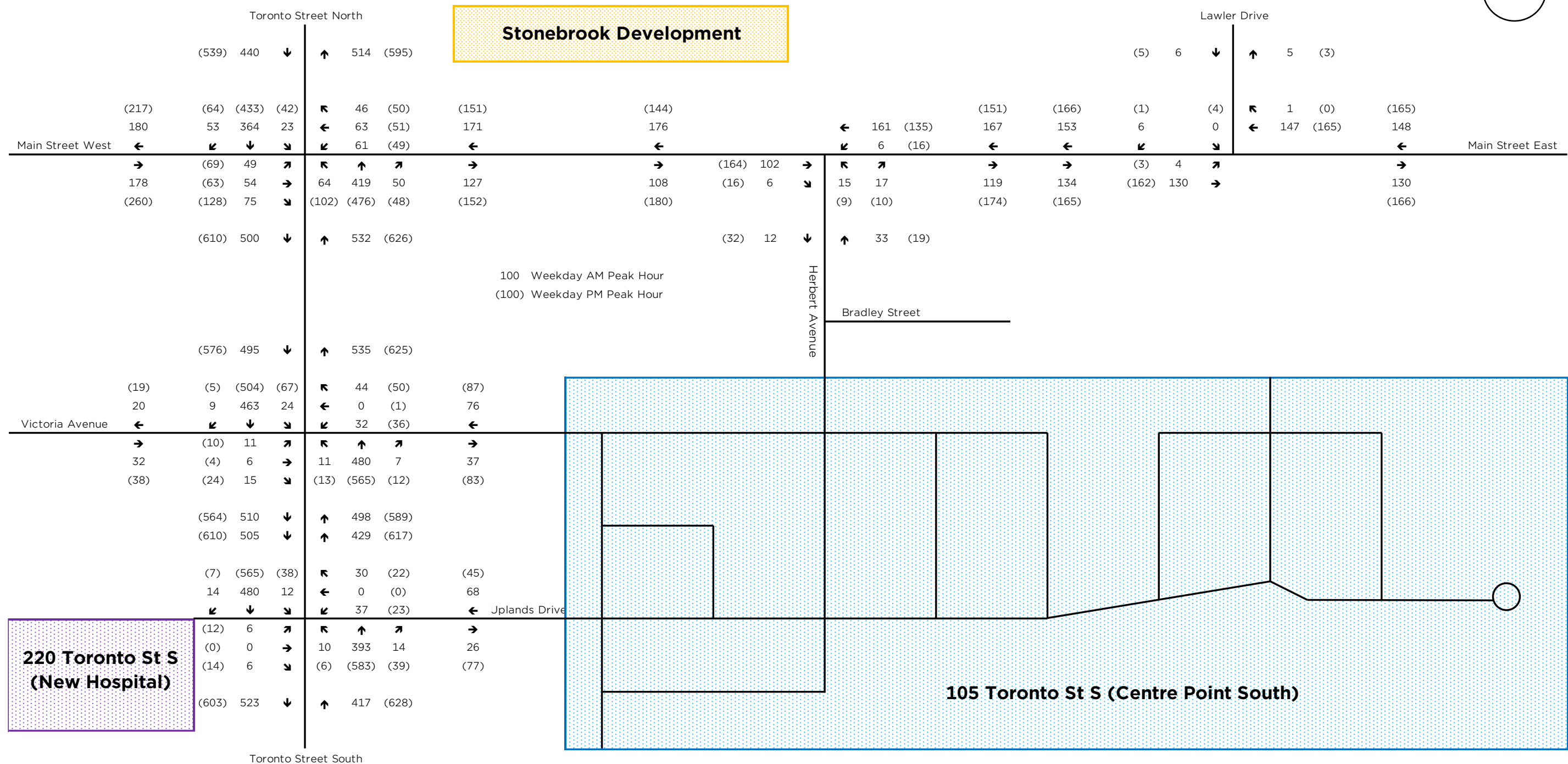
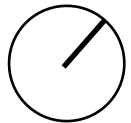


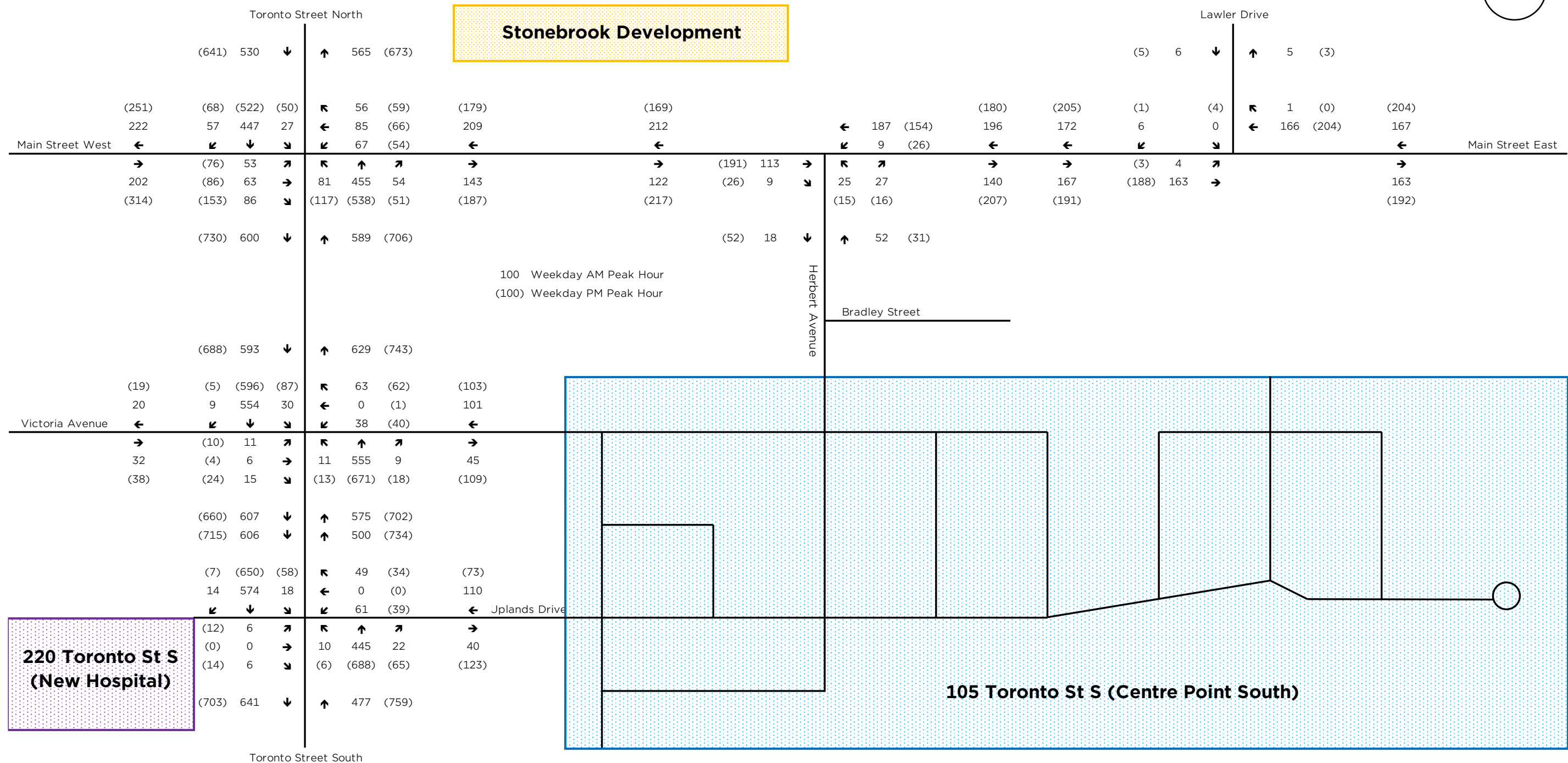
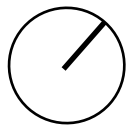


101 Main Street East

Figure 10: Background Development Traffic – Stonebrook

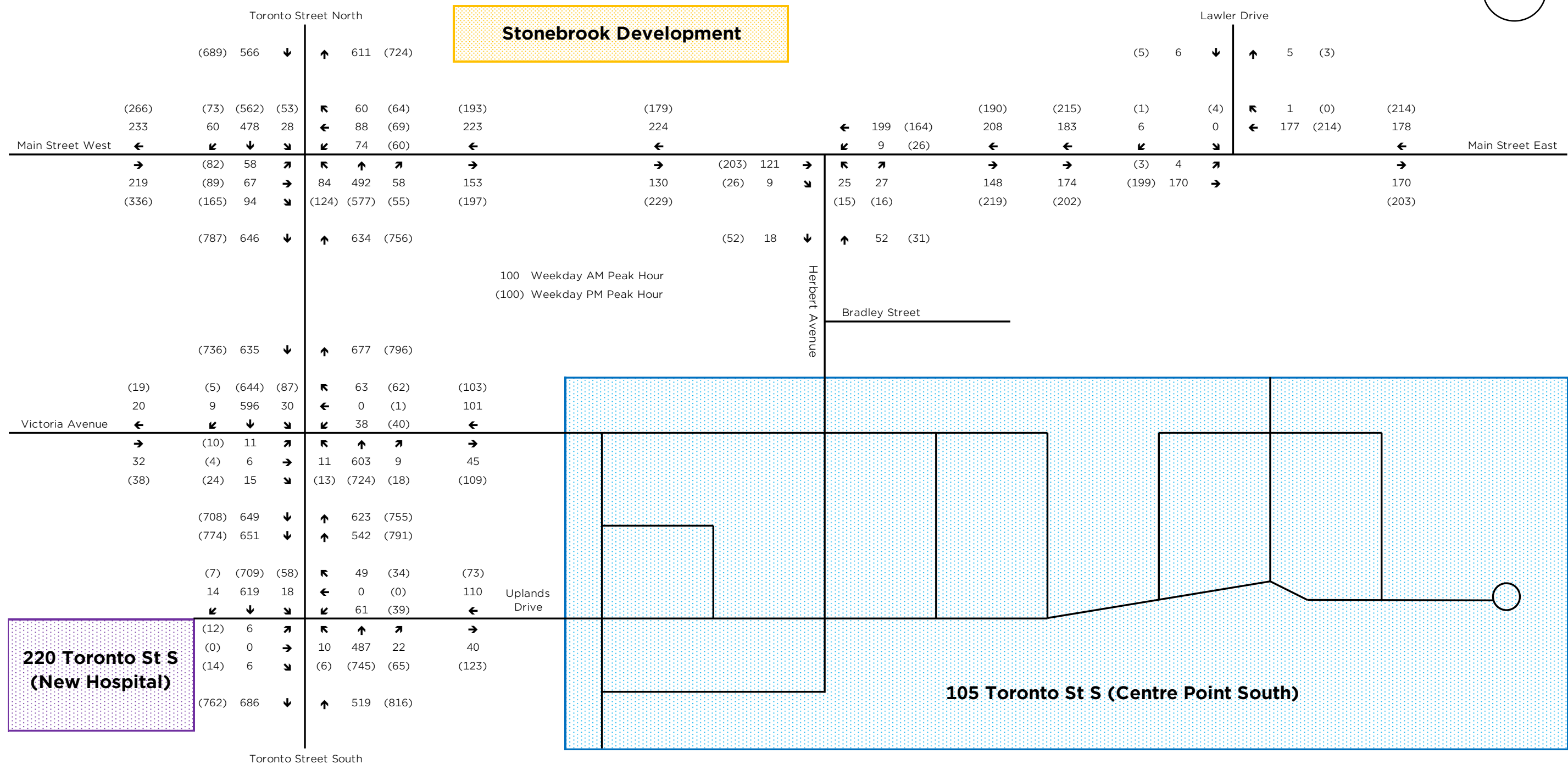
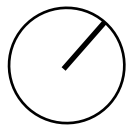






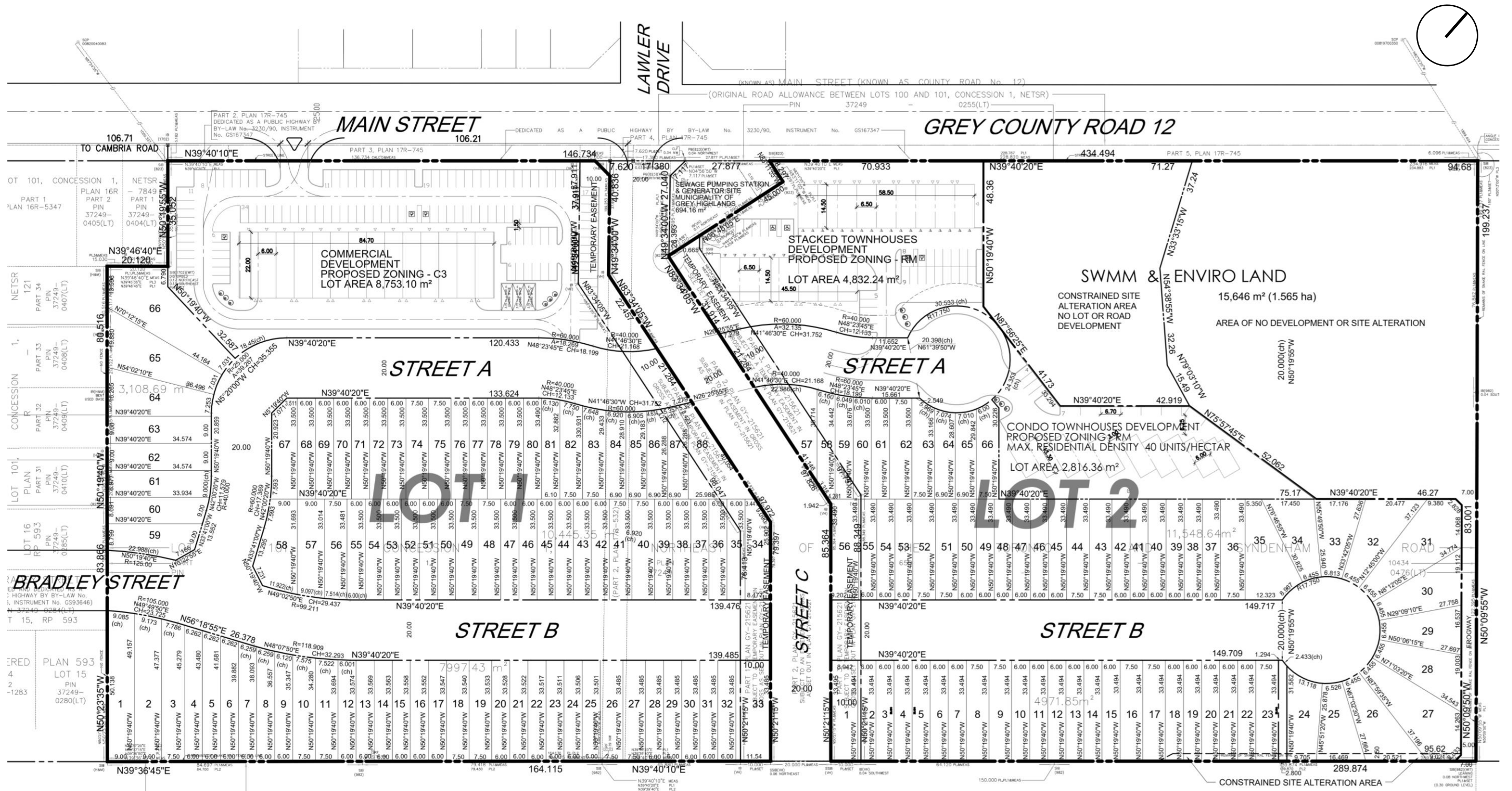
101 Main Street East
Figure 12: 2032 Background Traffic





101 Main Street East
Figure 13: 2037 Background Traffic

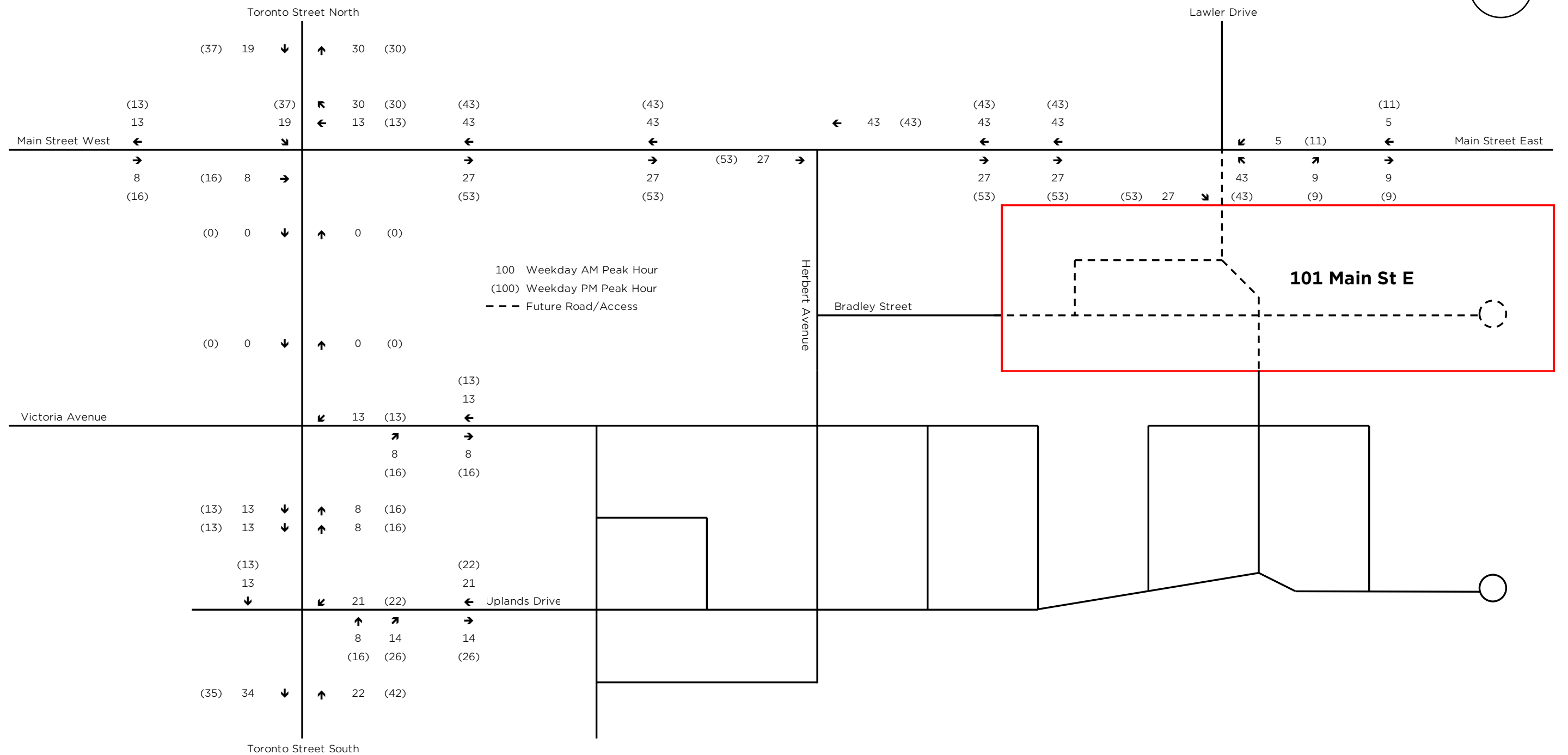
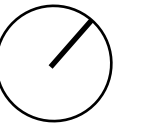




101 Main Street East

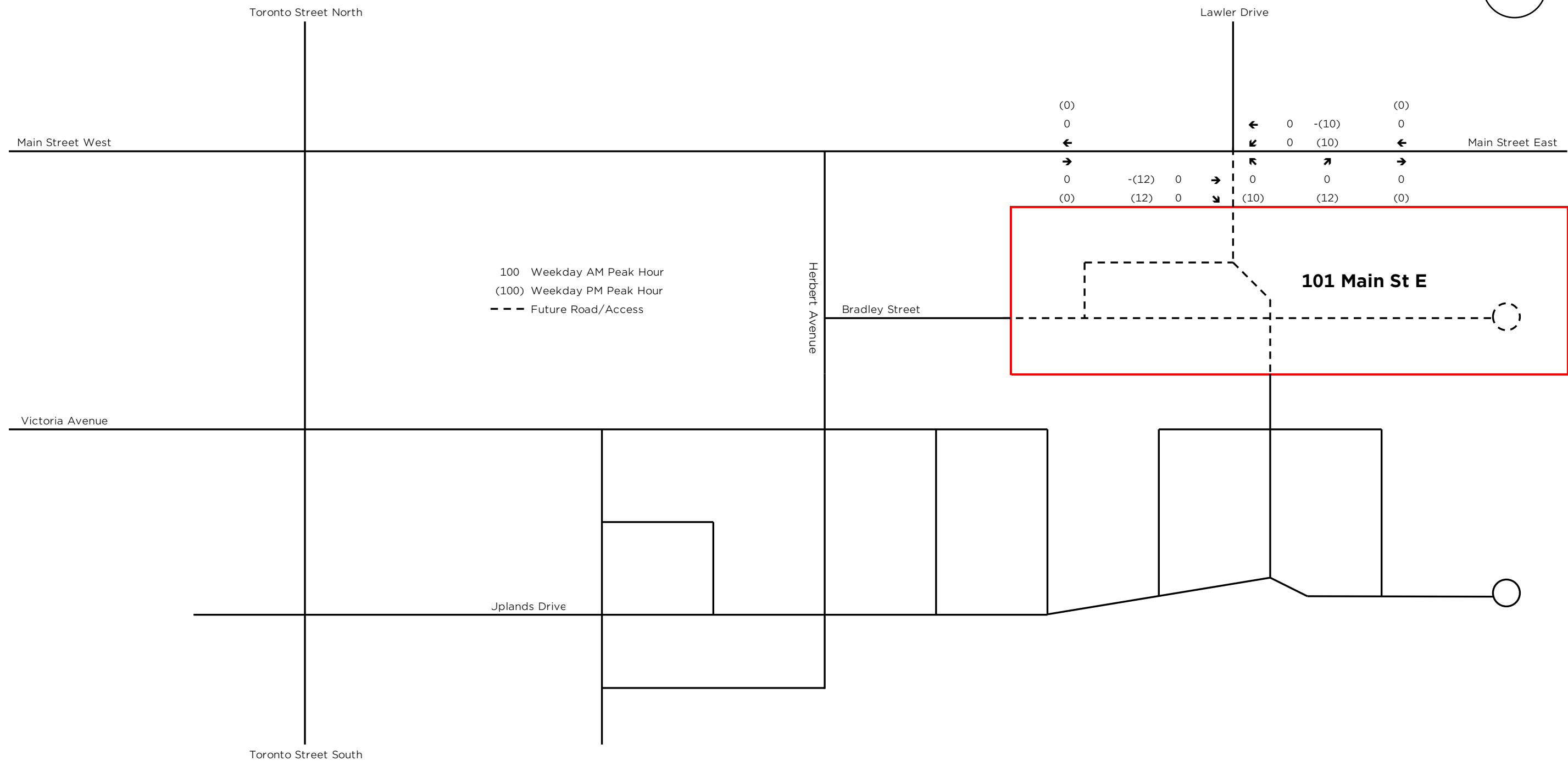
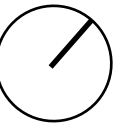
Figure 14: Draft Plan





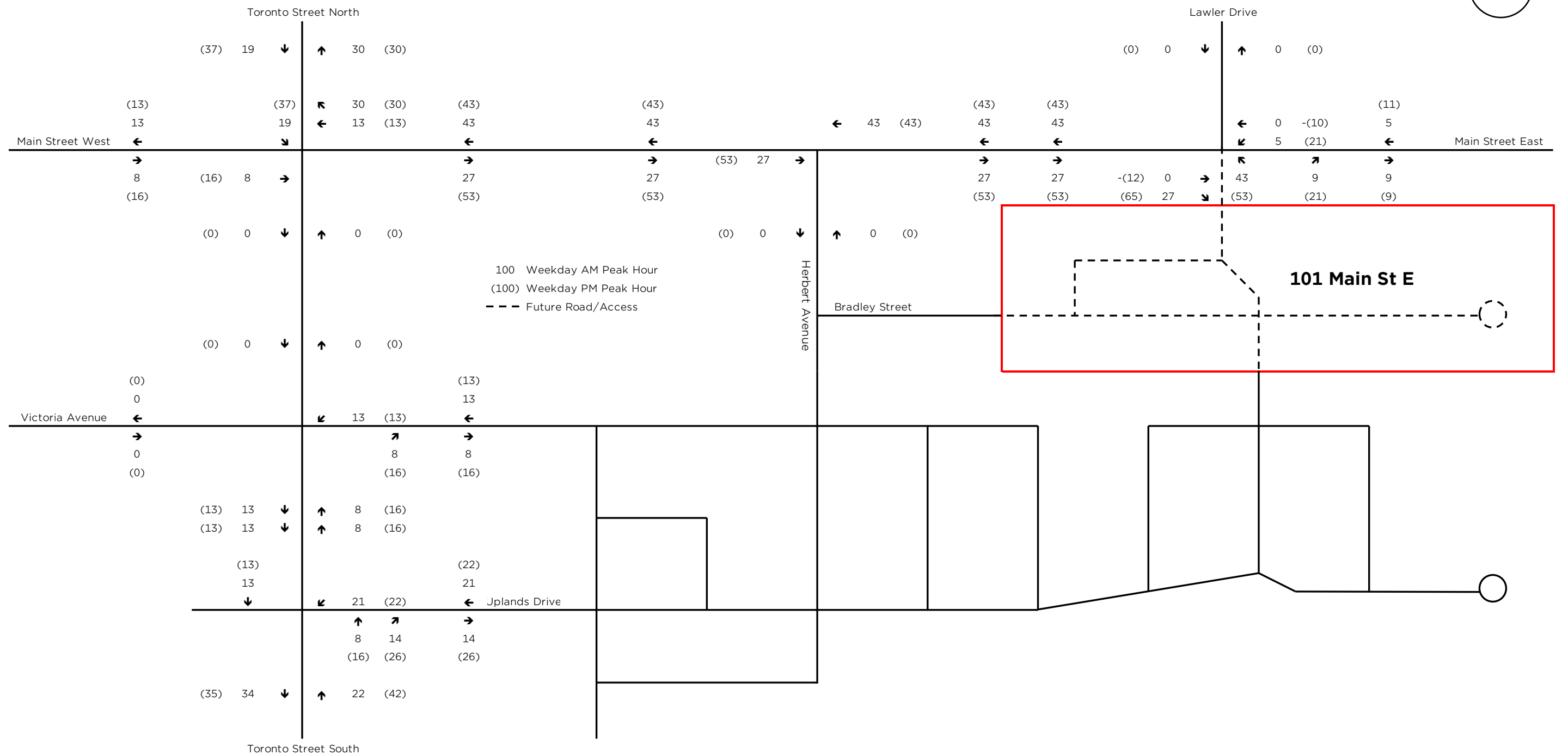
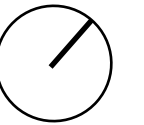
101 Main Street East
Figure 15: Site Traffic – New Trips





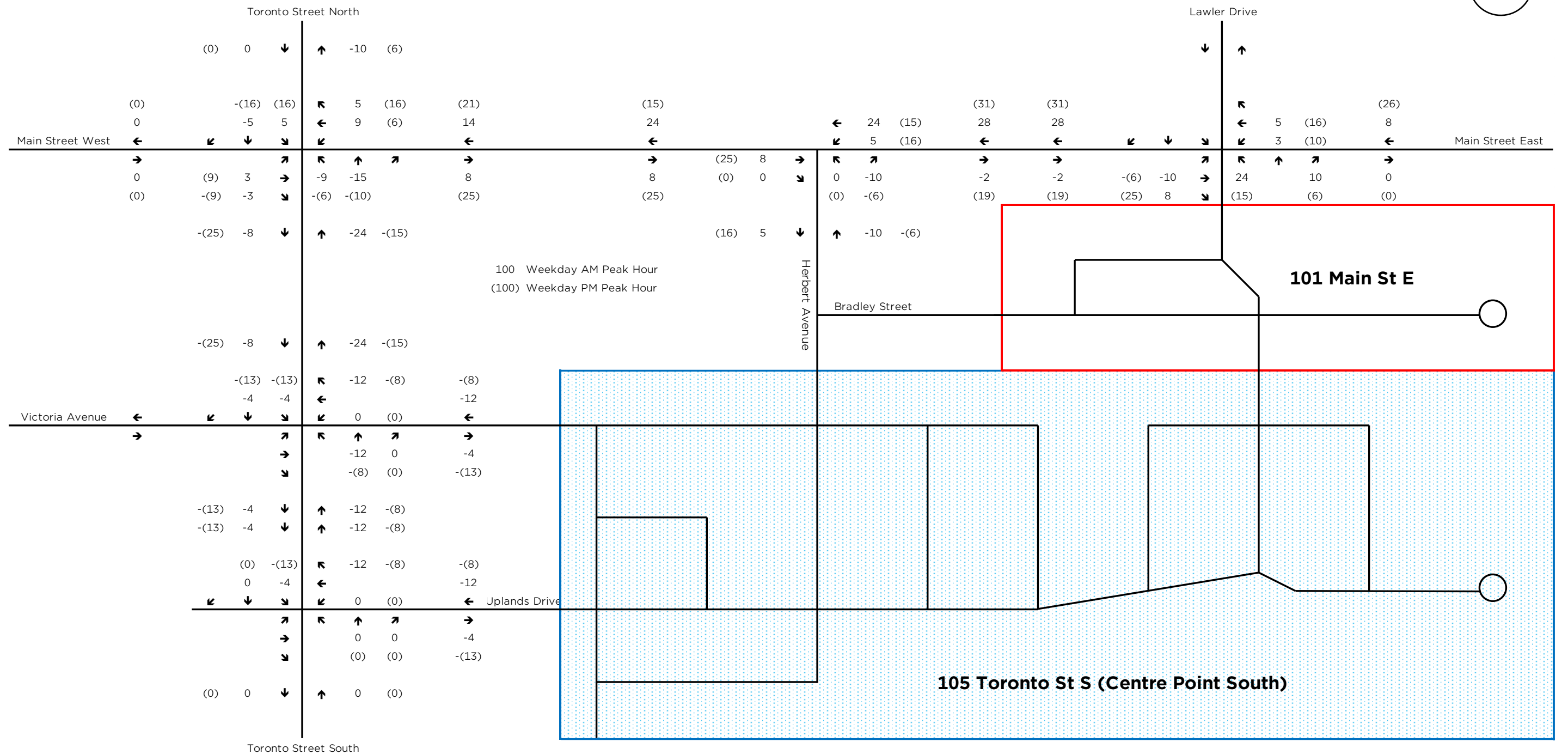
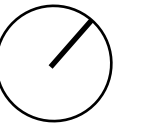
101 Main Street East
Figure 16: Site Traffic - Pass-by Trips





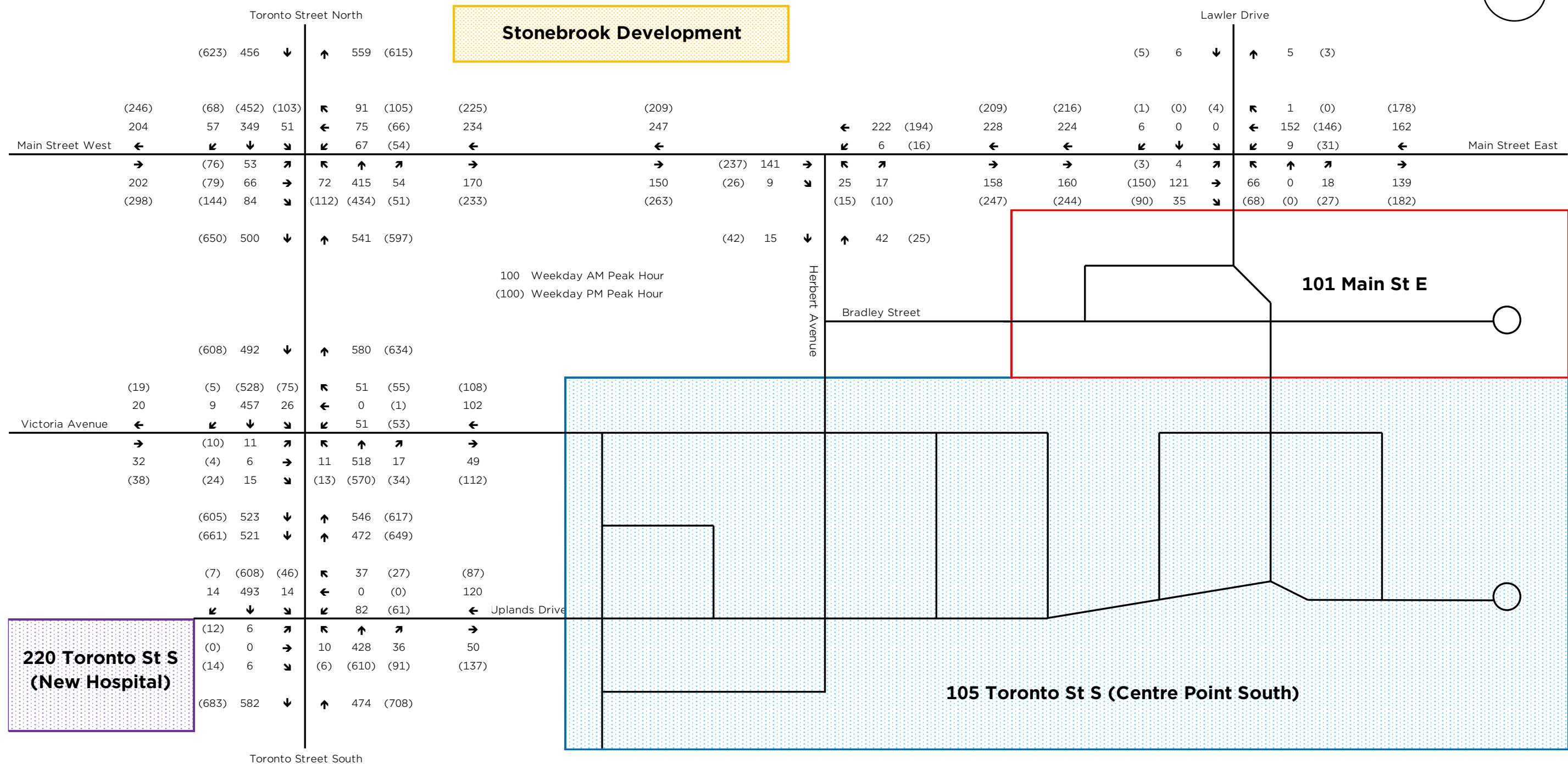
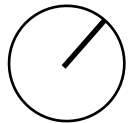
101 Main Street East
Figure 17: Site Traffic – Total Trips





101 Main Street East
Figure 18: Centre Point South Trip Reassignment





101 Main Street East
Figure 20: 2032 Total Traffic





101 Main Street East
Figure 22: Sight Lines



Appendix A: Traffic Counts

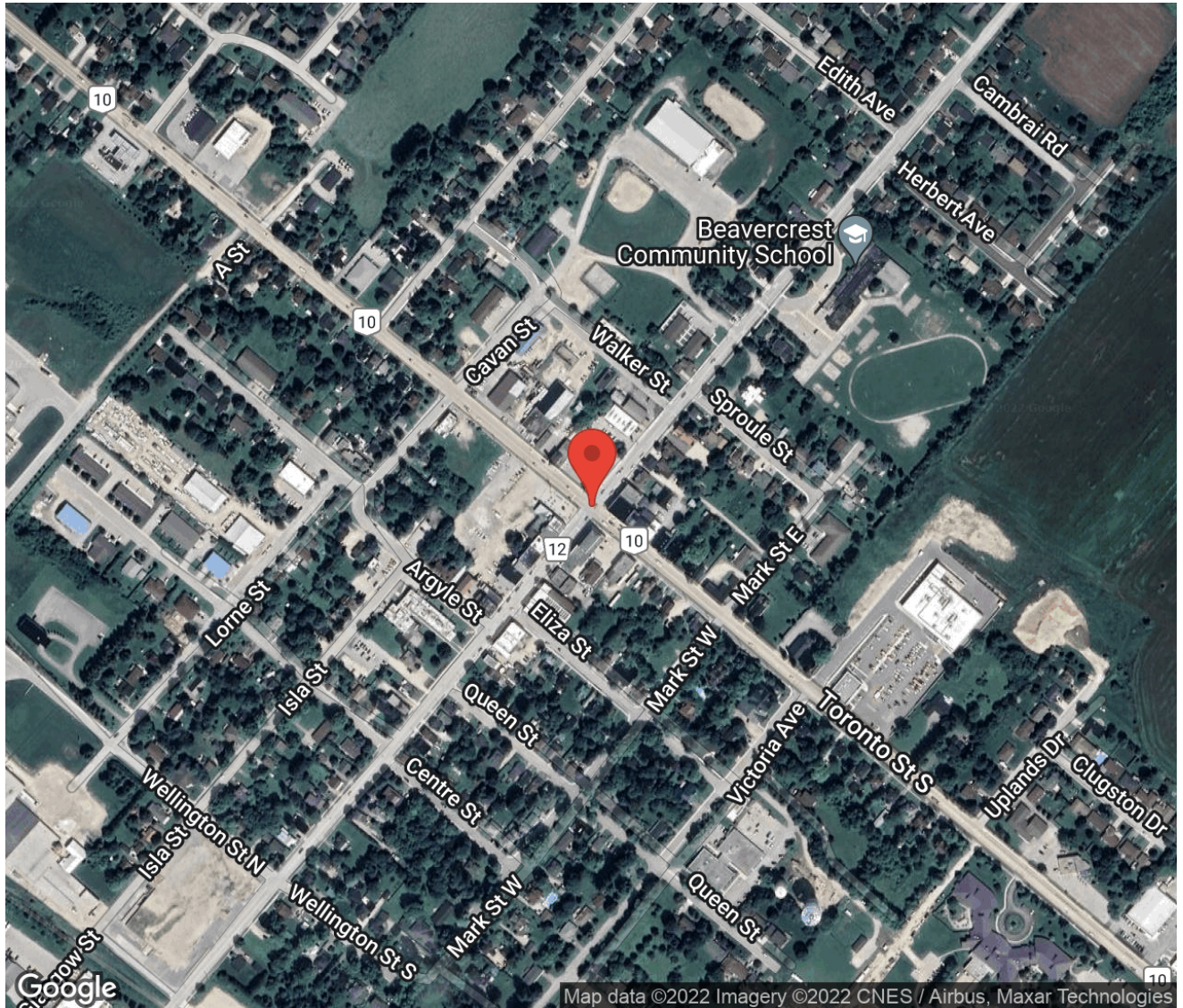
Project #22-085 - Tatham Engineering Ltd

Intersection Count Report

Intersection:	Main St & Toronto St
Municipality:	Markdale
Count Date:	Mar 31, 2022
Site Code:	2208500001
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 15:00-18:00
Weather:	Clear

Traffic Count Map

Intersection:	Main St & Toronto St
Site Code:	2208500001
Municipality:	Markdale
Count Date:	Mar 31, 2022



Traffic Count Summary

Intersection: Main St & Toronto St
Site Code: 2208500001
Municipality: Markdale
Count Date: Mar 31, 2022

Toronto St - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	17	200	41	0	258	3	35	131	16	0	182	1	440
08:00 - 09:00	16	189	34	0	239	10	47	199	37	0	283	9	522
09:00 - 10:00	6	218	26	0	250	6	26	270	23	0	319	7	569
BREAK													
15:00 - 16:00	14	211	47	0	272	11	52	228	36	0	316	27	588
16:00 - 17:00	24	242	43	0	309	4	62	261	33	0	356	7	665
17:00 - 18:00	16	182	56	0	254	2	45	259	29	0	333	0	587
GRAND TOTAL	93	1242	247	0	1582	36	267	1348	174	0	1789	51	3371

Traffic Count Summary

Intersection: Main St & Toronto St
Site Code: 2208500001
Municipality: Markdale
Count Date: Mar 31, 2022

Main St - Traffic Summary

Hour	East Approach Totals						West Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	15	24	16	0	55	3	23	23	55	0	101	4	156
08:00 - 09:00	42	32	30	0	104	3	27	34	55	0	116	3	220
09:00 - 10:00	21	23	19	0	63	5	31	21	33	0	85	12	148
BREAK													
15:00 - 16:00	41	36	27	0	104	6	35	42	54	0	131	14	235
16:00 - 17:00	33	29	31	0	93	4	42	31	72	0	145	3	238
17:00 - 18:00	43	21	19	0	83	0	22	22	58	0	102	1	185
GRAND TOTAL	195	165	142	0	502	21	180	173	327	0	680	37	1182

Traffic Count Data

Intersection: Main St & Toronto St
Site Code: 2208500001
Municipality: Markdale
Count Date: Mar 31, 2022

North Approach - Toronto St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	3	50	6	0	59	0	3	2	0	5	0	0	0	0	0	0
07:15	4	36	4	0	44	0	3	1	0	4	0	0	0	0	0	1
07:30	5	52	16	0	73	0	8	0	0	8	0	0	0	0	0	2
07:45	5	43	11	0	59	0	5	1	0	6	0	0	0	0	0	0
08:00	2	52	7	0	61	0	3	0	0	3	0	0	0	0	0	1
08:15	2	38	7	0	47	0	5	0	0	5	0	0	0	0	0	0
08:30	3	41	5	0	49	0	8	0	0	8	0	0	0	0	0	4
08:45	9	40	14	0	63	0	2	1	0	3	0	0	0	0	0	5
09:00	2	35	8	0	45	0	4	0	0	4	0	0	0	0	0	3
09:15	0	54	5	0	59	1	6	0	0	7	0	0	0	0	0	2
09:30	2	46	4	0	52	0	5	0	0	5	0	0	0	0	0	0
09:45	1	61	8	0	70	0	7	1	0	8	0	0	0	0	0	1
SUBTOTAL	38	548	95	0	681	1	59	6	0	66	0	0	0	0	0	19

Traffic Count Data

Intersection: Main St & Toronto St
Site Code: 2208500001
Municipality: Markdale
Count Date: Mar 31, 2022

North Approach - Toronto St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	4	41	12	0	57	0	3	0	0	3	0	0	0	0	0	4
15:15	4	62	13	0	79	0	10	0	0	10	0	0	0	0	0	1
15:30	3	49	9	0	61	1	7	0	0	8	0	0	0	0	0	6
15:45	2	35	13	0	50	0	4	0	0	4	0	0	0	0	0	0
16:00	8	55	11	0	74	2	6	0	0	8	0	0	0	0	0	2
16:15	3	70	16	0	89	0	3	0	0	3	0	0	0	0	0	1
16:30	6	46	6	0	58	0	6	0	0	6	0	0	0	0	0	0
16:45	5	53	10	0	68	0	3	0	0	3	0	0	0	0	0	1
17:00	4	53	18	0	75	0	0	0	0	0	0	0	0	0	0	0
17:15	5	49	15	0	69	0	3	1	0	4	0	0	0	0	0	0
17:30	3	25	11	0	39	0	5	0	0	5	0	0	0	0	0	0
17:45	4	45	11	0	60	0	2	0	0	2	0	0	0	0	0	2
SUBTOTAL	51	583	145	0	779	3	52	1	0	56	0	0	0	0	0	17
GRAND TOTAL	89	1131	240	0	1460	4	111	7	0	122	0	0	0	0	0	36

Traffic Count Data

Intersection: Main St & Toronto St
Site Code: 2208500001
Municipality: Markdale
Count Date: Mar 31, 2022

South Approach - Toronto St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	4	24	0	0	28	3	5	0	0	8	0	0	0	0	0	0
07:15	5	31	4	0	40	0	4	0	0	4	0	0	0	0	0	0
07:30	13	25	5	0	43	1	6	0	0	7	0	0	0	0	0	0
07:45	8	32	7	0	47	1	4	0	0	5	0	0	0	0	0	1
08:00	12	43	5	0	60	1	13	0	0	14	0	0	0	0	0	1
08:15	15	30	8	0	53	1	11	0	0	12	0	0	0	0	0	3
08:30	7	39	12	0	58	0	5	0	0	5	0	0	0	0	0	3
08:45	7	50	11	0	68	4	8	1	0	13	0	0	0	0	0	2
09:00	3	65	9	0	77	3	6	0	0	9	0	0	0	0	0	5
09:15	5	63	3	0	71	2	11	0	0	13	0	0	0	0	0	0
09:30	9	48	9	0	66	0	12	0	0	12	0	0	0	0	0	2
09:45	3	57	2	0	62	1	8	0	0	9	0	0	0	0	0	0
SUBTOTAL	91	507	75	0	673	17	93	1	0	111	0	0	0	0	0	17

Traffic Count Data

Intersection: Main St & Toronto St
Site Code: 2208500001
Municipality: Markdale
Count Date: Mar 31, 2022

South Approach - Toronto St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	10	42	8	0	60	2	5	0	0	7	0	0	0	0	0	14
15:15	19	55	12	0	86	1	10	0	0	11	0	0	0	0	0	7
15:30	8	56	6	0	70	0	2	1	0	3	0	0	0	0	0	2
15:45	12	53	9	0	74	0	5	0	0	5	0	0	0	0	0	4
16:00	14	59	11	0	84	1	5	0	0	6	0	0	0	0	0	2
16:15	17	69	5	0	91	1	3	0	0	4	0	0	0	0	0	2
16:30	10	69	11	0	90	1	6	0	0	7	0	0	0	0	0	3
16:45	15	49	6	0	70	3	1	0	0	4	0	0	0	0	0	0
17:00	11	63	10	0	84	1	1	1	0	3	0	0	0	0	0	0
17:15	13	72	5	0	90	0	2	0	0	2	0	0	0	0	0	0
17:30	12	64	7	0	83	0	2	0	0	2	0	0	0	0	0	0
17:45	8	52	6	0	66	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	149	703	96	0	948	10	45	2	0	57	0	0	0	0	0	34
GRAND TOTAL	240	1210	171	0	1621	27	138	3	0	168	0	0	0	0	0	51

Traffic Count Data

Intersection: Main St & Toronto St
Site Code: 2208500001
Municipality: Markdale
Count Date: Mar 31, 2022

East Approach - Main St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	4	2	0	0	6	0	0	0	0	0	0	0	0	0	0	0
07:15	3	3	2	0	8	0	0	1	0	1	0	0	0	0	0	1
07:30	2	7	8	0	17	0	0	0	0	0	0	0	0	0	0	2
07:45	6	12	5	0	23	0	0	0	0	0	0	0	0	0	0	0
08:00	6	8	7	0	21	0	0	0	0	0	0	0	0	0	0	1
08:15	8	4	7	0	19	0	0	0	0	0	0	0	0	0	0	0
08:30	15	12	8	0	35	2	0	0	0	2	0	0	0	0	0	0
08:45	9	8	8	0	25	2	0	0	0	2	0	0	0	0	0	2
09:00	6	6	4	0	16	1	0	0	0	1	0	0	0	0	0	4
09:15	5	6	6	0	17	0	0	0	0	0	0	0	0	0	0	0
09:30	7	6	7	0	20	0	1	0	0	1	0	0	0	0	0	1
09:45	2	4	2	0	8	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	73	78	64	0	215	5	1	1	0	7	0	0	0	0	0	11

Traffic Count Data

Intersection: Main St & Toronto St
Site Code: 2208500001
Municipality: Markdale
Count Date: Mar 31, 2022

East Approach - Main St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	18	10	6	0	34	0	1	0	0	1	0	0	0	0	0	3
15:15	4	9	11	0	24	0	0	0	0	0	0	0	0	0	0	1
15:30	10	5	2	0	17	0	0	0	0	0	0	0	0	0	0	2
15:45	7	11	7	0	25	2	0	1	0	3	0	0	0	0	0	0
16:00	10	6	3	0	19	0	0	1	0	1	0	0	0	0	0	1
16:15	7	5	7	0	19	0	1	1	0	2	0	0	0	0	0	3
16:30	12	8	9	0	29	0	1	0	0	1	0	0	0	0	0	0
16:45	4	7	10	0	21	0	1	0	0	1	0	0	0	0	0	0
17:00	15	11	3	0	29	1	0	0	0	1	0	0	0	0	0	0
17:15	12	5	8	0	25	1	0	0	0	1	0	0	0	0	0	0
17:30	11	3	4	0	18	0	0	0	0	0	0	0	0	0	0	0
17:45	3	2	4	0	9	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	113	82	74	0	269	4	4	3	0	11	0	0	0	0	0	10
GRAND TOTAL	186	160	138	0	484	9	5	4	0	18	0	0	0	0	0	21

Traffic Count Data

Intersection: Main St & Toronto St
Site Code: 2208500001
Municipality: Markdale
Count Date: Mar 31, 2022

West Approach - Main St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	6	5	6	0	17	0	0	1	0	1	0	0	0	0	0	1
07:15	3	3	15	0	21	0	1	2	0	3	0	0	0	0	0	0
07:30	9	9	18	0	36	0	0	0	0	0	0	0	0	0	0	1
07:45	5	5	10	0	20	0	0	3	0	3	0	0	0	0	0	2
08:00	3	4	8	0	15	0	0	2	0	2	0	0	0	0	0	0
08:15	9	7	16	0	32	0	2	2	0	4	0	0	0	0	0	1
08:30	8	13	12	0	33	0	2	2	0	4	0	0	0	0	0	2
08:45	7	6	10	0	23	0	0	3	0	3	0	0	0	0	0	0
09:00	10	6	9	0	25	0	0	3	0	3	0	0	0	0	0	5
09:15	5	9	6	0	20	1	0	0	0	1	0	0	0	0	0	2
09:30	9	4	10	0	23	0	0	1	0	1	0	0	0	0	0	2
09:45	6	2	3	0	11	0	0	1	0	1	0	0	0	0	0	3
SUBTOTAL	80	73	123	0	276	1	5	20	0	26	0	0	0	0	0	19

Traffic Count Data

Intersection: Main St & Toronto St
Site Code: 2208500001
Municipality: Markdale
Count Date: Mar 31, 2022

West Approach - Main St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	9	10	8	0	27	2	1	1	0	4	0	0	0	0	0	4
15:15	6	10	13	0	29	0	1	1	0	2	0	0	0	0	0	2
15:30	10	7	17	0	34	0	0	0	0	0	0	0	0	0	0	8
15:45	7	13	13	0	33	1	0	1	0	2	0	0	0	0	0	0
16:00	7	7	15	0	29	1	1	1	0	3	0	0	0	0	0	2
16:15	11	6	17	0	34	0	0	2	0	2	0	0	0	0	0	1
16:30	7	11	25	0	43	0	0	1	0	1	0	0	0	0	0	0
16:45	16	6	11	0	33	0	0	0	0	0	0	0	0	0	0	0
17:00	7	9	10	0	26	1	0	2	0	3	0	0	0	0	0	1
17:15	10	5	15	0	30	0	0	1	0	1	0	0	0	0	0	0
17:30	0	4	20	0	24	0	0	0	0	0	0	0	0	0	0	0
17:45	4	3	10	0	17	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	94	91	174	0	359	5	4	10	0	19	0	0	0	0	0	18
GRAND TOTAL	174	164	297	0	635	6	9	30	0	45	0	0	0	0	0	37

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 10:00:00

One Hour Peak

From: 08:30:00
To: 09:30:00

Intersection: Main St & Toronto St
Site Code: 2208500001
Count Date: Mar 31, 2022

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Toronto St runs N/S

North Approach

	Out	In	Total
	216	273	489
	22	31	53
	0	0	0
Totals	238	304	542

Toronto St

	0	0	0	0
	1	20	1	0
	32	170	14	0
Totals	33	190	15	0

East Approach

	Out	In	Total
	93	83	176
	5	4	9
	0	0	0
Totals	98	87	185

Main St

				Totals
	0	0	0	0
	0	1	30	31
	0	2	34	36
	0	8	37	45

Peds: 14



Peds: 9

Peds: 6

Peds: 10

Main St

Totals			
0	0	0	0
26	26	0	0
32	32	0	0
40	35	5	0

West Approach

	Out	In	Total
	101	86	187
	11	10	21
	0	0	0
Totals	112	96	208

	31	247	36	0
	22	217	35	0
	9	30	1	0
	0	0	0	0

Toronto St

South Approach

	Out	In	Total
	274	242	516
	40	33	73
	0	0	0
Totals	314	275	589

- Cars

- Trucks

- Bicycles

Comments

Peak Hour Summary

Intersection: Main St & Toronto St
Site Code: 2208500001
Count Date: Mar 31, 2022
Period: 07:00 - 10:00

Peak Hour Data (08:30 - 09:30)

Start Time	North Approach Toronto St						South Approach Toronto St						East Approach Main St						West Approach Main St						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
08:30	3	49	5	0	4	57	7	44	12	0	3	63	17	12	8	0	0	37	8	15	14	0	2	37	194
08:45	9	42	15	0	5	66	11	58	12	0	2	81	11	8	8	0	2	27	7	6	13	0	0	26	200
09:00	2	39	8	0	3	49	6	71	9	0	5	86	7	6	4	0	4	17	10	6	12	0	5	28	180
09:15	1	60	5	0	2	66	7	74	3	0	0	84	5	6	6	0	0	17	6	9	6	0	2	21	188
Grand Total	15	190	33	0	14	238	31	247	36	0	10	314	40	32	26	0	6	98	31	36	45	0	9	112	762
Approach %	6.3	79.8	13.9	0	-	-	9.9	78.7	11.5	0	-	-	40.8	32.7	26.5	0	-	-	27.7	32.1	40.2	0	-	-	-
Totals %	2	24.9	4.3	0	-	31.2	4.1	32.4	4.7	0	-	41.2	5.2	4.2	3.4	0	-	12.9	4.1	4.7	5.9	0	-	14.7	-
PHF	0.42	0.79	0.55	0	-	0.9	0.7	0.83	0.75	0	-	0.91	0.59	0.67	0.81	0	-	0.66	0.78	0.6	0.8	0	-	0.76	0.95
Cars	14	170	32	0	-	216	22	217	35	0	-	274	35	32	26	0	-	93	30	34	37	0	-	101	684
% Cars	93.3	89.5	97	0	-	90.8	71	87.9	97.2	0	-	87.3	87.5	100	100	0	-	94.9	96.8	94.4	82.2	0	-	90.2	89.8
Trucks	1	20	1	0	-	22	9	30	1	0	-	40	5	0	0	0	-	5	1	2	8	0	-	11	78
% Trucks	6.7	10.5	3	0	-	9.2	29	12.1	2.8	0	-	12.7	12.5	0	0	0	-	5.1	3.2	5.6	17.8	0	-	9.8	10.2
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0	0
Peds	-	-	-	-	14	-	-	-	-	-	10	-	-	-	-	-	6	-	-	-	-	-	9	-	39
% Peds	-	-	-	-	35.9	-	-	-	-	-	25.6	-	-	-	-	-	15.4	-	-	-	-	-	23.1	-	-

Peak Hour Diagram

Specified Period

From: 15:00:00
To: 18:00:00

One Hour Peak

From: 16:00:00
To: 17:00:00




Intersection: Main St & Toronto St
Site Code: 2208500001
Count Date: Mar 31, 2022

Weather conditions: Clear




**** Signalized Intersection ****





Major Road: Toronto St runs N/S

North Approach




	Out	In	Total
	289	316	605
	20	18	38
	0	0	0
Totals	309	334	643

Toronto St








	0	0	0	0
	0	18	2	0
	43	224	22	0
Totals	43	242	24	0

East Approach

	Out	In	Total
	88	85	173
	5	3	8
	0	0	0
Totals	93	88	181

Main St

				Totals
	0	0	0	0
	0	1	41	42
	0	1	30	31
	0	4	68	72

Peds: 3








Peds: 4






Peds: 4








Peds: 7

Main St

Totals			
	0	0	0
	31	29	2
	29	26	3
	33	33	0




West Approach

	Out	In	Total
	139	125	264
	6	9	15
	0	0	0
Totals	145	134	279


				
Totals	62	261	33	0
	56	246	33	0
	6	15	0	0
	0	0	0	0

Toronto St

South Approach

	Out	In	Total
	335	325	660
	21	22	43
	0	0	0
Totals	356	347	703

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Main St & Toronto St
Site Code: 2208500001
Count Date: Mar 31, 2022
Period: 15:00 - 18:00

Peak Hour Data (16:00 - 17:00)

Start Time	North Approach Toronto St						South Approach Toronto St						East Approach Main St						West Approach Main St						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
16:00	10	61	11	0	2	82	15	64	11	0	2	90	10	6	4	0	1	20	8	8	16	0	2	32	224
16:15	3	73	16	0	1	92	18	72	5	0	2	95	7	6	8	0	3	21	11	6	19	0	1	36	244
16:30	6	52	6	0	0	64	11	75	11	0	3	97	12	9	9	0	0	30	7	11	26	0	0	44	235
16:45	5	56	10	0	1	71	18	50	6	0	0	74	4	8	10	0	0	22	16	6	11	0	0	33	200
Grand Total	24	242	43	0	4	309	62	261	33	0	7	356	33	29	31	0	4	93	42	31	72	0	3	145	903
Approach %	7.8	78.3	13.9	0	-	-	17.4	73.3	9.3	0	-	-	35.5	31.2	33.3	0	-	-	29	21.4	49.7	0	-	-	-
Totals %	2.7	26.8	4.8	0	-	34.2	6.9	28.9	3.7	0	-	39.4	3.7	3.2	3.4	0	-	10.3	4.7	3.4	8	0	-	16.1	-
PHF	0.6	0.83	0.67	0	-	0.84	0.86	0.87	0.75	0	-	0.92	0.69	0.81	0.78	0	-	0.78	0.66	0.7	0.69	0	-	0.82	0.93
Cars	22	224	43	0	-	289	56	246	33	0	-	335	33	26	29	0	-	88	41	30	68	0	-	139	851
% Cars	91.7	92.6	100	0	-	93.5	90.3	94.3	100	0	-	94.1	100	89.7	93.5	0	-	94.6	97.6	96.8	94.4	0	-	95.9	94.2
Trucks	2	18	0	0	-	20	6	15	0	0	-	21	0	3	2	0	-	5	1	1	4	0	-	6	52
% Trucks	8.3	7.4	0	0	-	6.5	9.7	5.7	0	0	-	5.9	0	10.3	6.5	0	-	5.4	2.4	3.2	5.6	0	-	4.1	5.8
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Peds	-	-	-	-	4	-	-	-	-	-	7	-	-	-	-	-	4	-	-	-	-	-	3	-	18
% Peds	-	-	-	-	22.2	-	-	-	-	-	38.9	-	-	-	-	-	22.2	-	-	-	-	-	16.7	-	-

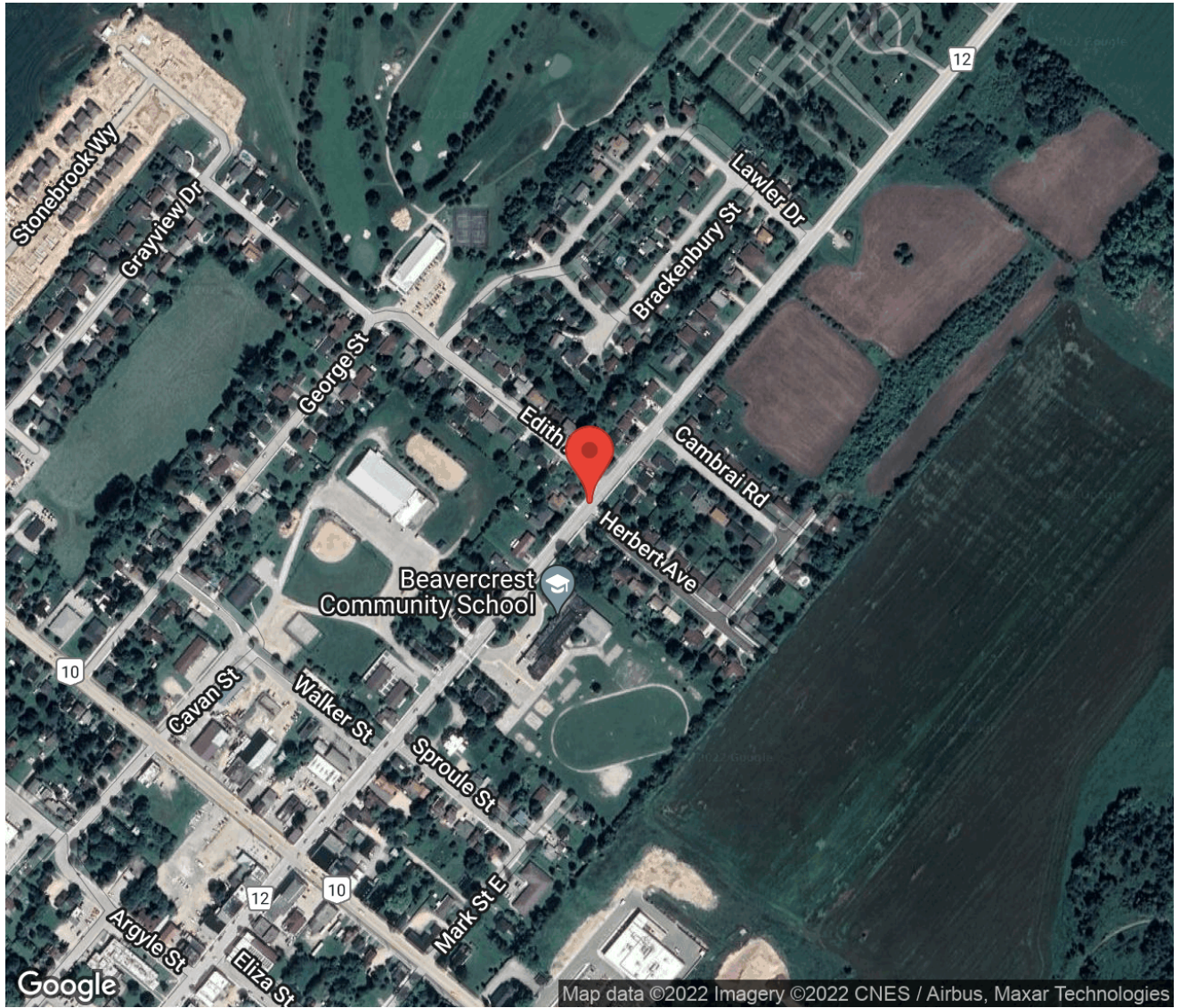
Project #22-085 - Tatham Engineering Ltd

Intersection Count Report

Intersection:	Main St E & Herbert Ave
Municipality:	Markdale
Count Date:	Mar 31, 2022
Site Code:	2208500002
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 15:00-18:00
Weather:	Clear

Traffic Count Map

Intersection:	Main St E & Herbert Ave
Site Code:	2208500002
Municipality:	Markdale
Count Date:	Mar 31, 2022



Traffic Count Summary

Intersection: Main St E & Herbert Ave
 Site Code: 2208500002
 Municipality: Markdale
 Count Date: Mar 31, 2022

Herbert Ave - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	0	0	0	0	0	0	2	0	0	0	2	2	2
08:00 - 09:00	0	0	0	0	0	0	1	0	3	0	4	16	4
09:00 - 10:00	0	0	0	0	0	0	5	0	0	0	5	2	5
BREAK													
15:00 - 16:00	0	0	0	0	0	0	2	0	0	0	2	11	2
16:00 - 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00 - 18:00	0	0	0	0	0	0	3	0	1	0	4	1	4
GRAND TOTAL	0	0	0	0	0	0	13	0	4	0	17	32	17

Traffic Count Summary

Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Municipality: Markdale
Count Date: Mar 31, 2022

Main St E - Traffic Summary

East Approach Totals							West Approach Totals						
Hour	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						Total
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	0	54	0	0	54	0	0	44	1	0	45	1	99
08:00 - 09:00	1	106	0	0	107	6	0	72	1	0	73	6	180
09:00 - 10:00	0	77	0	0	77	2	0	69	5	0	74	1	151
BREAK													
15:00 - 16:00	0	87	0	0	87	3	0	101	2	0	103	2	190
16:00 - 17:00	0	93	0	0	93	1	0	108	1	0	109	0	202
17:00 - 18:00	1	70	0	0	71	1	0	103	7	0	110	2	181
GRAND TOTAL	2	487	0	0	489	13	0	497	17	0	514	12	1003

Traffic Count Data

Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Municipality: Markdale
Count Date: Mar 31, 2022

South Approach - Herbert Ave

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:00	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	1
08:15	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	8
08:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
09:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
09:15	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
09:30	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	8	0	1	0	9	0	0	2	0	2	0	0	0	0	0	20

Traffic Count Data

Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Municipality: Markdale
Count Date: Mar 31, 2022

South Approach - Herbert Ave

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	8
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	5	0	1	0	6	0	0	0	0	0	0	0	0	0	0	12
GRAND TOTAL	13	0	2	0	15	0	0	2	0	2	0	0	0	0	0	32

Traffic Count Data

Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Municipality: Markdale
Count Date: Mar 31, 2022

East Approach - Main St E

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:00	0	13	0	0	13	0	0	0	0	0	0	0	0	0	0	0
07:15	0	8	0	0	8	0	1	0	0	1	0	0	0	0	0	0
07:30	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0
07:45	0	21	0	0	21	0	2	0	0	2	0	0	0	0	0	0
08:00	0	32	0	0	32	0	2	0	0	2	0	0	0	0	0	0
08:15	0	17	0	0	17	0	3	0	0	3	0	0	0	0	0	2
08:30	0	19	0	0	19	1	5	0	0	6	0	0	0	0	0	0
08:45	0	24	0	0	24	0	4	0	0	4	0	0	0	0	0	4
09:00	0	11	0	0	11	0	2	0	0	2	0	0	0	0	0	0
09:15	0	13	0	0	13	0	5	0	0	5	0	0	0	0	0	2
09:30	0	22	0	0	22	0	4	0	0	4	0	0	0	0	0	0
09:45	0	18	0	0	18	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	0	207	0	0	207	1	30	0	0	31	0	0	0	0	0	8

Traffic Count Data

Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Municipality: Markdale
Count Date: Mar 31, 2022

East Approach - Main St E

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	0	31	0	0	31	0	2	0	0	2	0	0	0	0	0	1
15:15	0	14	0	0	14	0	8	0	0	8	0	0	0	0	0	2
15:30	0	16	0	0	16	0	1	0	0	1	0	0	0	0	0	0
15:45	0	13	0	0	13	0	2	0	0	2	0	0	0	0	0	0
16:00	0	18	0	0	18	0	5	0	0	5	0	0	0	0	0	1
16:15	0	17	0	0	17	0	5	0	0	5	0	0	0	0	0	0
16:30	0	25	0	0	25	0	4	0	0	4	0	0	0	0	0	0
16:45	0	16	0	0	16	0	3	0	0	3	0	0	0	0	0	0
17:00	0	11	0	0	11	0	1	0	0	1	0	0	0	0	0	0
17:15	0	18	0	0	18	0	1	0	0	1	0	0	0	0	0	1
17:30	0	18	0	0	18	0	1	0	0	1	0	0	0	0	0	0
17:45	1	19	0	0	20	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	1	216	0	0	217	0	34	0	0	34	0	0	0	0	0	5
GRAND TOTAL	1	423	0	0	424	1	64	0	0	65	0	0	0	0	0	13

Traffic Count Data

Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Municipality: Markdale
Count Date: Mar 31, 2022

West Approach - Main St E

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	9	0	0	9	0	3	0	0	3	0	0	0	0	0	0
07:15	0	7	1	0	8	0	0	0	0	0	0	0	0	0	0	0
07:30	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	1
07:45	0	17	0	0	17	0	2	0	0	2	0	0	0	0	0	0
08:00	0	14	0	0	14	0	4	1	0	5	0	0	0	0	0	0
08:15	0	15	0	0	15	0	5	0	0	5	0	0	0	0	0	3
08:30	0	7	0	0	7	0	4	0	0	4	0	0	0	0	0	0
08:45	0	20	0	0	20	0	3	0	0	3	0	0	0	0	0	3
09:00	0	15	0	0	15	0	1	0	0	1	0	0	0	0	0	0
09:15	0	20	1	0	21	0	3	1	0	4	0	0	0	0	0	0
09:30	0	11	3	0	14	0	2	0	0	2	0	0	0	0	0	1
09:45	0	15	0	0	15	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	0	156	5	0	161	0	29	2	0	31	0	0	0	0	0	8

Traffic Count Data

Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Municipality: Markdale
Count Date: Mar 31, 2022

West Approach - Main St E

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	0	23	1	0	24	0	1	0	0	1	0	0	0	0	0	0
15:15	0	23	1	0	24	0	3	0	0	3	0	0	0	0	0	1
15:30	0	28	0	0	28	0	1	0	0	1	0	0	0	0	0	0
15:45	0	20	0	0	20	0	2	0	0	2	0	0	0	0	0	1
16:00	0	16	1	0	17	0	3	0	0	3	0	0	0	0	0	0
16:15	0	32	0	0	32	0	2	0	0	2	0	0	0	0	0	0
16:30	0	28	0	0	28	0	2	0	0	2	0	0	0	0	0	0
16:45	0	24	0	0	24	0	1	0	0	1	0	0	0	0	0	0
17:00	0	24	1	0	25	0	0	0	0	0	0	0	0	0	0	1
17:15	0	30	3	0	33	0	2	0	0	2	0	0	0	0	0	1
17:30	0	23	0	0	23	0	1	0	0	1	0	0	0	0	0	0
17:45	0	21	3	0	24	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	0	292	10	0	302	0	20	0	0	20	0	0	0	0	0	4
GRAND TOTAL	0	448	15	0	463	0	49	2	0	51	0	0	0	0	0	12

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 10:00:00

One Hour Peak

From: 08:00:00
To: 09:00:00




Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Count Date: Mar 31, 2022

Weather conditions: Clear




**** Unsignalized Intersection ****

Major Road: Main St E runs E/W

East Approach

	Out	In	Total
	92	57	149
	15	18	33
	0	0	0
	107	75	182

Main St E

			Totals
0	0	0	0
0	16	56	72
0	1	0	1




Peds: 6

Peds: 0












Peds: 6

Main St E

Totals			
0	0	0	0
106	92	14	0
1	0	1	0




West Approach

	Out	In	Total
	56	93	149
	17	14	31
	0	0	0
	73	107	180


Totals			
	1	1	0
	0	2	0
	0	0	0

Herbert Ave

South Approach

	Out	In	Total
	2	0	2
	2	2	4
	0	0	0
	4	2	6

 - Cars

 - Trucks

















 - Bicycles

Comments

Peak Hour Summary

Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Count Date: Mar 31, 2022
Period: 07:00 - 10:00

Peak Hour Data (08:00 - 09:00)

	North Approach						South Approach Herbert Ave						East Approach Main St E						West Approach Main St E						Total Vehicl es
Start Time					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
08:00					0		0		2	0	1	2	0	34		0	0	34		18	1	0	0	19	55
08:15					0		0		1	0	8	1	0	20		0	2	20		20	0	0	3	20	41
08:30					0		1		0	0	3	1	1	24		0	0	25		11	0	0	0	11	37
08:45					0		0		0	0	4	0	0	28		0	4	28		23	0	0	3	23	51
Grand Total					0	0	1		3	0	16	4	1	106		0	6	107		72	1	0	6	73	184
Approach %					-		25		75	0	-		0.9	99.1		0	-		98.6	1.4	0	-			
Totals %					0		0.5		1.6	0	2.2		0.5	57.6		0	58.2		39.1	0.5	0	39.7			
PHF					0		0.25		0.38	0	0.5		0.25	0.78		0	0.79		0.78	0.25	0	0.79		0.84	
Cars					0		1		1	0	2		0	92		0	92		56	0	0	56		150	
% Cars					0		100		33.3	0	50		0	86.8		0	86		77.8	0	0	76.7		81.5	
Trucks					0		0		2	0	2		1	14		0	15		16	1	0	17		34	
% Trucks					0		0		66.7	0	50		100	13.2		0	14		22.2	100	0	23.3		18.5	
Bicycles					0		0		0	0	0		0	0		0	0		0	0	0	0		0	
% Bicycles					0		0		0	0	0		0	0		0	0		0	0	0	0		0	
Peds					0	-					16	-					6	-					6	-	28
% Peds					0	-					57.1	-					21.4	-					21.4	-	

Peak Hour Diagram

Specified Period

From: 15:00:00
To: 18:00:00

One Hour Peak

From: 16:00:00
To: 17:00:00




Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Count Date: Mar 31, 2022

Weather conditions: Clear




**** Unsignalized Intersection ****

Major Road: Main St E runs E/W

East Approach

	Out	In	Total
	76	100	176
	17	8	25
	0	0	0
	93	108	201

Main St E

			Totals
0	0	0	0
0	8	100	108
0	0	1	1




Peds: 0

Peds: 0












Peds: 1

Main St E

Totals			
0	0	0	0
93	76	17	0
0	0	0	0




West Approach

	Out	In	Total
	101	76	177
	8	17	25
	0	0	0
	109	93	202


Totals			
	0	0	0
	0	0	0
	0	0	0

Herbert Ave

South Approach

	Out	In	Total
	0	1	1
	0	0	0
	0	0	0
	0	1	1

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Main St E & Herbert Ave
Site Code: 2208500002
Count Date: Mar 31, 2022
Period: 15:00 - 18:00

Peak Hour Data (16:00 - 17:00)

	North Approach						South Approach Herbert Ave						East Approach Main St E						West Approach Main St E						Total Vehicl es
Start Time	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
16:00					0		0		0	0	0	0	0	23		0	1	23		19	1	0	0	20	43
16:15					0		0		0	0	0	22	0	0		22	34	0		0	34	56			
16:30					0		0		0	0	0	29	0	0		29	30	0		0	30		59		
16:45					0		0		0	0	0	19	0	0		19	25	0		0	25			44	
Grand Total					0	0	0		0	0	0	0	0	93		0	1	93		108	1	0	0	109	202
Approach %					-		0		0	0	-		0	100		0	-		99.1	0.9	0	-			
Totals %					0		0		0	0	0		0	46		0	46		53.5	0.5	0	54			
PHF					0		0		0	0	0		0	0.8		0	0.8		0.79	0.25	0	0.8	0.86		
Cars					0		0		0	0	0		0	76		0	76		100	1	0	101	177		
% Cars					0		0		0	0	0		0	81.7		0	81.7		92.6	100	0	92.7	87.6		
Trucks					0		0		0	0	0		0	17		0	17		8	0	0	8	25		
% Trucks					0		0		0	0	0		0	18.3		0	18.3		7.4	0	0	7.3	12.4		
Bicycles					0		0		0	0	0		0	0		0	0		0	0	0	0	0		
% Bicycles					0		0		0	0	0		0	0		0	0		0	0	0	0	0		
Peds					0	-					0	-					1	-					0	-	1
% Peds					0	-					0	-					100	-					0	-	

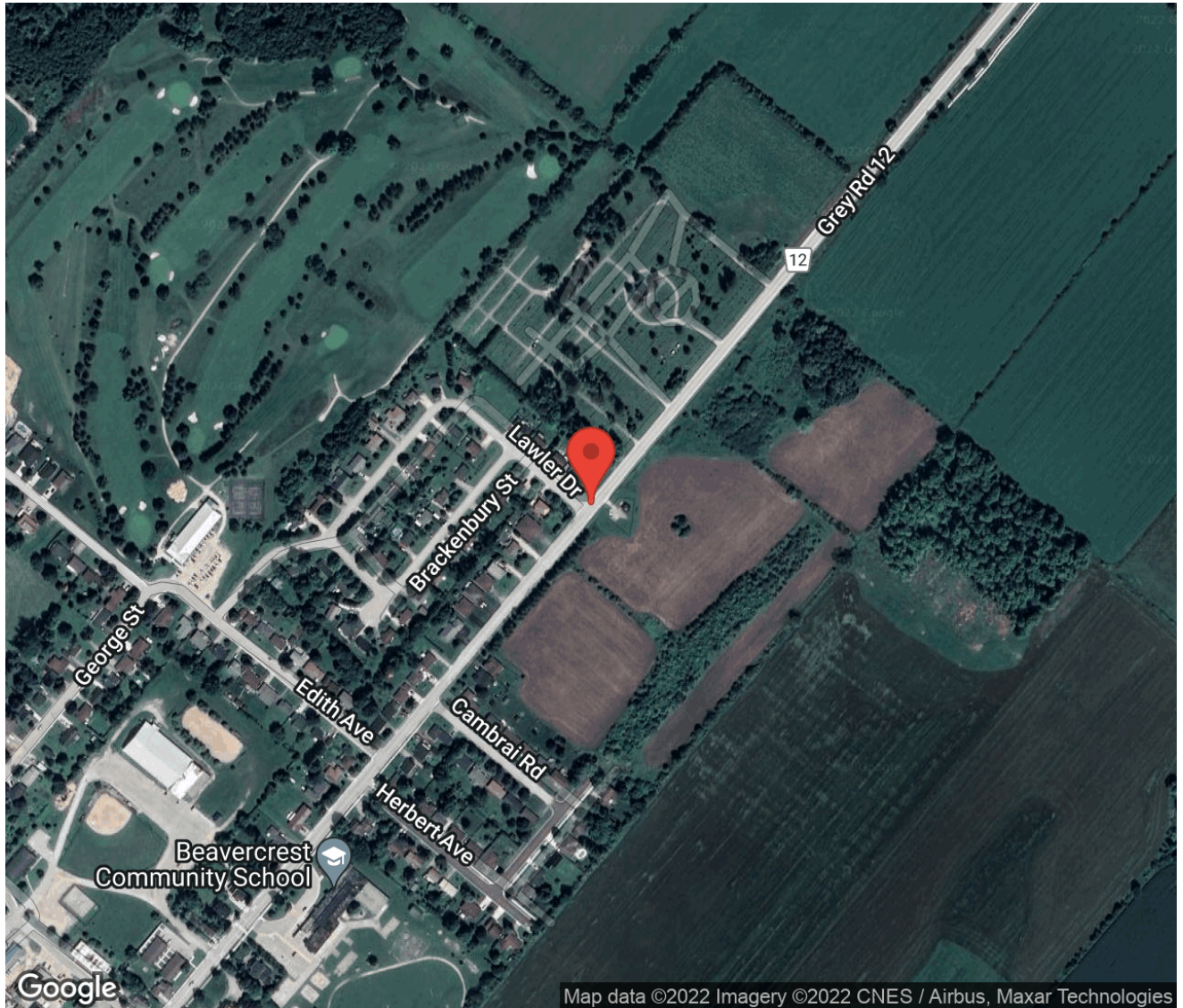
Project #22-085 - Tatham Engineering Ltd

Intersection Count Report

Intersection:	Main St E & Lawler Dr
Municipality:	Markdale
Count Date:	Mar 31, 2022
Site Code:	2208500003
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 15:00-18:00
Weather:	Clear

Traffic Count Map

Intersection:	Main St E & Lawler Dr
Site Code:	2208500003
Municipality:	Markdale
Count Date:	Mar 31, 2022



Traffic Count Summary

Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Municipality: Markdale
Count Date: Mar 31, 2022

Lawler Dr - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	0	0	3	0	3	0	0	0	0	0	0	0	3
08:00 - 09:00	0	0	6	0	6	1	0	0	0	0	0	0	6
09:00 - 10:00	0	0	4	0	4	0	0	0	0	0	0	0	4
BREAK													
15:00 - 16:00	1	0	7	0	8	0	0	0	0	0	0	0	8
16:00 - 17:00	4	0	1	0	5	0	0	0	0	0	0	0	5
17:00 - 18:00	0	0	3	0	3	0	0	0	0	0	0	0	3
GRAND TOTAL	5	0	24	0	29	1	0	0	0	0	0	0	29

Traffic Count Summary

Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Municipality: Markdale
Count Date: Mar 31, 2022

Main St E - Traffic Summary

Hour	East Approach Totals						West Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	0	51	0	0	51	0	0	45	0	0	45	0	96
08:00 - 09:00	0	98	1	0	99	0	4	69	0	0	73	0	172
09:00 - 10:00	0	79	0	0	79	0	2	66	0	0	68	0	147
BREAK													
15:00 - 16:00	0	78	1	0	79	0	6	98	0	0	104	0	183
16:00 - 17:00	0	93	0	0	93	0	3	101	0	0	104	0	197
17:00 - 18:00	0	68	2	0	70	0	3	101	0	0	104	0	174
GRAND TOTAL	0	467	4	0	471	0	18	480	0	0	498	0	969

Traffic Count Data

Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Municipality: Markdale
Count Date: Mar 31, 2022

North Approach - Lawler Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	0	0	12	0	12	0	0	1	0	1	0	0	0	0	0	1

Traffic Count Data

Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Municipality: Markdale
Count Date: Mar 31, 2022

North Approach - Lawler Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
15:15	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	2	0	2	0	0	1	0	1	0	0	0	0	0	0
16:00	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
16:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	5	0	10	0	15	0	0	1	0	1	0	0	0	0	0	0
GRAND TOTAL	5	0	22	0	27	0	0	2	0	2	0	0	0	0	0	1

Traffic Count Data

Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Municipality: Markdale
Count Date: Mar 31, 2022

East Approach - Main St E

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	11	0	0	11	0	1	0	0	1	0	0	0	0	0	0
07:15	0	11	0	0	11	0	1	0	0	1	0	0	0	0	0	0
07:30	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0
07:45	0	17	0	0	17	0	2	0	0	2	0	0	0	0	0	0
08:00	0	31	0	0	31	0	1	0	0	1	0	0	0	0	0	0
08:15	0	19	0	0	19	0	4	1	0	5	0	0	0	0	0	0
08:30	0	15	0	0	15	0	5	0	0	5	0	0	0	0	0	0
08:45	0	20	0	0	20	0	3	0	0	3	0	0	0	0	0	0
09:00	0	12	0	0	12	0	3	0	0	3	0	0	0	0	0	0
09:15	0	14	0	0	14	0	5	0	0	5	0	0	0	0	0	0
09:30	0	19	0	0	19	0	3	0	0	3	0	0	0	0	0	0
09:45	0	20	0	0	20	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	0	197	0	0	197	0	31	1	0	32	0	0	0	0	0	0

Traffic Count Data

Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Municipality: Markdale
Count Date: Mar 31, 2022

East Approach - Main St E

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	0	27	1	0	28	0	2	0	0	2	0	0	0	0	0	0
15:15	0	12	0	0	12	0	7	0	0	7	0	0	0	0	0	0
15:30	0	17	0	0	17	0	2	0	0	2	0	0	0	0	0	0
15:45	0	10	0	0	10	0	1	0	0	1	0	0	0	0	0	0
16:00	0	15	0	0	15	0	6	0	0	6	0	0	0	0	0	0
16:15	0	19	0	0	19	0	4	0	0	4	0	0	0	0	0	0
16:30	0	26	0	0	26	0	3	0	0	3	0	0	0	0	0	0
16:45	0	16	0	0	16	0	4	0	0	4	0	0	0	0	0	0
17:00	0	13	1	0	14	0	1	0	0	1	0	0	0	0	0	0
17:15	0	15	0	0	15	0	0	0	0	0	0	0	0	0	0	0
17:30	0	16	0	0	16	0	1	0	0	1	0	0	0	0	0	0
17:45	0	20	1	0	21	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	0	206	3	0	209	0	33	0	0	33	0	0	0	0	0	0
GRAND TOTAL	0	403	3	0	406	0	64	1	0	65	0	0	0	0	0	0

Traffic Count Data

Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Municipality: Markdale
Count Date: Mar 31, 2022

West Approach - Main St E

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	10	0	0	10	0	3	0	0	3	0	0	0	0	0	0
07:15	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0
07:30	0	5	0	0	5	0	1	0	0	1	0	0	0	0	0	0
07:45	0	16	0	0	16	0	2	0	0	2	0	0	0	0	0	0
08:00	1	13	0	0	14	0	4	0	0	4	0	0	0	0	0	0
08:15	0	17	0	0	17	0	6	0	0	6	0	0	0	0	0	0
08:30	0	10	0	0	10	0	4	0	0	4	0	0	0	0	0	0
08:45	3	12	0	0	15	0	3	0	0	3	0	0	0	0	0	0
09:00	1	13	0	0	14	0	2	0	0	2	0	0	0	0	0	0
09:15	1	18	0	0	19	0	2	0	0	2	0	0	0	0	0	0
09:30	0	13	0	0	13	0	2	0	0	2	0	0	0	0	0	0
09:45	0	13	0	0	13	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	6	148	0	0	154	0	32	0	0	32	0	0	0	0	0	0

Traffic Count Data

Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Municipality: Markdale
Count Date: Mar 31, 2022

West Approach - Main St E

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	1	20	0	0	21	0	1	0	0	1	0	0	0	0	0	0
15:15	1	25	0	0	26	0	3	0	0	3	0	0	0	0	0	0
15:30	4	22	0	0	26	0	1	0	0	1	0	0	0	0	0	0
15:45	0	23	0	0	23	0	3	0	0	3	0	0	0	0	0	0
16:00	3	15	0	0	18	0	2	0	0	2	0	0	0	0	0	0
16:15	0	29	0	0	29	0	1	0	0	1	0	0	0	0	0	0
16:30	0	29	0	0	29	0	3	0	0	3	0	0	0	0	0	0
16:45	0	21	0	0	21	0	1	0	0	1	0	0	0	0	0	0
17:00	1	25	0	0	26	0	1	0	0	1	0	0	0	0	0	0
17:15	0	29	0	0	29	0	1	0	0	1	0	0	0	0	0	0
17:30	1	23	0	0	24	0	1	0	0	1	0	0	0	0	0	0
17:45	1	20	0	0	21	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	12	281	0	0	293	0	19	0	0	19	0	0	0	0	0	0
GRAND TOTAL	18	429	0	0	447	0	51	0	0	51	0	0	0	0	0	0

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 10:00:00

One Hour Peak

From: 08:00:00
To: 09:00:00




Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Count Date: Mar 31, 2022

Weather conditions: Clear




**** Unsignalized Intersection ****




Major Road: Main St E runs E/W

North Approach




	Out	In	Total
	5	4	9
	1	1	2
	0	0	0
	6	5	11

Lawler Dr




	0	0	0
	1	0	0
	5	0	0
Totals	6	0	0








East Approach

	Out	In	Total
	85	52	137
	14	17	31
	0	0	0
	99	69	168

Main St E

				Totals
	0	0	0	0
	0	0	4	4
	0	17	52	69




Peds: 1




Peds: 0



Peds: 0




Main St E

Totals			
0	0	0	0
1	0	1	0
98	85	13	0






Peds: 0

West Approach

	Out	In	Total
	56	90	146
	17	14	31
	0	0	0
	73	104	177

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Count Date: Mar 31, 2022
Period: 07:00 - 10:00

Peak Hour Data (08:00 - 09:00)

Start Time	North Approach Lawler Dr						South Approach						East Approach Main St E						West Approach Main St E						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
08:00	0		2	0	0	2					0			32	0	0	0	32	1	17		0	0	18	52
08:15	0		0	0	1	0					0			23	1	0	0	24	0	23		0	0	23	47
08:30	0		1	0	0	1					0			20	0	0	0	20	0	14		0	0	14	35
08:45	0		3	0	0	3					0			23	0	0	0	23	3	15		0	0	18	44
Grand Total	0		6	0	1	6					0	0		98	1	0	0	99	4	69		0	0	73	178
Approach %	0		100	0	-	-					-	-		99	1	0	-	-	5.5	94.5		0	-	-	-
Totals %	0		3.4	0	3.4						0			55.1	0.6	0		55.6	2.2	38.8		0		41	
PHF	0		0.5	0	0.5						0			0.77	0.25	0		0.77	0.33	0.75		0		0.79	0.86
Cars	0		5	0		5					0			85	0	0		85	4	52		0		56	146
% Cars	0		83.3	0		83.3					0			86.7	0	0		85.9	100	75.4		0		76.7	82
Trucks	0		1	0		1					0			13	1	0		14	0	17		0		17	32
% Trucks	0		16.7	0		16.7					0			13.3	100	0		14.1	0	24.6		0		23.3	18
Bicycles	0		0	0		0					0			0	0	0		0	0	0		0		0	0
% Bicycles	0		0	0		0					0			0	0	0		0	0	0		0		0	0
Peds					1	-					0	-					0	-				0	-		1
% Peds					100	-					0	-					0	-				0	-		-

Peak Hour Diagram

Specified Period

From: 15:00:00
To: 18:00:00

One Hour Peak

From: 16:00:00
To: 17:00:00




Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Count Date: Mar 31, 2022

Weather conditions: Clear


**** Unsignalized Intersection ****

Major Road: Main St E runs E/W


North Approach

	Out	In	Total
	5	3	8
	0	0	0
	0	0	0
	5	3	8




Lawler Dr

	0	0	0
	0	0	0
	1	4	0
Totals	1	4	0











East Approach

	Out	In	Total
	76	98	174
	17	7	24
	0	0	0
	93	105	198

Main St E

				Totals
	0	0	0	0
	0	0	3	3
	0	7	94	101

Peds: 0









Peds: 0

Peds: 0




Peds: 0


Main St E


Totals			
0	0	0	0
0	0	0	0
93	76	17	0

West Approach

	Out	In	Total
	97	77	174
	7	17	24
	0	0	0
	104	94	198

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Main St E & Lawler Dr
Site Code: 2208500003
Count Date: Mar 31, 2022
Period: 15:00 - 18:00

Peak Hour Data (16:00 - 17:00)

Start Time	North Approach Lawler Dr						South Approach						East Approach Main St E						West Approach Main St E						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
16:00	1		1	0	0	2					0			21	0	0	0	21	3	17		0	0	20	43
16:15	0		0	0	0	0					0			23	0	0	0	23	0	30		0	0	30	53
16:30	2		0	0	0	2					0			29	0	0	0	29	0	32		0	0	32	63
16:45	1		0	0	0	1					0			20	0	0	0	20	0	22		0	0	22	43
Grand Total	4		1	0	0	5					0	0		93	0	0	0	93	3	101		0	0	104	202
Approach %	80		20	0		-					-			100	0	0		-	2.9	97.1		0		-	
Totals %	2		0.5	0		2.5					0			46	0	0		46	1.5	50		0		51.5	
PHF	0.5		0.25	0		0.63					0			0.8	0	0		0.8	0.25	0.79		0		0.81	0.8
Cars	4		1	0		5					0			76	0	0		76	3	94		0		97	178
% Cars	100		100	0		100					0			81.7	0	0		81.7	100	93.1		0		93.3	88.1
Trucks	0		0	0		0					0			17	0	0		17	0	7		0		7	24
% Trucks	0		0	0		0					0			18.3	0	0		18.3	0	6.9		0		6.7	11.9
Bicycles	0		0	0		0					0			0	0	0		0	0	0		0		0	0
% Bicycles	0		0	0		0					0			0	0	0		0	0	0		0		0	0
Peds					0	-					0	-					0	-				0	-	0	-
% Peds					0	-					0	-					0	-				0	-	0	-

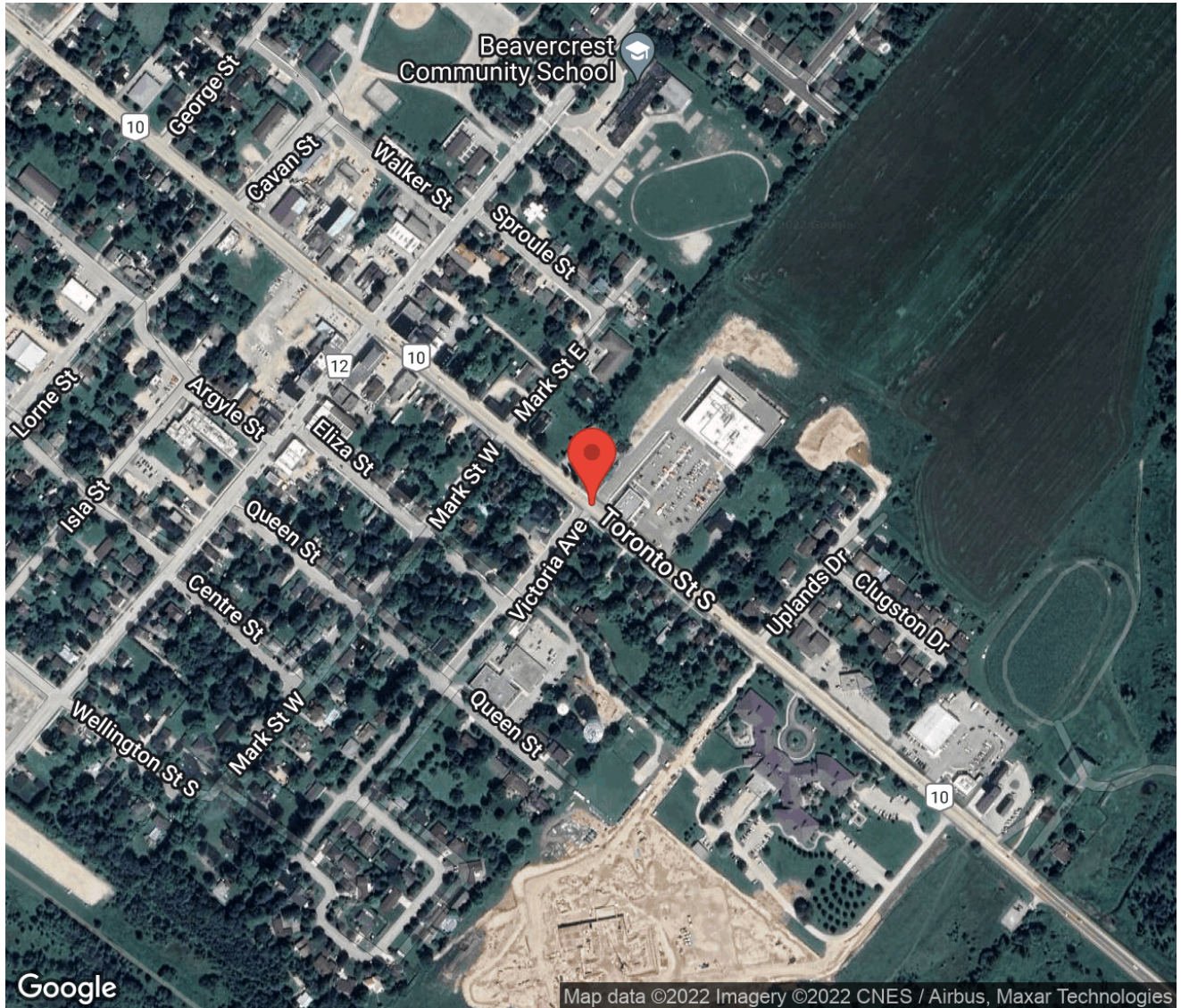
Project #22-085 - Tatham Engineering Ltd

Intersection Count Report

Intersection:	Toronto St S & Victoria St-Devonleigh Gate
Municipality:	Markdale
Count Date:	Mar 31, 2022
Site Code:	2208500004
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 15:00-18:00
Weather:	Clear

Traffic Count Map

Intersection:	Toronto St S & Victoria St-Devonleigh Gate
Site Code:	2208500004
Municipality:	Markdale
Count Date:	Mar 31, 2022



Traffic Count Summary

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Municipality: Markdale
 Count Date: Mar 31, 2022

Toronto St S - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	17	248	3	0	268	0	8	177	1	0	186	0	454
08:00 - 09:00	7	275	6	0	288	0	11	276	4	0	291	4	579
09:00 - 10:00	14	255	9	0	278	2	11	293	4	0	308	1	586
BREAK													
15:00 - 16:00	42	269	0	0	311	2	13	284	2	0	299	0	610
16:00 - 17:00	39	300	5	0	344	0	13	310	2	0	325	2	669
17:00 - 18:00	40	239	3	0	282	0	14	300	0	0	314	0	596
GRAND TOTAL	159	1586	26	0	1771	4	70	1640	13	0	1723	7	3494

Traffic Count Summary

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Municipality: Markdale
 Count Date: Mar 31, 2022

Devonleigh Gate - Traffic Summary

Hour	East Approach Totals						West Approach Totals							Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles							
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds		
07:00 - 08:00	5	0	5	0	10	0	0	0	16	0	16	0	26	
08:00 - 09:00	9	0	9	0	18	8	2	1	9	0	12	7	30	
09:00 - 10:00	23	0	16	0	39	8	11	6	15	0	32	3	71	
BREAK														
15:00 - 16:00	31	3	30	0	64	4	6	10	20	0	36	0	100	
16:00 - 17:00	27	2	32	0	61	3	13	2	25	0	40	1	101	
17:00 - 18:00	16	3	25	0	44	9	3	4	11	0	18	0	62	
GRAND TOTAL	111	8	117	0	236	32	35	23	96	0	154	11	390	

Traffic Count Data

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Municipality: Markdale
 Count Date: Mar 31, 2022

North Approach - Toronto St S

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	4	54	1	0	59	0	4	0	0	4	0	0	0	0	0	0
07:15	6	49	0	0	55	0	6	0	0	6	0	0	0	0	0	0
07:30	2	67	1	0	70	1	6	0	0	7	0	0	0	0	0	0
07:45	4	55	0	0	59	0	7	1	0	8	0	0	0	0	0	0
08:00	2	66	2	0	70	0	7	0	0	7	0	0	0	0	0	0
08:15	1	62	0	0	63	0	5	0	0	5	0	0	0	0	0	0
08:30	1	60	3	0	64	0	13	0	0	13	0	0	0	0	0	0
08:45	3	56	1	0	60	0	6	0	0	6	0	0	0	0	0	0
09:00	1	47	1	0	49	1	7	0	0	8	0	0	0	0	0	1
09:15	1	67	2	0	70	0	7	0	0	7	0	0	0	0	0	0
09:30	5	53	1	0	59	1	4	0	0	5	0	0	0	0	0	0
09:45	5	61	4	0	70	0	9	1	0	10	0	0	0	0	0	1
SUBTOTAL	35	697	16	0	748	3	81	2	0	86	0	0	0	0	0	2

Traffic Count Data

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Municipality: Markdale
 Count Date: Mar 31, 2022

North Approach - Toronto St S

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	9	61	0	0	70	0	5	0	0	5	0	0	0	0	0	1
15:15	10	72	0	0	82	1	10	0	0	11	0	0	0	0	0	0
15:30	15	54	0	0	69	0	10	0	0	10	0	0	0	0	0	1
15:45	7	53	0	0	60	0	4	0	0	4	0	0	0	0	0	0
16:00	5	69	1	0	75	0	7	0	0	7	0	0	0	0	0	0
16:15	14	79	1	0	94	0	5	0	0	5	0	0	0	0	0	0
16:30	11	71	3	0	85	0	6	0	0	6	0	0	0	0	0	0
16:45	9	59	0	0	68	0	4	0	0	4	0	0	0	0	0	0
17:00	19	62	0	0	81	0	3	0	0	3	0	0	0	0	0	0
17:15	6	68	0	0	74	0	6	0	0	6	0	0	0	0	0	0
17:30	9	42	1	0	52	0	3	0	0	3	0	0	0	0	0	0
17:45	6	51	2	0	59	0	4	0	0	4	0	0	0	0	0	0
SUBTOTAL	120	741	8	0	869	1	67	0	0	68	0	0	0	0	0	2
GRAND TOTAL	155	1438	24	0	1617	4	148	2	0	154	0	0	0	0	0	4

Traffic Count Data

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Municipality: Markdale
 Count Date: Mar 31, 2022

South Approach - Toronto St S

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	3	29	0	0	32	0	5	0	0	5	0	0	0	0	0	0
07:15	1	37	0	0	38	0	7	0	0	7	0	0	0	0	0	0
07:30	2	44	0	0	46	0	8	1	0	9	0	0	0	0	0	0
07:45	2	43	0	0	45	0	4	0	0	4	0	0	0	0	0	0
08:00	3	60	0	0	63	0	14	0	0	14	0	0	0	0	0	1
08:15	1	49	1	0	51	1	12	0	0	13	0	0	0	0	0	1
08:30	4	55	2	0	61	0	6	0	0	6	0	0	0	0	0	2
08:45	2	68	1	0	71	0	12	0	0	12	0	0	0	0	0	0
09:00	5	70	0	0	75	1	9	0	0	10	0	0	0	0	0	1
09:15	2	71	0	0	73	0	13	0	0	13	0	0	0	0	0	0
09:30	0	56	1	0	57	0	13	0	0	13	0	0	0	0	0	0
09:45	3	53	2	0	58	0	8	1	0	9	0	0	0	0	0	0
SUBTOTAL	28	635	7	0	670	2	111	2	0	115	0	0	0	0	0	5

Traffic Count Data

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Municipality: Markdale
 Count Date: Mar 31, 2022

South Approach - Toronto St S

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	4	56	2	0	62	0	7	0	0	7	0	0	0	0	0	0
15:15	3	75	0	0	78	1	12	0	0	13	0	0	0	0	0	0
15:30	0	62	0	0	62	0	2	0	0	2	0	0	0	0	0	0
15:45	5	66	0	0	71	0	4	0	0	4	0	0	0	0	0	0
16:00	2	68	0	0	70	0	7	0	0	7	0	0	0	0	0	2
16:15	2	86	0	0	88	0	3	0	0	3	0	0	0	0	0	0
16:30	4	78	2	0	84	0	8	0	0	8	0	0	0	0	0	0
16:45	5	55	0	0	60	0	5	0	0	5	0	0	0	0	0	0
17:00	4	79	0	0	83	0	1	0	0	1	0	0	0	0	0	0
17:15	4	78	0	0	82	0	2	0	0	2	0	0	0	0	0	0
17:30	3	71	0	0	74	0	2	0	0	2	0	0	0	0	0	0
17:45	3	65	0	0	68	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	39	839	4	0	882	1	55	0	0	56	0	0	0	0	0	2
GRAND TOTAL	67	1474	11	0	1552	3	166	2	0	171	0	0	0	0	0	7

Traffic Count Data

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Municipality: Markdale
 Count Date: Mar 31, 2022

East Approach - Devonleigh Gate

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	1	0	0	0	1	2	0	0	0	2	0	0	0	0	0	0
07:15	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
07:30	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
08:00	1	0	4	0	5	0	0	0	0	0	0	0	0	0	0	4
08:15	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
08:30	3	0	3	0	6	0	0	0	0	0	0	0	0	0	0	0
08:45	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	4
09:00	3	0	3	0	6	0	0	0	0	0	0	0	0	0	0	4
09:15	4	0	2	0	6	0	0	0	0	0	0	0	0	0	0	2
09:30	9	0	5	0	14	1	0	0	0	1	0	0	0	0	0	0
09:45	5	0	6	0	11	1	0	0	0	1	0	0	0	0	0	2
SUBTOTAL	33	0	30	0	63	4	0	0	0	4	0	0	0	0	0	16

Traffic Count Data

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Municipality: Markdale
 Count Date: Mar 31, 2022

East Approach - Devonleigh Gate

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	8	0	5	0	13	0	0	0	0	0	0	0	0	0	0	2
15:15	5	1	8	0	14	0	0	0	0	0	0	0	0	0	0	1
15:30	7	2	8	0	17	0	0	0	0	0	0	0	0	0	0	0
15:45	11	0	9	0	20	0	0	0	0	0	0	0	0	0	0	1
16:00	7	1	8	0	16	0	0	0	0	0	0	0	0	0	0	0
16:15	3	0	8	0	11	0	0	0	0	0	0	0	0	0	0	0
16:30	9	0	7	0	16	0	0	0	0	0	0	0	0	0	0	2
16:45	8	1	9	0	18	0	0	0	0	0	0	0	0	0	0	1
17:00	2	1	4	0	7	0	0	0	0	0	0	0	0	0	0	3
17:15	11	0	9	0	20	0	0	1	0	1	0	0	0	0	0	4
17:30	3	0	7	0	10	0	0	0	0	0	0	0	0	0	0	1
17:45	0	2	4	0	6	0	0	0	0	0	0	0	0	0	0	1
SUBTOTAL	74	8	86	0	168	0	0	1	0	1	0	0	0	0	0	16
GRAND TOTAL	107	8	116	0	231	4	0	1	0	5	0	0	0	0	0	32

Traffic Count Data

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Municipality: Markdale
 Count Date: Mar 31, 2022

West Approach - Victoria St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	2	0	2	0	0	1	0	1	0	0	0	0	0	0
07:45	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0
08:00	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	1
08:15	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	1
08:30	0	0	2	0	2	0	0	1	0	1	0	0	0	0	0	1
08:45	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	4
09:00	2	0	1	0	3	0	0	1	0	1	0	0	0	0	0	1
09:15	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
09:30	4	2	5	0	11	0	0	0	0	0	0	0	0	0	0	2
09:45	4	4	6	0	14	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	13	7	37	0	57	0	0	3	0	3	0	0	0	0	0	10

Traffic Count Data

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Municipality: Markdale
 Count Date: Mar 31, 2022

West Approach - Victoria St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	3	3	7	0	13	0	0	0	0	0	0	0	0	0	0	0
15:15	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	0
15:30	3	2	8	0	13	0	0	0	0	0	0	0	0	0	0	0
15:45	0	2	4	0	6	0	0	0	0	0	0	0	0	0	0	0
16:00	2	0	4	0	6	0	0	0	0	0	0	0	0	0	0	1
16:15	3	2	7	0	12	0	0	0	0	0	0	0	0	0	0	0
16:30	5	0	9	0	14	0	0	0	0	0	0	0	0	0	0	0
16:45	3	0	5	0	8	0	0	0	0	0	0	0	0	0	0	0
17:00	0	3	3	0	6	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
17:30	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0
17:45	2	1	3	0	6	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	22	16	56	0	94	0	0	0	0	0	0	0	0	0	0	1
GRAND TOTAL	35	23	93	0	151	0	0	3	0	3	0	0	0	0	0	11

Peak Hour Diagram

Specified Period

From: 07:00:00

To: 10:00:00

One Hour Peak

From: 09:00:00

To: 10:00:00

Intersection: Toronto St S & Victoria St-Devonleigh Gate

Site Code: 2208500004




Count Date: Mar 31, 2022

Weather conditions: Clear




**** Signalized Intersection ****





Major Road: Toronto St S runs N/S

North Approach




	Out	In	Total
	248	277	525
	30	43	73
	0	0	0
Totals	278	320	598

Toronto St S








	0	0	0	0
	1	27	2	0
	8	228	12	0
Totals	9	255	14	0

East Approach

	Out	In	Total
	37	21	58
	2	3	5
	0	0	0
Totals	39	24	63

Victoria St

				Totals
	0	0	0	0
	0	0	11	11
	0	0	6	6
	0	1	14	15

Peds: 2










Peds: 3




Peds: 8









Peds: 1

Devonleigh Gate

Totals			
	0	0	0
	16	16	0
	0	0	0
	23	21	2




West Approach

	Out	In	Total
	31	18	49
	1	2	3
	0	0	0
Totals	32	20	52


Totals				
	11	293	4	0
	10	250	3	0
	1	43	1	0
	0	0	0	0

Toronto St S

South Approach

	Out	In	Total
	263	263	526
	45	30	75
	0	0	0
Totals	308	293	601

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Count Date: Mar 31, 2022
 Period: 07:00 - 10:00

Peak Hour Data (09:00 - 10:00)

	North Approach Toronto St S						South Approach Toronto St S						East Approach Devonleigh Gate						West Approach Victoria St						Total Vehicl es	
Start Time	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total		
09:00	2	54	1	0	1	57	6	79	0	0	1	85	3	0	3	0	4	6	2	0	2	0	1	4	152	
09:15	1	74	2	0	0	77	2	84	0	0	0	86	4	0	2	0	2	6	1	0	2	0	0	3	172	
09:30	6	57	1	0	0	64	0	69	1	0	0	70	10	0	5	0	0	15	4	2	5	0	2	11	160	
09:45	5	70	5	0	1	80	3	61	3	0	0	67	6	0	6	0	2	12	4	4	6	0	0	14	173	
Grand Total	14	255	9	0	2	278	11	293	4	0	1	308	23	0	16	0	8	39	11	6	15	0	3	32	657	
Approach %	5	91.7	3.2	0	-	-	3.6	95.1	1.3	0	-	-	59	0	41	0	-	-	34.4	18.8	46.9	0	-	-	-	
Totals %	2.1	38.8	1.4	0	-	42.3	1.7	44.6	0.6	0	-	46.9	3.5	0	2.4	0	-	5.9	1.7	0.9	2.3	0	-	-	4.9	
PHF	0.58	0.86	0.45	0	-	0.87	0.46	0.87	0.33	0	-	0.9	0.58	0	0.67	0	-	0.65	0.69	0.38	0.63	0	-	-	0.57	0.95
Cars	12	228	8	0	-	248	10	250	3	0	-	263	21	0	16	0	-	37	11	6	14	0	-	31	579	
% Cars	85.7	89.4	88.9	0	-	89.2	90.9	85.3	75	0	-	85.4	91.3	0	100	0	-	94.9	100	100	93.3	0	-	96.9	88.1	
Trucks	2	27	1	0	-	30	1	43	1	0	-	45	2	0	0	0	-	2	0	0	1	0	-	1	78	
% Trucks	14.3	10.6	11.1	0	-	10.8	9.1	14.7	25	0	-	14.6	8.7	0	0	0	-	5.1	0	0	6.7	0	-	3.1	11.9	
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	
Peds	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	8	-	-	-	-	-	3	-	14	
% Peds	-	-	-	-	14.3	-	-	-	-	-	7.1	-	-	-	-	-	57.1	-	-	-	-	-	21.4	-	-	

Peak Hour Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 15:45:00

To: 16:45:00

Intersection: Toronto St S & Victoria St-Devonleigh Gate

Site Code: 2208500004




Count Date: Mar 31, 2022

Weather conditions: Clear




**** Signalized Intersection ****





Major Road: Toronto St S runs N/S

North Approach




	Out	In	Total
	314	340	654
	22	22	44
	0	0	0
Totals	336	362	698

Toronto St S




	0	0	0	0
	0	22	0	0
	5	272	37	0
Totals	5	294	37	0










East Approach

	Out	In	Total
	63	43	106
	0	0	0
	0	0	0
Totals	63	43	106

Victoria St

				Totals
0	0	0	0	0
0	0	10	0	10
0	0	4	0	4
0	0	24	0	24

Peds: 0










Peds: 1

Peds: 3




Peds: 2








Devonleigh Gate

Totals			
0	0	0	0
32	32	0	0
1	1	0	0
30	30	0	0




West Approach

	Out	In	Total
	38	19	57
	0	0	0
	0	0	0
Totals	38	19	57


Totals				
	13	298	2	0
	0	22	0	0
	0	0	0	0

Toronto St S

South Approach

	Out	In	Total
	313	326	639
	22	22	44
	0	0	0
Totals	335	348	683

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Toronto St S & Victoria St-Devonleigh Gate
 Site Code: 2208500004
 Count Date: Mar 31, 2022
 Period: 15:00 - 18:00

Peak Hour Data (15:45 - 16:45)

Start Time	North Approach Toronto St S						South Approach Toronto St S						East Approach Devonleigh Gate						West Approach Victoria St						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
15:45	7	57	0	0	0	64	5	70	0	0	0	75	11	0	9	0	1	20	0	2	4	0	0	6	165
16:00	5	76	1	0	0	82	2	75	0	0	2	77	7	1	8	0	0	16	2	0	4	0	1	6	181
16:15	14	84	1	0	0	99	2	89	0	0	0	91	3	0	8	0	0	11	3	2	7	0	0	12	213
16:30	11	77	3	0	0	91	4	86	2	0	0	92	9	0	7	0	2	16	5	0	9	0	0	14	213
Grand Total	37	294	5	0	0	336	13	320	2	0	2	335	30	1	32	0	3	63	10	4	24	0	1	38	772
Approach %	11	87.5	1.5	0	-	-	3.9	95.5	0.6	0	-	-	47.6	1.6	50.8	0	-	-	26.3	10.5	63.2	0	-	-	-
Totals %	4.8	38.1	0.6	0	-	43.5	1.7	41.5	0.3	0	-	43.4	3.9	0.1	4.1	0	-	8.2	1.3	0.5	3.1	0	-	4.9	-
PHF	0.66	0.88	0.42	0	-	0.85	0.65	0.9	0.25	0	-	0.91	0.68	0.25	0.89	0	-	0.79	0.5	0.5	0.67	0	-	0.68	0.91
Cars	37	272	5	0	-	314	13	298	2	0	-	313	30	1	32	0	-	63	10	4	24	0	-	38	728
% Cars	100	92.5	100	0	-	93.5	100	93.1	100	0	-	93.4	100	100	100	0	-	100	100	100	100	0	-	100	94.3
Trucks	0	22	0	0	-	22	0	22	0	0	-	22	0	0	0	0	-	0	0	0	0	0	0	0	44
% Trucks	0	7.5	0	0	-	6.5	0	6.9	0	0	-	6.6	0	0	0	0	-	0	0	0	0	0	0	0	5.7
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0	0
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0	0
Peds	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	3	-	-	-	-	-	1	-	6
% Peds	-	-	-	-	0	-	-	-	-	-	33.3	-	-	-	-	-	50	-	-	-	-	-	16.7	-	-

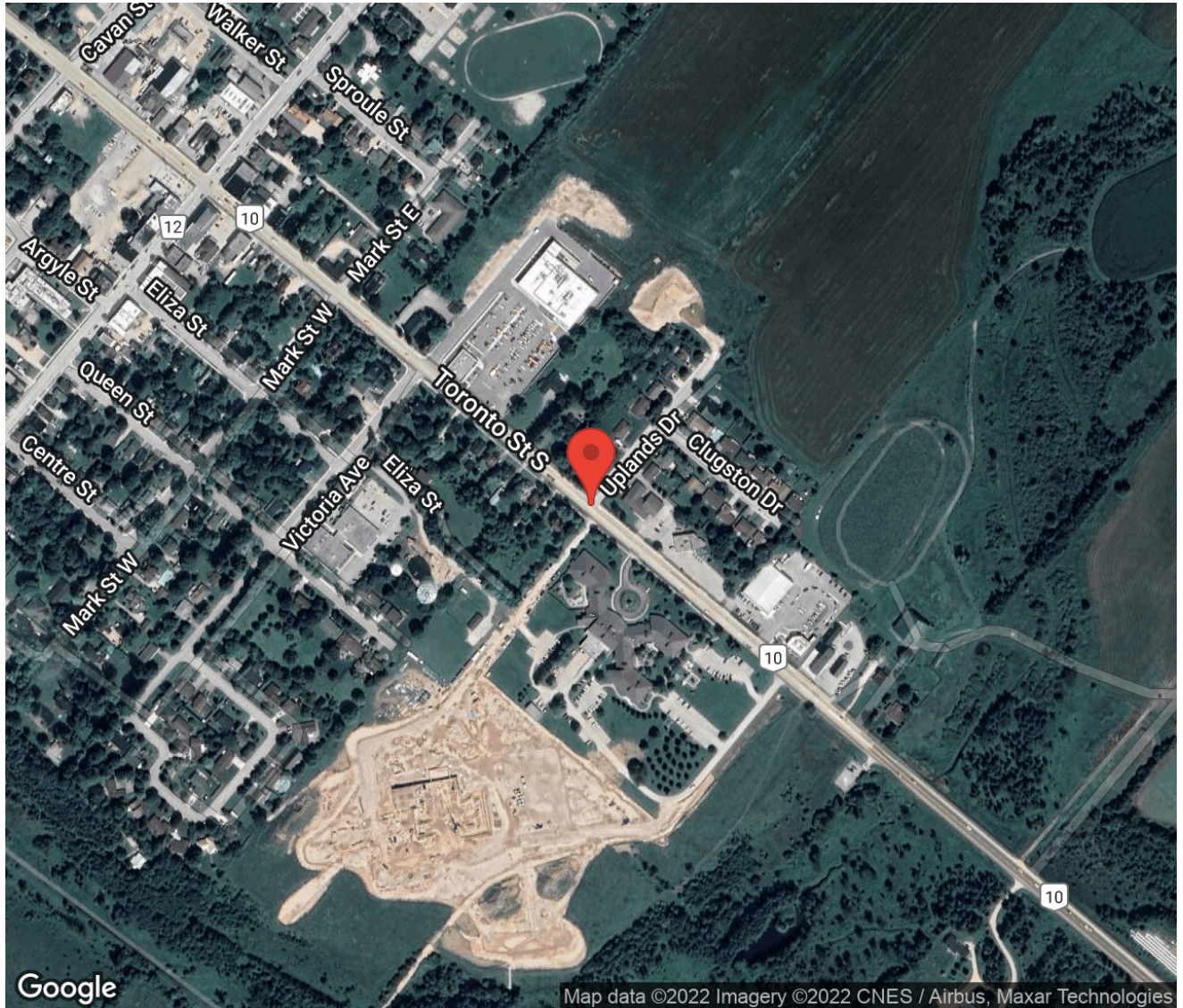
Project #22-085 - Tatham Engineering Ltd

Intersection Count Report

Intersection:	Toronto St S & Uplands Dr
Municipality:	Markdale
Count Date:	Mar 31, 2022
Site Code:	2208500005
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 15:00-18:00
Weather:	Clear

Traffic Count Map

Intersection:	Toronto St S & Uplands Dr
Site Code:	2208500005
Municipality:	Markdale
Count Date:	Mar 31, 2022



Traffic Count Summary

Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Municipality: Markdale
Count Date: Mar 31, 2022

Toronto St S - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	2	279	0	0	281	0	0	248	1	0	249	1	530
08:00 - 09:00	2	263	0	0	265	0	0	254	3	0	257	0	522
09:00 - 10:00	2	274	0	0	276	0	0	212	0	0	212	1	488
BREAK													
15:00 - 16:00	3	323	0	0	326	0	0	312	2	0	314	1	640
16:00 - 17:00	6	324	0	0	330	0	0	295	2	0	297	0	627
17:00 - 18:00	3	280	0	0	283	0	0	322	0	0	322	2	605
GRAND TOTAL	18	1743	0	0	1761	0	0	1643	8	0	1651	5	3412

Traffic Count Summary

Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Municipality: Markdale
Count Date: Mar 31, 2022

Uplands Dr - Traffic Summary

Hour	East Approach Totals						West Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	5	0	3	0	8	3	0	0	0	0	0	0	8
08:00 - 09:00	1	0	2	0	3	5	0	0	0	0	0	0	3
09:00 - 10:00	2	0	2	0	4	6	0	0	0	0	0	0	4
BREAK													
15:00 - 16:00	0	0	5	0	5	3	0	0	0	0	0	0	5
16:00 - 17:00	0	0	6	0	6	4	0	0	0	0	0	0	6
17:00 - 18:00	0	0	1	0	1	3	0	0	0	0	0	0	1
GRAND TOTAL	8	0	19	0	27	24	0	0	0	0	0	0	27

Traffic Count Data

Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Municipality: Markdale
Count Date: Mar 31, 2022

North Approach - Toronto St S

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:00	0	54	0	0	54	0	7	0	0	7	0	0	0	0	0	0
07:15	1	74	0	0	75	0	4	0	0	4	0	0	0	0	0	0
07:30	0	63	0	0	63	0	6	0	0	6	0	0	0	0	0	0
07:45	1	60	0	0	61	0	11	0	0	11	0	0	0	0	0	0
08:00	0	52	0	0	52	0	11	0	0	11	0	0	0	0	0	0
08:15	0	69	0	0	69	1	5	0	0	6	0	0	0	0	0	0
08:30	0	53	0	0	53	1	7	0	0	8	0	0	0	0	0	0
08:45	0	58	0	0	58	0	8	0	0	8	0	0	0	0	0	0
09:00	0	48	0	0	48	0	5	0	0	5	0	0	0	0	0	0
09:15	1	69	0	0	70	0	8	0	0	8	0	0	0	0	0	0
09:30	0	65	0	0	65	1	8	0	0	9	0	0	0	0	0	0
09:45	0	66	0	0	66	0	5	0	0	5	0	0	0	0	0	0
SUBTOTAL	3	731	0	0	734	3	85	0	0	88	0	0	0	0	0	0

Traffic Count Data

Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Municipality: Markdale
Count Date: Mar 31, 2022

North Approach - Toronto St S

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	0	80	0	0	80	0	6	0	0	6	0	0	0	0	0	0
15:15	0	68	0	0	68	0	7	0	0	7	0	0	0	0	0	0
15:30	2	70	0	0	72	1	9	0	0	10	0	0	0	0	0	0
15:45	0	74	0	0	74	0	9	0	0	9	0	0	0	0	0	0
16:00	1	83	0	0	84	0	7	0	0	7	0	0	0	0	0	0
16:15	4	102	0	0	106	0	4	0	0	4	0	0	0	0	0	0
16:30	0	57	0	0	57	0	5	0	0	5	0	0	0	0	0	0
16:45	1	62	0	0	63	0	4	0	0	4	0	0	0	0	0	0
17:00	1	64	0	0	65	0	4	0	0	4	0	0	0	0	0	0
17:15	1	61	0	0	62	0	4	0	0	4	0	0	0	0	0	0
17:30	0	75	0	0	75	0	6	0	0	6	0	0	0	0	0	0
17:45	1	63	0	0	64	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	11	859	0	0	870	1	68	0	0	69	0	0	0	0	0	0
GRAND TOTAL	14	1590	0	0	1604	4	153	0	0	157	0	0	0	0	0	0

Traffic Count Data

Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Municipality: Markdale
Count Date: Mar 31, 2022

South Approach - Toronto St S

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	61	0	0	61	0	4	0	0	4	0	0	0	0	0	0
07:15	0	57	0	0	57	0	5	0	0	5	0	0	0	0	0	0
07:30	0	55	0	0	55	0	8	0	0	8	0	0	0	0	0	0
07:45	0	53	1	0	54	0	5	0	0	5	0	0	0	0	0	1
08:00	0	53	1	0	54	0	6	0	0	6	0	0	0	0	0	0
08:15	0	63	0	0	63	0	11	0	0	11	0	0	0	0	0	0
08:30	0	52	0	0	52	0	5	0	0	5	0	0	0	0	0	0
08:45	0	55	2	0	57	0	9	0	0	9	0	0	0	0	0	0
09:00	0	50	0	0	50	0	4	0	0	4	0	0	0	0	0	0
09:15	0	46	0	0	46	0	5	0	0	5	0	0	0	0	0	0
09:30	0	48	0	0	48	0	7	0	0	7	0	0	0	0	0	0
09:45	0	49	0	0	49	0	3	0	0	3	0	0	0	0	0	1
SUBTOTAL	0	642	4	0	646	0	72	0	0	72	0	0	0	0	0	2

Traffic Count Data

Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Municipality: Markdale
Count Date: Mar 31, 2022

South Approach - Toronto St S

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	0	62	0	0	62	0	6	0	0	6	0	0	0	0	0	0
15:15	0	58	1	0	59	0	6	0	0	6	0	0	0	0	0	0
15:30	0	75	0	0	75	0	9	0	0	9	0	0	0	0	0	0
15:45	0	90	1	0	91	0	6	0	0	6	0	0	0	0	0	1
16:00	0	71	0	0	71	0	7	0	0	7	0	0	0	0	0	0
16:15	0	85	0	0	85	0	4	0	0	4	0	0	0	0	0	0
16:30	0	63	2	0	65	0	8	0	0	8	0	0	0	0	0	0
16:45	0	52	0	0	52	0	5	0	0	5	0	0	0	0	0	0
17:00	0	84	0	0	84	0	6	0	0	6	0	0	0	0	0	1
17:15	0	76	0	0	76	0	4	0	0	4	0	0	0	0	0	0
17:30	0	79	0	0	79	0	4	0	0	4	0	0	0	0	0	1
17:45	0	67	0	0	67	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	0	862	4	0	866	0	67	0	0	67	0	0	0	0	0	3
GRAND TOTAL	0	1504	8	0	1512	0	139	0	0	139	0	0	0	0	0	5

Traffic Count Data

Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Municipality: Markdale
Count Date: Mar 31, 2022

East Approach - Uplands Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1
07:15	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
07:30	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	2
07:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
08:45	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3
09:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
09:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
09:45	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	1
SUBTOTAL	7	0	5	0	12	1	0	2	0	3	0	0	0	0	0	14

Traffic Count Data

Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Municipality: Markdale
Count Date: Mar 31, 2022

East Approach - Uplands Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	2	0	2	0	0	1	0	1	0	0	0	0	0	2
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	3
16:15	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
16:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
SUBTOTAL	0	0	10	0	10	0	0	2	0	2	0	0	0	0	0	10
GRAND TOTAL	7	0	15	0	22	1	0	4	0	5	0	0	0	0	0	24

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 10:00:00

One Hour Peak

From: 07:30:00
To: 08:30:00




Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Count Date: Mar 31, 2022

Weather conditions: Clear




**** Unsignalized Intersection ****

Major Road: Toronto St S runs N/S

North Approach

	Out	In	Total
	245	226	471
	34	30	64
	0	0	0
Totals	279	256	535




Toronto St S

	0	0	0
	33	1	0
	244	1	0
Totals	277	2	0

Peds: 0






Peds: 1




Totals	254	2	0
	224	2	0
	30	0	0
	0	0	0

Toronto St S




East Approach

	Out	In	Total
	4	3	7
	0	1	1
	0	0	0
Totals	4	4	8


Uplands Dr

Totals			
0	0	0	0
2	2	0	0
2	2	0	0

South Approach

	Out	In	Total
	226	246	472
	30	33	63
	0	0	0
Totals	256	279	535

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Count Date: Mar 31, 2022
Period: 07:00 - 10:00

Peak Hour Data (07:30 - 08:30)

	North Approach Toronto St S						South Approach Toronto St S						East Approach Uplands Dr						West Approach						Total Vehicl es
Start Time	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
07:30	0	69	↻	0	0	69	↻	63	0	0	0	63	1	↻	1	0	2	2	↻	↻	↻	↻	0	↻	134
07:45	1	71		0	0	72		58	1	0	1	59	1		0	0	0	1					0		132
08:00	0	63		0	0	63		59	1	0	0	60	0		1	0	2	1					0		124
08:15	1	74		0	0	75		74	0	0	0	74	0		0	0	0	0					0		149
Grand Total	2	277		0	0	279		254	2	0	1	256	2		2	0	4	4					0	0	539
Approach %	0.7	99.3		0		-		99.2	0.8	0		-	50		50	0		-					-		
Totals %	0.4	51.4		0		51.8		47.1	0.4	0		47.5	0.4		0.4	0		0.7					0		
PHF	0.5	0.94		0		0.93		0.86	0.5	0		0.86	0.5		0.5	0		0.5					0		0.9
Cars	1	244		0		245		224	2	0		226	2		2	0		4					0		475
% Cars	50	88.1		0		87.8		88.2	100	0		88.3	100		100	0		100					0		88.1
Trucks	1	33		0		34		30	0	0		30	0		0	0		0					0		64
% Trucks	50	11.9		0		12.2		11.8	0	0		11.7	0		0	0		0					0		11.9
Bicycles	0	0		0		0		0	0	0		0	0		0	0		0					0		0
% Bicycles	0	0		0		0		0	0	0		0	0		0	0		0					0		0
Peds					0	-				1		-					4	-					0	-	5
% Peds					0	-				20		-					80	-					0	-	

Peak Hour Diagram

Specified Period

From: 15:00:00
To: 18:00:00

One Hour Peak

From: 15:30:00
To: 16:30:00




Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Count Date: Mar 31, 2022

Weather conditions: Clear




**** Unsignalized Intersection ****

Major Road: Toronto St S runs N/S

North Approach

	Out	In	Total
	336	324	660
	30	27	57
	0	0	0
Totals	366	351	717

Toronto St S




	0	0	0
	29	1	0
	329	7	0
Totals	358	8	0

↓ ↘ ↻

Peds: 0






Peds: 1

Totals	347	1	0
	321	1	0
	26	0	0
	0	0	0




↑ ↘ ↻

Toronto St S

East Approach




	Out	In	Total
	3	8	11
	1	1	2
	0	0	0
Totals	4	9	13

Uplands Dr


Totals			
0	0	0	0
4	3	1	0
0	0	0	0

↻ ↑ ↓

South Approach

	Out	In	Total
	322	329	651
	26	29	55
	0	0	0
Totals	348	358	706

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Toronto St S & Uplands Dr
Site Code: 2208500005
Count Date: Mar 31, 2022
Period: 15:00 - 18:00

Peak Hour Data (15:30 - 16:30)

	North Approach Toronto St S						South Approach Toronto St S						East Approach Uplands Dr						West Approach						Total Vehicl es
Start Time	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
15:30	3	79		0	0	82		84	0	0	0	84	0		0	0	1	0					0		166
15:45	0	83		0	0	83		96	1	0	1	97	0		0	0	0	0					0		0
16:00	1	90		0	0	91		78	0	0	0	78	0		2	0	3	2					0		
16:15	4	106		0	0	110		89	0	0	0	89	0		2	0	0	2					0		
Grand Total	8	358		0	0	366		347	1	0	1	348	0		4	0	4	4					0	0	718
Approach %	2.2	97.8		0		-		99.7	0.3	0		-	0		100	0		-					-		
Totals %	1.1	49.9		0		51		48.3	0.1	0		48.5	0		0.6	0		0.6					0		
PHF	0.5	0.84		0		0.83		0.9	0.25	0		0.9	0		0.5	0		0.5					0		0.89
Cars	7	329		0		336		321	1	0		322	0		3	0		3					0		661
% Cars	87.5	91.9		0		91.8		92.5	100	0		92.5	0		75	0		75					0		92.1
Trucks	1	29		0		30		26	0	0		26	0		1	0		1					0		57
% Trucks	12.5	8.1		0		8.2		7.5	0	0		7.5	0		25	0		25					0		7.9
Bicycles	0	0		0		0		0	0	0		0	0		0	0		0					0		0
% Bicycles	0	0		0		0		0	0	0		0	0		0	0		0					0		0
Peds					0	-					1	-					4	-					0	-	5
% Peds					0	-					20	-					80	-					0	-	

Appendix B: LOS Definitions

Level of Service - Unsignalized Intersections

Level of Service (LOS) for unsignalized intersections is defined in terms of control delay for each critical lane. Control delay include initial deceleration, queue move-up time, stopped delay, and final acceleration delay, and is a function of the service rate or capacity of the approach and degree of saturation.

The following table describes in detail the characteristics of each level:

LOS	Description of Traffic Operations	Delay (sec/veh)
A	Little or no delays	$0 < d \leq 10$
B	Short traffic delays	$10 < d \leq 15$
C	Average traffic delays	$15 < d \leq 25$
D	Long traffic delays	$25 < d \leq 35$
E	Very long traffic delays	$35 < d \leq 50$
F	Extreme delays with queuing which may cause congestion affecting other traffic movements in the intersection	$d > 50$

source: 2010 Highway Capacity Manual

Level of Service - Signalized Intersections

Level of Service (LOS) for signalized intersections is defined in terms of delay, which is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Only the portion of total delay attributed to the control facility is quantified. This control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay.

The following table describes in detail the characteristics of each level:

LOS	Description of Traffic Operations	Delay (sec/veh)
A	Describes operations with very low control delay, up to 10 seconds/vehicle. This level of service occurs when progression is extremely favourable and most vehicles arrive during the green phase. Most vehicles do not stop at all at this LOS. Short cycle lengths may also contribute to low delay.	$d \leq 10$
B	Describes operations with control delay greater than 10 seconds and up to 20 seconds/vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop at this level than at LOS A, causing longer average delays.	$10 < d \leq 20$
C	Describes operations with control delay greater than 20 seconds and up to 35 seconds/vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.	$20 < d \leq 35$
D	Describes operations with control delay greater than 35 seconds and up to 55 seconds/vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures become noticeable.	$35 < d \leq 55$
E	Describes operations with control delay greater than 55 seconds and up to 80 seconds/vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	$55 < d \leq 80$
F	LOS F describes operations with control delay in excess of 80 seconds/vehicle. This oversaturation, considered to be unacceptable to most drivers, occurs when arrival flow rates exceed the design capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such high delay levels.	$d > 80$

















source: 2010 Highway Capacity Manual

Appendix C: Existing Operations

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E










2022 Existing Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	50	63	56	45	36	43	346	50	21	266	46
Future Volume (vph)	43	50	63	56	45	36	43	346	50	21	266	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.95			0.96			0.98			0.98	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1757			1780			1846			1842	
Flt Permitted		0.88			0.82			0.94			0.96	
Satd. Flow (perm)		1564			1494			1736			1773	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	54	68	61	49	39	47	376	54	23	289	50
RTOR Reduction (vph)	0	32	0	0	16	0	0	4	0	0	5	0
Lane Group Flow (vph)	0	137	0	0	133	0	0	473	0	0	357	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0			20.0			45.0			45.0	
Effective Green, g (s)		20.0			20.0			45.0			45.0	
Actuated g/C Ratio		0.26			0.26			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		406			388			1014			1036	
v/s Ratio Prot												
v/s Ratio Perm		0.09			c0.09			c0.27			0.20	
v/c Ratio		0.34			0.34			0.47			0.34	
Uniform Delay, d1		23.1			23.2			9.1			8.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			0.5			0.3			0.2	
Delay (s)		23.6			23.7			9.5			8.5	
Level of Service		C			C			A			A	
Approach Delay (s)		23.6			23.7			9.5			8.5	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		13.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.43										
Actuated Cycle Length (s)		77.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		64.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2022 Existing Conditions
Weekday AM Peak Hour

















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	101	1	1	148	1	3
Future Volume (Veh/h)	101	1	1	148	1	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	1	1	161	1	3
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			111		274	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			111		274	110
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1479		716	943
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	111	162	4			
Volume Left	0	1	1			
Volume Right	1	0	3			
cSH	1700	1479	873			
Volume to Capacity	0.07	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.1			
Control Delay (s)	0.0	0.1	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			18.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Main St E & Lawler Dr

2022 Existing Conditions



















Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	97	0	0	137	1	0	0	0	0	0	6
Future Volume (Veh/h)	4	97	0	0	137	1	0	0	0	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	105	0	0	149	1	0	0	0	0	0	7
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	150			105			270	263	105	262	262	150
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	150			105			270	263	105	262	262	150
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1431			1486			676	640	949	689	641	897
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	109	150	0	7								
Volume Left	4	0	0	0								
Volume Right	0	1	0	7								
cSH	1431	1486	1700	897								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (m)	0.1	0.0	0.0	0.2								
Control Delay (s)	0.3	0.0	0.0	9.0								
Lane LOS	A		A	A								
Approach Delay (s)	0.3	0.0	0.0	9.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			18.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis


















4: Toronto St S & Victoria Ave

2022 Existing Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	6	15	23	0	16	11	410	4	14	357	9
Future Volume (vph)	11	6	15	23	0	16	11	410	4	14	357	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.95		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737			1729		1789	1881		1789	1876	
Flt Permitted		1.00			1.00		0.53	1.00		0.50	1.00	
Satd. Flow (perm)		1767			1781		993	1881		947	1876	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	7	16	25	0	17	12	446	4	15	388	10
RTOR Reduction (vph)	0	15	0	0	37	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	20	0	0	5	0	12	450	0	15	397	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		1.6			1.6		35.1	35.1		35.1	35.1	
Effective Green, g (s)		1.6			1.6		35.1	35.1		35.1	35.1	
Actuated g/C Ratio		0.03			0.03		0.74	0.74		0.74	0.74	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		59			59		730	1384		696	1380	
v/s Ratio Prot								c0.24			0.21	
v/s Ratio Perm		c0.01			0.00		0.01			0.02		
v/c Ratio		0.33			0.09		0.02	0.32		0.02	0.29	
Uniform Delay, d1		22.5			22.3		1.7	2.2		1.7	2.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.3			0.7		0.0	0.6		0.1	0.5	
Delay (s)		25.8			23.0		1.7	2.8		1.7	2.6	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		25.8			23.0			2.8			2.6	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		4.4			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.33										
Actuated Cycle Length (s)		47.7			Sum of lost time (s)			11.0				
Intersection Capacity Utilization		37.7%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis 5: Toronto St S & Hospital Access/Uplands Dr

















2022 Existing Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	2	0	2	0	356	2	2	388	0
Future Volume (Veh/h)	0	0	0	2	0	2	0	356	2	2	388	0
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	2	0	2	0	387	2	2	422	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (m)												205
pX, platoon unblocked												
vC, conflicting volume	816	815	422	814	814	388	422				389	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	816	815	422	814	814	388	422				389	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	100	99	100	100	100				100	
cM capacity (veh/h)	294	311	632	296	312	660	1137				1170	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	4	389	2	422							
Volume Left	0	2	0	2	0							
Volume Right	0	2	2	0	0							
cSH	1700	409	1137	1170	1700							
Volume to Capacity	0.00	0.01	0.00	0.00	0.25							
Queue Length 95th (m)	0.0	0.2	0.0	0.0	0.0							
Control Delay (s)	0.0	13.9	0.0	8.1	0.0							
Lane LOS	A	B		A								
Approach Delay (s)	0.0	13.9	0.0	0.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay				0.1								
Intersection Capacity Utilization				30.4%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E










2022 Existing Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	43	101	46	41	43	87	365	46	34	339	60
Future Volume (vph)	59	43	101	46	41	43	87	365	46	34	339	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.96			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1732			1768			1844			1841	
Flt Permitted		0.88			0.82			0.85			0.93	
Satd. Flow (perm)		1538			1481			1572			1728	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	47	110	50	45	47	95	397	50	37	368	65
RTOR Reduction (vph)	0	47	0	0	23	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	174	0	0	119	0	0	539	0	0	465	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0			20.0			45.0			45.0	
Effective Green, g (s)		20.0			20.0			45.0			45.0	
Actuated g/C Ratio		0.26			0.26			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		399			384			918			1009	
v/s Ratio Prot												
v/s Ratio Perm		c0.11			0.08			c0.34			0.27	
v/c Ratio		0.44			0.31			0.59			0.46	
Uniform Delay, d1		23.8			22.9			10.1			9.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			0.5			1.0			0.3	
Delay (s)		24.6			23.4			11.1			9.4	
Level of Service		C			C			B			A	
Approach Delay (s)		24.6			23.4			11.1			9.4	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.0			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		77.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		73.9%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2022 Existing Conditions
Weekday PM Peak Hour

















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	151	1	0	130	0	0
Future Volume (Veh/h)	151	1	0	130	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	164	1	0	141	0	0
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			165		306	164
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			165		306	164
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1413		686	880
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	165	141	0			
Volume Left	0	0	0			
Volume Right	1	0	0			
cSH	1700	1413	1700			
Volume to Capacity	0.10	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			11.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Main St E & Lawler Dr

2022 Existing Conditions

Weekday PM Peak Hour

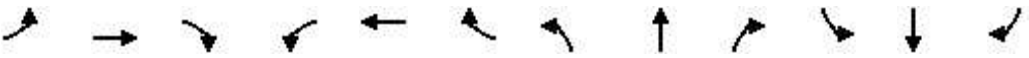
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	141	0	0	130	0	0	0	0	4	0	1
Future Volume (Veh/h)	3	141	0	0	130	0	0	0	0	4	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	153	0	0	141	0	0	0	0	4	0	1
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	141			153			301	300	153	300	300	141
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	141			153			301	300	153	300	300	141
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	100
cM capacity (veh/h)	1442			1428			650	611	893	651	611	907
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	156	141	0	5								
Volume Left	3	0	0	4								
Volume Right	0	0	0	1								
cSH	1442	1428	1700	690								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (m)	0.0	0.0	0.0	0.2								
Control Delay (s)	0.2	0.0	0.0	10.3								
Lane LOS	A		A	B								
Approach Delay (s)	0.2	0.0	0.0	10.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay	0.3											
Intersection Capacity Utilization	19.8%			ICU Level of Service						A		
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

2022 Existing Conditions

4: Toronto St S & Victoria Ave


















Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	10	4	24	30	1	32	13	448	2	37	412	5
Future Volume (vph)	10	4	24	30	1	32	13	448	2	37	412	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.93		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1713		1789	1882		1789	1880	
Flt Permitted		0.89			0.87		0.50	1.00		0.48	1.00	
Satd. Flow (perm)		1526			1526		944	1882		903	1880	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	4	26	33	1	35	14	487	2	40	448	5
RTOR Reduction (vph)	0	24	0	0	32	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	17	0	0	37	0	14	489	0	40	453	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		3.4			3.4		32.8	32.8		32.8	32.8	
Effective Green, g (s)		3.4			3.4		32.8	32.8		32.8	32.8	
Actuated g/C Ratio		0.07			0.07		0.69	0.69		0.69	0.69	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		109			109		656	1307		627	1306	
v/s Ratio Prot								0.26			0.24	
v/s Ratio Perm		0.01			0.02		0.01			0.04		
v/c Ratio		0.15			0.34		0.02	0.37		0.06	0.35	
Uniform Delay, d1		20.6			20.8		2.2	3.0		2.3	2.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7			1.8		0.1	0.8		0.2	0.7	
Delay (s)		21.2			22.6		2.3	3.8		2.5	3.6	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		21.2			22.6			3.7			3.5	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		5.5			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.37										
Actuated Cycle Length (s)		47.2			Sum of lost time (s)			11.0				
Intersection Capacity Utilization		46.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

2022 Existing Conditions
Weekday PM Peak Hour

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	4	0	486	1	8	501	0
Future Volume (Veh/h)	0	0	0	0	0	4	0	486	1	8	501	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	4	0	528	1	9	545	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)											205	
pX, platoon unblocked	0.96	0.96	0.96	0.96	0.96		0.96					
vC, conflicting volume	1096	1092	545	1092	1092	528	545			529		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1079	1075	506	1075	1075	528	506			529		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	99	100			99		
cM capacity (veh/h)	186	209	544	188	209	550	1017			1038		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	0	4	529	9	545							
Volume Left	0	0	0	9	0							
Volume Right	0	4	1	0	0							
cSH	1700	550	1017	1038	1700							
Volume to Capacity	0.00	0.01	0.00	0.01	0.32							
Queue Length 95th (m)	0.0	0.2	0.0	0.2	0.0							
Control Delay (s)	0.0	11.6	0.0	8.5	0.0							
Lane LOS	A	B		A								
Approach Delay (s)	0.0	11.6	0.0	0.1								
Approach LOS	A	B										
Intersection Summary												
Average Delay			0.1									
Intersection Capacity Utilization			36.4%			ICU Level of Service			A			
Analysis Period (min)			15									

Appendix D: Background Operations

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E

2027 Background Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	53	80	66	51	49	67	431	54	25	339	57
Future Volume (vph)	51	53	80	66	51	49	67	431	54	25	339	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.94			0.96			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1749			1773			1847			1844	
Flt Permitted		0.87			0.78			0.90			0.95	
Satd. Flow (perm)		1548			1409			1666			1758	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	58	87	72	55	53	73	468	59	27	368	62
RTOR Reduction (vph)	0	35	0	0	19	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	165	0	0	161	0	0	596	0	0	451	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.0			20.0			45.0			45.0	
Effective Green, g (s)		20.0			20.0			45.0			45.0	
Actuated g/C Ratio		0.26			0.26			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		402			365			973			1027	
v/s Ratio Prot												
v/s Ratio Perm		0.11			c0.11			c0.36			0.26	
v/c Ratio		0.41			0.44			0.61			0.44	
Uniform Delay, d1		23.6			23.8			10.4			8.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.7			0.9			1.1			0.3	
Delay (s)		24.3			24.7			11.5			9.2	
Level of Service		C			C			B			A	
Approach Delay (s)		24.3			24.7			11.5			9.2	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		77.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		74.8%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2027 Background Conditions
Weekday AM Peak Hour

















	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	105	6	6	156	15	17
Future Volume (Veh/h)	105	6	6	156	15	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	114	7	7	170	16	18
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			121		302	118
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			121		302	118
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	98
cM capacity (veh/h)			1467		687	934
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	121	177	34			
Volume Left	0	7	16			
Volume Right	7	0	18			
cSH	1700	1467	799			
Volume to Capacity	0.07	0.00	0.04			
Queue Length 95th (m)	0.0	0.1	1.0			
Control Delay (s)	0.0	0.3	9.7			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.3	9.7			
Approach LOS			A			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			23.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2027 Background Conditions

3: Main St E & Lawler Dr



















Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	121	0	0	151	1	0	0	0	0	0	6
Future Volume (Veh/h)	4	121	0	0	151	1	0	0	0	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	132	0	0	164	1	0	0	0	0	0	7
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	165			132			312	305	132	304	304	164
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	165			132			312	305	132	304	304	164
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1413			1453			635	607	917	646	607	880
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	136	165	0	7								
Volume Left	4	0	0	0								
Volume Right	0	1	0	7								
cSH	1413	1453	1700	880								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (m)	0.1	0.0	0.0	0.2								
Control Delay (s)	0.2	0.0	0.0	9.1								
Lane LOS	A		A	A								
Approach Delay (s)	0.2	0.0	0.0	9.1								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			19.6%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2027 Background Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	6	15	32	0	44	11	498	7	24	445	9
Future Volume (vph)	11	6	15	32	0	44	11	498	7	24	445	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737			1701		1789	1879		1789	1878	
Flt Permitted		0.85			0.85		0.47	1.00		0.43	1.00	
Satd. Flow (perm)		1507			1471		882	1879		814	1878	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	7	16	35	0	48	12	541	8	26	484	10
RTOR Reduction (vph)	0	14	0	0	43	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	21	0	0	40	0	12	548	0	26	493	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		5.0			5.0		34.4	34.4		34.4	34.4	
Effective Green, g (s)		5.0			5.0		34.4	34.4		34.4	34.4	
Actuated g/C Ratio		0.10			0.10		0.68	0.68		0.68	0.68	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		149			145		602	1282		555	1281	
v/s Ratio Prot								c0.29			0.26	
v/s Ratio Perm		0.01			c0.03		0.01			0.03		
v/c Ratio		0.14			0.27		0.02	0.43		0.05	0.39	
Uniform Delay, d1		20.7			21.0		2.6	3.6		2.6	3.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			1.0		0.1	1.0		0.2	0.9	
Delay (s)		21.2			22.0		2.6	4.6		2.8	4.3	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		21.2			22.0			4.6			4.2	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.1			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.41										
Actuated Cycle Length (s)		50.4			Sum of lost time (s)			11.0				
Intersection Capacity Utilization		42.5%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

2027 Background Conditions
Weekday AM Peak Hour

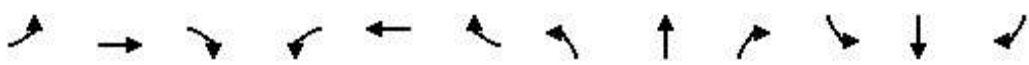
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	6	37	0	30	10	406	14	12	465	14
Future Volume (Veh/h)	6	0	6	37	0	30	10	406	14	12	465	14
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	7	40	0	33	11	441	15	13	505	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (m)												205
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	1042	1016	512	1008	1016	448	520					
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1006	978	434	969	978	448	442					
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					
p0 queue free %	96	100	99	81	100	95	99					
cM capacity (veh/h)	189	227	576	209	227	610	1036					
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	14	73	467	13	520							
Volume Left	7	40	11	13	0							
Volume Right	7	33	15	0	15							
cSH	285	298	1036	1105	1700							
Volume to Capacity	0.05	0.25	0.01	0.01	0.31							
Queue Length 95th (m)	1.2	7.2	0.2	0.3	0.0							
Control Delay (s)	18.3	21.0	0.3	8.3	0.0							
Lane LOS	C	C	A	A								
Approach Delay (s)	18.3	21.0	0.3	0.2								
Approach LOS	C	C										
Intersection Summary												
Average Delay				1.9								
Intersection Capacity Utilization				42.0%	ICU Level of Service					A		
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E

2027 Background Conditions

Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	75	50	135	53	45	54	108	459	51	44	431	67
Future Volume (vph)	75	50	135	53	45	54	108	459	51	44	431	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.95			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1726			1762			1847			1844	
Flt Permitted		0.85			0.77			0.81			0.91	
Satd. Flow (perm)		1489			1372			1516			1688	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	54	147	58	49	59	117	499	55	48	468	73
RTOR Reduction (vph)	0	48	0	0	25	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	235	0	0	141	0	0	668	0	0	584	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		21.1			21.1			45.4			45.4	
Effective Green, g (s)		21.1			21.1			45.4			45.4	
Actuated g/C Ratio		0.27			0.27			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		400			368			876			976	
v/s Ratio Prot												
v/s Ratio Perm		c0.16			0.10			c0.44			0.35	
v/c Ratio		0.59			0.38			0.76			0.60	
Uniform Delay, d1		24.9			23.4			12.5			10.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.2			0.7			4.0			1.0	
Delay (s)		27.1			24.1			16.4			11.7	
Level of Service		C			C			B			B	
Approach Delay (s)		27.1			24.1			16.4			11.7	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		17.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		78.5			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		86.4%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2027 Background Conditions
Weekday PM Peak Hour

















	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	159	16	16	135	9	10
Future Volume (Veh/h)	159	16	16	135	9	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	173	17	17	147	10	11
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			190		362	182
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190		362	182
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1384		629	861
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	190	164	21			
Volume Left	0	17	10			
Volume Right	17	0	11			
cSH	1700	1384	732			
Volume to Capacity	0.11	0.01	0.03			
Queue Length 95th (m)	0.0	0.3	0.7			
Control Delay (s)	0.0	0.9	10.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.9	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		30.5%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

2027 Background Conditions

3: Main St E & Lawler Dr



















Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	162	0	0	157	0	0	0	0	4	0	1
Future Volume (Veh/h)	3	162	0	0	157	0	0	0	0	4	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	176	0	0	171	0	0	0	0	4	0	1
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	171			176			354	353	176	353	353	171
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	171			176			354	353	176	353	353	171
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	100
cM capacity (veh/h)	1406			1400			599	571	867	601	571	873
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	179	171	0	5								
Volume Left	3	0	0	4								
Volume Right	0	0	0	1								
cSH	1406	1400	1700	641								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (m)	0.0	0.0	0.0	0.2								
Control Delay (s)	0.1	0.0	0.0	10.7								
Lane LOS	A		A	B								
Approach Delay (s)	0.1	0.0	0.0	10.7								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization			20.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2027 Background Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	4	24	36	1	50	13	554	12	67	508	5
Future Volume (vph)	10	4	24	36	1	50	13	554	12	67	508	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1702		1789	1877		1789	1881	
Flt Permitted		0.88			0.85		0.43	1.00		0.39	1.00	
Satd. Flow (perm)		1511			1471		802	1877		732	1881	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	4	26	39	1	54	14	602	13	73	552	5
RTOR Reduction (vph)	0	23	0	0	48	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	18	0	0	46	0	14	614	0	73	557	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		5.1			5.1		33.8	33.8		33.8	33.8	
Effective Green, g (s)		5.1			5.1		33.8	33.8		33.8	33.8	
Actuated g/C Ratio		0.10			0.10		0.68	0.68		0.68	0.68	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		154			150		543	1271		495	1274	
v/s Ratio Prot								c0.33			0.30	
v/s Ratio Perm		0.01			c0.03		0.02			0.10		
v/c Ratio		0.11			0.30		0.03	0.48		0.15	0.44	
Uniform Delay, d1		20.3			20.8		2.6	3.9		2.9	3.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			1.1		0.1	1.3		0.6	1.1	
Delay (s)		20.7			21.9		2.7	5.2		3.5	4.8	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		20.7			21.9			5.1			4.6	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.5			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.46										
Actuated Cycle Length (s)		49.9			Sum of lost time (s)			11.0				
Intersection Capacity Utilization		70.7%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

















2027 Background Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	14	23	0	22	6	576	39	38	576	7
Future Volume (Veh/h)	12	0	14	23	0	22	6	576	39	38	576	7
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	0	15	25	0	24	7	626	42	41	626	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (m)	205											
pX, platoon unblocked	0.89	0.89	0.89	0.89	0.89		0.89					
vC, conflicting volume	1397	1394	630	1384	1377	647	634	668				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1385	1381	527	1370	1362	647	532	668				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	87	100	97	76	100	95	99	96				
cM capacity (veh/h)	98	122	493	103	125	471	926	922				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	28	49	675	41	634							
Volume Left	13	25	7	41	0							
Volume Right	15	24	42	0	8							
cSH	172	167	926	922	1700							
Volume to Capacity	0.16	0.29	0.01	0.04	0.37							
Queue Length 95th (m)	4.3	8.8	0.2	1.1	0.0							
Control Delay (s)	29.9	35.3	0.2	9.1	0.0							
Lane LOS	D	E	A	A								
Approach Delay (s)	29.9	35.3	0.2	0.6								
Approach LOS	D	E										
Intersection Summary												
Average Delay	2.2											
Intersection Capacity Utilization	47.6%			ICU Level of Service				A				
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E










2032 Background Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	59	92	72	57	59	84	455	58	28	378	61
Future Volume (vph)	56	59	92	72	57	59	84	455	58	28	378	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.94			0.96			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1747			1770			1846			1845	
Flt Permitted		0.86			0.75			0.87			0.95	
Satd. Flow (perm)		1514			1360			1609			1749	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	64	100	78	62	64	91	495	63	30	411	66
RTOR Reduction (vph)	0	36	0	0	21	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	189	0	0	183	0	0	645	0	0	501	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.4			20.4			45.4			45.4	
Effective Green, g (s)		20.4			20.4			45.4			45.4	
Actuated g/C Ratio		0.26			0.26			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		396			356			938			1020	
v/s Ratio Prot												
v/s Ratio Perm		0.12			0.13			0.40			0.29	
v/c Ratio		0.48			0.52			0.69			0.49	
Uniform Delay, d1		24.2			24.5			11.3			9.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			1.3			2.1			0.4	
Delay (s)		25.1			25.7			13.4			9.8	
Level of Service		C			C			B			A	
Approach Delay (s)		25.1			25.7			13.4			9.8	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay		15.5			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		77.8			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		82.2%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2032 Background Conditions
Weekday AM Peak Hour

















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	113	9	9	168	25	27
Future Volume (Veh/h)	113	9	9	168	25	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	123	10	10	183	27	29
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			133	331		128
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			133	331		128
tC, single (s)			4.1	6.4		6.2
tC, 2 stage (s)						
tF (s)			2.2	3.5		3.3
p0 queue free %			99	96		97
cM capacity (veh/h)			1452	659		922
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	133	193	56			
Volume Left	0	10	27			
Volume Right	10	0	29			
cSH	1700	1452	773			
Volume to Capacity	0.08	0.01	0.07			
Queue Length 95th (m)	0.0	0.2	1.8			
Control Delay (s)	0.0	0.4	10.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.4	10.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			26.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2032 Background Conditions

3: Main St E & Lawler Dr


Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	139	0	0	165	1	0	0	0	0	0	6
Future Volume (Veh/h)	4	139	0	0	165	1	0	0	0	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	151	0	0	179	1	0	0	0	0	0	7
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	180			151			346	339	151	338	338	180
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	180			151			346	339	151	338	338	180
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1396			1430			603	581	895	614	581	863
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	155	180	0	7								
Volume Left	4	0	0	0								
Volume Right	0	1	0	7								
cSH	1396	1430	1700	863								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (m)	0.1	0.0	0.0	0.2								
Control Delay (s)	0.2	0.0	0.0	9.2								
Lane LOS	A		A	A								
Approach Delay (s)	0.2	0.0	0.0	9.2								
Approach LOS			A	A								
Intersection Summary												
Average Delay	0.3											
Intersection Capacity Utilization	20.5%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2032 Background Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↖		↗	↖	
Traffic Volume (vph)	11	6	15	38	0	63	11	564	9	30	493	9
Future Volume (vph)	11	6	15	38	0	63	11	564	9	30	493	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737			1693		1789	1879		1789	1878	
Flt Permitted		0.84			0.86		0.42	1.00		0.37	1.00	
Satd. Flow (perm)		1489			1486		796	1879		701	1878	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	7	16	41	0	68	12	613	10	33	536	10
RTOR Reduction (vph)	0	14	0	0	59	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	21	0	0	50	0	12	622	0	33	545	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.8			6.8		33.5	33.5		33.5	33.5	
Effective Green, g (s)		6.8			6.8		33.5	33.5		33.5	33.5	
Actuated g/C Ratio		0.13			0.13		0.65	0.65		0.65	0.65	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		197			196		519	1227		457	1226	
v/s Ratio Prot								c0.33			0.29	
v/s Ratio Perm		0.01			c0.03		0.02			0.05		
v/c Ratio		0.11			0.26		0.02	0.51		0.07	0.44	
Uniform Delay, d1		19.6			20.0		3.1	4.6		3.2	4.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.7		0.1	1.5		0.3	1.2	
Delay (s)		19.8			20.7		3.2	6.1		3.5	5.5	
Level of Service		B			C		A	A		A	A	
Approach Delay (s)		19.8			20.7			6.1			5.4	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.3										
HCM 2000 Volume to Capacity ratio		0.46										
Actuated Cycle Length (s)		51.3										
Intersection Capacity Utilization		47.5%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

















2032 Background Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	6	61	0	49	10	449	22	18	515	14
Future Volume (Veh/h)	6	0	6	61	0	49	10	449	22	18	515	14
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	7	66	0	53	11	488	24	20	560	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (m)												205
pX, platoon unblocked	0.88	0.88	0.88	0.88	0.88		0.88					
vC, conflicting volume	1182	1142	568	1129	1137	500	575	512				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1138	1092	437	1077	1086	500	446	512				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	95	100	99	60	100	91	99	98				
cM capacity (veh/h)	139	183	543	166	184	571	978	1053				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	14	119	523	20	575							
Volume Left	7	66	11	20	0							
Volume Right	7	53	24	0	15							
cSH	221	243	978	1053	1700							
Volume to Capacity	0.06	0.49	0.01	0.02	0.34							
Queue Length 95th (m)	1.5	18.9	0.3	0.4	0.0							
Control Delay (s)	22.4	33.2	0.3	8.5	0.0							
Lane LOS	C	D	A	A								
Approach Delay (s)	22.4	33.2	0.3	0.3								
Approach LOS	C	D										
Intersection Summary												
Average Delay	3.7											
Intersection Capacity Utilization	48.0%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E










2032 Background Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	57	162	58	51	63	124	474	55	53	495	72
Future Volume (vph)	81	57	162	58	51	63	124	474	55	53	495	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.95			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1723			1761			1844			1846	
Flt Permitted		0.84			0.73			0.76			0.90	
Satd. Flow (perm)		1471			1303			1409			1662	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	62	176	63	55	68	135	515	60	58	538	78
RTOR Reduction (vph)	0	52	0	0	25	0	0	4	0	0	5	0
Lane Group Flow (vph)	0	274	0	0	161	0	0	706	0	0	669	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		21.8			21.8			46.2			46.2	
Effective Green, g (s)		21.8			21.8			46.2			46.2	
Actuated g/C Ratio		0.27			0.27			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		400			355			813			959	
v/s Ratio Prot												
v/s Ratio Perm		c0.19			0.12			c0.50			0.40	
v/c Ratio		0.68			0.45			0.87			0.70	
Uniform Delay, d1		26.0			24.1			14.3			12.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.8			0.9			9.8			2.2	
Delay (s)		30.8			25.1			24.1			14.2	
Level of Service		C			C			C			B	
Approach Delay (s)		30.8			25.1			24.1			14.2	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay		21.8			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		94.0%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2032 Background Conditions
Weekday PM Peak Hour

















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	171	26	26	146	15	16
Future Volume (Veh/h)	171	26	26	146	15	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	186	28	28	159	16	17
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			214		415	200
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			214		415	200
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		97	98
cM capacity (veh/h)			1356		582	841
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	214	187	33			
Volume Left	0	28	16			
Volume Right	28	0	17			
cSH	1700	1356	691			
Volume to Capacity	0.13	0.02	0.05			
Queue Length 95th (m)	0.0	0.5	1.1			
Control Delay (s)	0.0	1.3	10.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.3	10.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			33.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Main St E & Lawler Dr

2032 Background Conditions



















Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	180	0	0	178	0	0	0	0	4	0	1
Future Volume (Veh/h)	3	180	0	0	178	0	0	0	0	4	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	196	0	0	193	0	0	0	0	4	0	1
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	193			196			396	395	196	395	395	193
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	193			196			396	395	196	395	395	193
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	100
cM capacity (veh/h)	1380			1377			562	541	845	564	541	849
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	199	193	0	5								
Volume Left	3	0	0	4								
Volume Right	0	0	0	1								
cSH	1380	1377	1700	604								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (m)	0.0	0.0	0.0	0.2								
Control Delay (s)	0.1	0.0	0.0	11.0								
Lane LOS	A		A	B								
Approach Delay (s)	0.1	0.0	0.0	11.0								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization			21.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2032 Background Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	4	24	40	1	62	13	618	18	87	575	5
Future Volume (vph)	10	4	24	40	1	62	13	618	18	87	575	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1697		1789	1875		1789	1881	
Flt Permitted		0.87			0.86		0.37	1.00		0.33	1.00	
Satd. Flow (perm)		1502			1480		691	1875		618	1881	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	4	26	43	1	67	14	672	20	95	625	5
RTOR Reduction (vph)	0	23	0	0	58	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	18	0	0	53	0	14	691	0	95	630	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.8			6.8		33.3	33.3		33.3	33.3	
Effective Green, g (s)		6.8			6.8		33.3	33.3		33.3	33.3	
Actuated g/C Ratio		0.13			0.13		0.65	0.65		0.65	0.65	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		199			196		450	1221		402	1225	
v/s Ratio Prot								c0.37			0.33	
v/s Ratio Perm		0.01			c0.04		0.02			0.15		
v/c Ratio		0.09			0.27		0.03	0.57		0.24	0.51	
Uniform Delay, d1		19.4			19.9		3.2	4.9		3.7	4.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.7		0.1	1.9		1.4	1.5	
Delay (s)		19.6			20.7		3.3	6.8		5.0	6.2	
Level of Service		B			C		A	A		A	A	
Approach Delay (s)		19.6			20.7			6.7			6.1	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		51.1			Sum of lost time (s)			11.0				
Intersection Capacity Utilization		75.7%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

2032 Background Conditions
Weekday PM Peak Hour

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	14	39	0	34	6	638	65	58	637	7
Future Volume (Veh/h)	12	0	14	39	0	34	6	638	65	58	637	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	0	15	42	0	37	7	693	71	63	692	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)											205	
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1602	1600	696	1576	1568	728	700			764		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1621	1619	541	1590	1582	728	546			764		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	78	100	97	36	100	91	99			93		
cM capacity (veh/h)	59	79	454	66	84	423	858			849		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	28	79	771	63	700							
Volume Left	13	42	7	63	0							
Volume Right	15	37	71	0	8							
cSH	111	109	858	849	1700							
Volume to Capacity	0.25	0.72	0.01	0.07	0.41							
Queue Length 95th (m)	7.1	29.5	0.2	1.8	0.0							
Control Delay (s)	48.1	96.7	0.2	9.6	0.0							
Lane LOS	E	F	A	A								
Approach Delay (s)	48.1	96.7	0.2	0.8								
Approach LOS	E	F										
Intersection Summary												
Average Delay			5.9									
Intersection Capacity Utilization			55.1%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E

2037 Background Conditions

Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	63	100	79	61	64	88	495	62	30	412	65
Future Volume (vph)	61	63	100	79	61	64	88	495	62	30	412	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.94			0.96			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1746			1769			1846			1845	
Flt Permitted		0.84			0.73			0.86			0.94	
Satd. Flow (perm)		1488			1318			1606			1737	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	66	68	109	86	66	70	96	538	67	33	448	71
RTOR Reduction (vph)	0	37	0	0	21	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	206	0	0	201	0	0	697	0	0	546	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.9			20.9			45.4			45.4	
Effective Green, g (s)		20.9			20.9			45.4			45.4	
Actuated g/C Ratio		0.27			0.27			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		397			351			931			1007	
v/s Ratio Prot												
v/s Ratio Perm		0.14			0.15			0.43			0.31	
v/c Ratio		0.52			0.57			0.75			0.54	
Uniform Delay, d1		24.4			24.8			12.2			10.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.2			2.3			3.3			0.6	
Delay (s)		25.6			27.1			15.5			10.7	
Level of Service		C			C			B			B	
Approach Delay (s)		25.6			27.1			15.5			10.7	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		16.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		78.3			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		87.1%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2037 Background Conditions
Weekday AM Peak Hour

















	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Traffic Volume (veh/h)	122	9	9	181	25	27
Future Volume (Veh/h)	122	9	9	181	25	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	133	10	10	197	27	29
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			143		355	138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			143		355	138
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		96	97
cM capacity (veh/h)			1440		639	910
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	143	207	56			
Volume Left	0	10	27			
Volume Right	10	0	29			
cSH	1700	1440	755			
Volume to Capacity	0.08	0.01	0.07			
Queue Length 95th (m)	0.0	0.2	1.8			
Control Delay (s)	0.0	0.4	10.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.4	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay		1.6				
Intersection Capacity Utilization		26.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

2037 Background Conditions

3: Main St E & Lawler Dr



















Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	147	0	0	177	1	0	0	0	0	0	6
Future Volume (Veh/h)	4	147	0	0	177	1	0	0	0	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	160	0	0	192	1	0	0	0	0	0	7
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	193			160			368	361	160	360	360	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	193			160			368	361	160	360	360	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1380			1419			583	564	885	594	565	849
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	164	193	0	7								
Volume Left	4	0	0	0								
Volume Right	0	1	0	7								
cSH	1380	1419	1700	849								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (m)	0.1	0.0	0.0	0.2								
Control Delay (s)	0.2	0.0	0.0	9.3								
Lane LOS	A		A	A								
Approach Delay (s)	0.2	0.0	0.0	9.3								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			21.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2037 Background Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	6	15	38	0	63	11	616	9	30	538	9
Future Volume (vph)	11	6	15	38	0	63	11	616	9	30	538	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737			1693		1789	1879		1789	1879	
Flt Permitted		0.84			0.86		0.39	1.00		0.34	1.00	
Satd. Flow (perm)		1489			1486		735	1879		633	1879	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	7	16	41	0	68	12	670	10	33	585	10
RTOR Reduction (vph)	0	14	0	0	59	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	21	0	0	50	0	12	679	0	33	594	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.8			6.8		33.5	33.5		33.5	33.5	
Effective Green, g (s)		6.8			6.8		33.5	33.5		33.5	33.5	
Actuated g/C Ratio		0.13			0.13		0.65	0.65		0.65	0.65	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		197			196		479	1227		413	1227	
v/s Ratio Prot								c0.36			0.32	
v/s Ratio Perm		0.01			c0.03		0.02			0.05		
v/c Ratio		0.11			0.26		0.03	0.55		0.08	0.48	
Uniform Delay, d1		19.6			20.0		3.1	4.8		3.3	4.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.7		0.1	1.8		0.4	1.4	
Delay (s)		19.8			20.7		3.2	6.6		3.6	5.9	
Level of Service		B			C		A	A		A	A	
Approach Delay (s)		19.8			20.7			6.6			5.8	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.6										
HCM 2000 Volume to Capacity ratio		0.50										
Actuated Cycle Length (s)		51.3										
Intersection Capacity Utilization		50.2%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

2037 Background Conditions
Weekday AM Peak Hour

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	6	61	0	49	10	494	22	18	565	14
Future Volume (Veh/h)	6	0	6	61	0	49	10	494	22	18	565	14
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	7	66	0	53	11	537	24	20	614	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked	0.85	0.85	0.85	0.85	0.85		0.85					
vC, conflicting volume	1286	1244	622	1232	1240	549	629	561				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1246	1198	461	1183	1193	549	470	561				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	94	100	99	51	100	90	99	98				
cM capacity (veh/h)	112	152	508	135	153	535	923	1010				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	14	119	572	20	629							
Volume Left	7	66	11	20	0							
Volume Right	7	53	24	0	15							
cSH	183	203	923	1010	1700							
Volume to Capacity	0.08	0.59	0.01	0.02	0.37							
Queue Length 95th (m)	1.9	24.7	0.3	0.5	0.0							
Control Delay (s)	26.2	45.2	0.3	8.6	0.0							
Lane LOS	D	E	A	A								
Approach Delay (s)	26.2	45.2	0.3	0.3								
Approach LOS	D	E										
Intersection Summary												
Average Delay												
Intersection Capacity Utilization												
Analysis Period (min)												
ICU Level of Service												
A												

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E

2037 Background Conditions

Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	61	175	64	54	68	131	516	59	56	538	77
Future Volume (vph)	89	61	175	64	54	68	131	516	59	56	538	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.95			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1723			1760			1845			1846	
Flt Permitted		0.83			0.70			0.73			0.89	
Satd. Flow (perm)		1446			1247			1367			1657	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	66	190	70	59	74	142	561	64	61	585	84
RTOR Reduction (vph)	0	51	0	0	25	0	0	4	0	0	5	0
Lane Group Flow (vph)	0	302	0	0	178	0	0	763	0	0	725	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.6			22.6			47.1			47.1	
Effective Green, g (s)		22.6			22.6			47.1			47.1	
Actuated g/C Ratio		0.28			0.28			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		399			344			788			955	
v/s Ratio Prot												
v/s Ratio Perm		c0.21			0.14			c0.56			0.44	
v/c Ratio		0.76			0.52			0.97			0.76	
Uniform Delay, d1		27.0			24.9			16.6			13.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.0			1.3			24.3			3.5	
Delay (s)		35.0			26.3			40.8			16.5	
Level of Service		C			C			D			B	
Approach Delay (s)		35.0			26.3			40.8			16.5	
Approach LOS		C			C			D			B	
Intersection Summary												
HCM 2000 Control Delay		29.7			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.90										
Actuated Cycle Length (s)		81.7			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		100.5%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2037 Background Conditions
Weekday PM Peak Hour

















	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↘↙	
Traffic Volume (veh/h)	184	26	26	157	15	16
Future Volume (Veh/h)	184	26	26	157	15	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	200	28	28	171	16	17
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			228		441	214
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			228		441	214
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		97	98
cM capacity (veh/h)			1340		562	826
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	228	199	33			
Volume Left	0	28	16			
Volume Right	28	0	17			
cSH	1700	1340	673			
Volume to Capacity	0.13	0.02	0.05			
Queue Length 95th (m)	0.0	0.5	1.2			
Control Delay (s)	0.0	1.2	10.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.2	10.6			
Approach LOS			B			
Intersection Summary						
Average Delay		1.3				
Intersection Capacity Utilization		34.3%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Main St E & Lawler Dr

2037 Background Conditions



















Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	192	0	0	189	0	0	0	0	4	0	1
Future Volume (Veh/h)	3	192	0	0	189	0	0	0	0	4	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	209	0	0	205	0	0	0	0	4	0	1
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	205			209			421	420	209	420	420	205
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	205			209			421	420	209	420	420	205
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	100
cM capacity (veh/h)	1366			1362			541	523	831	543	523	836
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	212	205	0	5								
Volume Left	3	0	0	4								
Volume Right	0	0	0	1								
cSH	1366	1362	1700	584								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (m)	0.1	0.0	0.0	0.2								
Control Delay (s)	0.1	0.0	0.0	11.2								
Lane LOS	A		A	B								
Approach Delay (s)	0.1	0.0	0.0	11.2								
Approach LOS			A	B								
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization			22.5%	ICU Level of Service						A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2037 Background Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	4	24	40	1	62	13	675	18	87	627	5
Future Volume (vph)	10	4	24	40	1	62	13	675	18	87	627	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1697		1789	1876		1789	1881	
Flt Permitted		0.87			0.86		0.33	1.00		0.29	1.00	
Satd. Flow (perm)		1502			1480		624	1876		546	1881	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	4	26	43	1	67	14	734	20	95	682	5
RTOR Reduction (vph)	0	23	0	0	58	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	18	0	0	53	0	14	753	0	95	687	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.8			6.8		33.3	33.3		33.3	33.3	
Effective Green, g (s)		6.8			6.8		33.3	33.3		33.3	33.3	
Actuated g/C Ratio		0.13			0.13		0.65	0.65		0.65	0.65	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		199			196		406	1222		355	1225	
v/s Ratio Prot								c0.40			0.36	
v/s Ratio Perm		0.01			c0.04		0.02			0.17		
v/c Ratio		0.09			0.27		0.03	0.62		0.27	0.56	
Uniform Delay, d1		19.4			19.9		3.2	5.2		3.8	4.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.7		0.2	2.3		1.8	1.9	
Delay (s)		19.6			20.7		3.3	7.5		5.6	6.7	
Level of Service		B			C		A	A		A	A	
Approach Delay (s)		19.6			20.7			7.4			6.6	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.2			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		51.1			Sum of lost time (s)			11.0				
Intersection Capacity Utilization		78.7%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr





















2037 Background Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	14	39	0	34	6	699	65	58	701	7
Future Volume (Veh/h)	12	0	14	39	0	34	6	699	65	58	701	7
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	0	15	42	0	37	7	760	71	63	762	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage veh												
Upstream signal (m)	205											
pX, platoon unblocked	0.80	0.80	0.80	0.80	0.80	0.80						
vC, conflicting volume	1738	1737	766	1712	1706	796	770			831		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1799	1797	580	1766	1758	796	585			831		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	69	100	96	10	100	90	99			92		
cM capacity (veh/h)	42	58	410	47	62	387	790			801		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	28	79	838	63	770							
Volume Left	13	42	7	63	0							
Volume Right	15	37	71	0	8							
cSH	80	80	790	801	1700							
Volume to Capacity	0.35	0.99	0.01	0.08	0.45							
Queue Length 95th (m)	10.1	41.1	0.2	1.9	0.0							
Control Delay (s)	72.0	190.6	0.2	9.9	0.0							
Lane LOS	F	F	A	A								
Approach Delay (s)	72.0	190.6	0.2	0.7								
Approach LOS	F	F										
Intersection Summary												
Average Delay			10.1									
Intersection Capacity Utilization			57.9%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E

2037 Background Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	61	175	64	54	68	131	516	59	56	538	77
Future Volume (vph)	89	61	175	64	54	68	131	516	59	56	538	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.92		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1674		1789	1726		1789	1855		1789	1848	
Flt Permitted	0.67	1.00		0.50	1.00		0.29	1.00		0.32	1.00	
Satd. Flow (perm)	1265	1674		936	1726		551	1855		608	1848	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	66	190	70	59	74	142	561	64	61	585	84
RTOR Reduction (vph)	0	130	0	0	55	0	0	5	0	0	6	0
Lane Group Flow (vph)	97	126	0	70	78	0	142	620	0	61	663	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Effective Green, g (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.58	0.58		0.58	0.58	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	328	434		243	448		322	1084		355	1080	
v/s Ratio Prot		0.08			0.05			0.33			c0.36	
v/s Ratio Perm	c0.08			0.07			0.26			0.10		
v/c Ratio	0.30	0.29		0.29	0.17		0.44	0.57		0.17	0.61	
Uniform Delay, d1	22.9	22.8		22.8	22.1		9.0	10.0		7.4	10.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.4		0.7	0.2		1.0	0.7		0.2	1.0	
Delay (s)	23.4	23.2		23.5	22.3		9.9	10.7		7.6	11.4	
Level of Service	C	C		C	C		A	B		A	B	
Approach Delay (s)		23.2			22.7			10.6			11.1	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay	14.1			HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio	0.52											
Actuated Cycle Length (s)	77.0			Sum of lost time (s)			12.0					
Intersection Capacity Utilization	128.3%			ICU Level of Service			H					
Analysis Period (min)	15											
c Critical Lane Group												

Appendix E: Traffic Signal Warrants

GENERAL INFORMATION

Analyst	<u>MJB</u>	Jurisdiction/Area	<u>Markdale</u>	Date	<u>April 7 2022</u>
Agency or Company	<u>Tatham Eng. Ltd</u>	East-West Street	<u>Uplands Drive</u>		
Analysis Period	<u></u>	North-South Street	<u>Toronto Street</u>		
Flow Conditions	<u>Free flow (rural)</u>	Major Street	<u>North-South</u>		
T Intersection	<u>No</u>	Approach Lanes per Direction	<u>1</u>		
		Hours of Traffic Volume Data	<u>AM & PM peaks only</u>		
Additional Comments					

TRAFFIC & PEDESTRIAN VOLUMES

Hour of Data		AM Peak						PM Peak	AM + PM
Hour Ending		hr ending						hr ending	4
MAJOR STREET									
Northbound	right	22						65	22
	thru	494						699	298
	left	10						6	4
Southbound	right	14						7	5
	thru	565						701	317
	left	18						58	19
MINOR STREET									
Eastbound	right	6						14	5
	thru	0						0	0
	left	6						12	5
Westbound	right	49						34	21
	thru	0						0	0
	left	61						39	25
PEDESTRIANS									
crossing MAJOR street		0							0
crossing MINOR street		0							0
APPROACH VOLUMES									
major		1123						1536	665
minor		122						99	55
TOTAL		1245						1635	720
CROSSING VOLUMES									
TOTAL		67						51	30
note 1		67						51	
note 2		0						0	
note 3		0						0	
3a		no						no	
3b		no						yes	
note 4		0						0	

NOTES

Traffic crossing MAJOR street defined as:

note 1: Left turns from both minor street approaches

note 2: The heaviest through volume from the minor street

note 3: 50% of the heavier left turn movement from the major street when both of the following are met:

3a: the left turn volume > 120

3b: the left turn volume + opposing volume > 720

note 4: Pedestrians crossing the major street

ACCIDENT HISTORY

Reportable accidents over the past 36 months susceptible to correction by a traffic signal.	months 1 to 12	-
	months 13 to 24	-
	months 25 to 36	-

GENERAL INFORMATION													
Analyst	MJB			Jurisdiction/Area	Markdale			Date	April 7 2022				
Agency or Company	Tatham Eng. Ltd			East-West Street	Uplands Drive								
Analysis Period	00 January 1900			North-South Street	Toronto Street								
Flow Conditions	Free flow (rural)			Major Street	Toronto Street								
T Intersection	No			Approach Lanes per Direction	1								
Additional Comments				Hours of Traffic Volume Data	AM & PM peaks only								
JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME													
JUSTIFICATION	GUIDANCE	HOUR ENDING								No. of hours with compliance			
		AM Peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	PM Peak				
1A	TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total)	1245	720	720	720	720	720	720	720	1635	100%	80%+	Average Compliance
	COMPLIANCE % $\frac{VOL \times 100}{480}$ OR $\frac{VOL \times 100}{600}$ (1 lane approach on main road) (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
1B	TRAFFIC VOLUME ON MINOR STREET (vph) (2 way Total)	122	55	55	55	55	55	55	55	99	100%	80%+	Average Compliance
	COMPLIANCE % $\frac{VOL \times 100}{120}$ OR $\frac{VOL \times 100}{180}$ (full intersection) (tee intersection)	100%	46%	46%	46%	46%	46%	46%	46%	83%	1	2	57%
(FREE FLOW)		BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS										NO	
SIGNAL JUSTIFICATION 1:		LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS										NO	
JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC													
JUSTIFICATION	GUIDANCE	HOUR ENDING								No. of hours with compliance			
		Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8				
2A	MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total)	1123	665	665	665	665	665	665	665	1536	100%	80%+	Average Compliance
	COMPLIANCE % $\frac{VOL \times 100}{480}$ OR $\frac{VOL \times 100}{600}$ (1 lane approach on main road) (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
2B	CROSSING TRAFFIC VOLUME (vph) (2 way Total)	67	30	30	30	30	30	30	30	51	100%	80%+	Average Compliance
	COMPLIANCE % $\frac{VOL \times 100}{50}$	100%	59%	59%	59%	59%	59%	59%	59%	100%	2	2	69%
(FREE FLOW)		BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS										NO	
SIGNAL JUSTIFICATION 2:		LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS										NO	
JUSTIFICATION 3 - COLLISION EXPERIENCE													
A. Number of reportable collisions susceptible to prevention by a traffic signal.									Preceding Months	Number of Collisions	% Fulfillment		
									1 - 12	-	-		
									13 - 24	-	-		
									25 - 36	-	-		
									annual average	-	-		
B. Adequate trial of less restrictive remedies has failed to reduce collision frequency.									<input type="checkbox"/> YES	<input type="checkbox"/> NO	n/a		
C. Either Justification 1 (Minimum Vehicular Volume) or Justification 2 (Delay to Cross Traffic) satisfied to 80% or more.									<input type="checkbox"/> YES	<input type="checkbox"/> NO	n/a		
SIGNAL JUSTIFICATION 3:		ALL OF 3A, 3B & 3C FULFILLED TO 100%?							NO				
JUSTIFICATION 4 - COMBINATION JUSTIFICATION													
JUSTIFICATION SATISFIED 80% OR MORE										Two Justifications Satisfied 80% or more			
Justification 1	-	Minimum Vehicle Volume	NO							NO			
Justification 2	-	Delay to Cross Traffic	NO										
Justification 3	-	Collision Experience	-										
JUSTIFICATION SUMMARY													
ARE TRAFFIC SIGNALS JUSTIFIED FOR THE INTERSECTION IN QUESTION?										NO			

GENERAL INFORMATION

Analyst	MJB	Jurisdiction/Area	Markdale	Date	01 Jun 2022
Agency or Company	Tatham Eng Ltd	East-West Street	Uplands Drive		
Analysis Period		North-South Street	Toronto Street		
Flow Conditions	Free flow (rural)	Major Street	North-South		
T Intersection	No	Approach Lanes per Direction	1		
		Hours of Traffic Volume Data	AM & PM peaks only		
Additional Comments					

TRAFFIC & PEDESTRIAN VOLUMES

Hour of Data		AM Peak						PM Peak	AM + PM
Hour Ending		hr ending						hr ending	4
MAJOR STREET									
Northbound	right	30						89	30
	thru	499						714	303
	left	10						6	4
Southbound	right	14						7	5
	thru	577						711	322
	left	14						46	15
MINOR STREET									
Eastbound	right	6						14	5
	thru	0						0	0
	left	6						12	5
Westbound	right	37						27	16
	thru	0						0	0
	left	81						55	34
PEDESTRIANS									
crossing MAJOR street		0							0
crossing MINOR street		0							0
APPROACH VOLUMES									
major		1144						1573	679
minor		130						108	60
TOTAL		1274						1681	739
CROSSING VOLUMES									
TOTAL		87						67	39
note 1		87						67	
note 2		0						0	
note 3		0						0	
3a		no						no	
3b		no						yes	
note 4		0						0	

NOTES

Traffic crossing MAJOR street defined as:

- note 1: Left turns from both minor street approaches
- note 2: The heaviest through volume from the minor street
- note 3: 50% of the heavier left turn movement from the major street when both of the following are met:
 - 3a: the left turn volume > 120
 - 3b: the left turn volume + opposing volume > 720
- note 4: Pedestrians crossing the major street

ACCIDENT HISTORY

Reportable accidents over the past 36 months susceptible to correction by a traffic signal.	months 1 to 12	-
	months 13 to 24	-
	months 25 to 36	-

















GENERAL INFORMATION													
Analyst	MJB			Jurisdiction/Area	Markdale			Date	01 Jun 2022				
Agency or Company	Tatham Eng Ltd			East-West Street	Uplands Drive								
Analysis Period	00 January 1900			North-South Street	Toronto Street								
Flow Conditions	Free flow (rural)			Major Street	Toronto Street								
T Intersection	No			Approach Lanes per Direction	1								
Additional Comments				Hours of Traffic Volume Data	AM & PM peaks only								
JUSTIFICATION 1 - MINIMUM VEHICLE VOLUME													
JUSTIFICATION	GUIDANCE	HOUR ENDING								No. of hours with compliance			
		AM Peak	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	PM Peak				
1A	TOTAL TRAFFIC VOLUME ENTERING INTERSECTION (vph) (2 way Total)	1274	739	739	739	739	739	739	739	1681	100%	80%+	Average Compliance
	COMPLIANCE % $\frac{VOL \times 100}{480}$ OR $\frac{VOL \times 100}{600}$ (1 lane approach on main road) (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
1B	TRAFFIC VOLUME ON MINOR STREET (vph) (2 way Total)	130	60	60	60	60	60	60	60	108	100%	80%+	Average Compliance
	COMPLIANCE % $\frac{VOL \times 100}{120}$ OR $\frac{VOL \times 100}{180}$ (full intersection) (tee intersection)	100%	50%	50%	50%	50%	50%	50%	50%	90%	1	2	61%
(FREE FLOW)		BOTH 1A AND 1B 100% FULFILLED EACH OF 8 HOURS										NO	
SIGNAL JUSTIFICATION 1:		LESSER OF 1A OR 1B AT LEAST 80% FULFILLED EACH OF 8 HOURS										NO	
JUSTIFICATION 2 - DELAY TO CROSS TRAFFIC													
JUSTIFICATION	GUIDANCE	HOUR ENDING								No. of hours with compliance			
		Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8				
2A	MAIN ROAD TRAFFIC VOLUME (vph) (2 way Total)	1144	679	679	679	679	679	679	679	1573	100%	80%+	Average Compliance
	COMPLIANCE % $\frac{VOL \times 100}{480}$ OR $\frac{VOL \times 100}{600}$ (1 lane approach on main road) (2 or more lane approach on main road)	100%	100%	100%	100%	100%	100%	100%	100%	100%	8	8	100%
2B	CROSSING TRAFFIC VOLUME (vph) (2 way Total)	87	39	39	39	39	39	39	39	67	100%	80%+	Average Compliance
	COMPLIANCE % $\frac{VOL \times 100}{50}$	100%	77%	77%	77%	77%	77%	77%	77%	100%	2	2	83%
(FREE FLOW)		BOTH 2A AND 2B 100% FULFILLED EACH OF 8 HOURS										NO	
SIGNAL JUSTIFICATION 2:		LESSER OF 2A OR 2B AT LEAST 80% FULFILLED EACH OF 8 HOURS										NO	
JUSTIFICATION 3 - COLLISION EXPERIENCE													
A. Number of reportable collisions susceptible to prevention by a traffic signal.									Preceding Months	Number of Collisions	% Fulfillment		
									1 - 12	-	-		
									13 - 24	-	-		
									25 - 36	-	-		
									annual average	-	-		
B. Adequate trial of less restrictive remedies has failed to reduce collision frequency.									<input type="checkbox"/>	YES	<input type="checkbox"/>	NO	n/a
C. Either Justification 1 (Minimum Vehicular Volume) or Justification 2 (Delay to Cross Traffic) satisfied to 80% or more.									<input type="checkbox"/>	YES	<input type="checkbox"/>	NO	n/a
SIGNAL JUSTIFICATION 3:		ALL OF 3A, 3B & 3C FULFILLED TO 100%?							NO				
JUSTIFICATION 4 - COMBINATION JUSTIFICATION													
JUSTIFICATION SATISFIED 80% OR MORE									Two Justifications Satisfied 80% or more				
Justification 1	-	Minimum Vehicle Volume	NO						NO				
Justification 2	-	Delay to Cross Traffic	NO										
Justification 3	-	Collision Experience	-										
JUSTIFICATION SUMMARY													
ARE TRAFFIC SIGNALS JUSTIFIED FOR THE INTERSECTION IN QUESTION?									NO				

Appendix F: Total Operations

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E

2027 Total Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	60	79	66	68	80	62	422	54	39	336	57
Future Volume (vph)	51	60	79	66	68	80	62	422	54	39	336	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.94			0.95			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1754			1761			1847			1842	
Flt Permitted		0.85			0.82			0.90			0.92	
Satd. Flow (perm)		1504			1463			1676			1699	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	65	86	72	74	87	67	459	59	42	365	62
RTOR Reduction (vph)	0	32	0	0	26	0	0	5	0	0	6	0
Lane Group Flow (vph)	0	174	0	0	207	0	0	580	0	0	463	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		20.5			20.5			45.0			45.0	
Effective Green, g (s)		20.5			20.5			45.0			45.0	
Actuated g/C Ratio		0.26			0.26			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		397			386			973			986	
v/s Ratio Prot												
v/s Ratio Perm		0.12			c0.14			c0.35			0.27	
v/c Ratio		0.44			0.54			0.60			0.47	
Uniform Delay, d1		23.7			24.4			10.4			9.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			1.4			1.0			0.4	
Delay (s)		24.5			25.8			11.4			9.7	
Level of Service		C			C			B			A	
Approach Delay (s)		24.5			25.8			11.4			9.7	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay		14.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		77.5			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		67.9%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2027 Total Conditions
Weekday AM Peak Hour

















	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	
Traffic Volume (veh/h)	126	6	4	210	15	17
Future Volume (Veh/h)	126	6	4	210	15	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	137	7	4	228	16	18
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			144		376	140
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			144		376	140
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	98
cM capacity (veh/h)			1438		623	907
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	144	232	34			
Volume Left	0	4	16			
Volume Right	7	0	18			
cSH	1700	1438	747			
Volume to Capacity	0.08	0.00	0.05			
Queue Length 95th (m)	0.0	0.1	1.1			
Control Delay (s)	0.0	0.2	10.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	10.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			24.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Main St E & Lawler Dr

2027 Total Conditions



















Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	116	21	5	149	1	54	0	14	0	0	6
Future Volume (Veh/h)	4	116	21	5	149	1	54	0	14	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	126	23	5	162	1	59	0	15	0	0	7
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	163			149			325	318	138	333	330	162
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	163			149			325	318	138	333	330	162
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			90	100	98	100	100	99
cM capacity (veh/h)	1416			1432			620	594	911	607	586	882
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	153	168	74	7								
Volume Left	4	5	59	0								
Volume Right	23	1	15	7								
cSH	1416	1432	663	882								
Volume to Capacity	0.00	0.00	0.11	0.01								
Queue Length 95th (m)	0.1	0.1	2.9	0.2								
Control Delay (s)	0.2	0.3	11.1	9.1								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.2	0.3	11.1	9.1								
Approach LOS			B	A								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			27.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2027 Total Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	6	15	44	0	37	11	491	12	21	443	9
Future Volume (vph)	11	6	15	44	0	37	11	491	12	21	443	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.94		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737			1721		1789	1877		1789	1878	
Flt Permitted		0.85			0.81		0.47	1.00		0.43	1.00	
Satd. Flow (perm)		1504			1433		883	1877		815	1878	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	7	16	48	0	40	12	534	13	23	482	10
RTOR Reduction (vph)	0	14	0	0	36	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	21	0	0	52	0	12	546	0	23	491	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		5.1			5.1		34.2	34.2		34.2	34.2	
Effective Green, g (s)		5.1			5.1		34.2	34.2		34.2	34.2	
Actuated g/C Ratio		0.10			0.10		0.68	0.68		0.68	0.68	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		152			145		600	1276		554	1276	
v/s Ratio Prot								c0.29			0.26	
v/s Ratio Perm		0.01			c0.04		0.01			0.03		
v/c Ratio		0.14			0.36		0.02	0.43		0.04	0.39	
Uniform Delay, d1		20.6			21.1		2.6	3.6		2.7	3.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			1.5		0.1	1.1		0.1	0.9	
Delay (s)		21.0			22.6		2.7	4.7		2.8	4.4	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		21.0			22.6			4.6			4.3	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.3			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		50.3			Sum of lost time (s)			11.0				
Intersection Capacity Utilization		43.4%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

















2027 Total Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	6	57	0	23	10	411	22	9	477	14
Future Volume (Veh/h)	6	0	6	57	0	23	10	411	22	9	477	14
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	7	62	0	25	11	447	24	10	518	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (m)												205
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.92					
vC, conflicting volume	1052	1038	526	1026	1034	459	533	471				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1015	1001	446	988	996	459	454	471				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	96	100	99	70	100	96	99	99				
cM capacity (veh/h)	189	220	566	204	222	602	1023	1091				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	14	87	482	10	533							
Volume Left	7	62	11	10	0							
Volume Right	7	25	24	0	15							
cSH	284	251	1023	1091	1700							
Volume to Capacity	0.05	0.35	0.01	0.01	0.31							
Queue Length 95th (m)	1.2	11.3	0.2	0.2	0.0							
Control Delay (s)	18.4	26.7	0.3	8.3	0.0							
Lane LOS	C	D	A	A								
Approach Delay (s)	18.4	26.7	0.3	0.2								
Approach LOS	C	D										
Intersection Summary												
Average Delay	2.5											
Intersection Capacity Utilization	44.4%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E










2027 Total Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	70	130	53	58	86	105	453	51	87	422	67
Future Volume (vph)	75	70	130	53	58	86	105	453	51	87	422	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.94			0.94			0.99			0.98	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1740			1749			1846			1840	
Flt Permitted		0.82			0.80			0.81			0.83	
Satd. Flow (perm)		1448			1414			1502			1538	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	76	141	58	63	93	114	492	55	95	459	73
RTOR Reduction (vph)	0	39	0	0	34	0	0	4	0	0	5	0
Lane Group Flow (vph)	0	260	0	0	180	0	0	657	0	0	622	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		21.6			21.6			45.4			45.4	
Effective Green, g (s)		21.6			21.6			45.4			45.4	
Actuated g/C Ratio		0.27			0.27			0.57			0.57	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		395			386			863			883	
v/s Ratio Prot												
v/s Ratio Perm		c0.18			0.13			c0.44			0.40	
v/c Ratio		0.66			0.47			0.76			0.70	
Uniform Delay, d1		25.4			23.9			12.7			12.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.9			0.9			4.0			2.6	
Delay (s)		29.4			24.8			16.7			14.6	
Level of Service		C			C			B			B	
Approach Delay (s)		29.4			24.8			16.7			14.6	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		19.0			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		79.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		76.9%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2027 Total Conditions
Weekday PM Peak Hour

















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	221	16	9	177	9	10
Future Volume (Veh/h)	221	16	9	177	9	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	240	17	10	192	10	11
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			257		460	248
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			257		460	248
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1308		555	790
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	257	202	21			
Volume Left	0	10	10			
Volume Right	17	0	11			
cSH	1700	1308	657			
Volume to Capacity	0.15	0.01	0.03			
Queue Length 95th (m)	0.0	0.2	0.8			
Control Delay (s)	0.0	0.4	10.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.4	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			26.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Main St E & Lawler Dr

2027 Total Conditions



















Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	151	69	22	145	0	48	0	18	4	0	1
Future Volume (Veh/h)	3	151	69	22	145	0	48	0	18	4	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	164	75	24	158	0	52	0	20	4	0	1
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	158			239			414	414	202	434	451	158
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	158			239			414	414	202	434	451	158
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			90	100	98	99	100	100
cM capacity (veh/h)	1422			1328			539	518	839	512	494	887
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	242	182	72	5								
Volume Left	3	24	52	4								
Volume Right	75	0	20	1								
cSH	1422	1328	599	559								
Volume to Capacity	0.00	0.02	0.12	0.01								
Queue Length 95th (m)	0.0	0.4	3.1	0.2								
Control Delay (s)	0.1	1.2	11.8	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.2	11.8	11.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay												
Intersection Capacity Utilization												
Analysis Period (min)												

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2027 Total Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	4	24	46	1	46	13	550	26	60	500	5
Future Volume (vph)	10	4	24	46	1	46	13	550	26	60	500	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.93		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1715		1789	1871		1789	1881	
Flt Permitted		0.88			0.82		0.43	1.00		0.38	1.00	
Satd. Flow (perm)		1507			1445		811	1871		718	1881	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	4	26	50	1	50	14	598	28	65	543	5
RTOR Reduction (vph)	0	23	0	0	45	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	18	0	0	56	0	14	624	0	65	548	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		5.2			5.2		33.6	33.6		33.6	33.6	
Effective Green, g (s)		5.2			5.2		33.6	33.6		33.6	33.6	
Actuated g/C Ratio		0.10			0.10		0.67	0.67		0.67	0.67	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		157			150		547	1262		484	1269	
v/s Ratio Prot								c0.33			0.29	
v/s Ratio Perm		0.01			c0.04		0.02			0.09		
v/c Ratio		0.11			0.37		0.03	0.49		0.13	0.43	
Uniform Delay, d1		20.2			20.8		2.7	4.0		2.9	3.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			1.6		0.1	1.4		0.6	1.1	
Delay (s)		20.5			22.4		2.8	5.3		3.5	4.8	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		20.5			22.4			5.3			4.7	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		49.8			Sum of lost time (s)			11.0				
Intersection Capacity Utilization		68.8%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

















2027 Total Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	14	40	0	18	6	590	63	31	585	7
Future Volume (Veh/h)	12	0	14	40	0	18	6	590	63	31	585	7
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	0	15	43	0	20	7	641	68	34	636	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage veh												
Upstream signal (m)	205											
pX, platoon unblocked	0.89	0.89	0.89	0.89	0.89		0.89					
vC, conflicting volume	1417	1431	640	1408	1401	675	644			709		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1407	1423	539	1397	1389	675	543			709		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	97	57	100	96	99			96		
cM capacity (veh/h)	96	116	486	99	122	454	918			890		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	28	63	716	34	644							
Volume Left	13	43	7	34	0							
Volume Right	15	20	68	0	8							
cSH	169	132	918	890	1700							
Volume to Capacity	0.17	0.48	0.01	0.04	0.38							
Queue Length 95th (m)	4.4	16.6	0.2	0.9	0.0							
Control Delay (s)	30.6	55.1	0.2	9.2	0.0							
Lane LOS	D	F	A	A								
Approach Delay (s)	30.6	55.1	0.2	0.5								
Approach LOS	D	F										
Intersection Summary												
Average Delay				3.2								
Intersection Capacity Utilization				51.4%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E










2032 Total Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	66	89	72	78	92	75	440	58	44	373	61
Future Volume (vph)	56	66	89	72	78	92	75	440	58	44	373	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.94			0.95			0.99			0.98	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		1753			1761			1846			1843	
Flt Permitted		0.82			0.80			0.87			0.91	
Satd. Flow (perm)		1455			1426			1623			1680	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	72	97	78	85	100	82	478	63	48	405	66
RTOR Reduction (vph)	0	33	0	0	27	0	0	5	0	0	6	0
Lane Group Flow (vph)	0	197	0	0	236	0	0	618	0	0	513	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		21.1			21.1			45.4			45.4	
Effective Green, g (s)		21.1			21.1			45.4			45.4	
Actuated g/C Ratio		0.27			0.27			0.58			0.58	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		391			383			938			971	
v/s Ratio Prot												
v/s Ratio Perm		0.14			c0.17			c0.38			0.31	
v/c Ratio		0.50			0.62			0.66			0.53	
Uniform Delay, d1		24.3			25.2			11.3			10.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.0			2.9			1.7			0.5	
Delay (s)		25.3			28.1			13.0			10.6	
Level of Service		C			C			B			B	
Approach Delay (s)		25.3			28.1			13.0			10.6	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		16.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.65										
Actuated Cycle Length (s)		78.5			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		74.5%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2032 Total Conditions
Weekday AM Peak Hour

















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	137	9	6	231	25	17
Future Volume (Veh/h)	137	9	6	231	25	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	149	10	7	251	27	18
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				159	419	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				159	419	154
tC, single (s)				4.1	6.4	6.2
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	95	98
cM capacity (veh/h)				1420	588	892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	159	258	45			
Volume Left	0	7	27			
Volume Right	10	0	18			
cSH	1700	1420	681			
Volume to Capacity	0.09	0.00	0.07			
Queue Length 95th (m)	0.0	0.1	1.6			
Control Delay (s)	0.0	0.2	10.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			27.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Main St E & Lawler Dr

2032 Total Conditions



















Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	129	24	6	162	1	63	0	18	0	0	6
Future Volume (Veh/h)	4	129	24	6	162	1	63	0	18	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	140	26	7	176	1	68	0	20	0	0	7
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	177			166			358	352	153	372	364	176
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	177			166			358	352	153	372	364	176
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			88	100	98	100	100	99
cM capacity (veh/h)	1399			1412			589	568	893	569	559	867
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	170	184	88	7								
Volume Left	4	7	68	0								
Volume Right	26	1	20	7								
cSH	1399	1412	638	867								
Volume to Capacity	0.00	0.00	0.14	0.01								
Queue Length 95th (m)	0.1	0.1	3.6	0.2								
Control Delay (s)	0.2	0.3	11.5	9.2								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.2	0.3	11.5	9.2								
Approach LOS			B	A								
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			29.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2032 Total Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	6	15	50	0	51	11	552	14	26	489	9
Future Volume (vph)	11	6	15	50	0	51	11	552	14	26	489	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.93		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737			1713		1789	1877		1789	1878	
Flt Permitted		0.84			0.83		0.42	1.00		0.38	1.00	
Satd. Flow (perm)		1489			1448		800	1877		709	1878	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	7	16	54	0	55	12	600	15	28	532	10
RTOR Reduction (vph)	0	14	0	0	48	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	21	0	0	61	0	12	614	0	28	541	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.9			6.9		33.5	33.5		33.5	33.5	
Effective Green, g (s)		6.9			6.9		33.5	33.5		33.5	33.5	
Actuated g/C Ratio		0.13			0.13		0.65	0.65		0.65	0.65	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		199			194		521	1223		462	1223	
v/s Ratio Prot								c0.33				0.29
v/s Ratio Perm		0.01			c0.04		0.02			0.04		
v/c Ratio		0.11			0.32		0.02	0.50		0.06	0.44	
Uniform Delay, d1		19.5			20.1		3.2	4.6		3.2	4.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.9		0.1	1.5		0.3	1.2	
Delay (s)		19.8			21.1		3.2	6.1		3.5	5.5	
Level of Service		B			C		A	A		A	A	
Approach Delay (s)		19.8			21.1			6.1			5.4	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.4										
HCM 2000 Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		51.4										
Intersection Capacity Utilization		48.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

2032 Total Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	6	81	0	37	10	454	30	14	527	14
Future Volume (Veh/h)	6	0	6	81	0	37	10	454	30	14	527	14
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	7	88	0	40	11	493	33	15	573	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (m)												205
pX, platoon unblocked	0.88	0.88	0.88	0.88	0.88		0.88					
vC, conflicting volume	1182	1158	580	1142	1150	510	588	526				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1137	1110	451	1091	1100	510	459	526				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	95	100	99	46	100	93	99	99				
cM capacity (veh/h)	143	179	533	163	181	564	965	1041				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	14	128	537	15	588							
Volume Left	7	88	11	15	0							
Volume Right	7	40	33	0	15							
cSH	225	210	965	1041	1700							
Volume to Capacity	0.06	0.61	0.01	0.01	0.35							
Queue Length 95th (m)	1.5	26.6	0.3	0.3	0.0							
Control Delay (s)	22.0	45.9	0.3	8.5	0.0							
Lane LOS	C	E	A	A								
Approach Delay (s)	22.0	45.9	0.3	0.2								
Approach LOS	C	E										
Intersection Summary												
Average Delay	5.1											
Intersection Capacity Utilization	50.1%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E

2032 Total Conditions
Weekday PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	81	80	153	58	66	102	118	464	55	102	479	72
Future Volume (vph)	81	80	153	58	66	102	118	464	55	102	479	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.94			0.99			0.99	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1737			1746			1844			1841	
Flt Permitted		0.80			0.77			0.76			0.80	
Satd. Flow (perm)		1408			1365			1409			1493	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	87	166	63	72	111	128	504	60	111	521	78
RTOR Reduction (vph)	0	42	0	0	36	0	0	4	0	0	5	0
Lane Group Flow (vph)	0	299	0	0	210	0	0	688	0	0	705	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		22.7			22.7			46.3			46.3	
Effective Green, g (s)		22.7			22.7			46.3			46.3	
Actuated g/C Ratio		0.28			0.28			0.57			0.57	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		394			382			805			853	
v/s Ratio Prot												
v/s Ratio Perm		c0.21			0.15			c0.49			0.47	
v/c Ratio		0.76			0.55			0.85			0.83	
Uniform Delay, d1		26.7			24.8			14.5			14.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		8.2			1.6			8.8			6.6	
Delay (s)		34.8			26.4			23.4			20.7	
Level of Service		C			C			C			C	
Approach Delay (s)		34.8			26.4			23.4			20.7	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay		24.7			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		81.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		82.7%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2032 Total Conditions
Weekday PM Peak Hour

















	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	243	26	16	194	15	10
Future Volume (Veh/h)	243	26	16	194	15	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	264	28	17	211	16	11
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			292		523	278
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			292		523	278
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	99
cM capacity (veh/h)			1270		507	761
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	292	228	27			
Volume Left	0	17	16			
Volume Right	28	0	11			
cSH	1700	1270	587			
Volume to Capacity	0.17	0.01	0.05			
Queue Length 95th (m)	0.0	0.3	1.1			
Control Delay (s)	0.0	0.7	11.4			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.7	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		33.4%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Main St E & Lawler Dr

2032 Total Conditions



















Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	166	79	26	161	0	54	0	20	4	0	1
Future Volume (Veh/h)	3	166	79	26	161	0	54	0	20	4	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	180	86	28	175	0	59	0	22	4	0	1
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	175			266			461	460	223	482	503	175
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	175			266			461	460	223	482	503	175
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			88	100	97	99	100	100
cM capacity (veh/h)	1401			1298			501	486	817	473	460	868
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	269	203	81	5								
Volume Left	3	28	59	4								
Volume Right	86	0	22	1								
cSH	1401	1298	560	520								
Volume to Capacity	0.00	0.02	0.14	0.01								
Queue Length 95th (m)	0.0	0.5	3.8	0.2								
Control Delay (s)	0.1	1.2	12.5	12.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.2	12.5	12.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			36.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2032 Total Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	4	24	50	1	55	13	610	32	75	562	5
Future Volume (vph)	10	4	24	50	1	55	13	610	32	75	562	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.93		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1711		1789	1869		1789	1881	
Flt Permitted		0.88			0.83		0.37	1.00		0.32	1.00	
Satd. Flow (perm)		1515			1453		705	1869		607	1881	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	4	26	54	1	60	14	663	35	82	611	5
RTOR Reduction (vph)	0	22	0	0	52	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	19	0	0	63	0	14	696	0	82	616	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.0			7.0		33.1	33.1		33.1	33.1	
Effective Green, g (s)		7.0			7.0		33.1	33.1		33.1	33.1	
Actuated g/C Ratio		0.14			0.14		0.65	0.65		0.65	0.65	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		207			199		456	1210		393	1218	
v/s Ratio Prot								c0.37			0.33	
v/s Ratio Perm		0.01			c0.04		0.02			0.14		
v/c Ratio		0.09			0.32		0.03	0.58		0.21	0.51	
Uniform Delay, d1		19.3			19.9		3.2	5.1		3.7	4.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.9		0.1	2.0		1.2	1.5	
Delay (s)		19.5			20.8		3.4	7.0		4.9	6.2	
Level of Service		B			C		A	A		A	A	
Approach Delay (s)		19.5			20.8			7.0			6.1	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		51.1			Sum of lost time (s)			11.0				
Intersection Capacity Utilization		77.4%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

















2032 Total Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	14	55	0	27	6	652	89	46	647	7
Future Volume (Veh/h)	12	0	14	55	0	27	6	652	89	46	647	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	0	15	60	0	29	7	709	97	50	703	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												205
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1608	1627	707	1590	1582	758	711	806				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1628	1651	554	1607	1598	758	559	806				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	78	100	97	8	100	93	99	94				
cM capacity (veh/h)	60	77	446	65	83	407	849	819				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	28	89	813	50	711							
Volume Left	13	60	7	50	0							
Volume Right	15	29	97	0	8							
cSH	112	89	849	819	1700							
Volume to Capacity	0.25	1.00	0.01	0.06	0.42							
Queue Length 95th (m)	7.0	43.7	0.2	1.5	0.0							
Control Delay (s)	47.4	178.5	0.2	9.7	0.0							
Lane LOS	E	F	A	A								
Approach Delay (s)	47.4	178.5	0.2	0.6								
Approach LOS	E	F										
Intersection Summary												
Average Delay			10.6									
Intersection Capacity Utilization			58.3%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E










2037 Total Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	71	97	79	82	97	79	480	62	46	407	65
Future Volume (vph)	61	71	97	79	82	97	79	480	62	46	407	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.94			0.95			0.99			0.98	
Flt Protected		0.99			0.98			0.99			1.00	
Satd. Flow (prot)		1752			1761			1846			1843	
Flt Permitted		0.80			0.77			0.87			0.90	
Satd. Flow (perm)		1428			1377			1620			1671	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	66	77	105	86	89	105	86	522	67	50	442	71
RTOR Reduction (vph)	0	33	0	0	27	0	0	4	0	0	6	0
Lane Group Flow (vph)	0	215	0	0	253	0	0	671	0	0	557	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		21.6			21.6			45.4			45.4	
Effective Green, g (s)		21.6			21.6			45.4			45.4	
Actuated g/C Ratio		0.27			0.27			0.57			0.57	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		390			376			930			960	
v/s Ratio Prot												
v/s Ratio Perm		0.15			c0.18			c0.41			0.33	
v/c Ratio		0.55			0.67			0.72			0.58	
Uniform Delay, d1		24.6			25.6			12.2			10.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.7			4.7			2.8			0.9	
Delay (s)		26.3			30.3			15.0			11.6	
Level of Service		C			C			B			B	
Approach Delay (s)		26.3			30.3			15.0			11.6	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		17.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		79.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		79.7%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2037 Total Conditions
Weekday AM Peak Hour

















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	146	9	6	244	25	17
Future Volume (Veh/h)	146	9	6	244	25	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	159	10	7	265	27	18
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	169			443	164	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	169			443	164	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			95	98	
cM capacity (veh/h)	1409			569	881	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	169	272	45			
Volume Left	0	7	27			
Volume Right	10	0	18			
cSH	1700	1409	663			
Volume to Capacity	0.10	0.00	0.07			
Queue Length 95th (m)	0.0	0.1	1.7			
Control Delay (s)	0.0	0.2	10.8			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.2	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			27.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Main St E & Lawler Dr

2037 Total Conditions



















Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	137	24	6	174	1	63	0	18	0	0	6
Future Volume (Veh/h)	4	137	24	6	174	1	63	0	18	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	149	26	7	189	1	68	0	20	0	0	7
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	190			175			380	374	162	394	386	190
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	190			175			380	374	162	394	386	190
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			88	100	98	100	100	99
cM capacity (veh/h)	1384			1401			569	552	883	550	543	852
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	179	197	88	7								
Volume Left	4	7	68	0								
Volume Right	26	1	20	7								
cSH	1384	1401	619	852								
Volume to Capacity	0.00	0.00	0.14	0.01								
Queue Length 95th (m)	0.1	0.1	3.7	0.2								
Control Delay (s)	0.2	0.3	11.8	9.3								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.2	0.3	11.8	9.3								
Approach LOS			B	A								
Intersection Summary												
Average Delay	2.5											
Intersection Capacity Utilization	30.0%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2037 Total Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	6	15	50	0	51	11	604	14	26	534	9
Future Volume (vph)	11	6	15	50	0	51	11	604	14	26	534	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.94			0.93		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737			1713		1789	1877		1789	1879	
Flt Permitted		0.84			0.83		0.39	1.00		0.34	1.00	
Satd. Flow (perm)		1489			1448		740	1877		641	1879	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	7	16	54	0	55	12	657	15	28	580	10
RTOR Reduction (vph)	0	14	0	0	48	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	21	0	0	61	0	12	671	0	28	589	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.9			6.9		33.5	33.5		33.5	33.5	
Effective Green, g (s)		6.9			6.9		33.5	33.5		33.5	33.5	
Actuated g/C Ratio		0.13			0.13		0.65	0.65		0.65	0.65	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		199			194		482	1223		417	1224	
v/s Ratio Prot								c0.36				0.31
v/s Ratio Perm		0.01			c0.04		0.02			0.04		
v/c Ratio		0.11			0.32		0.02	0.55		0.07	0.48	
Uniform Delay, d1		19.5			20.1		3.2	4.9		3.3	4.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.9		0.1	1.8		0.3	1.4	
Delay (s)		19.8			21.1		3.3	6.6		3.6	5.9	
Level of Service		B			C		A	A		A	A	
Approach Delay (s)		19.8			21.1			6.6			5.8	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.6										
HCM 2000 Volume to Capacity ratio		0.51										
Actuated Cycle Length (s)		51.4										
Intersection Capacity Utilization		50.9%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr

















2037 Total Conditions
Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	6	81	0	37	10	499	30	14	577	14
Future Volume (Veh/h)	6	0	6	81	0	37	10	499	30	14	577	14
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	7	88	0	40	11	542	33	15	627	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked	0.85	0.85	0.85	0.85	0.85		0.85					
vC, conflicting volume	1285	1262	634	1244	1252	558	642			575		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1246	1218	476	1198	1207	558	485			575		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	99	34	100	92	99			98		
cM capacity (veh/h)	115	149	498	133	151	529	911			998		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	14	128	586	15	642							
Volume Left	7	88	11	15	0							
Volume Right	7	40	33	0	15							
cSH	187	173	911	998	1700							
Volume to Capacity	0.07	0.74	0.01	0.02	0.38							
Queue Length 95th (m)	1.8	35.4	0.3	0.3	0.0							
Control Delay (s)	25.8	68.8	0.3	8.7	0.0							
Lane LOS	D	F	A	A								
Approach Delay (s)	25.8	68.8	0.3	0.2								
Approach LOS	D	F										
Intersection Summary												
Average Delay												
Intersection Capacity Utilization												
Analysis Period (min)												

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E










2037 Total Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	84	165	64	70	107	126	506	59	105	522	77
Future Volume (vph)	89	84	165	64	70	107	126	506	59	105	522	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.93			0.94			0.99			0.99	
Flt Protected		0.99			0.99			0.99			0.99	
Satd. Flow (prot)		1736			1748			1845			1842	
Flt Permitted		0.78			0.74			0.73			0.79	
Satd. Flow (perm)		1381			1312			1365			1471	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	91	179	70	76	116	137	550	64	114	567	84
RTOR Reduction (vph)	0	41	0	0	34	0	0	4	0	0	5	0
Lane Group Flow (vph)	0	326	0	0	228	0	0	747	0	0	760	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		23.5			23.5			47.1			47.1	
Effective Green, g (s)		23.5			23.5			47.1			47.1	
Actuated g/C Ratio		0.28			0.28			0.57			0.57	
Clearance Time (s)		6.0			6.0			6.0			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		392			373			778			838	
v/s Ratio Prot												
v/s Ratio Perm		c0.24			0.17			c0.55			0.52	
v/c Ratio		0.83			0.61			0.96			0.91	
Uniform Delay, d1		27.7			25.6			16.9			15.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		13.8			2.9			22.9			13.3	
Delay (s)		41.5			28.5			39.8			29.1	
Level of Service		D			C			D			C	
Approach Delay (s)		41.5			28.5			39.8			29.1	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			34.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			82.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			89.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Herbert Ave & Main St E

2037 Total Conditions
Weekday PM Peak Hour

















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	256	26	16	205	15	10
Future Volume (Veh/h)	256	26	16	205	15	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	278	28	17	223	16	11
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			306		549	292
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			306		549	292
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	99
cM capacity (veh/h)			1255		490	747
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	306	240	27			
Volume Left	0	17	16			
Volume Right	28	0	11			
cSH	1700	1255	570			
Volume to Capacity	0.18	0.01	0.05			
Queue Length 95th (m)	0.0	0.3	1.1			
Control Delay (s)	0.0	0.7	11.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.7	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			34.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Main St E & Lawler Dr

2037 Total Conditions



















Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	178	79	26	173	0	54	0	20	4	0	1
Future Volume (Veh/h)	3	178	79	26	173	0	54	0	20	4	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	193	86	28	188	0	59	0	22	4	0	1
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	188			279			487	486	236	508	529	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	188			279			487	486	236	508	529	188
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			88	100	97	99	100	100
cM capacity (veh/h)	1386			1284			481	470	803	454	444	854
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	282	216	81	5								
Volume Left	3	28	59	4								
Volume Right	86	0	22	1								
cSH	1386	1284	540	501								
Volume to Capacity	0.00	0.02	0.15	0.01								
Queue Length 95th (m)	0.0	0.5	4.0	0.2								
Control Delay (s)	0.1	1.2	12.8	12.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.2	12.8	12.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			37.1%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Toronto St S & Victoria Ave


















2037 Total Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	4	24	50	1	55	13	667	32	75	615	5
Future Volume (vph)	10	4	24	50	1	55	13	667	32	75	615	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.93		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1699			1711		1789	1870		1789	1881	
Flt Permitted		0.88			0.83		0.34	1.00		0.28	1.00	
Satd. Flow (perm)		1515			1453		637	1870		535	1881	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	4	26	54	1	60	14	725	35	82	668	5
RTOR Reduction (vph)	0	22	0	0	52	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	19	0	0	63	0	14	758	0	82	673	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.0			7.0		33.1	33.1		33.1	33.1	
Effective Green, g (s)		7.0			7.0		33.1	33.1		33.1	33.1	
Actuated g/C Ratio		0.14			0.14		0.65	0.65		0.65	0.65	
Clearance Time (s)		6.0			6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		207			199		412	1211		346	1218	
v/s Ratio Prot								c0.41			0.36	
v/s Ratio Perm		0.01			c0.04		0.02			0.15		
v/c Ratio		0.09			0.32		0.03	0.63		0.24	0.55	
Uniform Delay, d1		19.3			19.9		3.2	5.3		3.7	4.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.9		0.2	2.5		1.6	1.8	
Delay (s)		19.5			20.8		3.4	7.8		5.4	6.7	
Level of Service		B			C		A	A		A	A	
Approach Delay (s)		19.5			20.8			7.7			6.6	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.4			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		51.1			Sum of lost time (s)			11.0				
Intersection Capacity Utilization		80.4%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Toronto St S & Hospital Access/Uplands Dr





















2037 Total Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	0	14	55	0	27	6	714	89	46	711	7
Future Volume (Veh/h)	12	0	14	55	0	27	6	714	89	46	711	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	0	15	60	0	29	7	776	97	50	773	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												205
pX, platoon unblocked	0.80	0.80	0.80	0.80	0.80		0.80					
vC, conflicting volume	1744	1764	777	1726	1720	824	781	873				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1806	1831	594	1784	1775	824	599	873				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	69	100	96	0	100	92	99	94				
cM capacity (veh/h)	43	57	403	46	61	373	780	773				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2							
Volume Total	28	89	880	50	781							
Volume Left	13	60	7	50	0							
Volume Right	15	29	97	0	8							
cSH	82	64	780	773	1700							
Volume to Capacity	0.34	1.38	0.01	0.06	0.46							
Queue Length 95th (m)	9.9	57.1	0.2	1.6	0.0							
Control Delay (s)	70.5	351.1	0.3	10.0	0.0							
Lane LOS	F	F	A	A								
Approach Delay (s)	70.5	351.1	0.3	0.6								
Approach LOS	F	F										
Intersection Summary												
Average Delay			18.6									
Intersection Capacity Utilization			61.5%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

1: Toronto St S/Toronto St N & Main St W/Main St E

2037 Total Conditions
Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	84	165	64	70	107	126	506	59	105	522	77
Future Volume (vph)	89	84	165	64	70	107	126	506	59	105	522	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.91		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	1696		1789	1713		1789	1854		1789	1847	
Flt Permitted	0.61	1.00		0.47	1.00		0.30	1.00		0.33	1.00	
Satd. Flow (perm)	1151	1696		890	1713		574	1854		623	1847	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	91	179	70	76	116	137	550	64	114	567	84
RTOR Reduction (vph)	0	89	0	0	69	0	0	5	0	0	6	0
Lane Group Flow (vph)	97	181	0	70	123	0	137	609	0	114	645	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Effective Green, g (s)	20.0	20.0		20.0	20.0		45.0	45.0		45.0	45.0	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.58	0.58		0.58	0.58	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	298	440		231	444		335	1083		364	1079	
v/s Ratio Prot		c0.11			0.07			0.33			c0.35	
v/s Ratio Perm	0.08			0.08			0.24			0.18		
v/c Ratio	0.33	0.41		0.30	0.28		0.41	0.56		0.31	0.60	
Uniform Delay, d1	23.0	23.6		22.9	22.7		8.7	9.9		8.1	10.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.6		0.7	0.3		0.8	0.7		0.5	0.9	
Delay (s)	23.7	24.3		23.6	23.1		9.6	10.6		8.6	11.1	
Level of Service	C	C		C	C		A	B		A	B	
Approach Delay (s)		24.1			23.2			10.4			10.7	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			77.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			128.3%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												