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505-533 Yonge Street

TRAFFIC IMPACT STUDY

Renaissance Barrie Retirement Trust

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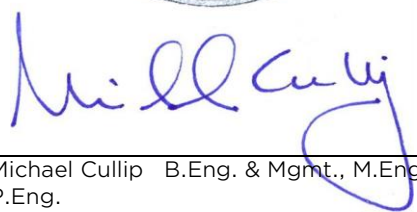
December
17, 2021

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Issue	Date	Description
1	December 17, 2021	Final Report

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1 Introduction

Tatham Engineering Limited was retained by Renaissance Barrie Retirement Trust to address the traffic impacts associated with the proposed mixed-use development to be located at 505-533 Yonge Street in the City of Barrie. The location of the development site is illustrated in Figure 1.

The purpose of this study is to review the requirements of the City of Barrie with respect to the potential transportation impacts of the development on the local 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;

Chapter 2 of this report addresses the existing conditions, detailing the road system and corresponding traffic operations. Chapter 3 addresses future conditions, prior to the completion of the proposed development, and the expected growth in the traffic levels and the resulting operating conditions. Chapters 4 and 5 address the proposed development, the ensuing vehicle trips that it will generate, and the associated impacts on the road system. Lastly, Chapter 6 summarizes the report and the key findings.



2 Existing Conditions

This chapter will describe the road network, traffic volumes and operations for the existing conditions.

2.1 EXISTING ROAD NETWORK

The road network to be addressed by this study consists of Yonge Street, Little Avenue, D'Ambrosio Drive, Cox Mill Road, Big Bay Point Road and the following intersections:

- Little Avenue and Yonge Street;
- D'Ambrosio Drive and Yonge Street;
- Cox Mill Road and Yonge Street; and
- Big Bay Point Road and Yonge Street.

Aerial mapping and photographs of the road system are provided in Figure 2.

2.1.1 Road Network

A summary of the road network is provided in Table 1. The functional classification and capacity for each road is based on the *City of Barrie Transportation Master Plan*¹.

Table 1: Road Network

ROAD	CLASS	CROSS SECTION	SPEED LIMIT (km/h)	CAPACITY ¹ (vphpl)
Yonge Street	Arterial	5-lane	50	850
Little Avenue	Arterial	2-lane	50	750
D'Ambrosio Drive	Local	2-lane	50	400
Cox Mill Road	Major Collector	2-lane	50	500
Big Bay Point Road	Arterial	5-lane	50	850

¹ capacity is denoted as vehicles per hour per lane (vphpl)

¹ The City of Barrie Transportation Master Plan. WSP, June 2019



2.1.2 Key Intersections

Yonge Street and Little Avenue

The intersection of Yonge Street with Little Avenue is a 4-leg signalized intersection. The north and south approaches consist of an exclusive left turn lane, a through lane and a shared through-right turn lane. The east and west approaches consist of an exclusive left turn lane and a shared through-right turn lane.

Yonge Street and D'Ambrosio Drive

The intersection of Yonge Street with D'Ambrosio Drive is a 3-leg signalized intersection. The north approach consists of a through lane and a through-right turn lane, whereas the south approach consists of an exclusive left turn lane and two through lanes. The west approach has sufficient width to accommodate separate left and right turn lanes, although it is not painted as such. For the purpose of this study, it has been assumed that the west approach consists of a shared left/right turn lane.

Yonge Street & Cox Mill Road

The intersection of Yonge Street with Cox Mill Road is a 4-leg signalized intersection (albeit the west leg is a small commercial access). The north approach consists of an exclusive left turn lane, a through lane and a shared through-right turn lane, whereas the south approach consists of an exclusive left turn lane, two through lanes and an exclusive right turn lane. The west approach (commercial access) has a shared left-through-right turn lane, and the east approach provides an exclusive left turn lane and a shared through-right turn lane.

Yonge Street and Big Bay Point Road

The intersection of Yonge Street with Big Bay Point Road is a 4-leg signalized intersection. The north and south approaches each consist of an exclusive left turn lane, two through lanes, and a channelized right turn lane. The east approach consists of an exclusive left turn lane, two through lanes and an exclusive right turn lane, whereas the west approach consists of an exclusive left turn lane, a through lane, and a through-right turn lane.

2.2 EXISTING TRAFFIC VOLUMES

To establish the existing traffic volumes on the road network, the following traffic counts were obtained:

- Little Avenue and Yonge Street – Thursday April 11, 2019;
- D'Ambrosio Drive and Yonge Street – Tuesday April 16, 2019;



- Cox Mill Road and Yonge Street – Thursday June 28, 2018; and
- Big Bay Point Road and Yonge Street – Thursday June 28, 2018.

The corresponding traffic count details are provided Appendix A.

In reviewing the available data in context of growth projections provided by the City and midblock volumes obtained from the City's EMME traffic model (2031 and 2041), the 2019 volumes observed on Yonge Street at D'Ambrosio Drive were determined to be the most appropriate base from which to establish existing and future volumes on Yonge Street. To reflect 2021 conditions, the volumes on Yonge Street were adjusted by an annual growth rate of 3% and carried through the adjacent intersections. Adjustments to the turning movements were made as appropriate to ensure volume balance on Yonge Street between D'Ambrosio Drive and Big Bay Point Road. The volumes on Yonge Street between D'Ambrosio Drive and Little Avenue were reduced by 10% to reflect the various connections along this section of road (it is noted that the 2019 counts indicate a larger decrease in the order of 30% during the AM peak hour and 20% during the PM peak hour). The 2018 and 2019 observed volumes on Big Bay Point Road, Cox Mill Road and Little Avenue were also adjusted by the background growth rates noted in Section 3.3.1 to reflect 2021 conditions.

The resulting 2021 peak hour volumes are illustrated in Figure 3.

2.3 EXISTING TRAFFIC OPERATIONS

The assessment of existing conditions provides the baseline from which the future traffic volumes and operations (both with and without the subject development) can be assessed. The capacity, and hence operations, of a road system is effectively dictated by its intersections and as such, the analysis focused on the operations of the noted key intersections. The analysis is based on the peak 2021 traffic volumes, the existing configuration and intersection control and procedures outlined in the *2000 Highway Capacity Manual*² (using Synchro v.10 software). The signal timing plans for each intersection reflect those provided by the City. For signalized intersections, the review considers the average delay (measured in seconds), level of service (LOS) and volume to capacity (v/c) for each approach and the overall intersection (additional details are provided on the detailed worksheets).

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. 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.

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



A summary of the existing traffic conditions analyses is provided in Table 2 whereas detailed operations worksheets are included in Appendix B.

Table 2: Intersection Operations – 2021 Conditions

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Little Avenue & Yonge Street	EB	signal	37	D	0.77	36	D	0.77
	WB	signal	39	D	0.77	27	C	0.38
	NB	signal	10	B	0.27	12	B	0.32
	SB	signal	12	B	0.23	14	B	0.45
	overall	signal	21	C	0.43	19	B	0.54
D'Ambrosio Drive & Yonge Street	EB	signal	36	D	0.31	35	D	0.25
	NB	signal	3	A	0.27	3	A	0.28
	SB	signal	5	A	0.04	7	A	0.42
	overall	signal	6	A	0.29	7	A	0.40
Cox Mill Road & Yonge Street	EB	signal	0	A	0.00	0	A	0.00
	WB	signal	61	E	0.81	73	E	0.90
	NB	signal	8	A	0.30	9	A	0.33
	SB	signal	5	A	0.20	6	A	0.36
	overall	signal	15	B	0.40	16	B	0.49
Big Bay Point Road & Yonge Street	EB	signal	38	D	0.61	51	D	0.86
	WB	signal	44	D	0.70	43	D	0.68
	NB	signal	16	B	0.27	23	C	0.57
	SB	signal	15	B	0.26	25	C	0.60
	overall	signal	29	C	0.40	35	C	0.72



Based on the existing volumes and intersection configuration and control, the study area intersections provide acceptable overall operations level of service (LOS C or better) with average delays during both peak hours. As such, no intersection improvements are required to support the existing conditions.

2.4 EXISTING TRANSIT & ACTIVE TRANSPORTATION

2.4.1 Transit Service

Barrie Transit currently operates two routes along Yonge Street across the frontage of the site:

- 8A – RVH/Yonge (southbound); and
- 8B – Crosstown/Essa (northbound).

The routes operate on a 30-minute schedule during weekdays and Saturdays, and on a 60 minute service during the evening hours and Sundays. The routes provide connectivity to most of the City through connections with the Barrie Downtown Terminal, the Allandale Waterfront Station and the Barrie South GO Station.

Barrie Transit also operates routes 3A Bayview, 3B Painswick, 4A East Bayfield and 4B South GO which have stops along Big Bay Point Road in the vicinity of Yonge Street.

2.4.2 Active Transportation

Sidewalks are provided on both sides of Yonge Street with controlled pedestrian crossings provided at all of the study area signalized intersections.

It is noted that there are currently no on-street cycling facilities in the study area.



3 Future Background Conditions

This chapter will describe the road network and background traffic volumes expected for the years 2026, 2031 and 2036. The 2026 horizon year has been adopted to reflect full build-out of the proposed development, whereas the 2031 and 2036 horizons will address the longer-term impacts (5 and 10 years beyond build-out).

3.1 FUTURE ROAD NETWORK

The *City of Barrie Transportation Master Plan* (TMP) recommends that Little Avenue be widened from a 2-lane cross-section to a 3-lane cross-section with a continuous two-way left turn lane by 2031. This improvement will not have any impact to the intersection operation at the study area intersection of Little Avenue with Yonge Street recognizing that the Little Avenue approaches already provide exclusive left turn lanes.

There are no other road improvements identified for the study area. As such, the road network as described in Section 2.1 has been maintained.

3.2 FUTURE TRANSIT & ACTIVE TRANSPORTATION

3.2.1 Transit

As identified in the City's TMP, a new transit strategy has been identified for implementation by 2041 which includes a core transit route along Yonge Street, connecting south, central and north Barrie. In conjunction with the new transit strategy, high occupancy vehicle (HOV) lanes are proposed for Yonge Street by 2041 to support improved transit service delivery. The proposed HOV lanes are to be provide via conversion of the existing curb lane from general purpose to HOV (rather than widening the road).

The transit strategy also proposed transit support routes along Little Avenue and Big Bay Point Road that will support the core service routes.

It is noted that the transit improvements and implementation of HOV lanes on Yonge Street are proposed by the 2041 horizon, which is beyond the study horizon considered herein.

3.2.2 Active Transportation

With respect to active transportation improvements, the following have been recommended in the City's TMP:

- Yonge Street – cycle track (separated facility);
- Big Bay Point Road – cycle track (separated facility);



- Little Avenue – buffered bicycle lanes;
- Cox Mill Road – bicycle lanes; and
- D'Ambrosio Drive – signed bicycle route.

The timing of the noted active transportation improvements are not identified other than being proposed by the 2041 horizon.

3.3 FUTURE BACKGROUND TRAFFIC VOLUMES

Background traffic volumes expected for the 2026, 2031 and 2036 horizon years have been determined based on the existing traffic volumes, projected growth and additional volumes generated by other planned developments in the area.

3.3.1 Background Growth

Based on traffic projections from the City's Transportation Model, City staff have indicated that the following annual growth rates should be applied:

- Yonge Street – 3% through 2031 and 1% beyond 2031;
- Little Avenue – 1%;
- Cox Mill Road – 1%;
- Big Bay Point Road (west of Yonge Street) – 3% through 2031 and 1% beyond 2031; and
- Big Bay Point Road (east of Yonge Street) – 1%.

No growth has been applied to D'Ambrosio Drive recognizing that it is a local road serving a built-out area and not subject to year over year growth.

3.3.2 Development Growth

The following planned developments have been identified within the study area for inclusion in the establishment of future background traffic volumes.

520 & 526 Big Bay Point Road

The proposed residential development to be located at 520 & 526 Big Bay Point Road will consist of a 6 storey, 46-unit apartment building. For the purpose of this study, full build-out has been assumed by 2026.



The trip estimates and distribution are based on the information provided in the *520 & 526 Big Bay Point Road Traffic Brief*³ report. The proposed development is expected to generate 17 trips during the AM peak hour and 21 trips during the PM peak hour. The assignment of trips to the study area road network is illustrated in Figure 4, whereas excerpts from the study are provided in Appendix C.

343 Little Avenue/410 Yonge Street

The proposed development to be located at 343 Little Avenue/410 Yonge Street will consist of 153 townhouse units with full build-out assumed by 2026.

The trip estimates and distribution for the development are based on those provided in the *Traffic Impact Study - Yonge Street & Little Avenue Residential Development*⁴. The development is estimated to generate 71 new trips during AM peak hour and 86 trips during the PM peak hour. The distribution and assignment of trips to the road network are illustrated in Figure 5, with excerpts from the noted report provided in Appendix C.

481 Yonge Street

The proposed residential development to be located at 481 Yonge Street is to consist of 67 apartment units. For the purpose of this study, full build-out has been assumed by 2026.

The trip estimates and distribution are based on the information provided in the *481 Yonge Street Traffic Brief*⁵ prepared in support of the development. It is noted that the development is estimated to generate 25 new trips during AM peak hour and 31 trips during the PM peak hour. The distribution and assignment of trips to the road network are illustrated in Figure 6, whereas excerpts from the study are provided in Appendix C.

Background Development Traffic – Total

The total traffic volumes associated with the noted background developments is provided in Figure 7.

3.3.3 Background Traffic Volumes

The resulting 2026, 2031 and 2036 background traffic volumes are illustrated in Figure 8 through Figure 10. The background volumes reflect the 2021 volumes, the noted annual background

³ *520 & 526 Big Bay Point Road Traffic Brief*. JD Northcote Engineering Inc. April 13, 2021.

⁴ *Traffic Impact Study - Yonge Street & Little Avenue Residential Development*. C.F. Crozier & Associates Inc. July 2018

⁵ *481 Yonge Street Traffic Brief*. JD Northcote Engineering Inc. May 16, 2021.



growth rates and the additional traffic volumes associated with the identified background developments.

3.4 FUTURE BACKGROUND TRAFFIC OPERATIONS

The key intersections were again analyzed for each horizon year given the projected background volumes and the existing intersection configurations. The signal timings have been optimized where appropriate to ensure optimal intersection operations are maintained – this includes implementation of an advance green phase for the eastbound left turn movement on Little Avenue during the AM peak hour under the 2031 conditions. The results of the assessment are summarized in Table 3 through Table 5 (detailed worksheets are provided in Appendix D).

As indicated, the key intersections are expected to continue to provide acceptable overall operating conditions (LOS D or better) with average delays through the considered horizon periods given the assumed background traffic volumes. As per the detailed worksheets provided in Appendix D, all individual movements will provide acceptable levels of service (LOS E or better) and operate under capacity.

Notwithstanding the above, it is noted that the overall intersection of Big Bay Point Road with Yonge Street is expected to exceed capacity ($v/c > 1.0$) during the PM peak hour by 2036 given the projected background volumes (although the level of service and delay are still within the acceptable thresholds). To address the capacity issue, it is recommended that a southbound right turn lane be provided (the right turn volumes are in the order of 320 vehicles during the PM peak hour). While the right turn movement is currently channelized, there is no taper or parallel lane to allow right turning traffic to be removed from the through movement (and thus access to the right turn channel is impeded by the queue of southbound through traffic). The intersection operations were reviewed again to consider the recommended southbound right turn lane, the results of which are summarized in Table 6. As noted, the provision of the right turn lane addresses the capacity concerns under 2036 background conditions.

Aside from ongoing review and optimization of the traffic signal timing plans, the following improvements are recommended to accommodate the projected background traffic volumes:

- 2031 Horizon
 - implement advance green phase for the eastbound left turn movement on Little Avenue at Yonge Street; and
- 2036 Horizon
 - construct a southbound right turn lane on Yonge Street at Big Bay Point Road .



Table 3: Intersection Operations - 2026 Background Conditions

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Little Avenue & Yonge Street	EB	signal	42	D	0.86	39	D	0.83
	WB	signal	39	D	0.78	27	C	0.38
	NB	signal	12	B	0.37	14	B	0.45
	SB	signal	14	B	0.28	17	B	0.55
	overall	signal	22	C	0.52	21	C	0.63
D'Ambrosio Drive & Yonge Street	EB	signal	36	D	0.31	35	D	0.23
	NB	signal	4	A	0.31	4	A	0.33
	SB	signal	6	A	0.26	8	A	0.49
	overall	signal	6	A	0.33	7	A	0.46
Cox Mill Road & Yonge Street	EB	signal	0	A	0.00	0	A	0.00
	WB	signal	62	E	0.83	64	E	0.86
	NB	signal	9	A	0.35	11	B	0.40
	SB	signal	5	A	0.24	8	A	0.44
	overall	signal	15	B	0.45	15	B	0.55
Big Bay Point Road & Yonge Street	EB	signal	24	C	0.60	38	D	0.91
	WB	signal	30	C	0.63	36	D	0.91
	NB	signal	18	B	0.40	25	C	0.80
	SB	signal	18	B	0.42	33	C	0.87
	overall	signal	23	C	0.52	33	C	0.92



Table 4: Intersection Operations – 2031 Background Conditions

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Little Avenue & Yonge Street	EB	signal	27	C	0.57	43	D	0.87
	WB	signal	49	D	0.84	27	C	0.40
	NB	signal	18	B	0.53	16	B	0.61
	SB	signal	19	B	0.36	19	B	0.64
	overall	signal	25	C	0.64	23	C	0.71
D'Ambrosio Drive & Yonge Street	EB	signal	36	D	0.31	35	D	0.23
	NB	signal	4	A	0.36	4	A	0.38
	SB	signal	6	A	0.29	9	A	0.57
	overall	signal	6	A	0.38	7	A	0.52
Cox Mill Road & Yonge Street	EB	signal	0	E	0.00	0	A	0.00
	WB	signal	64	A	0.85	66	E	0.88
	NB	signal	9	A	0.41	12	B	0.46
	SB	signal	5	B	0.28	9	A	0.51
	overall	signal	15	B	0.50	16	B	0.61
Big Bay Point Road & Yonge Street	EB	signal	25	C	0.65	58	E	0.94
	WB	signal	30	C	0.64	49	D	0.88
	NB	signal	21	C	0.49	43	D	0.96
	SB	signal	19	B	0.50	43	D	0.91
	overall	signal	24	C	0.60	48	D	0.96



Table 5: Intersection Operations – 2036 Background Conditions

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Little Avenue & Yonge Street	EB	signal	28	C	0.61	45	D	0.89
	WB	signal	50	D	0.86	28	C	0.44
	NB	signal	19	B	0.59	17	B	0.64
	SB	signal	19	B	0.37	22	C	0.70
	overall	signal	26	C	0.69	25	C	0.76
D'Ambrosio Drive & Yonge Street	EB	signal	36	D	0.31	35	D	0.23
	NB	signal	4	A	0.38	4	A	0.40
	SB	signal	6	A	0.31	9	A	0.59
	overall	signal	6	A	0.39	8	A	0.54
Cox Mill Road & Yonge Street	EB	signal	0	A	0.00	0	A	0.00
	WB	signal	67	E	0.88	69	E	0.90
	NB	signal	10	B	0.43	13	B	0.48
	SB	signal	6	A	0.29	9	A	0.54
	overall	signal	16	B	0.53	17	B	0.64
Big Bay Point Road & Yonge Street	EB	signal	26	C	0.70	64	E	0.99
	WB	signal	30	C	0.66	50	D	0.91
	NB	signal	21	C	0.50	42	D	0.94
	SB	signal	21	C	0.53	50	D	0.96
	overall	signal	24	C	0.64	52	D	1.01



Table 6: Intersection Operations – 2036 Background (with improvements)

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Big Bay Point Road & Yonge Street	EB	signal	26	C	0.70	52	D	0.93
	WB	signal	30	C	0.66	44	D	0.78
	NB	signal	21	C	0.50	41	D	0.82
	SB	signal	18	B	0.47	39	D	0.86
	overall	signal	23	C	0.61	44	D	0.93



4 Proposed Development

This chapter will provide additional details with respect to the proposed development, including its location, 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 proposed development is to be located at 505-533 Yonge Street within the City of Barrie.

4.2 PROPOSED LAND-USE & PHASING

The proposed development will consist of 400 residential units and 1,076 m² of ground floor commercial space contained in 4 residential apartment/condominium buildings. The development details are as follows:

- Building 1 – 8 storeys with 56 condominium apartment units;
- Building 2 – 10 storeys with 117 market rental apartment units and 1,076 m² (11,582 ft²) of ground floor commercial space;
- Building 3 – 8 storeys with 56 condominium apartment units; and
- Building 4 – 12 storeys with 171 condominium apartment units.

A site plan is provided in Figure 11. A single 5-year phase has been considered with full build-out and occupancy by 2026.

4.3 PARKING

The development will provide 38 surface parking spaces and 431 underground parking spaces for a total of 469 spaces.

As per the City's *Zoning By-Law*, a residential development must provide 1.5 parking spaces per unit; however, it is noted that the site is located along an intensification corridor as identified by the City. To support intensification efforts, lower parking rates are being considered along primary corridors (of which Yonge Street is considered). As per *Staff Report PLN029-13*, a reduced rate of 1 space per residential unit is recommended along the targeted intensification corridors. As such, a parking rate of 1 space per unit has been considered for the residential units. With respect to the ground floor commercial space, the City's parking rate for retail (1 space per 30 m²) has been applied.



In consideration of the above, the development is required to provide 400 spaces to support the residential component, and 36 spaces to support the commercial space ($1,076 \text{ m}^2 \div 30 = 36$ spaces), for a total parking requirement of 436 spaces. As previously noted, the site will provide 469 spaces, thus satisfying the City's parking supply requirements.

4.4 SITE ACCESS & ON-SITE CIRCULATION

As per the site plan, the development will be served by two access points. The south access will be located opposite D'Ambrosio Drive, creating a 4-leg intersection with D'Ambrosio Drive and Yonge Street. The north access will be located approximately 90 metres north of D'Ambrosio Drive and will operate under stop control. Both access points will accommodate two-way operations, providing one lane of travel per direction.

The City's zoning by-law requires that an aisle providing access to a parking area have a minimum width of 6.4 metres. As per the site plan, a minimum aisle width of 6.9 metres will be maintained throughout the site, thus satisfying the City's requirements.

With respect to emergency vehicle operations, the Ontario Building Code requires a fire access route to provide a minimum clear width of 6.0 metres with a minimum centre turn radius of 12.0 metres. The fire access route, as identified on the site plan, satisfies the building code requirements.

Waste collection and loading areas are provided at each building. A truck turning assessment illustrating waste collection can be readily accommodated is provided in Appendix E.

In consideration of the above, the internal aisle layout as proposed is considered sufficient with respect to the circulation of site generated traffic and the manoeuvring requirements of typical design vehicles (i.e. passenger vehicles, fire truck, etc.).

4.5 SITE TRAFFIC

4.5.1 Trip Generation

The number of vehicle trips to be generated by the proposed development for the weekday AM and PM peak hours has been determined based on type of use, development size, and trip generation rates as per the *ITE Trip Generation Manual, 10th Edition*. Based on the proposed development, trip rates for the following ITE land use categories have been employed:

- *multifamily housing - mid-rise* (ITE code 221);
- *multifamily housing - high-rise* (ITE code 222); and
- *shopping centre* (ITE code 820).



The associated trip rates and trip estimates are provided in Table 7 and Table 8 respectively. It is noted that the *multifamily housing - midrise* rates have been applied to Building 1, 2 and 3 (10 storeys or less), whereas the *multifamily housing - high-rise* rates have been applied to Building 4 (greater than 10 storeys).

Table 7: Trip Rates – 505-533 Yonge Street

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
multifamily housing - mid-rise (ITE 221)	units	0.09	0.27	0.36	0.27	0.17	0.44
multifamily housing - high-rise (ITE 222)	units	0.07	0.24	0.31	0.22	0.14	0.36
shopping centre (ITE 820)	1,000 ft ² GFA	0.58	0.36	0.94	1.83	1.98	3.81

Table 8: Trip Estimates - 505-533 Yonge Street

LAND USE	UNITS/ SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
Buildings 1, 2 & 3 (mid rise)	229 units	21	61	82	61	39	100
Building 4 (high rise)	171 units	13	40	53	38	24	62
retail	11,581 ft ²	7	4	11	21	23	44
Total		41	105	146	120	86	206

As indicated, the proposed development is expected to generate 146 trips during the AM peak hour and 206 trips during the PM peak hour. While the site is expected to generate internal trips (i.e. residents accessing the retail/commercial uses) and pass-by trips (i.e. trips already on the road network for other purposes that visit the retail uses before continuing to the initial origin/destination, adjustments have not been considered in order to ensure a conservative approach.



4.5.2 Trip Distribution & Assignment

The distribution of the new trips generated by the proposed development has been established separately for the commercial and residential uses, recognizing that the commercial space will serve the local community, whereas the residential use will have origins and destinations both within and beyond the local community.

Commercial Site Trips

It has been assumed that the trip distribution and assignment associated with the ground floor commercial space will be largely influenced by the surrounding neighbourhoods within and abutting the study area. In this respect, the following trip distribution has been assumed:

- to/from the north via Yonge Street – 10%;
- to/from the south via Yonge Street – 30%;
- to/from the west via Little Avenue – 20%;
- to/from the west via D'Ambrosio Drive – 10%
- to/from the east via Cox Mill Road – 10%; and
- to/from the east via Big Bay Point Road – 20%.

With respect to access assignment, it has been assumed that trips traveling to/from the north will utilize the north access, with the remaining trips utilizing the south access. The assignment of commercial trips to the road network based on the above is illustrated in Figure 12.

Residential Site Trips

The distribution of residential trips has been based on trip distribution data provided in the 2016 *Transportation Tomorrow Survey*. The TTS is a comprehensive travel survey conducted in the Greater Golden Horseshoe Area once every five years. As per the *TTS 2016 Data Guide*, development site resides in Traffic Boundary Zone 8528. As such, the trip data was filtered to show all trips to/from the respective traffic zone. The following distribution was established:

- to/from locations within Barrie – 78%;
- to/from the south of Barrie – 18%;
- to/from the north of Barrie – 4%;
- to/from the east of Barrie – <1%; and
- to/from the west of Barrie – <1%.



As indicated, 78% of the trips remain wholly within Barrie whereas only 22% originate from, or are destined to, areas outside of the City. The trips that remain within Barrie were distributed based on additional TTS trip data for the traffic zone within which the development is located. When considering the distribution of trips that remain within the City, the ultimate trip distribution for the site is as follows:

- to/from the north via Yonge Street – 20%;
- to/from the north via Little Ave/FairviewDr/Hwy 400 – 20%;
- to/from the south via Yonge Street – 30%;
- to/from the west via Big Bay Point Road – 25%; and
- to/from the east via Big Bay Point Road – 5%.

The assignment of the trips generated by the development to the area road network and site access points has been based on the trip distribution noted above with consideration given to the expected travel routes.

The assignment of residential trips to the road network based on the above is illustrated in Figure 13

Total Site Trips

The resulting total site trips assigned to the road network are illustrated in Figure 14.



5 Future Total Conditions

This chapter will address the resulting impacts of the proposed residential development on the adjacent road system. The following areas are to be addressed:

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

5.1 TOTAL TRAFFIC VOLUMES

To assess the impacts of the increased traffic volumes resulting from the proposed development, the site generated traffic was combined with the 2026, 2031 and 2036 background traffic volumes. The resulting total traffic volumes are presented in Figure 15 through Figure 17.

5.2 TOTAL TRAFFIC OPERATIONS

The operations of the key intersections were again investigated considering the total traffic volumes for each horizon year. In addition to this, the site access operations have also been reviewed. The improvements recommended under background conditions, namely the advance left turn phase for the eastbound left turn movement at the Little Avenue/Yonge Street intersection (2031, AM peak hour) and the implementation of a southbound right turn lane on Yonge Street at Big Bay Point Road (2036), have been maintained as recommended. The results of the operational review are provided in Table 9 through Table 11 (detailed worksheets are provided in Appendix F).

As indicated, the study area intersection and site access points will provide acceptable overall operations (LOS D or better) with average delays. As per the detailed worksheets provided in Appendix F, all individual movements will provide acceptable levels of service (LOS E or better) and operate under capacity.

Notwithstanding signal optimization to accommodate growth on the road network and the additional improvements recommended under background conditions, no further intersection or road network improvements are required to support the proposed development.



Table 9: Intersection Operations – 2026 Total Conditions

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Little Avenue & Yonge Street	EB	signal	41	D	0.76	42	D	0.86
	WB	signal	39	D	0.78	27	C	0.36
	NB	signal	11	B	0.41	14	B	0.53
	SB	signal	13	B	0.29	17	B	0.57
	overall	signal	22	C	0.56	22	C	0.66
D'Ambrosio Drive/ South Access & Yonge Street	EB	signal	43	D	0.33	42	D	0.25
	WB	signal	50	D	0.58	47	D	0.52
	NB	signal	7	A	0.37	7	A	0.40
	SB	signal	10	A	0.29	13	B	0.55
	overall	signal	12	B	0.40	12	B	0.52
Cox Mill Road & Yonge Street	EB	signal	0	A	0.00	0	A	0.00
	WB	signal	61	E	0.83	63	E	0.86
	NB	signal	9	A	0.36	11	B	0.43
	SB	signal	5	A	0.27	8	A	0.46
	overall	signal	14	B	0.46	15	B	0.56
Big Bay Point Road & Yonge Street	EB	signal	24	C	0.63	47	D	0.95
	WB	signal	29	C	0.62	36	D	0.79
	NB	signal	19	B	0.42	33	C	0.91
	SB	signal	18	B	0.47	32	C	0.84
	overall	signal	22	C	0.56	37	D	0.94
North Access & Yonge Street	WB	stop	10	B	0.07	10	B	0.05



Table 10: Intersection Operations – 2031 Total Conditions

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Little Avenue & Yonge Street	EB	signal	27	C	0.57	45	D	0.89
	WB	signal	49	D	0.84	27	C	0.45
	NB	signal	19	B	0.59	17	B	0.66
	SB	signal	19	B	0.37	21	C	0.68
	overall	signal	25	C	0.68	25	C	0.76
D'Ambrosio Drive/ South Access & Yonge Street	EB	signal	43	D	0.33	42	D	0.25
	WB	signal	50	D	0.58	47	D	0.52
	NB	signal	8	A	0.42	8	A	0.46
	SB	signal	10	B	0.34	14	B	0.63
	overall	signal	12	B	0.45	13	B	0.58
Cox Mill Road & Yonge Street	EB	signal	0	A	0.00	0	A	0.00
	WB	signal	65	E	0.86	66	E	0.88
	NB	signal	9	A	0.42	12	B	0.49
	SB	signal	5	A	0.30	9	A	0.53
	overall	signal	14	B	0.51	16	B	0.63
Big Bay Point Road & Yonge Street	EB	signal	24	C	0.64	57	E	0.94
	WB	signal	30	C	0.64	45	D	0.79
	NB	signal	21	C	0.50	45	D	0.95
	SB	signal	21	C	0.56	55	E	0.98
	overall	signal	24	C	0.63	51	D	0.99
North Access & Yonge Street	WB	stop	11	B	0.07	10	B	0.05



Table 11: Intersection Operations – 2036 Total Conditions

INTERSECTION, CONTROL & MOVEMENT			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Little Avenue & Yonge Street	EB	signal	27	C	0.61	48	D	0.91
	WB	signal	50	D	0.86	27	C	0.49
	NB	signal	19	B	0.63	18	B	0.73
	SB	signal	21	C	0.40	23	C	0.73
	overall	signal	26	C	0.72	27	C	0.82
D'Ambrosio Drive/ South Access & Yonge Street	EB	signal	43	D	0.33	42	D	0.25
	WB	signal	50	D	0.58	47	D	0.52
	NB	signal	8	A	0.45	8	A	0.48
	SB	signal	10	B	0.35	15	B	0.66
	overall	signal	12	B	0.47	13	B	0.61
Cox Mill Road & Yonge Street	EB	signal	0	A	0.00	0	A	0.00
	WB	signal	67	E	0.88	69	E	0.90
	NB	signal	10	B	0.45	13	B	0.52
	SB	signal	5	A	0.32	9	A	0.56
	overall	signal	15	B	0.54	17	B	0.66
Big Bay Point Road & Yonge Street	EB	signal	26	C	0.73	55	E	0.93
	WB	signal	30	C	0.66	44	D	0.78
	NB	signal	21	C	0.53	43	D	0.802
	SB	signal	18	B	0.48	41	D	0.90
	overall	signal	23	C	0.64	46	D	0.97
North Access & Yonge Street	WB	stop	11	B	0.07	11	B	0.05



5.3 TURN LANE REQUIREMENTS

Despite the otherwise acceptable operations provided at the site access, the need for exclusive right turn lanes on Yonge Street at the proposed access points to serve site traffic has been reviewed based on MTO warrants. Given the presence of the existing two way left turn lane along Yonge Street, a review of left turn lane warrants is not required (in that left turn lanes are provided).

MTO guidelines suggest that an exclusive right turn lane be considered where right turn volumes exceed 60 vehicles per hour and/or impede the operations of through traffic. It is noted that while the volume of right turning traffic at the south access surpasses the 60 vehicle threshold (66 vehicles during the PM peak hour), Yonge Street has sufficient through capacity such that the right turn volumes are not expected to impede through volumes. Recall that Yonge Street has an assumed planning capacity of 850 vphpl, or 1,700 vph per direction (recognizing that there are two travel lanes provided per direction). The PM peak hour northbound volumes at the site's south access are in the order of 1,090 vph under 2036 total conditions. Thus, Yonge Street will be operating at 64% of capacity. In consideration of the above, a right turn lane is not required at the south site access point. At the north access point, the right turn volumes will be minimal and thus a right turn lane is not required at this access either.

5.4 SIGHT LINE ANALYSIS

The sight line assessment has considered the following as per Transportation Association of Canada (TAC) guidelines:

- the minimum stopping sight distance which provides 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; and
- intersection sight distance which 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 sight and intersection sight distance requirements, as well as the available sight distances along Yonge Street at the site access points, are summarized in Table 12 for a design speed of 60 km/h (reflective of the 50 km/h speed limit).

As noted, the available sight distances along Yonge Street satisfy the minimum stopping and intersection sight distance requirements at both site access points for the noted design speed.



Table 12: Sight Line Assessment

LOCATION	DESIGN SPEED	STOPPING SIGHT DISTANCE	INTERSECTION SIGHT DISTANCE		AVAILABLE SIGHTLINES TO/FROM	
			Left Turn	Right Turn	North	South
North Access	60 km/h	85 m	130 m	110 m	>300 m	>200 m
South Access	60 km/h	85 m	130 m	110 m	>300 m	>170 m

5.5 CONSTRUCTION STAGING

A construction staging plan is typically prepared to illustrate the potential impacts of construction activities on the adjacent road network. Given the location and size of the subject site, it is anticipated that all construction activities, including parking area for trades people, will be accommodated wholly within the site. No impacts are anticipated to Yonge Street or the existing sidewalk network. Construction access to the site will be provided via the proposed site access locations.

A detailed construction staging plan will be provided in advance of construction; however, no impacts to the adjacent road network are anticipated.



6 Summary

Proposed Development

This study has addressed the transportation impacts associated with the proposed mixed-use development located at 505-533 Yonge Street within the City of Barrie. The development will consist of 400 residential units and 1,076 m² of ground floor commercial space contained in 4 residential apartment/condominium buildings. Upon build-out, the development is expected to generate 146 new trips during the AM peak hour and 206 new trips during the PM peak hour.

Traffic Operations

In addressing the study area traffic operations, the key intersections were analysed under existing (2021) and future (2026, 2031 and 2036) horizon periods. The site access points were also reviewed under the noted future horizons.

To accommodate future background traffic volumes, the following improvements are recommended:

- implement an advance green phase for eastbound left turns on Little Avenue at the Yonge Street intersection (AM peak hour only) for 2031; and
- construct a southbound right turn lane on Yonge Street at Big Bay Point Road for 2036.

No additional improvements (notwithstanding minor traffic signal optimization as appropriate) are required to support the future total conditions associated with the proposed mixed-use development.

Turn Lane Requirements

The need for exclusive right turn lanes on Yonge Street at the site access points was reviewed in consideration of MTO guidelines. Based on the projected volume of right turning vehicles accessing the site and the available capacity on Yonge Street, exclusive turn lanes are not considered necessary.

Sight Lines

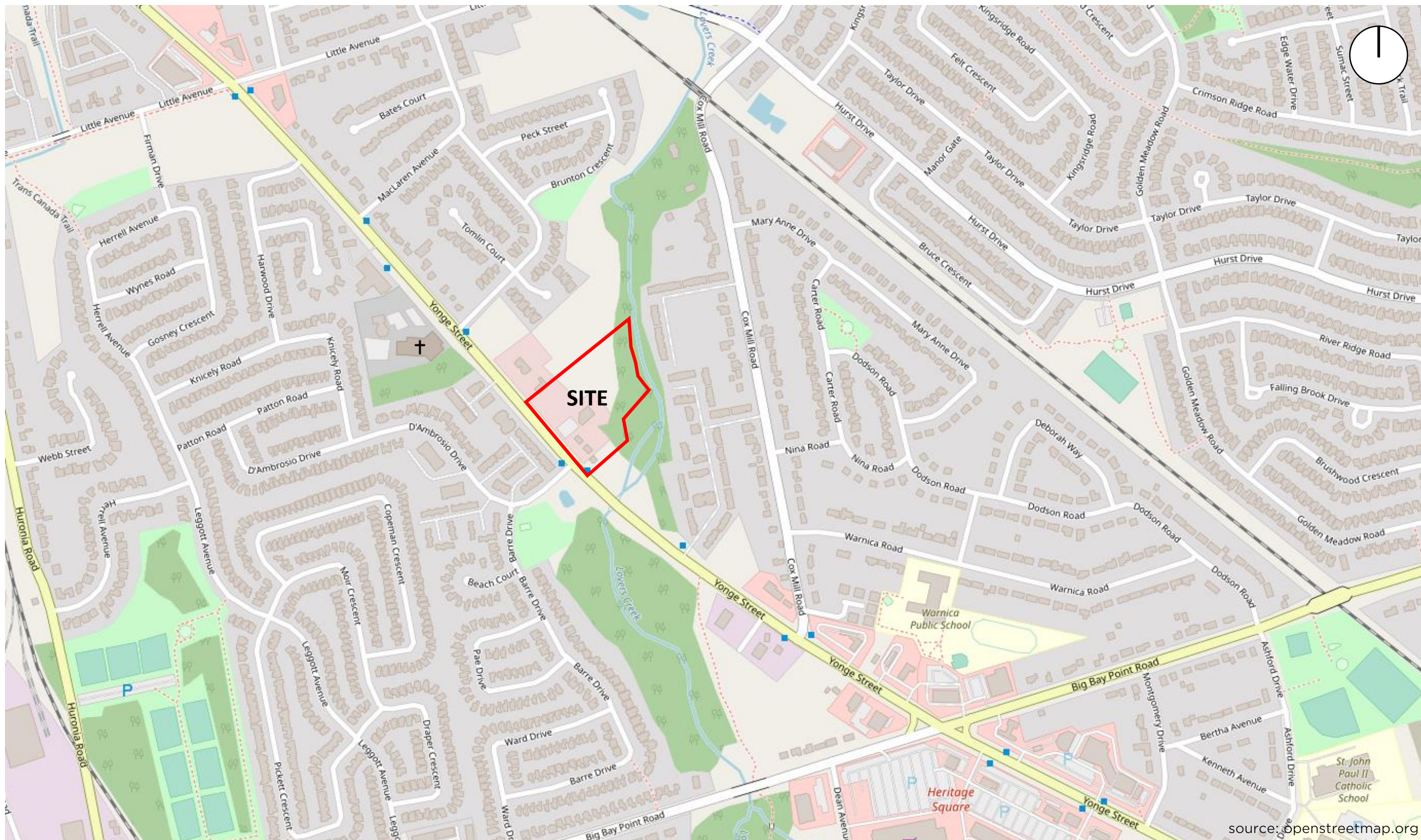
The available sight lines along Yonge Street at the proposed site access points were reviewed and are considered appropriate in consideration of TAC design guidelines for minimum stopping and intersection sight distance requirements for a design speed of 60 km/h.



Construction Staging Plan

Given the location and size of the subject site, it is anticipated that all construction activities, including parking provision for trades people, will be accommodated wholly within the site. No impacts are anticipated to Yonge Street or the existing sidewalk network.

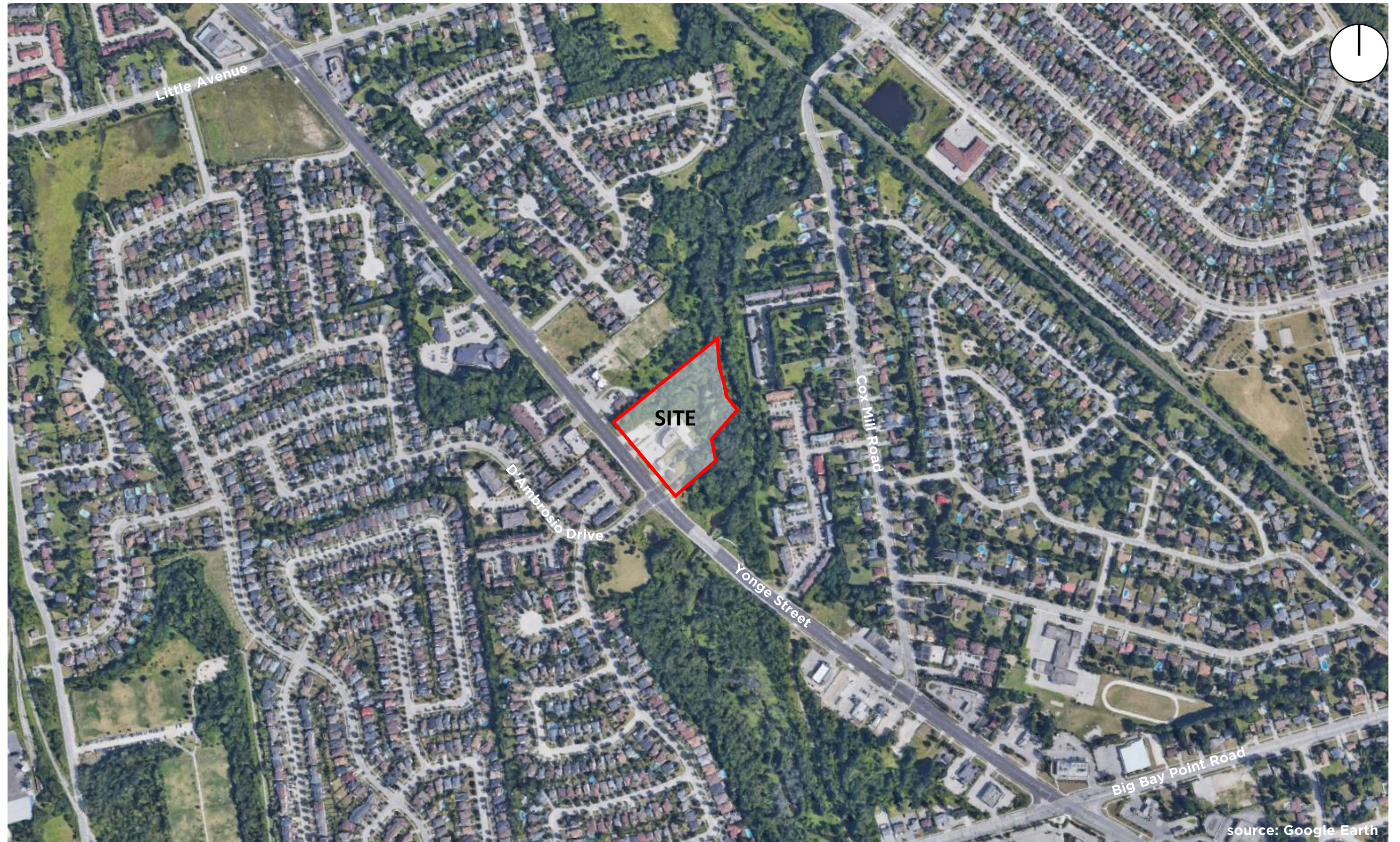




505-533 Yonge Street

Figure 1: Site Location



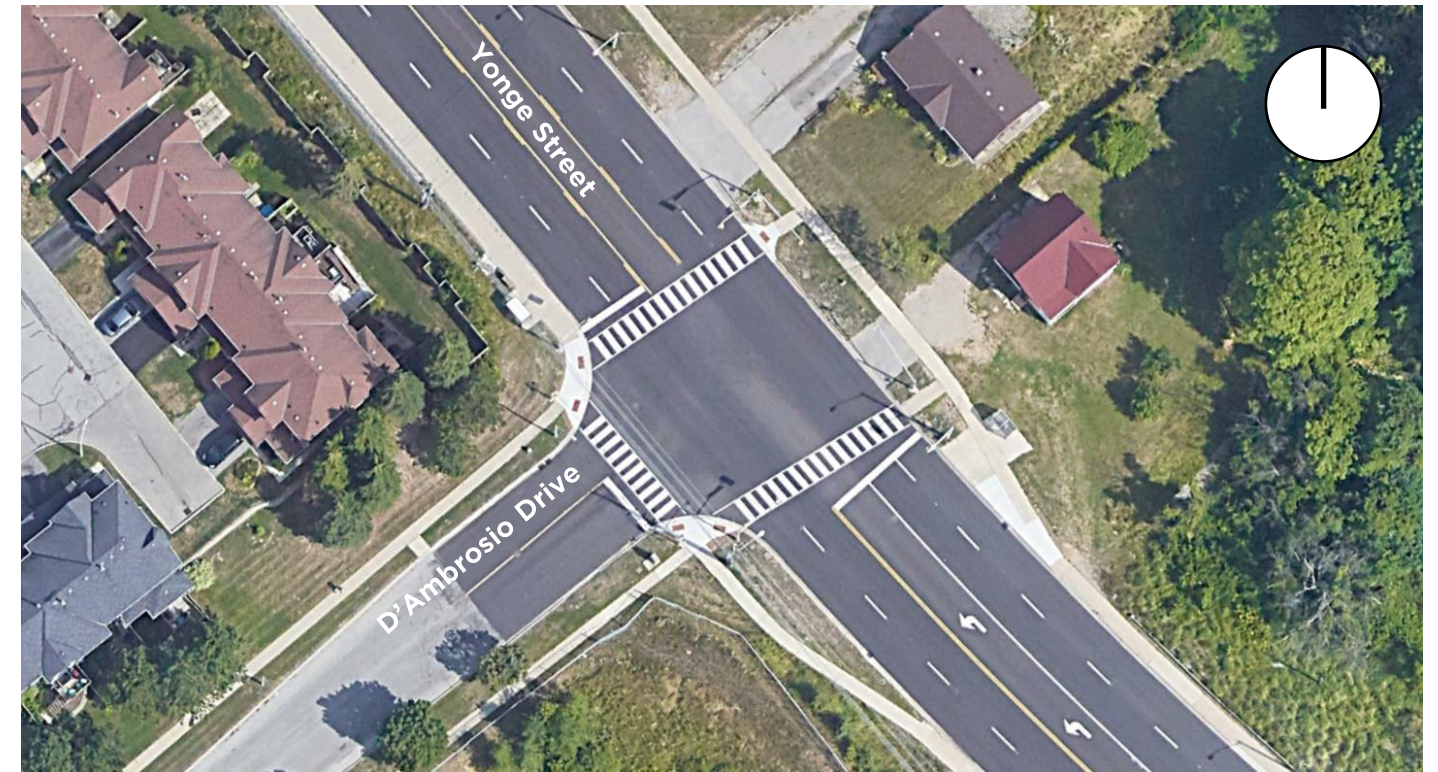


505-533 Yonge Street
Figure 2A: Area Road Network





Yonge Street with Little Avenue



Yonge Street with D'Ambrosio Drive



Yonge Street with Cox Mill Road



Yonge Street with Big Bay Point Road

source: Google Earth

505-533 Yonge Street

Figure 2B: Area Road Network





Looking north along Yonge Street from proposed north access



Looking south along Yonge Street from proposed north access



Looking north along Yonge Street from proposed south access

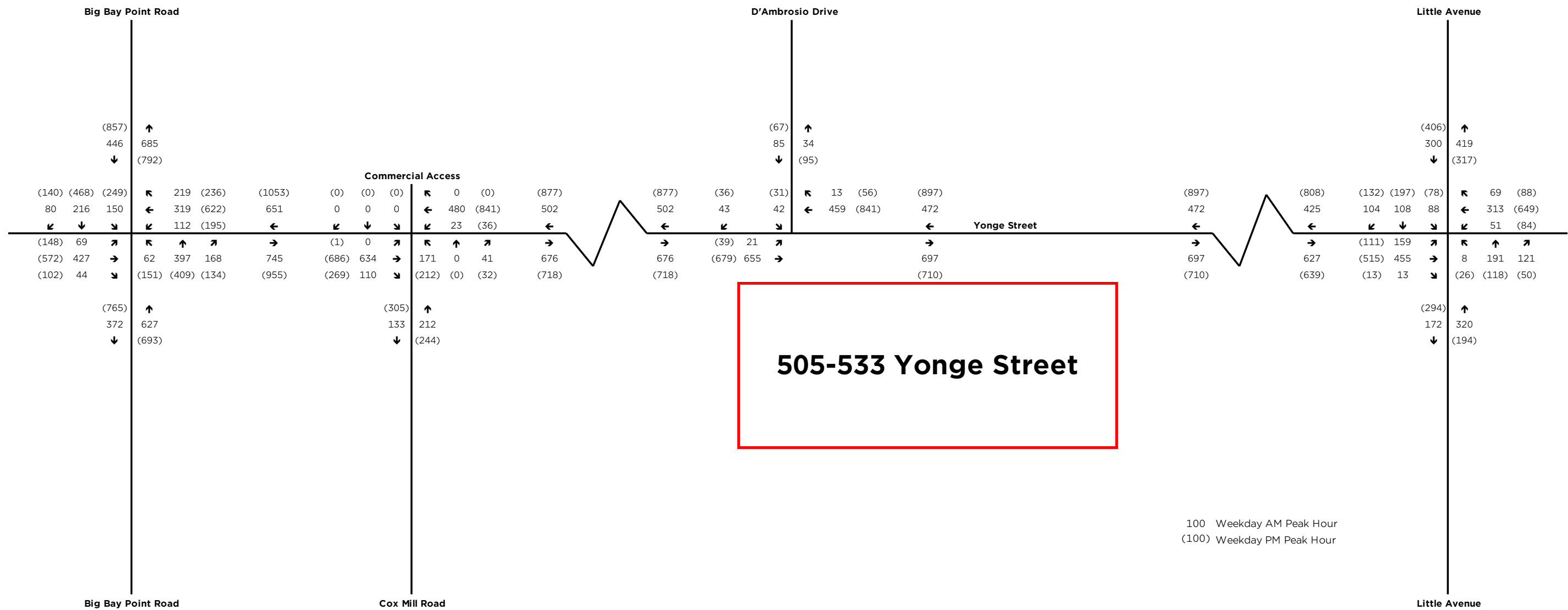
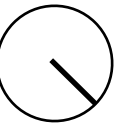


Looking south along Yonge Street from proposed south access

505-533 Yonge Street

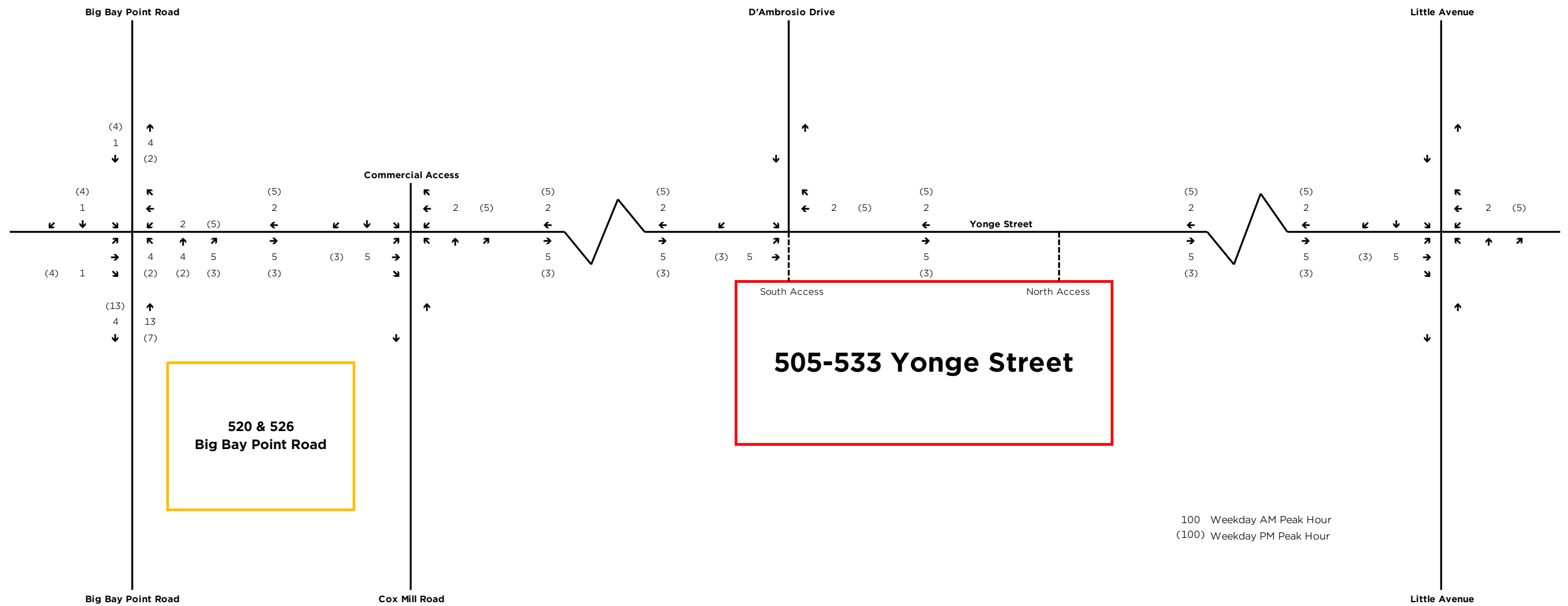
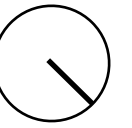
Figure 2C: Area Road Network





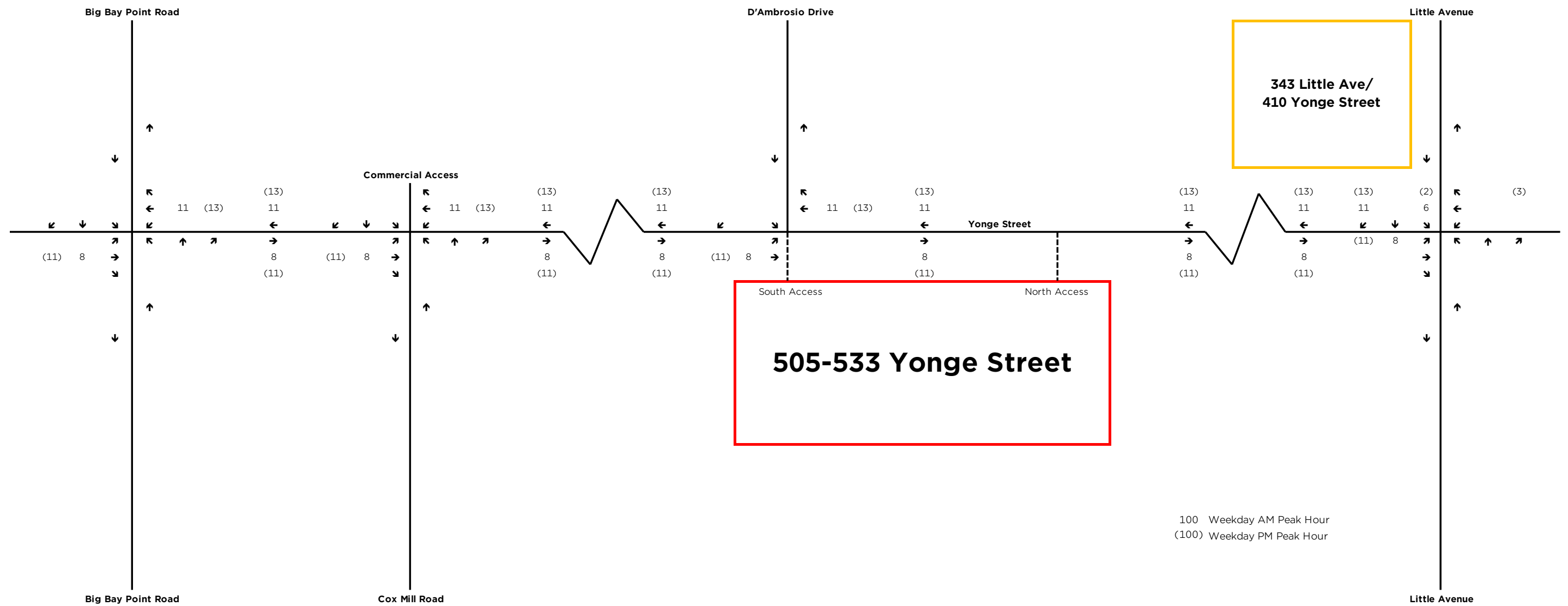
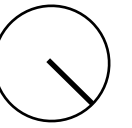
505-533 Yonge Street
Figure 3: 2021 Traffic Volumes





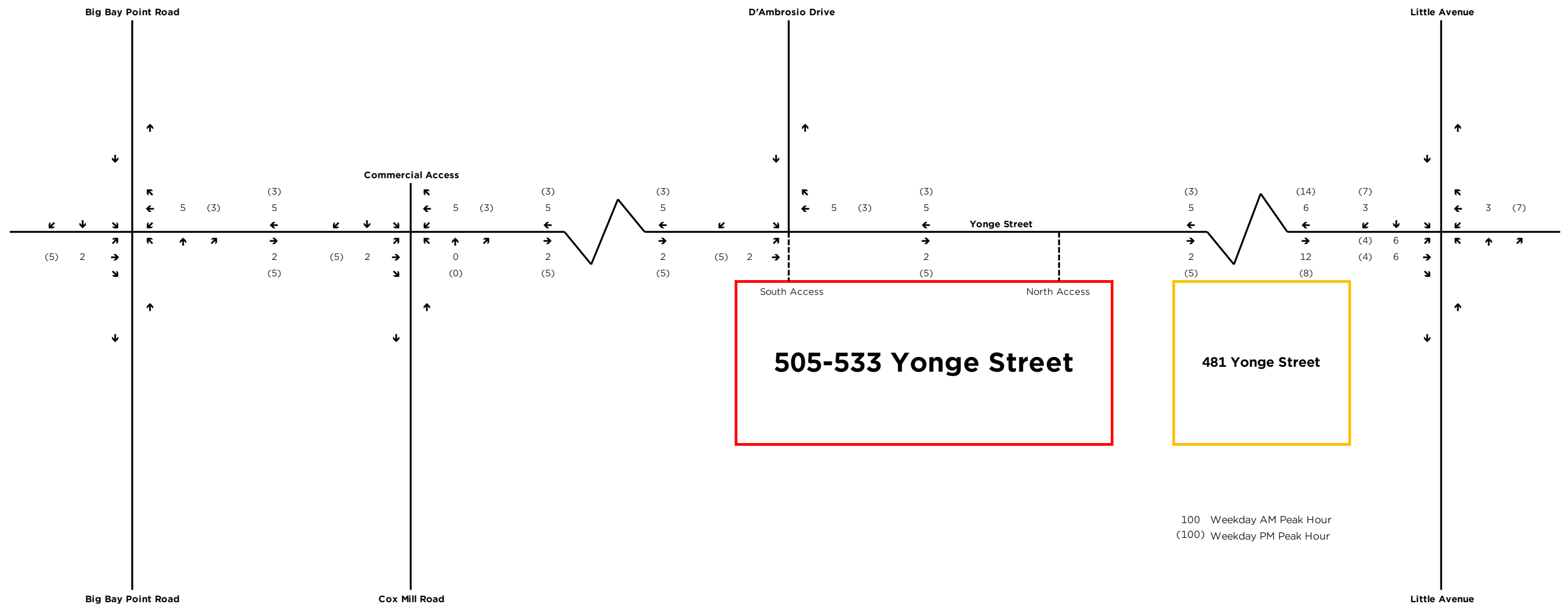
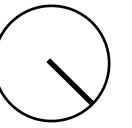
505-533 Yonge Street
Figure 4: Background Development Volumes – 520/526 Big Bay Point Road





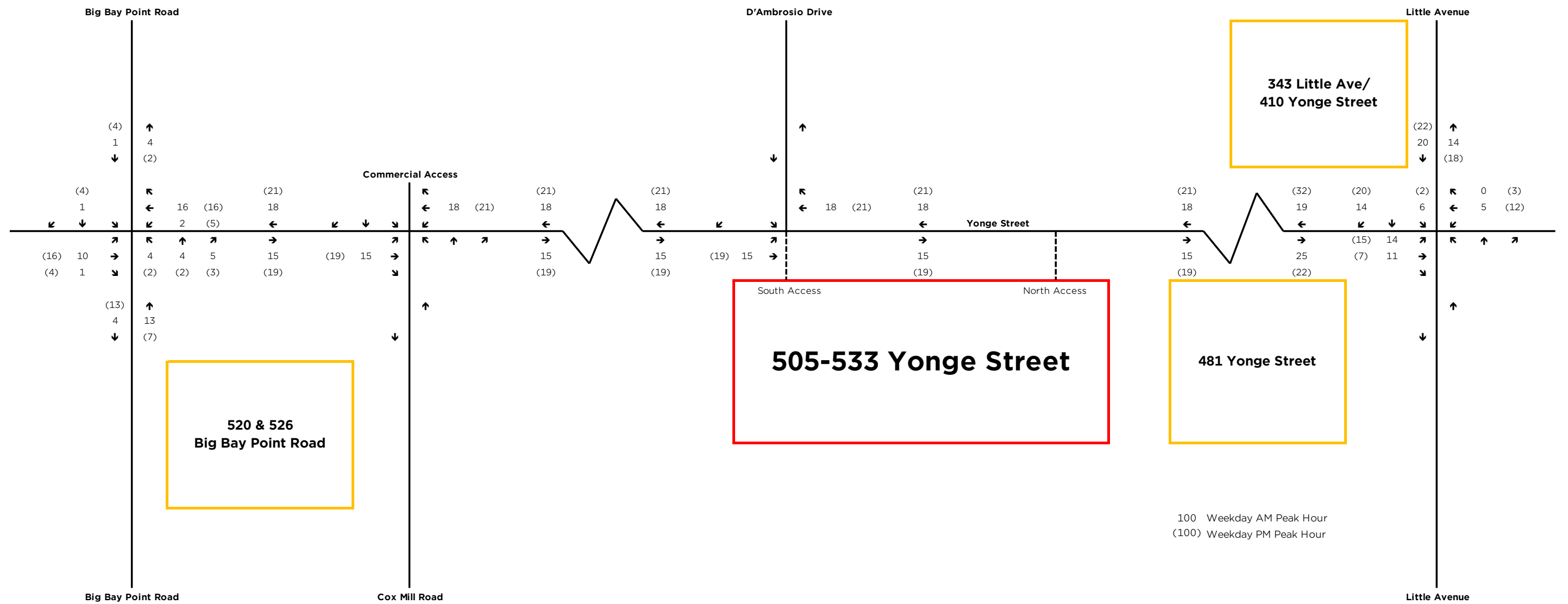
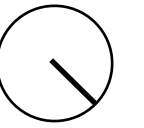
505-533 Yonge Street
Figure 5: Background Development Volumes – 343 Little Avenue/410 Yonge Street





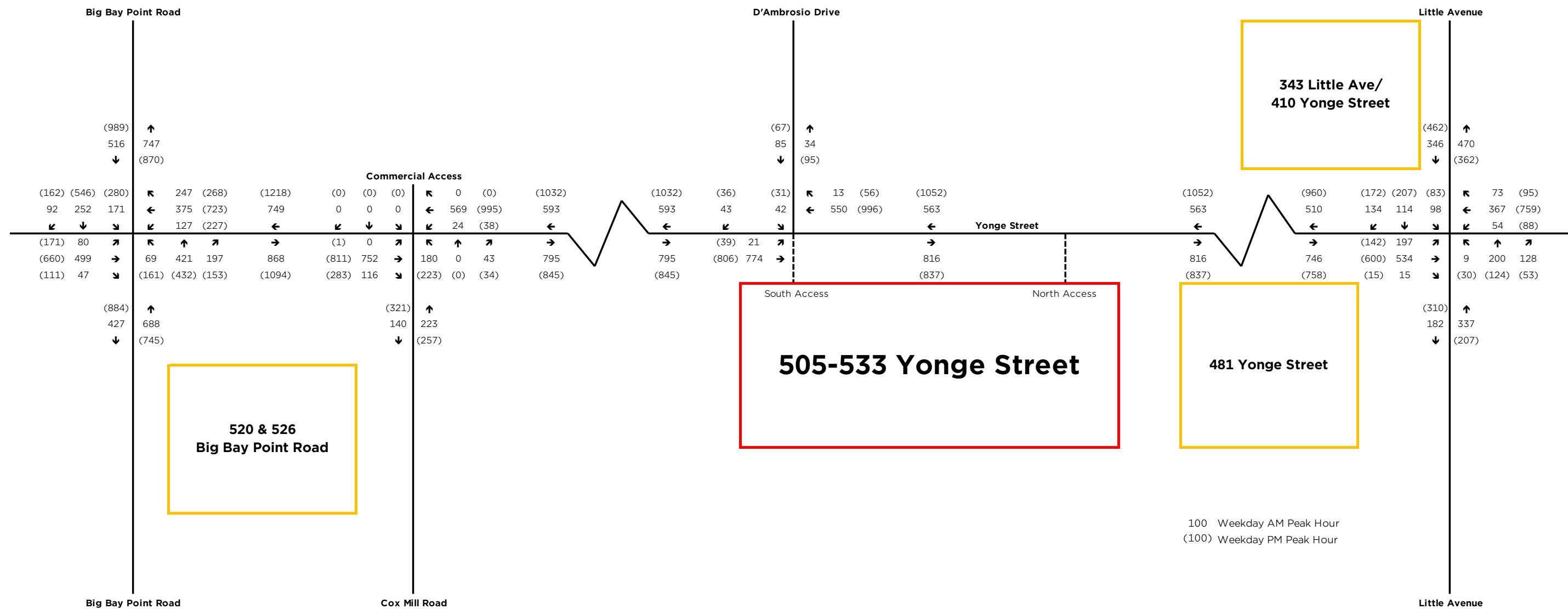
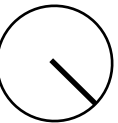
505-533 Yonge Street
Figure 6: Background Development Volumes – 481 Yonge Street





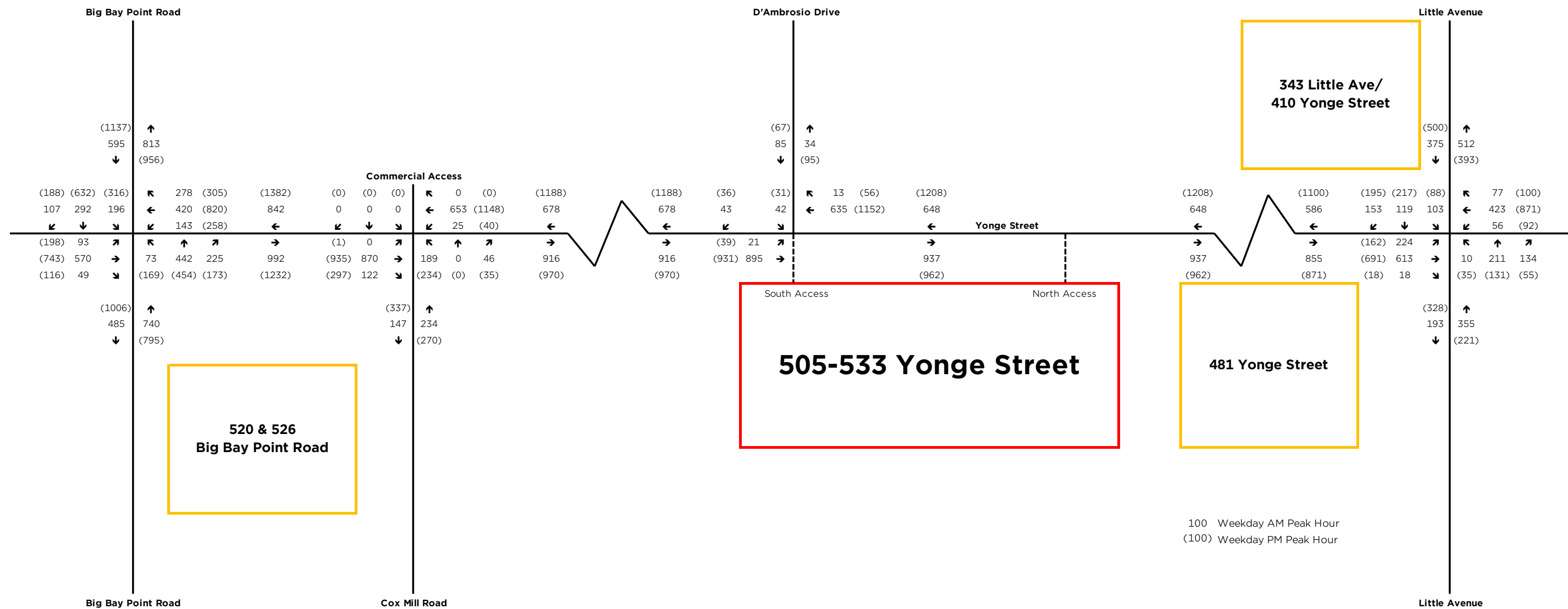
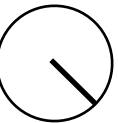
505-533 Yonge Street
Figure 7: Background Development Volumes – Total





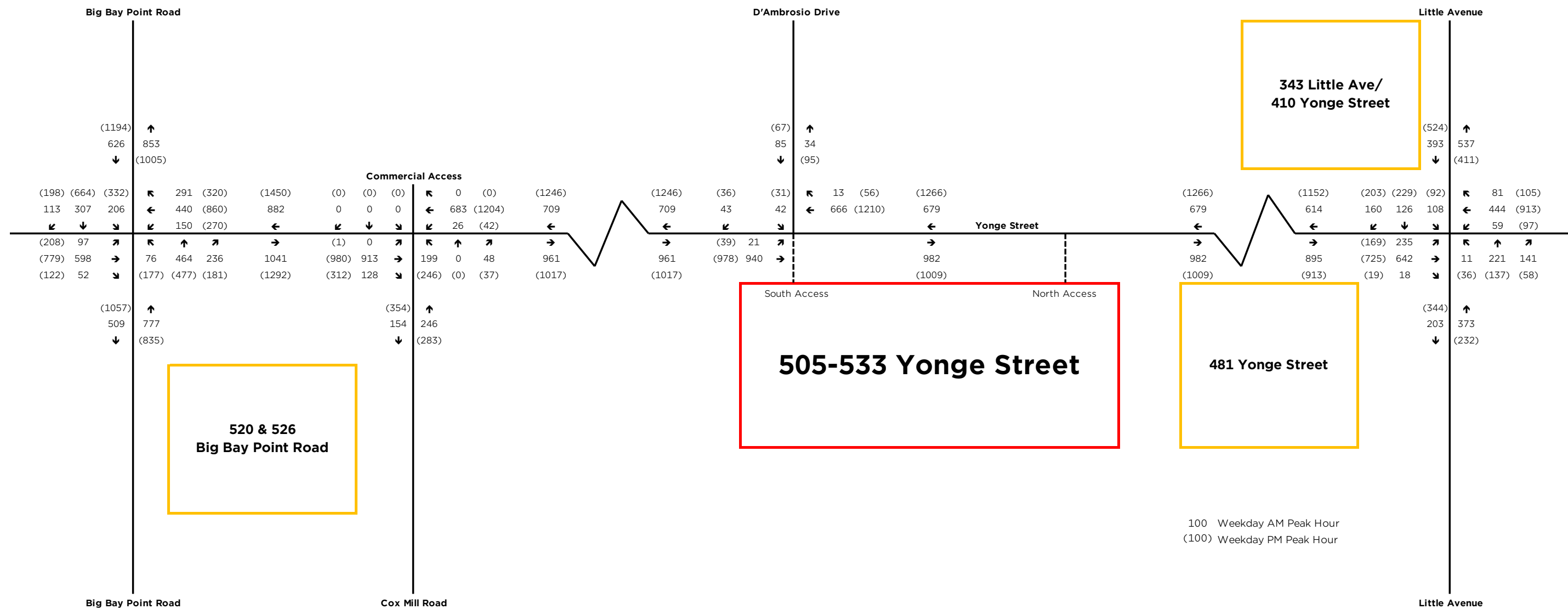
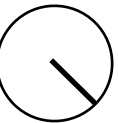
505-533 Yonge Street
Figure 8: 2026 Background Traffic Volumes





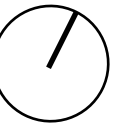
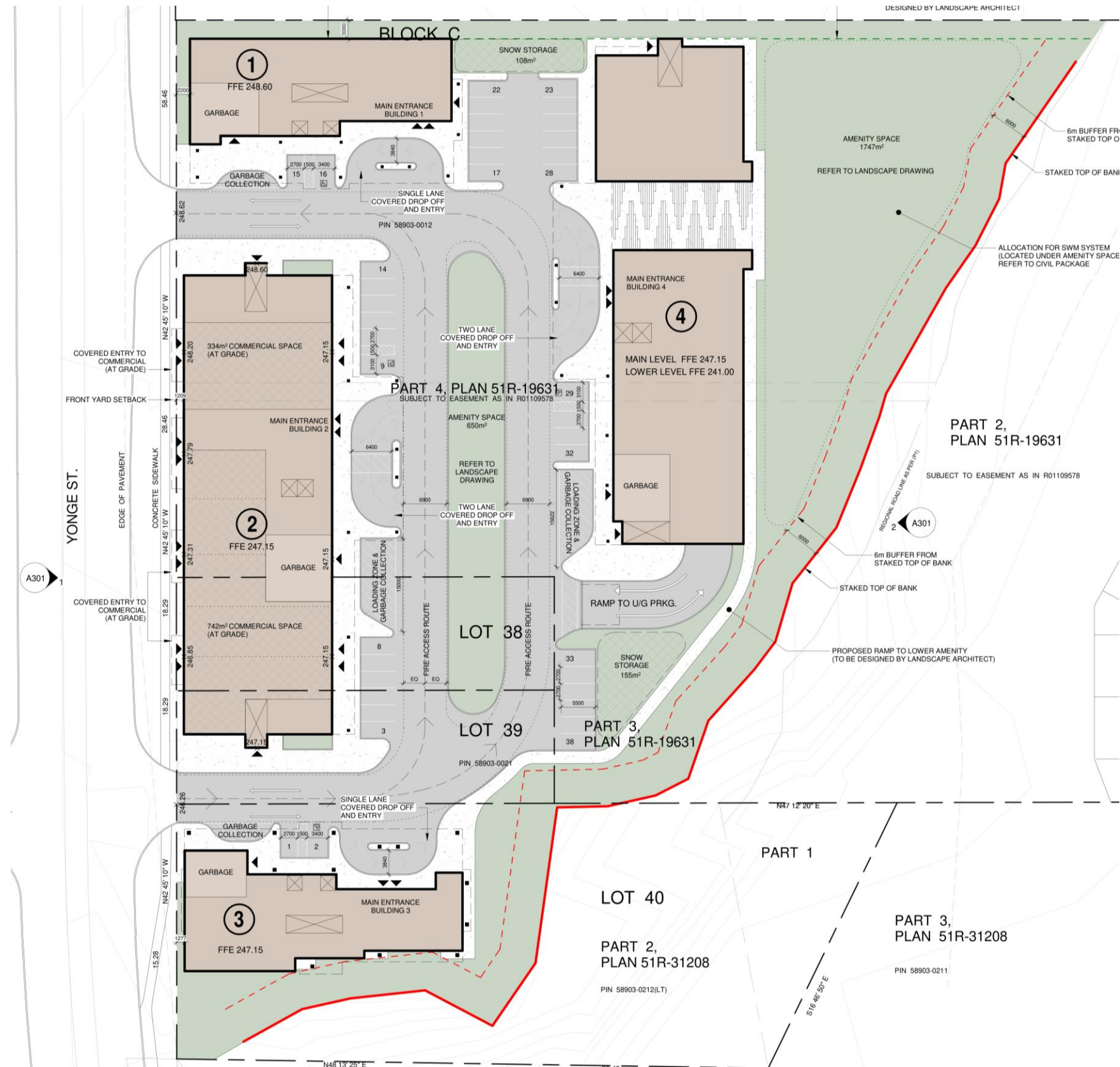
505-533 Yonge Street
Figure 9: 2031 Background Traffic Volumes





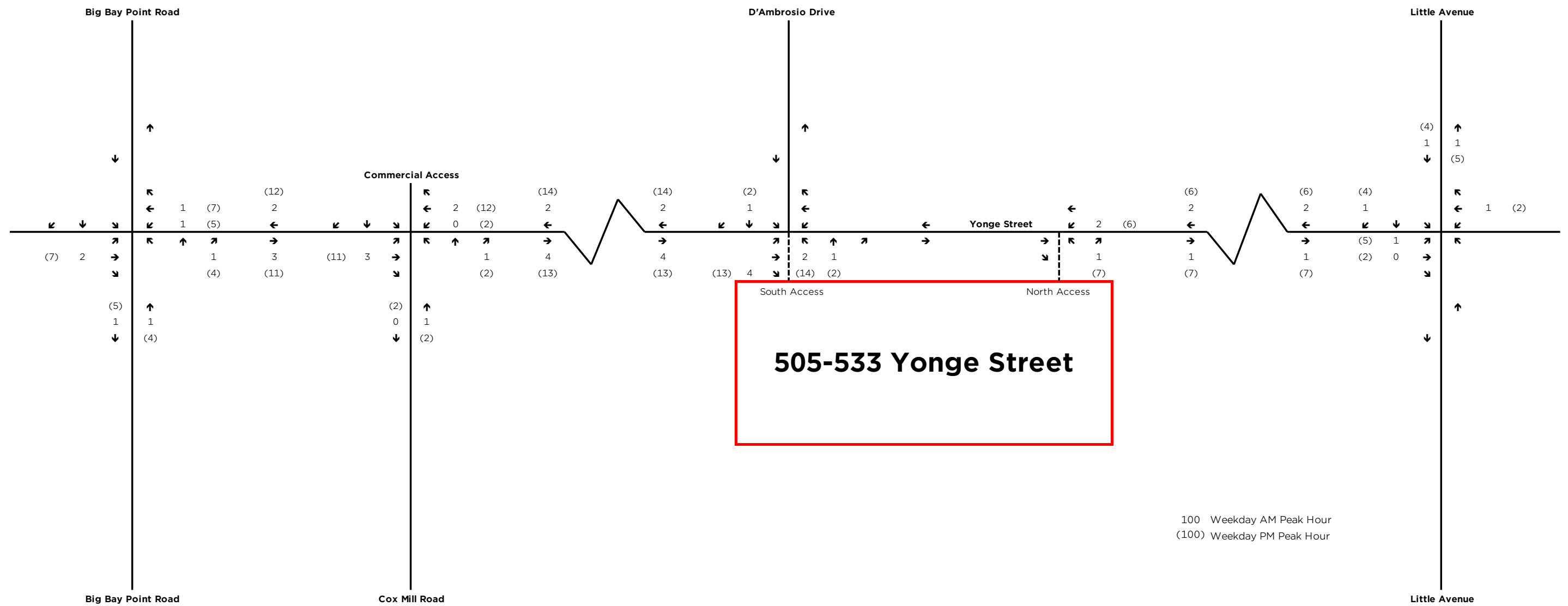
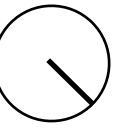
505-533 Yonge Street
Figure 10: 2036 Background Traffic Volumes





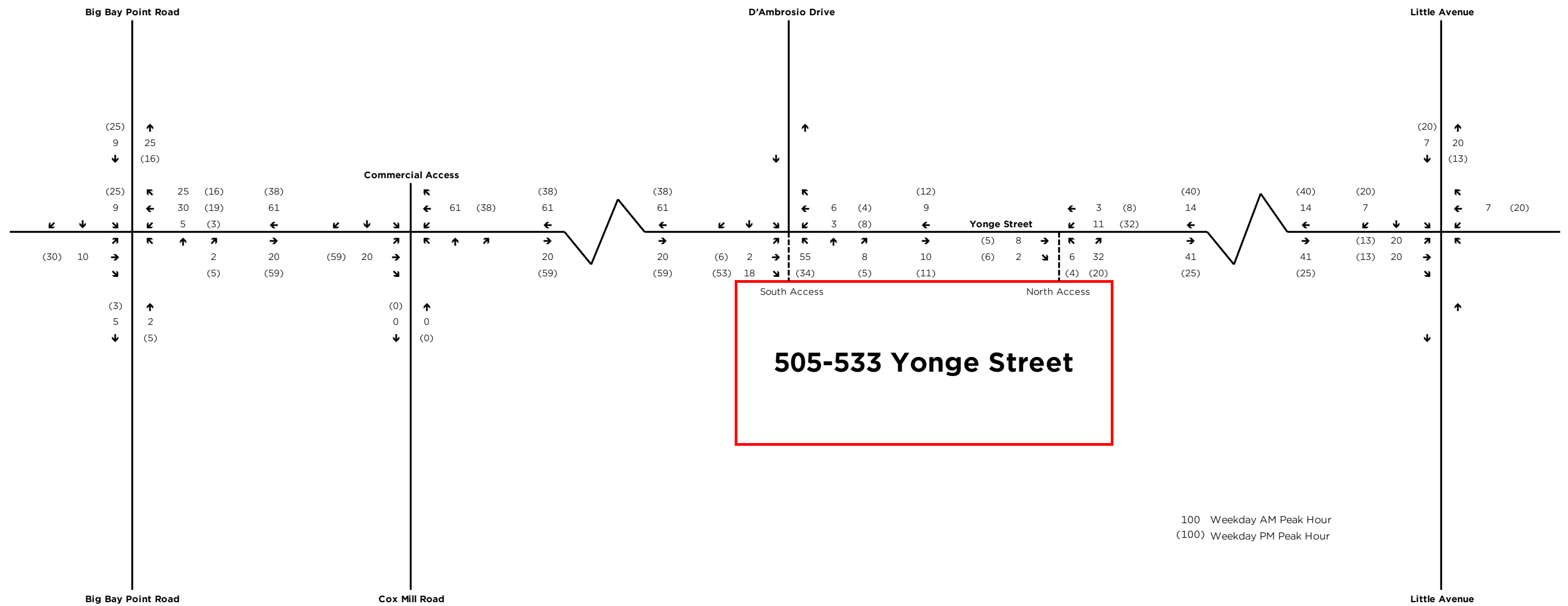
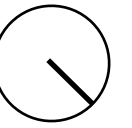
505-533 Yonge Street
Figure 11: Site Plan





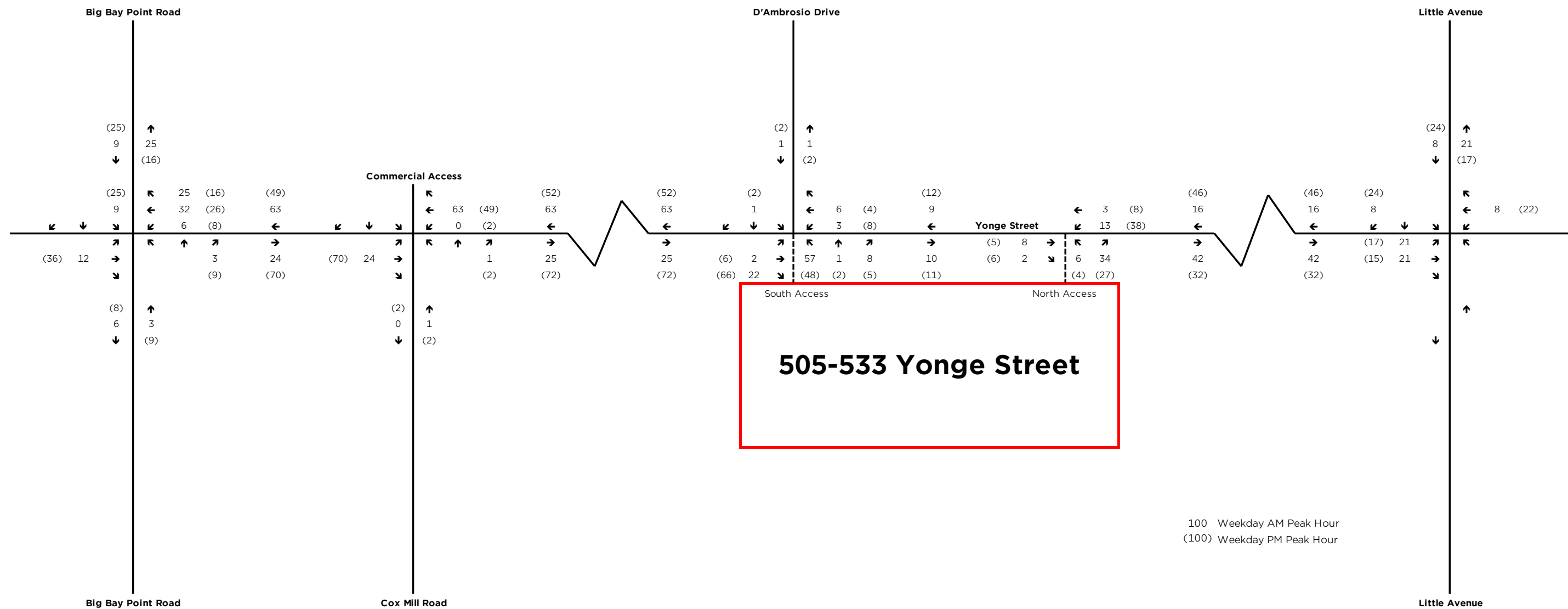
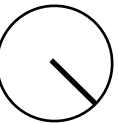
505-533 Yonge Street
Figure 12: Site Traffic - Commercial





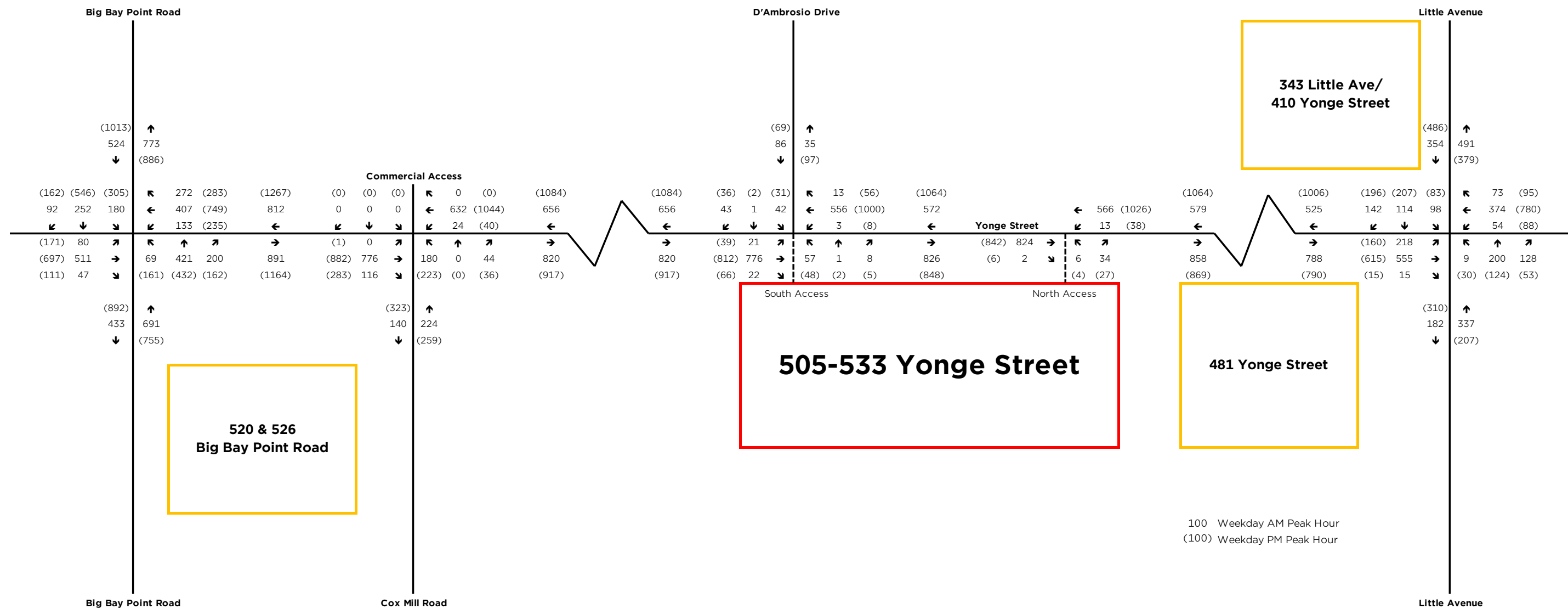
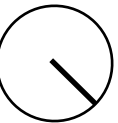
505-533 Yonge Street
Figure 13: Site Traffic - Residential





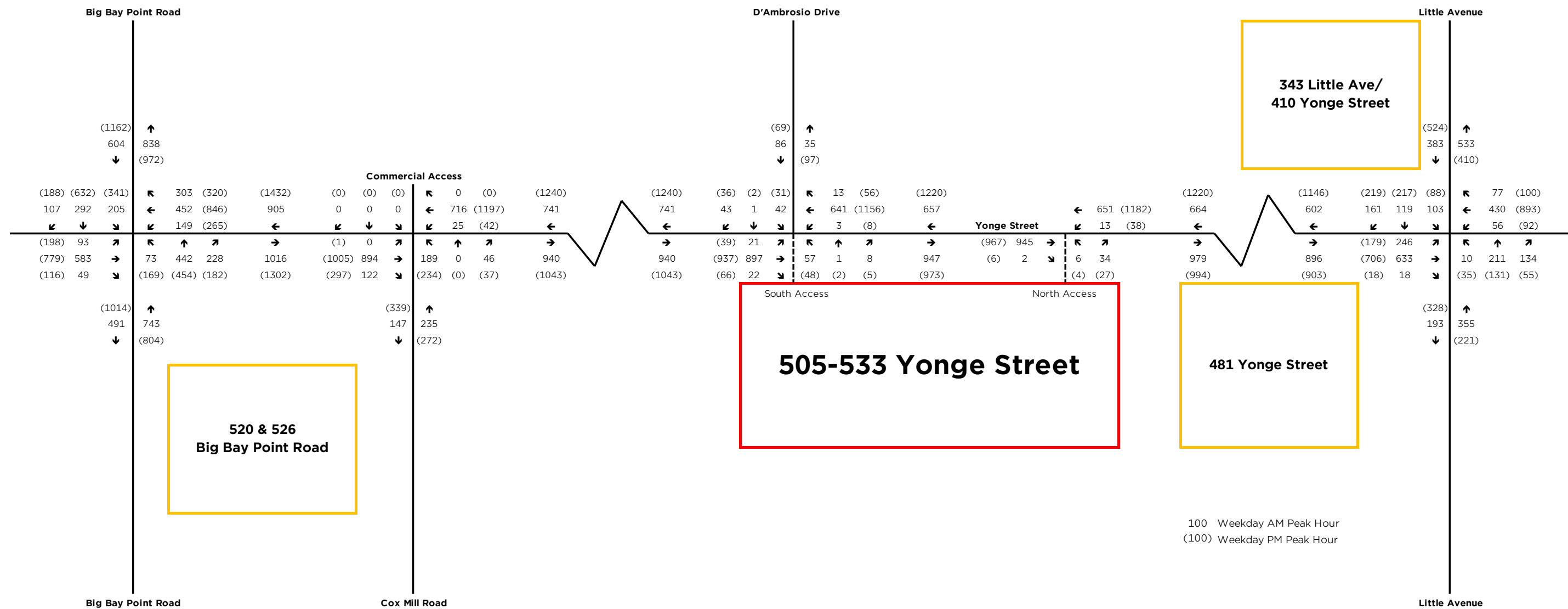
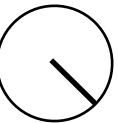
505-533 Yonge Street
Figure 14: Site Traffic - Total





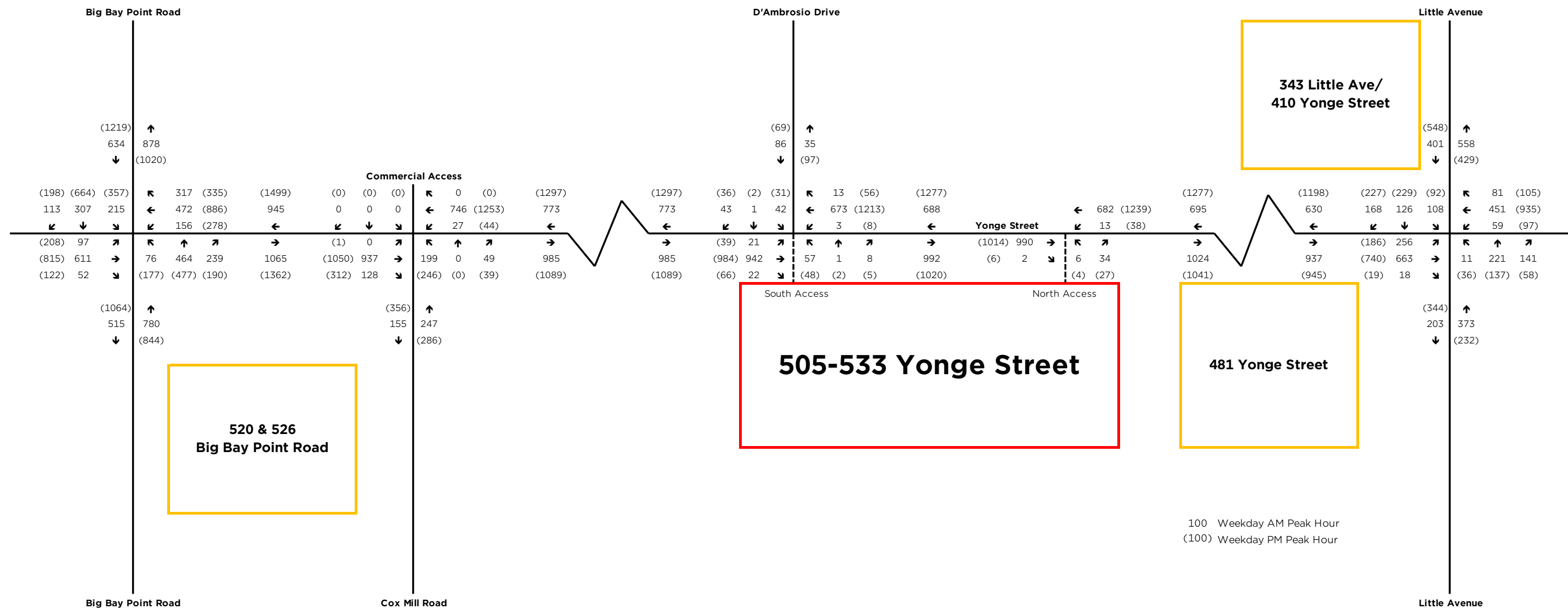
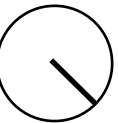
505-533 Yonge Street
Figure 15: 2026 Total Traffic Volumes





505-533 Yonge Street
Figure 16: 2031 Total Traffic Volumes





505-533 Yonge Street
Figure 17: 2036 Total Traffic Volumes



Appendix A: Traffic Counts

July 06, 2021

File: T07-SI

Justin MacDonald
City of Barrie
70 Collier Street
Barrie, ON L4M 4T5

Dear Mr. MacDonald

RE: **Traffic Signal Timings**

With respect to your inquiry on June 17, 2021, attached are the Signal Timings for the following intersections:

- Yonge Street & Big Bay Point Road
- Yonge Street & Coxmill Road
- Yonge Street & D'Ambrosio Drive
- Yonge Street & Little Avenue

Signalized Intersections within the City of Barrie function as a semi-actuated; meaning the signals remain green on the major road/ main street until a vehicle is detected on the minor road/ side street or a pedestrian pushes the pushbutton to activate the pedestrian phase.

Vehicles on the minor road/side street are detected by electromagnetic wires, which are embedded in the pavement on the side street near the painted stop bar. Vehicle presence only on the side street would result in a possible green time of between the minimum and maximum times, as noted, depending on vehicle demand detected.

Pedestrians must push the pedestrian push button to be detected. Pedestrian "Walk" and "Flashing Don't Walk" times on the side street, as noted, would be used in the event that the pedestrian push button was activated.

If you require any further information please feel free to contact me at (705) 739-4220 ext. 4937.

Sincerely,

A handwritten signature in blue ink, reading "Stephen Salis".

Stephen Salis, C.E.T.
Transportation Systems Technologist

Yonge Street & Big Bay Point Road – FREE PLAN (NO COORDINATION)

Roadway	Direction	Vehicular Indications				Pedestrian Indications	
		Minimum Green	Maximum Green	Amber	All Red	Walk	Flashing Don't Walk
Yonge Street (main street)	Advanced Northbound Left Turn	7	7	3	1	N/A	N/A
Yonge Street (main street)	Advanced Southbound Left Turn	7	7	3	1	N/A	N/A
Yonge Street (main street)	Northbound	29	29	4	2	12	17
Yonge Street (main street)	Southbound	29	29	4	2	12	17
Big Bay Point Road (side street)	Advanced Eastbound Left Turn	7	7	3	1	N/A	N/A
Big Bay Pont Road (side street)	Advanced Westbound Left Turn	7	7	3	1	N/A	N/A
Big Bay Point Road (side street)	Eastbound	12	26	4	2	10	15
Big Bay Point Road (side street)	Westbound	12	26	4	2	10	15

NOTE: All times are recorded in seconds, based on full demand.

Yonge Street & Big Bay Point Road – AM WEEKDAY PLAN (6:30AM – 9:00AM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Yonge Street (main street)	Advanced Northbound Left Turn	12
Yonge Street (main street)	Advanced Southbound Left Turn	12
Yonge Street (main street)	Northbound	61
Yonge Street (main street)	Southbound	61
Big Bay Point Road (side street)	Advanced Eastbound Left Turn	15
Big Bay Pont Road (side street)	Advanced Westbound Left Turn	13
Big Bay Point Road (side street)	Eastbound	34
Big Bay Point Road (side street)	Westbound	32
Total Cycle Length		120

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Yonge Street & Big Bay Point Road – NOON WEEKDAY PLAN (9:00AM – 3:30PM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Yonge Street (main street)	Advanced Northbound Left Turn	12
Yonge Street (main street)	Advanced Southbound Left Turn	12
Yonge Street (main street)	Northbound	60
Yonge Street (main street)	Southbound	60
Big Bay Point Road (side street)	Advanced Eastbound Left Turn	16
Big Bay Pont Road (side street)	Advanced Westbound Left Turn	15
Big Bay Point Road (side street)	Eastbound	33
Big Bay Point Road (side street)	Westbound	32
Total Cycle Length		120

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Yonge Street & Big Bay Point Road – PM WEEKDAY PLAN (3:30PM – 6:30PM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Yonge Street (main street)	Advanced Northbound Left Turn	12
Yonge Street (main street)	Advanced Southbound Left Turn	14
Yonge Street (main street)	Northbound	55
Yonge Street (main street)	Southbound	57
Big Bay Point Road (side street)	Advanced Eastbound Left Turn	19
Big Bay Point Road (side street)	Advanced Westbound Left Turn	17
Big Bay Point Road (side street)	Eastbound	34
Big Bay Point Road (side street)	Westbound	32
Total Cycle Length		120

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Yonge Street & Coxmill Road – FREE PLAN (NO COORDINATION)

Roadway	Direction	Vehicular Indications				Pedestrian Indications	
		Minimum Green	Maximum Green	Amber	All Red	Walk	Flashing Don't Walk
Yonge Street (main street)	Advanced Southbound Left Turn	7	10	4	1	N/A	N/A
Yonge Street (main street)	Northbound	40	40	4	2	28	12
Yonge Street (main street)	Southbound	40	40	4	2	28	12
Coxmill Street (side street)	Eastbound	10	24	4	2	9	12
Coxmill Street (side street)	Westbound	10	24	4	2	9	12

NOTE: All times are recorded in seconds, based on full demand.

Yonge Street & Coxmill Road AM WEEKDAY PLAN (6:30AM – 9:00AM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Yonge Street (main street)	Advanced Southbound Left Turn	12
Yonge Street (main street)	Northbound	80
Yonge Street (main street)	Southbound	92
Coxmill Street (side street)	Eastbound	28
Coxmill Street (side street)	Westbound	28
Total Cycle Length		120

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Yonge Street & Coxmill Road – NOON WEEKDAY PLAN (9:00AM – 3:30PM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Yonge Street (main street)	Advanced Southbound Left Turn	12
Yonge Street (main street)	Northbound	80
Yonge Street (main street)	Southbound	92
Coxmill Street (side street)	Eastbound	28
Coxmill Street (side street)	Westbound	28
Total Cycle Length		120

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Yonge Street & Coxmill Road – PM WEEKDAY PLAN (3:30PM – 6:30PM)

Roadway	Direction	Split Timings (Including Amber + All Red)
Yonge Street (main street)	Advanced Southbound Left Turn	12
Yonge Street (main street)	Northbound	80
Yonge Street (main street)	Southbound	92
Coxmill Street (side street)	Eastbound	28
Coxmill Street (side street)	Westbound	28
Total Cycle Length		120

NOTE: All times are recorded in seconds, based on full demand.

Refer to the FREE PLAN for the Walk and Flashing Don't Walk Timings

Yonge Street & D'Ambrosio Drive – FREE PLAN (NO COORDINATION)

Roadway	Direction	Vehicular Indications				Pedestrian Indications	
		Minimum Green	Maximum Green	Amber	All Red	Walk	Flashing Don't Walk
Yonge Street (main street)	Advanced Northbound Left Turn	7	7	3	1	N/A	N/A
Yonge Street (main street)	Northbound	44	44	4	2	34	10
Yonge Street (main street)	Southbound	44	44	4	2	34	10
D'Ambrosio Drive (side street)	Eastbound	10	24	4	2	10	15

NOTE: All times are recorded in seconds, based on full demand.

Yonge Street & Little Avenue – FREE PLAN (NO COORDINATION)

Roadway	Direction	Vehicular Indications				Pedestrian Indications	
		Minimum Green	Maximum Green	Amber	All Red	Walk	Flashing Don't Walk
Yonge Street (main street)	Advanced Northbound Left Turn	7	10	3	1	N/A	N/A
Yonge Street (main street)	Advanced Southbound Left Turn	7	7	3	1	N/A	N/A
Yonge Street (main street)	Northbound	40	40	4	2	24	16
Yonge Street (main street)	Southbound	40	40	4	2	24	16
Little Avenue (side street)	Eastbound	10	30	4	2	14	16
Little Avenue (side street)	Westbound	10	30	4	2	14	16

NOTE: All times are recorded in seconds, based on full demand.

Site ID Code:
Intersection Location:
Municipality:
Count Date:
Weather and Temperature:
Surveyor:

Site ID Code:
Intersection Location:
Municipality:
Count Date:
Weather and Temperature:
Surveyor:

AM	NORTH APPROACH										Total	EAST APPROACH										Total	SOUTH APPROACH										Total	WEST APPROACH										Total	Grand Total
	CAR			TRUCKS			CYCLISTS			Peds		CAR			TRUCKS			CYCLISTS			Peds		CAR			TRUCKS			CYCLISTS			Peds													
	L	T	R	L	T	R	L	T	R			L	T	R	L	T	R	L	T	R			L	T	R	L	T	R	L	T	R														
7:00	9	42	16	1	2	1	0	0	0	0	71	1	36	20	0	0	0	0	0	0	1	58	12	52	0	0	4	0	0	0	0	0	68	9	9	11	1	2	0	0	0	0	1	33	230
7:15	8	44	14	0	2	0	0	0	0	2	70	2	46	26	2	0	0	0	0	0	1	77	17	62	1	0	3	0	0	0	0	2	85	9	16	9	0	0	11	0	0	0	45	277	
7:30	9	56	14	0	2	0	0	0	0	1	82	2	59	38	0	1	0	0	0	0	0	100	34	82	0	11	4	1	0	0	0	0	132	16	10	6	0	1	3	0	0	0	36	350	
7:45	11	58	23	0	0	0	0	0	0	0	92	3	53	52	0	1	0	0	0	0	0	109	30	81	0	1	2	0	0	0	0	1	115	20	27	19	0	0	2	0	0	0	69	385	
8:00	16	50	14	0	4	0	0	0	0	1	85	2	48	28	0	0	1	0	0	0	0	79	28	87	1	1	2	1	0	0	0	0	120	20	39	18	0	2	0	0	0	1	80	364	
8:15	7	53	20	0	1	1	0	0	0	0	82	3	42	29	0	2	0	0	0	0	0	76	29	76	4	0	2	0	0	0	0	6	117	17	16	13	0	0	0	0	0	2	48	323	
8:30	7	63	16	1	2	0	0	0	0	2	91	1	48	29	0	1	0	0	0	0	1	80	33	84	3	2	2	0	0	0	0	0	124	25	16	13	0	3	0	0	0	0	57	352	
8:45	19	72	14	0	2	3	0	0	0	2	112	0	46	32	0	0	0	0	0	0	1	79	27	88	1	0	2	0	0	0	0	1	119	24	30	35	0	0	3	0	0	0	93	403	
MD																																													
11:00	17	92	13	0	2	1	0	0	0	0	125	2	29	14	0	3	0	0	0	0	1	49	19	72	3	0	5	0	0	0	0	1	100	15	24	17	0	1	0	0	0	0	1	58	332
11:15	25	69	21	0	0	1	0	0	0	1	117	1	21	19	0	0	1	0	0	0	0	42	20	61	1	0	0	0	0	0	0	0	82	7	26	16	0	0	0	0	0	1	50	291	
11:30	15	79	21	0	3	0	0	0	0	0	118	4	26	17	0	0	1	0	0	0	0	48	23	69	1	0	1	0	0	0	0	0	94	16	24	17	0	0	0	0	0	0	57	317	
11:45	10	85	27	0	4	0	0	0	0	0	126	4	41	9	0	0	0	0	0	0	1	55	15	53	1	0	2	0	0	0	0	0	71	24	35	24	0	1	0	0	0	0	84	336	
12:00	13	94	18	0	3	0	0	0	0	0	128	2	41	16	0	1	0	0	0	0	1	61	22	73	2	1	1	0	0	0	0	2	101	15	60	18	0	0	0	0	0	1	94	384	
12:15	18	106	20	0	1	1	0	0	0	0	146	1	35	21	0	1	0	0	0	0	2	60	31	75	1	1	0	0	0	0	0	1	109	11	32	20	0	0	0	0	0	0	63	378	
12:30	16	96	17	0	5	1	0	0	0	0	135	4	21	21	0	1	2	0	0	0	1	50	27	90	0	1	2	1	0	0	0	0	121	13	35	13	0	0	0	0	0	0	61	367	
12:45	8	91	26	0	1	2	0	0	0	0	128	3	36	30	0	2	1	0	0	0	4	76	23	57	3	0	1	0	0	0	0	4	88	24	26	21	1	1	0	0	0	2	75	367	
13:00	15	81	19	0	4	0	0	0	0	0	119	1	27	14	0	0	0	0	0	0	3	45	13	69	2	1	3	0	0	0	0	2	90	28	34	22	0	0	1	0	0	0	86	340	
13:15	20	93	21	1	4	0	0	0	0	0	139	6	24	17	0	0	0	0	0	0	1	48	19	70	3	0	2	0	0	0	0	0	94	21	47	18	0	0	0	0	0	0	86	367	
13:30	13	84	24	0	2	0	0	0	0	2	125	6	29	7	0	0	0	0	0	0	2	44	26	75	2	1	1	0	0	0	0	4	109	24	32	30	0	0	0	0	0	2	88	366	
13:45	20	87	14	0	2	1	0	0	0	2	126	4	26	16	0	0	0	0	0	0	2	48	17	76	4	0	1	0	0	0	0	0	98	24	26	11	0	0	0	0	0	0	61	333	
PM																																													
15:00	17	93	21	1	1	1	0	0	0	4	138	4	31	14	0	0	0	0	0	0	49	24	89	3	1	1	0	0	0	0	0	4	122	14	46	20	0	0	0	0	0	2	82	391	
15:15	18	115	23	0	0	0	0	0	0	4	160	3	29	11	0	0	0	0	0	0	1	44	26	78	0	0	0	0	0	0	0	0	104	18	56	23	0	1	1	0	0	0	1	100	408
15:30	12	108	29	0	3	0	0	0	0	0	152	1	36	22	2	0	1	0	0	0	0	62	18	96	5	0	4	0	0	0	0	0	123	18	41	27	0	0	1	0	0	0	87	424	
15:45	19	111	22	0	1	2	0	0	0	0	155	5	38	9	0	0	0	0	0	0	0	52	22	92	1	0	2	0	0	0	0	0	117	17	45	22	0	3	0	0	0	0	1	88	412
16:00	28	102	18	0	2	0	0	0	0	2	152	6	31	11	0	0	0	0	0	0	0	48	14	98	4	0	4	0	0	0	0	0	120	10	47	30	0	0	0	0	0	0	87	407	
16:15	14	131	18	0	4	0	0	0	0	0	167	3	34	15	0	0	0	0	0	0	0	52	26	114	4	0	2	0	0	0	0	0	146	21	44	24	0	0	1	0	0	0	1	91	456
16:30	18	138	25	0	2	0	0	0	0	0	183	6	30	14	0	0	0	0	0	0	0	50	19	121	2	1	5	0	0	0	0	1	149	23	58	32	0	0	1	0	0	0	114	496	
16:45	19	145	25	0	1	1	0	0	0	0	191	7	31	9	0	0	0	0	0	0	0	47	20	112	3	0	2	0	0	0	0	1	138	18	39	26	0	0	0	0	0	0	83	459	
17:00	31	123	17	0	2	0	0	0	0	1	174	6	21	11	0	0	0	0	0	0	1	39	33	103	3	0	2	0	0	0	0	1	142	14	51	27	0	1	0	0	0	0	93	448	
17:15	21	138	25	0	1	0	0	0	0	1	186	2	17	7	0	0	0	0	0	0	0	26	18	119	4	0	2	0	0	0	0	0	143	13	40	27	0	0	0	0	0	0	80	435	
17:30	17	129	23	0	1	0	0	0	0	1	171	4	32	9	0	0	0	0	0	0	1	46	26	106	6	0	1	0	0	0	0	1	140	18	50	25	0	0	1	0	0	0	2	96	453
17:45	19	92	22	0	0	1	0	0	0	0	134	4	31	18	0	0	0	0	0	0	0	53	21	83	3	0	0	0	0	0	0	0	107	13	51	28	0	0	0	0	0	0	92	386	



Turning Movement Count Diagram

Intersection: Yonge Street & Little Avenue

Municipality: Barrie, Ontario

Intersection ID:

Date: Thursday April 11, 2019

AM Peak Hour: 8:00 to 9:00

Yonge Street													
North Total 913				East Total 478									
North Entering 365		Cyclists	0	0	0	East Entering 312							
North Receiving 548		Truck	4	9	1	East Receiving 166							
North Peds 5		Cars	64	238	49	East Peds 2							
			⬅	⬇	➡								
Little Avenue	0	0	86	⬆						⬆	118	1	0
	0	5	101	➡						⬅	184	3	0
	0	3	79	⬇						⬇	6	0	0
			⬅	⬆	➡								
West Total 649				117	335	9	South Total 808						
West Entering 274				3	8	1	South Entering 473						
West Receiving 375				0	0	0	South Receiving 335						
West Peds 4				South Peds 7									

MD Peak Hour: 12:00 to 13:00

Yonge Street									
North Total 991						East Total 455			
North Entering 537	Cyclists	0 0 0				East Entering 239			
North Receiving 454	Truck	4 10 0				East Receiving 216			
North Peds 0	Cars	81 387 55				East Peds 8			
			←	↓	↘				
Little Avenue	0 1 63	↗				↗ 88 3 0			
	0 1 153	→				← 133 5 0			
	0 0 72	↘				↘ 10 0 0			
			↙	↑	↗				
West Total 619			103	295	6	South Total 891			
West Entering 290		3 4 1				South Entering 412			
West Receiving 329		0 0 0				South Receiving 479			
West Peds 3						South Peds 7			

PM Peak Hour: 16:15 to 17:15

Yonge Street										
North Total 1300				East Total 474						
North Entering 714		Cyclists	0	0	0	East Entering 187				
North Receiving 586		Truck	1	9	0	East Receiving 287				
North Peds 1		Cars	85	537	82	East Peds 1				
			⬅	⬇	➡					
Little Avenue	0	0	76	⬆		⬆		49	0	0
	0	1	192	➡		⬅		116	0	0
	0	2	109	⬇		⬇		22	0	0
			⬅	⬆	➡					
West Total 681				98		450		12		South Total 1251
West Entering 380				1		11		0		South Entering 572
West Receiving 301				0		0		0		South Receiving 679
West Peds 1										South Peds 3

Total 8-Hour Count

Yonge Street									
North Total 8055						East Total 3562			
North Entering 4154		Cyclists	0	0	0	East Entering 1827			
North Receiving 3901		Truck	17	64	4	East Receiving 1735			
North Peds 26		Cars	640	2920	509	East Peds 25			
			⬅	⬇	➡				
Little Avenue	0	2	559	↗	↖ 605 7 0				
	0	16	1132	➡	← 1095 13 0				
	0	25	662	↘	↙ 103 4 0				
			↖	⬆	↗				
West Total 4915				732	2663	71	South Total 7334		
West Entering 2396				22	65	3	South Entering 3556		
West Receiving 2519				0	0	0	South Receiving 3778		
West Peds 21							South Peds 32		

Trans-Plan Transportation Inc.

Site ID Code:
Intersection Location:
Municipality:
Count Date:
Weather and Temperature:
Surveyor:

Yonge Street & D'Ambrosio Drive
Barrie, Ontario
Tuesday April 16, 2019
Partly Sunny, 8 Degrees
TP

AM	NORTH APPROACH										Total	EAST APPROACH										Total	SOUTH APPROACH										Total	WEST APPROACH										Total	Grand Total		
	CAR			TRUCKS			CYCLISTS			Peds		CAR			TRUCKS			CYCLISTS			Peds		CAR			TRUCKS			CYCLISTS			Peds															
	L	T	R	L	T	R	L	T	R			L	T	R	L	T	R	L	T	R			L	T	R	L	T	R	L	T	R			L	T	R											
7:00	0	72	1	0	5	0	0	0	0	0	78	0	0	0	0	0	0	0	0	0	0	0	0	2	92	0	0	1	0	0	0	0	0	1	96	6	0	7	0	0	0	0	0	4	17	191	
7:15	0	81	1	0	5	1	0	0	0	0	88	0	0	0	0	0	0	0	0	0	0	0	0	1	89	0	0	6	0	0	0	0	0	0	96	10	0	6	0	0	0	0	0	0	16	200	
7:30	0	108	0	0	4	0	0	0	0	0	112	0	0	0	0	0	0	0	0	0	0	0	0	4	138	0	3	21	0	0	0	0	0	0	166	14	0	11	2	0	1	0	0	0	2	30	308
7:45	0	97	2	0	5	0	0	0	0	0	104	0	0	0	0	0	0	0	0	0	0	0	0	8	149	0	0	4	0	0	0	0	0	1	162	8	0	7	0	0	0	0	0	1	16	282	
8:00	0	106	6	0	6	0	0	0	0	0	118	0	0	0	0	0	0	0	0	0	0	0	0	5	160	0	0	2	0	0	0	0	0	0	167	13	0	8	0	0	2	0	0	0	23	308	
8:15	0	105	4	0	2	1	0	0	0	1	113	0	0	0	0	0	0	0	0	0	0	0	0	1	139	0	0	4	0	0	0	0	0	1	145	5	0	13	0	0	1	0	0	0	19	277	
8:30	0	101	6	0	3	0	0	0	0	2	112	0	0	0	0	0	0	0	0	0	0	0	0	3	150	0	0	3	0	0	0	0	0	2	158	10	0	7	0	0	0	0	0	0	17	287	
8:45	0	117	5	0	4	0	0	0	0	0	126	0	0	0	0	0	0	0	0	0	0	0	0	5	144	0	0	2	0	0	0	0	0	3	154	12	0	9	0	0	0	0	0	0	21	301	
MD																																															
11:00	0	111	5	0	6	0	0	0	0	0	122	0	0	0	0	0	0	0	0	0	0	0	0	6	116	0	0	4	0	0	1	0	0	1	128	2	0	3	0	0	0	0	0	2	7	257	
11:15	0	131	2	0	2	0	0	0	0	0	135	0	0	0	0	0	0	0	0	0	0	0	0	3	118	0	0	3	0	0	0	0	0	0	124	7	0	2	0	0	0	0	0	1	10	269	
11:30	0	124	1	0	3	0	0	0	0	2	130	0	0	0	0	0	0	0	0	0	0	0	0	6	146	0	0	3	0	0	0	0	0	0	155	8	0	7	0	0	0	0	0	0	1	16	301
11:45	0	134	8	0	4	0	0	0	0	0	146	0	0	0	0	0	0	0	0	0	0	0	0	3	127	0	0	5	0	0	0	0	0	0	135	7	0	7	0	0	0	0	0	0	0	14	295
12:00	0	164	5	0	4	0	0	0	0	1	174	0	0	0	0	0	0	0	0	0	0	0	0	5	150	0	1	4	0	0	0	0	0	0	160	7	0	5	0	0	1	0	0	0	0	13	347
12:15	0	167	6	0	4	0	0	0	0	0	177	0	0	0	0	0	0	0	0	0	0	0	0	8	131	0	0	3	0	0	0	0	0	1	143	4	0	3	1	0	0	0	0	0	0	8	328
12:30	0	157	9	0	3	0	0	0	0	0	169	0	0	0	0	0	0	0	0	0	0	0	0	4	145	0	0	2	0	0	0	0	0	0	151	6	0	5	0	0	0	0	0	0	11	331	
12:45	0	136	7	0	5	0	0	0	0	0	148	0	0	0	0	0	0	0	0	0	0	0	0	5	122	0	0	3	0	0	0	0	0	0	130	4	0	2	0	0	0	0	0	0	1	7	285
13:00	0	135	5	0	1	0	0	0	0	0	141	0	0	0	0	0	0	0	0	0	0	0	0	7	137	0	0	8	0	0	0	0	0	0	152	5	0	3	1	0	0	0	0	0	0	9	302
13:15	0	129	6	0	5	1	0	1	0	0	142	0	0	0	0	0	0	0	0	0	0	0	0	2	125	0	0	2	0	0	0	0	0	1	130	4	0	2	0	0	0	0	0	0	0	6	278
13:30	0	167	3	0	2	0	0	0	0	0	172	0	0	0	0	0	0	0	0	0	0	0	0	6	132	0	0	2	0	0	0	0	0	1	141	2	0	5	1	0	0	0	0	0	0	8	321
13:45	0	156	2	0	4	0	0	0	0	0	162	0	0	0	0	0	0	0	0	0	0	0	0	1	124	0	1	5	0	0	0	0	0	1	132	6	0	5	0	0	1	0	0	0	2	14	308
PM																																															
15:00	0	166	7	0	5	1	0	0	0	1	180	0	0	0	0	0	0	0	0	0	0	0	0	6	139	0	0	9	0	0	0	0	0	0	154	8	0	5	0	0	1	0	0	0	0	14	348
15:15	0	171	14	0	3	1	0	0	0	3	192	0	0	0	0	0	0	0	0	0	0	0	0	10	139	0	0	0	0	0	0	0	0	6	155	6	0	11	0	0	0	0	0	0	4	21	368
15:30	0	169	7	0	3	0	0	0	0	0	179	0	0	0	0	0	0	0	0	0	0	0	0	13	143	0	0	2	0	0	0	0	0	0	158	12	0	6	0	0	0	0	0	0	1	19	356
15:45	0	168	9	0	2	0	0	0	0	0	179	0	0	0	0	0	0	0	0	0	0	0	0	11	152	0	0	10	0	0	0	0	0	1	174	6	0	9	0	0	0	0	0	0	1	16	369
16:00	0	196	9	0	3	1	0	0	0	0	209	0	0	0	0	0	0	0	0	0	0	0	0	6	151	0	1	2	0	0	0	0	0	0	160	8	0	6	1	0	0	0	0	0	1	16	385
16:15	0	180	10	0	1	0	0	0	0	0	191	0	0	0	0	0	0	0	0	0	0	0	0	12	142	0	0	1	0	0	0	0	0	1	156	11	0	6	0	0	0	0	0	0	2	19	366
16:30	0	178	17	0	2	0	0	0	0	0	197	0	0	0	0	0	0	0	0	0	0	0	0	9	161	0	0	3	0	0	0	0	0	1	174	8	0	9	0	0	0	0	0	0	1	18	389
16:45	0	215	7	0	2	0	0	0	0	2	226	0	0	0	0	0	0	0	0	0	0	0	0	16	136	0	0	0	0	0	0	0	0	0	152	6	0	9	0	0	0	0	0	0	1	16	394
17:00	0	193	20	0	3	1	0	0	0	0	217	0	0	0	0	0	0	0	0	0	0	0	0	6	175	0	0	2	0	0	0	0	0	0	183	10	0	15	1	0	1	0	0	0	0	27	427
17:15	0	199	11	0	1	0	0	0	0	0	211	0	0	0	0	0	0	0	0	0	0	0	0	8	162	0	0	1	0	0	0	0	0	1	172	6	0	2	0	0	0	0	0	0	1	9	392
17:30	0	157	15	0	2	0	0	0	0	0	174	0	0	0	0	0	0	0	0	0	0	0	0	12	150	0	0	1	0	0	0	0	0	1	164	8	0	6	0	0	0	0	0	0	1	15	353
17:45	0	144	9	0	2	0	0	0	0	0	155	0	0	0	0	0	0	0	0	0	0	0	0	11	137	0	0	1	0	0	0	0	0	2	151	8	0	9	0	0	0	0	0	0	1	18	324



Turning Movement Count Diagram

Intersection: Yonge Street & D'Ambrosio Drive

Municipality: Barrie, Ontario

Intersection ID:

Date: Tuesday April 16, 2019

AM Peak Hour: 7:30 to 8:30

Yonge Street											
North Total 1105							East Total 0				
North Entering 446	Cyclists	0	0	0				East Entering 0			
North Receiving 659	Truck	1	17	0				East Receiving 0			
North Peds 1	Cars	12	416	0				East Peds 0			
				⬅	⬇	➡					
D'Ambrosia Drive	0	2	40	⬆				⬆	0	0	0
	0	0	0	➡				➡	0	0	0
	0	4	39	⬇				⬇	0	0	0
				⬅	⬆	➡					
West Total 119				18	586	0	South Total 1114				
West Entering 85		3	31	0				South Entering 638			
West Receiving 34		0	0	0				South Receiving 476			
West Peds 3							South Peds 2				

MD Peak Hour: 11:45 to 12:45

Yonge Street									
North Total 1257							East Total 0		
North Entering 665		Cyclists	0	0	0	East Entering 0			
North Receiving 592		Truck	0	15	0	East Receiving 0			
North Peds 1		Cars	28	622	0	East Peds 0			
			⬅	⬇	➡				
D'Ambrosia Drive	0	1	24	⬆	⬆ 0 0 0				
	0	0	0	➡	⬅ 0 0 0				
	0	1	20	⬇	⬇ 0 0 0				
			⬅	⬆	➡				
West Total 95				20	553	0	South Total 1246		
West Entering 46			1	14	0	South Entering 588			
West Receiving 49			0	0	0	South Receiving 658			
West Peds 0						South Peds 1			

PM Peak Hour: 16:30 to 17:30

Yonge Street													
North Total 1520								East Total 0					
North Entering 849		Cyclists	0	0	0			East Entering 0					
North Receiving 671		Truck	1	8	0			East Receiving 0					
North Peds 2		Cars	55	785	0			East Peds 0					
			⬅	⬇	➡								
D'Ambrosia Drive	0	1	30	⬆						⬆	0	0	0
	0	0	0	➡						➡	0	0	0
	0	1	35	⬇						⬇	0	0	0
			⬅	⬆	➡								
West Total 162			39	634	0			South Total 1508					
West Entering 67			0	6	0			South Entering 679					
West Receiving 95			0	0	0			South Receiving 829					
West Peds 3								South Peds 2					

Total 8-Hour Count

Yonge Street													
North Total 9752						East Total 0							
North Entering 4967		Cyclists	0	1	0	East Entering 0							
North Receiving 4785		Truck	7	106	0	East Receiving 0							
North Peds 12		Cars	219	4634	0	East Peds 0							
			⬅	⬇	⬇								
D'Ambrosia Drive	0	7	237	⬆						⬆	0	0	0
	0	0	0	➡						➡	0	0	0
	0	8	210	⬇						⬇	0	0	0
			⬅	⬆	➡								
West Total 899			205	4421	0	South Total 9711							
West Entering 462			6	119	0	South Entering 4752							
West Receiving 437			0	1	0	South Receiving 4959							
West Peds 28						South Peds 26							

Trans-Plan Transportation Inc.

Site ID Code:
Intersection Location: Yonge Street & Cox Mill Road
Municipality: Barrie, Ontario
Count Date: Thursday June 28, 2018
Weather and Temperature: Sunny, 20C
Surveyor: TP

AM	NORTH APPROACH										Total	EAST APPROACH										Total	SOUTH APPROACH										Total	WEST APPROACH										Total	Grand Total
	CAR			TRUCKS			CYCLISTS			Peds		CAR			TRUCKS			CYCLISTS			Peds		CAR			TRUCKS			CYCLISTS			Peds													
	L	T	R	L	T	R	L	T	R			L	T	R	L	T	R	L	T	R			L	T	R	L	T	R	L	T	R														
7:00	26	0	6	0	0	0	0	0	0	1	33	0	67	8	0	3	2	0	1	0	0	81	0	0	0	0	0	0	0	0	0	0	0	3	77	0	0	7	0	0	0	0	1	88	202
7:15	32	0	7	0	0	0	1	0	0	0	41	0	73	8	0	5	1	0	0	0	0	87	0	0	0	0	0	0	0	0	0	0	0	99	0	0	4	0	0	0	0	0	103	231	
7:30	26	0	4	0	0	1	0	0	0	3	34	0	118	8	0	5	0	0	0	0	0	131	0	0	0	0	0	0	0	0	0	0	4	89	0	0	7	0	0	0	0	0	100	265	
7:45	37	0	3	1	0	0	0	0	0	0	41	0	111	14	0	7	1	0	0	0	2	135	0	0	0	0	0	0	0	0	0	0	3	75	0	0	5	0	0	0	0	0	83	259	
8:00	44	0	11	0	0	0	0	0	0	1	56	0	141	23	0	5	1	0	0	0	1	171	0	0	0	0	0	0	0	0	0	0	3	115	0	0	8	0	0	0	0	4	130	357	
8:15	38	0	5	0	0	1	0	0	0	0	44	0	156	24	0	6	1	0	0	0	0	187	0	0	0	0	0	0	0	0	0	0	0	86	0	0	5	0	0	0	0	0	91	322	
8:30	40	0	8	1	0	0	0	0	0	0	49	0	138	26	0	4	3	0	0	0	1	172	0	0	0	0	0	0	0	0	0	0	10	100	0	0	5	0	0	0	0	1	116	337	
8:45	43	0	15	0	0	0	0	0	0	2	60	0	141	24	0	3	5	0	0	0	0	173	0	0	0	0	0	0	0	0	0	0	9	103	0	0	6	0	0	0	0	2	120	353	
MD																																													
11:00	39	0	9	0	0	0	0	0	0	0	48	0	146	42	0	2	0	0	0	0	1	191	0	0	0	0	0	0	0	0	0	0	6	136	0	0	3	0	0	0	0	0	145	384	
11:15	43	0	5	1	0	0	0	0	0	0	49	0	136	29	0	5	0	0	0	0	1	171	0	0	0	0	0	0	0	0	0	0	4	162	0	0	6	0	0	0	0	0	172	392	
11:30	24	0	6	0	0	1	0	0	0	0	31	0	158	38	0	5	0	0	1	0	0	202	0	0	0	0	0	0	0	0	0	0	6	156	0	0	3	0	0	0	0	1	166	399	
11:45	36	0	8	1	0	0	0	0	0	2	47	0	152	35	0	8	2	0	0	0	0	197	0	0	0	0	0	0	0	0	0	0	3	154	0	0	4	0	0	0	0	0	161	405	
12:00	28	0	9	0	0	0	0	0	0	0	37	0	170	46	0	7	0	0	0	0	0	223	0	0	0	0	0	0	0	0	0	0	7	145	0	0	4	0	0	0	0	0	156	416	
12:15	48	0	13	1	0	0	0	0	0	1	63	0	143	34	0	3	0	0	0	0	0	180	0	0	0	0	0	0	0	0	0	0	8	171	0	0	3	0	0	0	0	0	182	425	
12:30	35	0	9	1	0	1	0	0	0	0	46	2	191	41	0	5	0	0	0	0	0	239	0	0	0	0	0	0	0	0	0	0	14	186	0	0	3	0	0	0	0	1	204	489	
12:45	51	0	12	1	0	0	0	0	0	0	64	0	142	35	0	3	0	0	0	0	0	180	0	0	0	0	0	0	0	0	0	0	9	181	1	0	4	0	0	0	0	0	195	439	
13:00	40	1	8	0	0	0	0	0	0	1	50	0	169	36	0	4	0	0	0	0	3	212	0	0	0	0	0	0	0	0	0	0	9	155	0	0	8	0	0	0	0	0	172	434	
13:15	38	0	7	0	0	0	0	0	0	0	45	0	153	45	0	4	0	0	0	0	0	202	0	0	0	0	0	0	0	0	0	0	6	200	0	0	3	0	0	0	0	2	211	458	
13:30	35	0	12	0	0	0	0	0	0	1	48	0	201	28	0	1	0	0	4	0	1	235	0	0	0	0	0	0	0	0	0	0	9	173	0	0	3	0	0	0	0	1	186	469	
13:45	46	0	6	0	0	0	0	0	0	0	52	0	165	30	0	2	1	0	0	0	3	201	0	0	0	0	0	0	0	0	0	0	0	176	0	0	7	0	0	0	0	0	183	436	
PM																																													
15:00	35	0	5	0	0	0	0	0	0	1	41	0	179	33	0	7	4	0	0	0	1	224	0	0	0	0	0	0	0	0	0	0	6	197	0	0	4	0	0	0	0	2	209	474	
15:15	33	1	4	2	0	0	0	0	0	2	42	0	199	50	0	4	5	0	1	0	0	259	0	0	0	0	0	0	0	0	0	0	11	194	0	0	2	0	0	0	0	0	207	508	
15:30	41	1	17	1	0	1	0	0	0	1	62	0	194	44	0	2	1	0	0	0	0	241	0	0	0	0	0	0	0	0	0	0	5	190	0	0	5	0	0	0	0	0	200	503	
15:45	36	0	17	0	0	0	0	0	0	0	53	0	188	49	0	8	2	0	0	0	0	247	0	0	0	0	0	0	0	0	0	0	7	197	0	0	6	0	0	0	0	0	210	510	
16:00	40	0	5	0	0	0	0	0	0	3	48	0	186	55	0	4	1	0	0	0	0	246	0	0	0	0	0	0	0	0	0	0	10	190	0	0	3	0	0	0	0	0	203	497	
16:15	52	0	6	0	0	0	0	0	0	0	58	0	184	64	0	6	0	0	0	0	0	254	0	0	0	0	0	0	0	0	0	0	12	196	0	0	5	0	0	0	0	1	214	526	
16:30	45	0	10	0	0	0	0	0	0	1	56	0	187	55	0	1	0	0	0	0	0	243	0	0	0	0	0	0	0	0	0	0	9	208	0	0	4	0	0	0	0	0	221	520	
16:45	48	0	11	0	0	0	0	0	0	0	59	0	208	68	0	3	0	0	0	0	0	279	0	0	0	0	0	0	0	0	0	0	9	216	0	0	5	0	0	0	0	0	230	568	
17:00	51	0	6	1	0	0	0	0	0	3	61	1	193	80	0	1	0	0	0	1	0	276	0	0	0	0	0	0	0	0	0	0	8	236	0	0	0	0	0	1	0	0	245	582	
17:15	62	0	7	0	0	0	0	0	0	0	69	0	233	54	0	3	0	0	0	0	1	291	0	0	0	0	0	0	0	0	0	0	10	209	0	0	2	0	0	0	0	0	221	581	
17:30	44	0	7	0	0	0	0	0	0	3	54	0	209	59	0	5	0	0	0	0	4	277	0	0	0	0	0	0	0	0	0	0	8	188	0	0	2	0	0	0	0	0	198	529	
17:45	46	0	6	0	0	0	0	0	0	0	52	0	182	68	0	2	0	0	0	0	0	252	0	0	0	0	0	0	0	0	0	0	10	178	0	0	2	0	0	0	0	2	192	496	



Turning Movement Count Diagram

Intersection: Yonge Street & Cox Mill Road

Municipality: Barrie, Ontario

Intersection ID:

Date: Thursday June 28, 2018

AM Peak Hour: 8:00 to 9:00

Cox Mill Road													
North Total 335							East Total 1295						
North Entering 206		Cyclists	0	0	0			East Entering 701					
North Receiving 129		Truck	1	0	1			East Receiving 594					
North Peds 3		Cars	39	0	165			East Peds 2					
			⬅	⬇	➡								
Yonge Street	0	0	22	⬆						⬆	97	10	0
	0	24	404	➡						⬅	576	18	0
	0	0	0	⬇						⬇	0	0	0
			⬅	⬆	➡								
West Total 1084				0			0	0	South Total 0				
West Entering 450				0			0	0	South Entering 0				
West Receiving 634				0			0	0	South Receiving 0				
West Peds 7										South Peds 0			

MD Peak Hour: 12:30 to 13:30

Cox Mill Road													
North Total 399							East Total 1736						
North Entering 204		Cyclists	0	0	0	East Entering 830							
North Receiving 195		Truck	1	0	2	East Receiving 906							
North Peds 1		Cars	36	1	164	East Peds 3							
			⬅	⬇	⬇								
Yonge Street	0	0	38	⬆						⬆	157	0	0
	0	18	722	➡						⬅	655	16	0
	0	0	1	⬇						⬇	2	0	0
			⬅	⬆	➡								
West Total 1487				0	0	0	South Total 4						
West Entering 779				0	0	0	South Entering 0						
West Receiving 708				0	0	0	South Receiving 4						
West Peds 3							South Peds 0						

PM Peak Hour: 16:45 to 17:45

Cox Mill Road													
North Total 534				East Total 2183									
North Entering 237		Cyclists	0	0	0	East Entering 1118							
North Receiving 297		Truck	0	0	1	East Receiving 1065							
North Peds 6		Cars	31	0	205	East Peds 5							
			⬅	⬇	➡								
Yonge Street	0	0	35	⬆						⬆	261	0	1
	1	9	849	➡						➡	843	12	0
	0	0	0	⬇						⬇	1	0	0
			⬅	⬆	➡								
West Total 1780				0	0	0	South Total 1						
West Entering 894				0	0	0	South Entering 0						
West Receiving 886				0	0	0	South Receiving 1						
West Peds 0				South Peds 0									

Total 8-Hour Count

Cox Mill Road													
North Total 3068						East Total 13210							
North Entering 1566	Cyclists	0	0	0		East Entering 6640							
North Receiving 1502	Truck	6	0	11		East Receiving 6570							
North Peds 27	Cars	264	3	1282		East Peds 19							
					←	↓	→						
Yonge Street	0	0	218	↗						↖	1253	30	1
	1	138	5138	→						←	5213	133	7
	0	0	1	↘						↙	3	0	0
					←	↑	→						
West Total 11119			0			0	0	South Total 7					
West Entering 5496			0			0	0	South Entering 0					
West Receiving 5623			0			0	0	South Receiving 7					
West Peds 18								South Peds 0					

Trans-Plan Transportation Inc.

Site ID Code:
Intersection Location:
Municipality:
Count Date:
Weather and Temperature:
Surveyor:

Yonge Street & Big Bay Point Road
Barrie, Ontario
Thursday June 28, 2018
Sunny, 20C
TP

AM	NORTH APPROACH										Total	EAST APPROACH										Total	SOUTH APPROACH										Total	WEST APPROACH										Total	Grand Total
	CAR			TRUCKS			CYCLISTS			Peds		CAR			TRUCKS			CYCLISTS			Peds		CAR			TRUCKS			CYCLISTS			Peds		Total											
	L	T	R	L	T	R	L	T	R			L	T	R	L	T	R	L	T	R			L	T	R	L	T	R	L	T	R				L	T	R								
7:00	10	45	32	4	2	0	0	0	0	1	94	9	86	18	0	1	0	0	0	0	1	115	14	46	3	1	0	2	0	0	0	0	66	8	27	14	5	8	1	0	0	0	1	64	339
7:15	17	89	33	2	1	1	0	0	0	0	143	5	78	25	0	1	0	0	0	0	2	111	15	47	7	0	4	0	0	0	0	73	16	24	10	0	6	0	0	0	0	0	56	383	
7:30	21	61	31	2	4	1	0	0	0	0	120	8	90	26	0	5	0	0	0	0	0	129	25	74	4	2	5	3	0	0	0	2	115	25	22	13	0	3	0	0	0	0	0	63	427
7:45	18	60	32	1	3	1	0	0	0	0	115	6	106	31	0	1	3	0	0	0	0	147	21	63	3	0	4	0	0	0	0	91	29	29	11	1	3	0	0	0	0	0	73	426	
8:00	23	72	55	1	5	1	0	0	0	1	158	9	80	30	1	1	1	0	0	0	1	123	14	110	8	0	4	1	0	0	0	0	137	26	38	17	1	4	1	0	0	0	1	88	506
8:15	16	69	52	0	4	0	0	0	0	0	141	14	98	35	2	3	1	0	0	0	0	153	21	100	15	2	5	1	0	0	0	0	144	32	39	9	1	3	0	0	0	0	0	84	522
8:30	32	64	38	2	5	1	0	0	0	0	142	16	79	34	0	2	2	0	0	0	0	133	12	99	9	0	1	0	0	0	0	122	30	45	19	3	1	0	0	0	0	0	98	495	
8:45	28	66	48	0	3	3	0	0	0	2	150	15	93	49	0	7	4	0	0	0	0	168	14	74	6	0	4	0	0	0	0	98	46	63	26	0	5	1	0	0	0	0	141	557	
11:00	26	96	48	0	2	1	0	0	0	2	175	23	76	24	1	7	1	0	0	0	0	132	12	110	19	2	0	0	0	0	0	1	144	47	66	23	1	2	0	0	0	0	0	139	590
11:15	41	103	53	2	4	0	0	0	0	1	204	16	52	33	0	2	1	0	0	0	2	106	22	90	15	0	6	1	0	0	0	3	137	39	49	19	0	0	0	0	0	0	1	108	555
11:30	26	85	46	0	2	1	0	0	0	1	161	24	79	36	0	4	1	0	0	0	7	151	18	100	22	1	3	0	0	0	0	4	148	54	67	23	0	2	0	0	0	0	0	146	606
11:45	30	109	34	1	2	2	0	0	0	3	181	26	68	27	0	3	1	0	0	0	4	129	25	99	22	0	4	0	0	0	0	1	151	52	73	21	3	4	0	0	0	0	1	154	615
12:00	22	93	41	1	2	2	0	0	0	0	161	27	50	49	0	4	1	0	0	0	0	131	29	104	27	0	5	1	0	0	0	1	167	54	96	29	1	0	0	0	0	0	5	185	644
12:15	27	133	38	0	3	1	0	0	0	1	203	23	79	38	0	1	3	0	0	0	2	146	34	104	20	1	0	0	0	0	0	1	160	48	58	23	0	1	0	0	0	0	3	133	642
12:30	28	128	45	0	2	2	0	0	0	9	214	45	69	39	1	2	0	0	0	0	2	158	24	111	19	0	5	1	0	0	0	1	161	53	54	23	0	0	1	0	0	0	1	132	665
12:45	30	130	54	0	5	0	0	0	0	2	221	27	78	31	0	2	0	0	0	0	2	140	25	100	32	0	2	1	0	0	0	0	160	33	55	24	1	2	0	0	0	0	7	122	643
13:00	21	119	50	0	6	1	0	0	0	3	200	30	89	28	0	1	2	0	0	0	2	152	33	127	32	2	5	3	0	0	0	2	204	55	69	21	0	0	1	0	0	0	3	149	705
13:15	41	119	43	0	3	1	0	0	0	9	216	25	79	31	0	4	0	0	0	0	3	142	17	117	32	1	5	0	0	0	0	1	173	46	84	29	0	3	0	0	0	0	6	168	699
13:30	34	131	43	1	2	2	0	0	0	4	217	22	70	38	1	1	1	0	0	0	8	141	28	127	18	0	0	0	0	1	0	7	181	42	57	17	1	1	0	0	0	0	1	119	658
13:45	23	133	41	1	5	0	0	0	0	3	206	34	68	32	1	2	0	0	0	0	1	138	24	104	23	0	3	0	0	0	0	0	161	45	64	27	0	1	1	0	0	0	1	139	644
PM																																													
15:00	32	129	43	0	3	2	0	0	0	1	210	29	71	36	0	3	2	0	2	0	3	146	25	94	23	0	6	0	0	0	0	0	148	57	82	27	2	3	1	0	0	0	1	173	677
15:15	35	140	54	0	2	0	0	0	0	2	233	20	62	37	1	2	3	0	0	0	3	128	25	145	28	0	5	0	0	2	0	0	205	61	83	28	4	5	1	0	0	0	4	186	752
15:30	34	130	42	0	3	2	0	0	0	1	212	29	74	44	0	4	0	0	0	0	4	155	19	121	37	1	2	0	0	0	0	0	180	61	83	27	1	2	0	0	0	0	0	174	721
15:45	43	142	42	1	6	1	0	0	0	0	235	28	82	39	0	2	1	0	0	0	2	154	24	142	18	2	8	2	0	0	0	0	196	54	101	30	1	4	0	0	0	0	0	190	775
16:00	38	143	46	1	1	2	0	0	0	1	232	26	61	44	0	2	2	0	0	0	1	136	32	121	22	2	3	0	0	0	0	0	180	64	96	26	0	5	0	0	0	0	1	192	740
16:15	39	131	60	1	2	0	0	0	0	0	233	28	80	44	0	6	2	0	0	0	0	160	28	127	29	0	5	0	0	0	0	0	189	78	82	23	0	1	0	0	0	0	0	184	766
16:30	42	156	54	0	3	0	0	0	0	0	255	27	103	35	0	1	0	0	0	0	2	168	28	152	17	1	1	0	0	0	0	0	199	56	98	32	0	0	0	0	0	0	1	187	809
16:45	46	146	56	1	2	0	0	0	0	0	251	43	97	37	0	3	0	0	0	0	1	181	27	151	29	0	3	0	0	0	0	0	210	77	125	33	0	1	0	0	0	0	1	237	879
17:00	54	163	53	0	1	1	0	0	0	0	272	31	76	34	1	2	0	0	0	0	1	145	39	163	26	0	1	0	0	0	0	4	233	79	108	31	0	0	0	0	0	0	0	218	868
17:15	51	146	70	0	1	0	0	0	0	1	269	36	89	41	0	3	1	0	1	0	1	172	40	162	21	0	1	0	0	0	0	3	227	63	96	32	1	0	0	0	0	0	0	192	860
17:30	36	154	42	0	2	0	0	0	0	0	234	24	86	32	0	2	1	0	0	0	2	147	33	141	27	1	3	0	0	0	0	0	205	69	96	40	0	2	0	0	0	0	1	208	794
17:45	34	119	45	0	3	0	0	0	0	0	201	21	93	29	0	1	0	0	0	0	2	146	37	144	27	1	2	0	0	0	0	1	214	70	71	27	0	0	0	0	0	0	2	170	731



Turning Movement Count Diagram

Intersection: Yonge Street & Big Bay Point Road

Municipality: Barrie, Ontario

Intersection ID:

Date: Thursday June 28, 2018

AM Peak Hour: 8:00 to 9:00

Yonge Street									
North Total 1280						East Total 916			
North Entering 588	Cyclists	0	0	0		East Entering 576			
North Receiving 692	Truck	5	17	3		East Receiving 340			
North Peds 3	Cars	193	271	99		East Peds 1			
Big Bay Point Road		↙	↓	↘					
	0	5	134	↗		↖	148	8	0
	0	13	185	→		←	350	13	0
	0	2	71	↘		↙	54	3	0
		↙	↑	↘					
West Total 1034		61	383	38		South Total 918			
West Entering 410		2	14	2		South Entering 500			
West Receiving 624		0	0	0		South Receiving 418			
West Peds 1						South Peds 1			

MD Peak Hour: 12:30 to 13:30

Yonge Street									
North Total 1619							East Total 1090		
North Entering 828		Cyclists	0	0	0	East Entering 583			
North Receiving 791		Truck	4	16	0	East Receiving 507			
North Peds 23		Cars	192	496	120	East Peds 9			
Big Bay Point Road	0	1	187	↗		↖	129	2	0
	0	5	262	→		←	315	9	0
	0	2	97	↘		↙	127	1	0
				↖	↗				
West Total 1176			99	455	115	South Total 1433			
West Entering 554			3	17	5	South Entering 694			
West Receiving 622			0	0	0	South Receiving 739			
West Peds 17						South Peds 4			

PM Peak Hour: 16:30 to 17:30

Yonge Street										
North Total 2104				East Total 1376						
North Entering 1046		Cyclists	0	0	0	East Entering 661				
North Receiving 1058		Truck	1	7	1	East Receiving 715				
North Peds 1		Cars	233	611	193	East Peds 5				
Big Bay Point Road			↙	↓	↘					
	0	1	275	↗			↖	147	1	0
	0	1	427	→			←	365	9	1
	0	0	128	↘			↙	137	1	0
West Total 1576			134	628	93	South Total 1746				
West Entering 832			1	6	0	South Entering 862				
West Receiving 744			0	0	0	South Receiving 884				
West Peds 2						South Peds 7				

Total 8-Hour Count

Yonge Street									
North Total 12624					East Total 8473				
North Entering 6211		Cyclists	0	0	0	East Entering 4524			
North Receiving 6413		Truck	29	94	22	East Receiving 3949			
North Peds 48		Cars	1464	3604	998	East Peds 59			
			⬅	⬇	➡				
Big Bay Point Road	0	27	1569	↗	↖ 1106 34 0				
	0	72	2200	➡	⬅ 2541 85 3				
	0	8	754	⬇	↙ 746 9 0				
			⬅	⬆	➡				
West Total 9556			784	3569	640	South Total 10353			
West Entering 4630			20	105	16	South Entering 5138			
West Receiving 4926			0	3	1	South Receiving 5215			
West Peds 42						South Peds 41			

Appendix B: Existing Operations

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2021 Existing Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	108	104	8	191	121	159	455	13	51	313	69
Future Volume (vph)	88	108	104	8	191	121	159	455	13	51	313	69
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		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.94		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1725		1770	1754		1770	3525		1770	3443	
Flt Permitted	0.29	1.00		0.50	1.00		0.48	1.00		0.46	1.00	
Satd. Flow (perm)	542	1725		929	1754		887	3525		865	3443	
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)	96	117	113	9	208	132	173	495	14	55	340	75
RTOR Reduction (vph)	0	41	0	0	27	0	0	2	0	0	18	0
Lane Group Flow (vph)	96	189	0	9	313	0	173	507	0	55	397	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.1	20.1		20.1	20.1		53.9	46.9		47.9	43.9	
Effective Green, g (s)	20.1	20.1		20.1	20.1		53.9	46.9		47.9	43.9	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.62	0.54		0.55	0.50	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	125	398		214	405		620	1900		517	1737	
v/s Ratio Prot		0.11			c0.18		c0.02	0.14		0.00	0.12	
v/s Ratio Perm	0.18			0.01			c0.15			0.05		
v/c Ratio	0.77	0.48		0.04	0.77		0.28	0.27		0.11	0.23	
Uniform Delay, d1	31.3	28.9		26.0	31.3		7.0	10.8		9.1	12.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.2	0.9		0.1	8.9		0.2	0.3		0.1	0.3	
Delay (s)	55.4	29.8		26.1	40.2		7.3	11.1		9.2	12.4	
Level of Service	E	C		C	D		A	B		A	B	
Approach Delay (s)		37.3			39.8			10.2			12.0	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			21.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			87.0			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			86.2%			ICU Level of Service				E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive

2021 Existing Conditions
AM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	43	42	21	655	459	13
Future Volume (vph)	43	42	21	655	459	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	6.0	6.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.93		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1696		1770	3539	3525	
Flt Permitted	0.98		0.43	1.00	1.00	
Satd. Flow (perm)	1696		805	3539	3525	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	46	23	712	499	14
RTOR Reduction (vph)	41	0	0	0	1	0
Lane Group Flow (vph)	52	0	23	712	512	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	8.2		63.5	63.5	56.7	
Effective Green, g (s)	8.2		63.5	63.5	56.7	
Actuated g/C Ratio	0.10		0.76	0.76	0.68	
Clearance Time (s)	6.0		4.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	166		643	2684	2387	
v/s Ratio Prot	c0.03		0.00	c0.20	0.15	
v/s Ratio Perm			0.03			
v/c Ratio	0.31		0.04	0.27	0.21	
Uniform Delay, d1	35.1		2.6	3.1	5.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.1		0.0	0.2	0.2	
Delay (s)	36.2		2.6	3.3	5.3	
Level of Service	D		A	A	A	
Approach Delay (s)	36.2			3.3	5.3	
Approach LOS	D			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.3	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.29			
Actuated Cycle Length (s)			83.7	Sum of lost time (s)		16.0
Intersection Capacity Utilization			55.0%	ICU Level of Service		B
Analysis Period (min)			15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2021 Existing Conditions
AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↑↑	↕	↕	↑↑	
Traffic Volume (vph)	0	0	0	171	0	41	0	634	110	23	480	0
Future Volume (vph)	0	0	0	171	0	41	0	634	110	23	480	0
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	5.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.35	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	645	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	1.00	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	186	0	41	0	689	120	25	522	0
RTOR Reduction (vph)	0	0	0	0	34	0	0	0	41	0	0	0
Lane Group Flow (vph)	0	0	0	186	7	0	0	689	79	25	522	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				18.5	18.5			74.5	74.5	83.0	83.0	
Effective Green, g (s)				18.5	18.5			74.5	74.5	83.0	83.0	
Actuated g/C Ratio				0.16	0.16			0.66	0.66	0.73	0.73	
Clearance Time (s)				6.0	6.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				229	258			2322	1039	506	2587	
v/s Ratio Prot					0.00			c0.19		0.00	c0.15	
v/s Ratio Perm				c0.13					0.05	0.03		
v/c Ratio				0.81	0.03			0.30	0.08	0.05	0.20	
Uniform Delay, d1				45.8	39.9			8.3	7.1	4.5	4.8	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				19.3	0.0			0.3	0.1	0.0	0.0	
Delay (s)				65.1	40.0			8.6	7.2	4.6	4.8	
Level of Service				E	D			A	A	A	A	
Approach Delay (s)		0.0			60.6			8.4			4.8	
Approach LOS		A			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			14.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			113.5			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			38.6%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2021 Existing Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	216	80	62	397	168	69	427	44	112	319	112
Future Volume (vph)	150	216	80	62	397	168	69	427	44	112	319	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3396		1770	3539	1583	1770	3539	1583	1770	3401	
Flt Permitted	0.26	1.00		0.56	1.00	1.00	0.47	1.00	1.00	0.44	1.00	
Satd. Flow (perm)	482	3396		1037	3539	1583	879	3539	1583	828	3401	
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)	163	235	87	67	432	183	75	464	48	122	347	122
RTOR Reduction (vph)	0	33	0	0	0	89	0	0	25	0	27	0
Lane Group Flow (vph)	163	289	0	67	432	94	75	464	23	122	442	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	34.8	24.1		26.8	20.1	20.1	61.9	56.0	56.0	65.3	57.7	
Effective Green, g (s)	34.8	24.1		26.8	20.1	20.1	61.9	56.0	56.0	65.3	57.7	
Actuated g/C Ratio	0.30	0.21		0.23	0.18	0.18	0.54	0.49	0.49	0.57	0.50	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	267	715		285	621	278	521	1732	774	535	1715	
v/s Ratio Prot	c0.06	0.09		0.01	c0.12		0.01	c0.13		c0.02	0.13	
v/s Ratio Perm	0.13			0.04		0.06	0.07		0.01	0.12		
v/c Ratio	0.61	0.40		0.24	0.70	0.34	0.14	0.27	0.03	0.23	0.26	
Uniform Delay, d1	31.2	39.0		34.9	44.3	41.3	12.6	17.2	15.1	11.4	16.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.1	0.4		0.4	3.4	0.7	0.1	0.4	0.1	0.2	0.4	
Delay (s)	35.3	39.3		35.3	47.7	42.0	12.7	17.5	15.2	11.7	16.5	
Level of Service	D	D		D	D	D	B	B	B	B	B	
Approach Delay (s)		38.0			44.9			16.7			15.5	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			29.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			114.4				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			54.0%				ICU Level of Service			A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2021 Existing Conditions
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	197	132	26	118	50	111	515	13	84	649	88
Future Volume (vph)	78	197	132	26	118	50	111	515	13	84	649	88
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		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.96		1.00	1.00		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)	1770	1751		1770	1780		1770	3526		1770	3476	
Flt Permitted	0.61	1.00		0.29	1.00		0.29	1.00		0.41	1.00	
Satd. Flow (perm)	1129	1751		539	1780		545	3526		765	3476	
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)	85	214	143	28	128	54	121	560	14	91	705	96
RTOR Reduction (vph)	0	28	0	0	17	0	0	1	0	0	10	0
Lane Group Flow (vph)	85	329	0	28	165	0	121	573	0	91	791	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.8	20.8		20.8	20.8		47.9	42.6		47.9	42.6	
Effective Green, g (s)	20.8	20.8		20.8	20.8		47.9	42.6		47.9	42.6	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.57	0.50		0.57	0.50	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	277	429		132	437		384	1773		495	1748	
v/s Ratio Prot		c0.19			0.09		c0.02	0.16		0.01	c0.23	
v/s Ratio Perm	0.08			0.05			0.16			0.09		
v/c Ratio	0.31	0.77		0.21	0.38		0.32	0.32		0.18	0.45	
Uniform Delay, d1	26.1	29.7		25.4	26.6		8.9	12.5		8.5	13.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	8.0		0.8	0.5		0.5	0.5		0.2	0.8	
Delay (s)	26.7	37.7		26.2	27.1		9.4	13.0		8.6	14.4	
Level of Service	C	D		C	C		A	B		A	B	
Approach Delay (s)		35.6			27.0			12.4			13.8	
Approach LOS		D			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			84.7			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			84.6%			ICU Level of Service				E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive

2021 Existing Conditions
PM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	31	39	679	841	56
Future Volume (vph)	36	31	39	679	841	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	6.0	6.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.94		1.00	1.00	0.99	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1700		1770	3539	3506	
Flt Permitted	0.97		0.25	1.00	1.00	
Satd. Flow (perm)	1700		460	3539	3506	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	34	42	738	914	61
RTOR Reduction (vph)	31	0	0	0	3	0
Lane Group Flow (vph)	42	0	42	738	972	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	8.1		62.7	62.7	54.5	
Effective Green, g (s)	8.1		62.7	62.7	54.5	
Actuated g/C Ratio	0.10		0.76	0.76	0.66	
Clearance Time (s)	6.0		4.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	166		414	2679	2307	
v/s Ratio Prot	c0.02		0.01	c0.21	c0.28	
v/s Ratio Perm			0.07			
v/c Ratio	0.25		0.10	0.28	0.42	
Uniform Delay, d1	34.6		3.1	3.1	6.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.8		0.1	0.3	0.6	
Delay (s)	35.4		3.2	3.3	7.3	
Level of Service	D		A	A	A	
Approach Delay (s)	35.4			3.3	7.3	
Approach LOS	D			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.7	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			82.8	Sum of lost time (s)		16.0
Intersection Capacity Utilization			55.0%	ICU Level of Service		B
Analysis Period (min)			15			

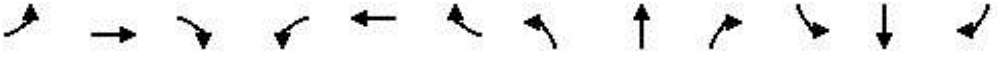
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2021 Existing Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	0	0	0	212	0	32	1	686	269	36	841	0
Future Volume (vph)	0	0	0	212	0	32	1	686	269	36	841	0
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	5.0	6.0	
Lane Util. Factor				1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt				1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583		1770	3539	1583	1770	3539	
Flt Permitted				0.76	1.00		0.31	1.00	1.00	0.32	1.00	
Satd. Flow (perm)				1410	1583		581	3539	1583	594	3539	
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)	0	0	0	230	0	35	1	746	292	39	914	0
RTOR Reduction (vph)	0	0	0	0	29	0	0	0	99	0	0	0
Lane Group Flow (vph)	0	0	0	230	6	0	1	746	193	39	914	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				21.0	21.0		74.3	74.3	74.3	83.1	83.1	
Effective Green, g (s)				21.0	21.0		74.3	74.3	74.3	83.1	83.1	
Actuated g/C Ratio				0.18	0.18		0.64	0.64	0.64	0.72	0.72	
Clearance Time (s)				6.0	6.0		6.0	6.0	6.0	5.0	6.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				255	286		371	2264	1013	463	2533	
v/s Ratio Prot					0.00			0.21		0.00	c0.26	
v/s Ratio Perm				c0.16			0.00		0.12	0.06		
v/c Ratio				0.90	0.02		0.00	0.33	0.19	0.08	0.36	
Uniform Delay, d1				46.5	39.1		7.5	9.5	8.6	5.3	6.3	
Progression Factor				1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2				31.7	0.0		0.0	0.4	0.4	0.1	0.1	
Delay (s)				78.3	39.1		7.6	9.9	9.0	5.4	6.4	
Level of Service				E	D		A	A	A	A	A	
Approach Delay (s)		0.0			73.1			9.7			6.4	
Approach LOS		A			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			15.7			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			116.1			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			51.7%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2021 Existing Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	249	468	140	151	409	134	148	572	102	195	622	239
Future Volume (vph)	249	468	140	151	409	134	148	572	102	195	622	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3417		1770	3539	1583	1770	3539	1583	1770	3392	
Flt Permitted	0.28	1.00		0.18	1.00	1.00	0.20	1.00	1.00	0.33	1.00	
Satd. Flow (perm)	523	3417		334	3539	1583	377	3539	1583	614	3392	
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)	271	509	152	164	445	146	161	622	111	212	676	260
RTOR Reduction (vph)	0	23	0	0	0	81	0	0	57	0	32	0
Lane Group Flow (vph)	271	638	0	164	445	65	161	622	54	212	904	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	39.8	25.2		34.0	22.3	22.3	57.2	49.3	49.3	60.8	51.1	
Effective Green, g (s)	39.8	25.2		34.0	22.3	22.3	57.2	49.3	49.3	60.8	51.1	
Actuated g/C Ratio	0.34	0.22		0.29	0.19	0.19	0.49	0.43	0.43	0.52	0.44	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	336	742		242	680	304	281	1505	673	418	1495	
v/s Ratio Prot	c0.10	c0.19		0.07	0.13		0.04	0.18		c0.04	c0.27	
v/s Ratio Perm	0.18			0.13		0.04	0.24		0.03	0.22		
v/c Ratio	0.81	0.86		0.68	0.65	0.21	0.57	0.41	0.08	0.51	0.60	
Uniform Delay, d1	30.2	43.6		32.8	43.2	39.4	18.0	23.2	19.8	15.5	24.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.2	9.7		7.3	2.3	0.4	2.8	0.8	0.2	1.0	1.8	
Delay (s)	43.4	53.4		40.1	45.5	39.8	20.8	24.1	20.0	16.5	26.5	
Level of Service	D	D		D	D	D	C	C	C	B	C	
Approach Delay (s)		50.5			43.2			23.0			24.7	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			34.5			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			115.9			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			75.5%			ICU Level of Service			D			
Analysis Period (min)			15									

c Critical Lane Group

Appendix C: Background Development

Appendix D: Future Background Operations

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2026 Background Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	114	134	9	200	128	197	531	15	54	366	73
Future Volume (vph)	98	114	134	9	200	128	197	531	15	54	366	73
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		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.94		1.00	1.00		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)	1770	1712		1770	1754		1770	3525		1770	3451	
Flt Permitted	0.28	1.00		0.43	1.00		0.43	1.00		0.43	1.00	
Satd. Flow (perm)	520	1712		807	1754		805	3525		797	3451	
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)	107	124	146	10	217	139	214	577	16	59	398	79
RTOR Reduction (vph)	0	49	0	0	27	0	0	2	0	0	16	0
Lane Group Flow (vph)	107	221	0	10	329	0	214	591	0	59	461	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.9	20.9		20.9	20.9		52.9	44.4		46.9	41.4	
Effective Green, g (s)	20.9	20.9		20.9	20.9		52.9	44.4		46.9	41.4	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.61	0.51		0.54	0.48	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	125	412		194	422		585	1803		492	1645	
v/s Ratio Prot		0.13			0.19		c0.04	0.17		0.01	0.13	
v/s Ratio Perm	c0.21			0.01			c0.19			0.06		
v/c Ratio	0.86	0.54		0.05	0.78		0.37	0.33		0.12	0.28	
Uniform Delay, d1	31.5	28.7		25.3	30.8		7.7	12.4		9.5	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	40.2	1.3		0.1	9.1		0.4	0.5		0.1	0.4	
Delay (s)	71.7	30.1		25.4	39.9		8.1	12.9		9.6	14.1	
Level of Service	E	C		C	D		A	B		A	B	
Approach Delay (s)		41.9			39.5			11.6			13.6	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.5			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			86.8			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			89.3%			ICU Level of Service				E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive

2026 Background Conditions
AM Peak



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	✕		✕	↑↑	↑↑	
Traffic Volume (vph)	42	43	21	771	549	13
Future Volume (vph)	42	43	21	771	549	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	6.0	6.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.93		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1694		1770	3539	3527	
Flt Permitted	0.98		0.39	1.00	1.00	
Satd. Flow (perm)	1694		732	3539	3527	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	47	23	838	597	14
RTOR Reduction (vph)	42	0	0	0	1	0
Lane Group Flow (vph)	51	0	23	838	610	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	8.2		63.5	63.5	56.7	
Effective Green, g (s)	8.2		63.5	63.5	56.7	
Actuated g/C Ratio	0.10		0.76	0.76	0.68	
Clearance Time (s)	6.0		4.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	165		590	2684	2389	
v/s Ratio Prot	c0.03		0.00	c0.24	0.17	
v/s Ratio Perm			0.03			
v/c Ratio	0.31		0.04	0.31	0.26	
Uniform Delay, d1	35.1		2.6	3.2	5.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.1		0.0	0.3	0.3	
Delay (s)	36.2		2.6	3.5	5.5	
Level of Service	D		A	A	A	
Approach Delay (s)	36.2			3.5	5.5	
Approach LOS	D			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.2	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.33			
Actuated Cycle Length (s)			83.7	Sum of lost time (s)		16.0
Intersection Capacity Utilization			55.0%	ICU Level of Service		B
Analysis Period (min)			15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2026 Background Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	180	0	43	0	749	116	24	569	0
Future Volume (vph)	0	0	0	180	0	43	0	749	116	24	569	0
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	5.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.30	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	550	3539	
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)	0	0	0	196	0	47	0	814	126	26	618	0
RTOR Reduction (vph)	0	0	0	0	39	0	0	0	38	0	0	0
Lane Group Flow (vph)	0	0	0	196	8	0	0	814	88	26	618	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				19.1	19.1			74.5	74.5	83.0	83.0	
Effective Green, g (s)				19.1	19.1			74.5	74.5	83.0	83.0	
Actuated g/C Ratio				0.17	0.17			0.65	0.65	0.73	0.73	
Clearance Time (s)				6.0	6.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				236	264			2310	1033	437	2574	
v/s Ratio Prot					0.00			c0.23		0.00	c0.17	
v/s Ratio Perm				c0.14					0.06	0.04		
v/c Ratio				0.83	0.03			0.35	0.09	0.06	0.24	
Uniform Delay, d1				45.9	39.7			8.9	7.3	4.9	5.1	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				21.3	0.0			0.4	0.2	0.1	0.0	
Delay (s)				67.2	39.8			9.3	7.4	4.9	5.2	
Level of Service				E	D			A	A	A	A	
Approach Delay (s)		0.0			61.9			9.1			5.2	
Approach LOS		A			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			14.7			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			114.1			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			40.7%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2026 Background Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	252	92	69	421	195	80	499	47	127	375	247
Future Volume (vph)	171	252	92	69	421	195	80	499	47	127	375	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3397		1770	3539	1583	1770	3539	1583	1770	3329	
Flt Permitted	0.30	1.00		0.53	1.00	1.00	0.33	1.00	1.00	0.38	1.00	
Satd. Flow (perm)	553	3397		986	3539	1583	622	3539	1583	715	3329	
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)	186	274	100	75	458	212	87	542	51	138	408	268
RTOR Reduction (vph)	0	45	0	0	0	145	0	0	31	0	111	0
Lane Group Flow (vph)	186	329	0	75	458	67	87	542	20	138	565	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	28.9	22.5		19.3	16.9	16.9	36.6	31.9	31.9	39.2	33.2	
Effective Green, g (s)	28.9	22.5		19.3	16.9	16.9	36.6	31.9	31.9	39.2	33.2	
Actuated g/C Ratio	0.35	0.27		0.23	0.20	0.20	0.44	0.39	0.39	0.47	0.40	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	310	923		252	722	323	340	1363	609	414	1334	
v/s Ratio Prot	c0.06	0.10		0.01	0.13		0.01	0.15		c0.02	c0.17	
v/s Ratio Perm	c0.15			0.06		0.04	0.10		0.01	0.13		
v/c Ratio	0.60	0.36		0.30	0.63	0.21	0.26	0.40	0.03	0.33	0.42	
Uniform Delay, d1	20.1	24.3		25.4	30.1	27.4	13.7	18.5	15.8	12.6	17.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	0.2		0.7	1.8	0.3	0.4	0.9	0.1	0.5	1.0	
Delay (s)	23.2	24.5		26.1	32.0	27.7	14.1	19.3	15.9	13.1	18.9	
Level of Service	C	C		C	C	C	B	B	B	B	B	
Approach Delay (s)		24.1			30.2			18.4			17.9	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.5									
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			82.8									
Intersection Capacity Utilization			60.5%									
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2026 Background Conditions
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	207	172	30	124	53	142	599	15	88	756	95
Future Volume (vph)	83	207	172	30	124	53	142	599	15	88	756	95
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		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.95		1.00	1.00		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)	1770	1736		1770	1779		1770	3526		1770	3480	
Flt Permitted	0.59	1.00		0.22	1.00		0.22	1.00		0.37	1.00	
Satd. Flow (perm)	1092	1736		413	1779		409	3526		683	3480	
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)	90	225	187	33	135	58	154	651	16	96	822	103
RTOR Reduction (vph)	0	35	0	0	18	0	0	2	0	0	9	0
Lane Group Flow (vph)	90	377	0	33	175	0	154	665	0	96	916	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	23.2	23.2		23.2	23.2		50.6	43.6		47.6	42.1	
Effective Green, g (s)	23.2	23.2		23.2	23.2		50.6	43.6		47.6	42.1	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.57	0.49		0.54	0.48	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	286	456		108	467		342	1741		435	1659	
v/s Ratio Prot		c0.22			0.10		c0.04	0.19		0.01	c0.26	
v/s Ratio Perm	0.08			0.08			0.22			0.11		
v/c Ratio	0.31	0.83		0.31	0.38		0.45	0.38		0.22	0.55	
Uniform Delay, d1	26.2	30.7		26.1	26.6		10.0	13.9		10.0	16.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	11.7		1.6	0.5		0.9	0.6		0.3	1.3	
Delay (s)	26.8	42.4		27.7	27.1		11.0	14.6		10.2	17.7	
Level of Service	C	D		C	C		B	B		B	B	
Approach Delay (s)		39.6			27.2			13.9			17.0	
Approach LOS		D			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			21.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			88.3			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			89.3%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive

2026 Background Conditions
PM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	31	36	39	805	994	56
Future Volume (vph)	31	36	39	805	994	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	6.0	6.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.93		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1689		1770	3539	3511	
Flt Permitted	0.98		0.20	1.00	1.00	
Satd. Flow (perm)	1689		368	3539	3511	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	39	42	875	1080	61
RTOR Reduction (vph)	35	0	0	0	3	0
Lane Group Flow (vph)	38	0	42	875	1138	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	8.0		62.7	62.7	54.5	
Effective Green, g (s)	8.0		62.7	62.7	54.5	
Actuated g/C Ratio	0.10		0.76	0.76	0.66	
Clearance Time (s)	6.0		4.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	163		350	2683	2313	
v/s Ratio Prot	c0.02		0.01	c0.25	c0.32	
v/s Ratio Perm			0.08			
v/c Ratio	0.23		0.12	0.33	0.49	
Uniform Delay, d1	34.5		3.5	3.2	7.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.7		0.2	0.3	0.8	
Delay (s)	35.2		3.6	3.5	7.9	
Level of Service	D		A	A	A	
Approach Delay (s)	35.2			3.5	7.9	
Approach LOS	D			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.9	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.46			
Actuated Cycle Length (s)			82.7	Sum of lost time (s)		16.0
Intersection Capacity Utilization			55.0%	ICU Level of Service		B
Analysis Period (min)			15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2026 Background Conditions
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	223	0	34	1	810	283	38	992	0
Future Volume (vph)	0	0	0	223	0	34	1	810	283	38	992	0
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	3.0	6.0	
Lane Util. Factor				1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt				1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583		1770	3539	1583	1770	3539	
Flt Permitted				0.76	1.00		0.26	1.00	1.00	0.27	1.00	
Satd. Flow (perm)				1410	1583		478	3539	1583	507	3539	
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)	0	0	0	242	0	37	1	880	308	41	1078	0
RTOR Reduction (vph)	0	0	0	0	30	0	0	0	83	0	0	0
Lane Group Flow (vph)	0	0	0	242	7	0	1	880	225	41	1078	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				23.7	23.7		74.4	74.4	74.4	82.5	82.5	
Effective Green, g (s)				23.7	23.7		74.4	74.4	74.4	82.5	82.5	
Actuated g/C Ratio				0.20	0.20		0.63	0.63	0.63	0.70	0.70	
Clearance Time (s)				6.0	6.0		6.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				282	317		300	2227	996	408	2470	
v/s Ratio Prot					0.00			0.25		0.00	c0.30	
v/s Ratio Perm				c0.17			0.00		0.14	0.07		
v/c Ratio				0.86	0.02		0.00	0.40	0.23	0.10	0.44	
Uniform Delay, d1				45.6	38.0		8.1	10.8	9.5	6.2	7.8	
Progression Factor				1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2				21.9	0.0		0.0	0.5	0.5	0.1	0.1	
Delay (s)				67.5	38.0		8.2	11.3	10.0	6.3	7.9	
Level of Service				E	D		A	B	A	A	A	
Approach Delay (s)		0.0			63.6			11.0			7.8	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.3			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			118.2			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			53.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2026 Background Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	546	162	161	432	152	171	660	111	225	723	268
Future Volume (vph)	280	546	162	161	432	152	171	660	111	225	723	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3418		1770	3539	1583	1770	3539	1583	1770	3396	
Flt Permitted	0.33	1.00		0.20	1.00	1.00	0.13	1.00	1.00	0.27	1.00	
Satd. Flow (perm)	614	3418		373	3539	1583	248	3539	1583	503	3396	
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)	304	593	176	175	470	165	186	717	121	245	786	291
RTOR Reduction (vph)	0	33	0	0	0	101	0	0	78	0	41	0
Lane Group Flow (vph)	304	736	0	175	470	64	186	717	43	245	1036	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	31.3	23.3		25.3	20.3	20.3	37.1	30.1	30.1	37.1	30.1	
Effective Green, g (s)	31.3	23.3		25.3	20.3	20.3	37.1	30.1	30.1	37.1	30.1	
Actuated g/C Ratio	0.37	0.27		0.30	0.24	0.24	0.43	0.35	0.35	0.43	0.35	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	333	932		192	841	376	232	1247	557	322	1196	
v/s Ratio Prot	c0.09	0.22		0.05	0.13		c0.07	0.20		0.06	c0.31	
v/s Ratio Perm	c0.25			0.22		0.04	0.28		0.03	0.27		
v/c Ratio	0.91	0.79		0.91	0.56	0.17	0.80	0.57	0.08	0.76	0.87	
Uniform Delay, d1	23.6	28.8		26.5	28.6	25.9	18.3	22.5	18.4	17.3	25.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	28.2	4.5		40.8	0.8	0.2	17.8	1.9	0.3	10.1	8.5	
Delay (s)	51.8	33.3		67.3	29.4	26.1	36.1	24.4	18.7	27.5	34.3	
Level of Service	D	C		E	C	C	D	C	B	C	C	
Approach Delay (s)		38.6			36.9			25.8			33.0	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			33.4				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			85.4				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			83.9%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2031 Background Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	119	153	10	211	134	224	610	18	56	422	77
Future Volume (vph)	103	119	153	10	211	134	224	610	18	56	422	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.94		1.00	1.00		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)	1770	1706		1770	1754		1770	3524		1770	3457	
Flt Permitted	0.19	1.00		0.58	1.00		0.38	1.00		0.34	1.00	
Satd. Flow (perm)	356	1706		1080	1754		701	3524		641	3457	
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)	112	129	166	11	229	146	243	663	20	61	459	84
RTOR Reduction (vph)	0	47	0	0	24	0	0	2	0	0	14	0
Lane Group Flow (vph)	112	248	0	11	351	0	243	681	0	61	529	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	33.4	33.4		23.9	23.9		53.0	45.0		48.0	42.5	
Effective Green, g (s)	33.4	33.4		23.9	23.9		53.0	45.0		48.0	42.5	
Actuated g/C Ratio	0.33	0.33		0.24	0.24		0.53	0.45		0.48	0.43	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	196	570		258	419		457	1587		370	1470	
v/s Ratio Prot	c0.03	0.15			c0.20		c0.04	0.19		0.01	0.15	
v/s Ratio Perm	0.16			0.01			c0.24			0.07		
v/c Ratio	0.57	0.43		0.04	0.84		0.53	0.43		0.16	0.36	
Uniform Delay, d1	25.5	25.9		29.2	36.2		13.1	18.7		14.1	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.0	0.5		0.1	13.7		1.2	0.9		0.2	0.7	
Delay (s)	29.4	26.4		29.3	49.8		14.3	19.6		14.3	20.2	
Level of Service	C	C		C	D		B	B		B	C	
Approach Delay (s)		27.3			49.3			18.2			19.6	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			25.3				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			99.9				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			88.0%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive

2031 Background Conditions
AM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	WT		WT	TT	TT	WT
Traffic Volume (vph)	42	43	21	892	634	13
Future Volume (vph)	42	43	21	892	634	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	6.0	6.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.93		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1694		1770	3539	3529	
Flt Permitted	0.98		0.35	1.00	1.00	
Satd. Flow (perm)	1694		657	3539	3529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	47	23	970	689	14
RTOR Reduction (vph)	42	0	0	0	1	0
Lane Group Flow (vph)	51	0	23	970	702	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	8.2		63.5	63.5	56.7	
Effective Green, g (s)	8.2		63.5	63.5	56.7	
Actuated g/C Ratio	0.10		0.76	0.76	0.68	
Clearance Time (s)	6.0		4.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	165		535	2684	2390	
v/s Ratio Prot	c0.03		0.00	c0.27	0.20	
v/s Ratio Perm			0.03			
v/c Ratio	0.31		0.04	0.36	0.29	
Uniform Delay, d1	35.1		2.6	3.4	5.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.1		0.0	0.4	0.3	
Delay (s)	36.2		2.7	3.7	5.7	
Level of Service	D		A	A	A	
Approach Delay (s)	36.2			3.7	5.7	
Approach LOS	D			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.2	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			83.7	Sum of lost time (s)		16.0
Intersection Capacity Utilization			55.0%	ICU Level of Service		B
Analysis Period (min)			15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2031 Background Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	186	0	46	0	868	122	25	652	0
Future Volume (vph)	0	0	0	186	0	46	0	868	122	25	652	0
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	5.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.25	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	464	3539	
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)	0	0	0	202	0	50	0	943	133	27	709	0
RTOR Reduction (vph)	0	0	0	0	42	0	0	0	35	0	0	0
Lane Group Flow (vph)	0	0	0	202	8	0	0	943	98	27	709	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				19.3	19.3			74.5	74.5	83.1	83.1	
Effective Green, g (s)				19.3	19.3			74.5	74.5	83.1	83.1	
Actuated g/C Ratio				0.17	0.17			0.65	0.65	0.73	0.73	
Clearance Time (s)				6.0	6.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				237	267			2304	1030	378	2570	
v/s Ratio Prot					0.01			c0.27		0.00	c0.20	
v/s Ratio Perm				c0.14					0.06	0.05		
v/c Ratio				0.85	0.03			0.41	0.10	0.07	0.28	
Uniform Delay, d1				46.2	39.7			9.5	7.4	5.3	5.4	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				24.4	0.0			0.5	0.2	0.1	0.1	
Delay (s)				70.5	39.8			10.0	7.6	5.4	5.4	
Level of Service				E	D			B	A	A	A	
Approach Delay (s)		0.0			64.4			9.7			5.4	
Approach LOS		A			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			14.9			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			114.4			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			44.3%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2031 Background Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	196	292	107	73	442	223	93	570	49	143	420	278
Future Volume (vph)	196	292	107	73	442	223	93	570	49	143	420	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3397		1770	3539	1583	1770	3539	1583	1770	3328	
Flt Permitted	0.29	1.00		0.50	1.00	1.00	0.29	1.00	1.00	0.31	1.00	
Satd. Flow (perm)	531	3397		932	3539	1583	531	3539	1583	581	3328	
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)	213	317	116	79	480	242	101	620	53	155	457	302
RTOR Reduction (vph)	0	44	0	0	0	146	0	0	34	0	115	0
Lane Group Flow (vph)	213	389	0	79	480	96	101	620	19	155	644	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	30.7	22.8		21.6	17.7	17.7	34.6	29.9	29.9	39.0	32.1	
Effective Green, g (s)	30.7	22.8		21.6	17.7	17.7	34.6	29.9	29.9	39.0	32.1	
Actuated g/C Ratio	0.37	0.27		0.26	0.21	0.21	0.41	0.36	0.36	0.47	0.38	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	328	927		280	750	335	289	1267	566	369	1279	
v/s Ratio Prot	c0.07	0.11		0.01	0.14		0.02	0.18		c0.03	c0.19	
v/s Ratio Perm	c0.17			0.06		0.06	0.12		0.01	0.16		
v/c Ratio	0.65	0.42		0.28	0.64	0.29	0.35	0.49	0.03	0.42	0.50	
Uniform Delay, d1	19.6	24.9		24.0	30.0	27.6	15.5	20.9	17.4	13.5	19.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.4	0.3		0.6	1.9	0.5	0.7	1.4	0.1	0.8	1.4	
Delay (s)	24.0	25.2		24.6	31.9	28.1	16.2	22.2	17.5	14.3	21.0	
Level of Service	C	C		C	C	C	B	C	B	B	C	
Approach Delay (s)		24.8			30.0			21.1			19.9	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			23.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			83.5			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			65.4%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2031 Background Conditions
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	217	195	35	131	55	162	691	18	92	871	100
Future Volume (vph)	88	217	195	35	131	55	162	691	18	92	871	100
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		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.96		1.00	1.00		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)	1770	1731		1770	1780		1770	3525		1770	3484	
Flt Permitted	0.57	1.00		0.18	1.00		0.17	1.00		0.31	1.00	
Satd. Flow (perm)	1065	1731		344	1780		313	3525		575	3484	
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)	96	236	212	38	142	60	176	751	20	100	947	109
RTOR Reduction (vph)	0	36	0	0	17	0	0	2	0	0	9	0
Lane Group Flow (vph)	96	412	0	38	185	0	176	769	0	100	1047	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.1	25.1		25.1	25.1		51.6	44.6		48.6	43.1	
Effective Green, g (s)	25.1	25.1		25.1	25.1		51.6	44.6		48.6	43.1	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.57	0.49		0.53	0.47	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	293	476		94	489		288	1723		378	1646	
v/s Ratio Prot		c0.24			0.10		c0.05	0.22		0.02	c0.30	
v/s Ratio Perm	0.09			0.11			0.30			0.12		
v/c Ratio	0.33	0.87		0.40	0.38		0.61	0.45		0.26	0.64	
Uniform Delay, d1	26.3	31.4		27.0	26.7		12.0	15.2		10.8	18.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	15.1		2.8	0.5		3.8	0.8		0.4	1.9	
Delay (s)	27.0	46.5		29.8	27.2		15.8	16.1		11.2	20.0	
Level of Service	C	D		C	C		B	B		B	C	
Approach Delay (s)		43.1			27.6			16.0			19.3	
Approach LOS		D			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			23.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			91.2			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			92.3%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive

2031 Background Conditions
PM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	31	36	39	931	1152	56
Future Volume (vph)	31	36	39	931	1152	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	6.0	6.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.93		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1689		1770	3539	3515	
Flt Permitted	0.98		0.15	1.00	1.00	
Satd. Flow (perm)	1689		286	3539	3515	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	39	42	1012	1252	61
RTOR Reduction (vph)	35	0	0	0	2	0
Lane Group Flow (vph)	38	0	42	1012	1311	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	8.0		62.7	62.7	54.5	
Effective Green, g (s)	8.0		62.7	62.7	54.5	
Actuated g/C Ratio	0.10		0.76	0.76	0.66	
Clearance Time (s)	6.0		4.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	163		292	2683	2316	
v/s Ratio Prot	c0.02		0.01	c0.29	c0.37	
v/s Ratio Perm			0.10			
v/c Ratio	0.23		0.14	0.38	0.57	
Uniform Delay, d1	34.5		4.1	3.4	7.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.7		0.2	0.4	1.0	
Delay (s)	35.2		4.3	3.8	8.7	
Level of Service	D		A	A	A	
Approach Delay (s)	35.2			3.8	8.7	
Approach LOS	D			A	A	
Intersection Summary						
HCM 2000 Control Delay			7.4	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.52			
Actuated Cycle Length (s)			82.7	Sum of lost time (s)		16.0
Intersection Capacity Utilization			55.0%	ICU Level of Service		B
Analysis Period (min)			15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2031 Background Conditions

PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↑↑	↔	↔	↑↑	
Traffic Volume (vph)	0	0	0	234	0	35	1	935	297	40	1148	0
Future Volume (vph)	0	0	0	234	0	35	1	935	297	40	1148	0
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	3.0	6.0	
Lane Util. Factor				1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt				1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583		1770	3539	1583	1770	3539	
Flt Permitted				0.76	1.00		0.20	1.00	1.00	0.22	1.00	
Satd. Flow (perm)				1410	1583		378	3539	1583	418	3539	
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)	0	0	0	254	0	38	1	1016	323	43	1248	0
RTOR Reduction (vph)	0	0	0	0	30	0	0	0	76	0	0	0
Lane Group Flow (vph)	0	0	0	254	8	0	1	1016	247	43	1248	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				24.4	24.4		74.3	74.3	74.3	82.4	82.4	
Effective Green, g (s)				24.4	24.4		74.3	74.3	74.3	82.4	82.4	
Actuated g/C Ratio				0.21	0.21		0.63	0.63	0.63	0.69	0.69	
Clearance Time (s)				6.0	6.0		6.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				289	325		236	2213	990	347	2454	
v/s Ratio Prot					0.00			0.29		0.01	c0.35	
v/s Ratio Perm				c0.18			0.00		0.16	0.08		
v/c Ratio				0.88	0.02		0.00	0.46	0.25	0.12	0.51	
Uniform Delay, d1				45.8	37.7		8.4	11.7	9.9	6.9	8.6	
Progression Factor				1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2				24.6	0.0		0.0	0.7	0.6	0.2	0.2	
Delay (s)				70.4	37.7		8.4	12.4	10.5	7.0	8.8	
Level of Service				E	D		A	B	B	A	A	
Approach Delay (s)		0.0			66.2			11.9			8.7	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.9			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			118.8			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			56.2%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2031 Background Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	316	632	188	169	454	173	198	743	116	258	820	305
Future Volume (vph)	316	632	188	169	454	173	198	743	116	258	820	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3418		1770	3539	1583	1770	3539	1583	1770	3395	
Flt Permitted	0.24	1.00		0.16	1.00	1.00	0.10	1.00	1.00	0.18	1.00	
Satd. Flow (perm)	446	3418		305	3539	1583	180	3539	1583	331	3395	
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)	343	687	204	184	493	188	215	808	126	280	891	332
RTOR Reduction (vph)	0	23	0	0	0	138	0	0	82	0	32	0
Lane Group Flow (vph)	343	868	0	184	493	50	215	808	44	280	1191	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	46.4	32.4		34.4	24.4	24.4	52.4	41.4	41.4	61.0	46.0	
Effective Green, g (s)	46.4	32.4		34.4	24.4	24.4	52.4	41.4	41.4	61.0	46.0	
Actuated g/C Ratio	0.39	0.27		0.29	0.20	0.20	0.44	0.35	0.35	0.51	0.39	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	372	927		210	723	323	225	1227	548	357	1307	
v/s Ratio Prot	c0.14	c0.25		0.07	0.14		c0.09	0.23		c0.10	c0.35	
v/s Ratio Perm	0.22			0.18		0.03	0.33		0.03	0.30		
v/c Ratio	0.92	0.94		0.88	0.68	0.16	0.96	0.66	0.08	0.78	0.91	
Uniform Delay, d1	29.0	42.5		35.2	43.9	39.0	31.3	33.0	26.2	20.6	34.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	27.8	16.2		30.9	2.7	0.2	47.1	2.8	0.3	10.8	11.1	
Delay (s)	56.9	58.6		66.1	46.6	39.3	78.4	35.8	26.5	31.3	45.8	
Level of Service	E	E		E	D	D	E	D	C	C	D	
Approach Delay (s)		58.1			49.1			42.8			43.1	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			48.0				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			119.4				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			92.9%				ICU Level of Service			F		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2036 Background Conditions
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	126	160	11	221	141	235	642	18	59	444	81
Future Volume (vph)	108	126	160	11	221	141	235	642	18	59	444	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.94		1.00	1.00		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)	1770	1706		1770	1754		1770	3524		1770	3457	
Flt Permitted	0.18	1.00		0.57	1.00		0.37	1.00		0.31	1.00	
Satd. Flow (perm)	330	1706		1064	1754		688	3524		586	3457	
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)	117	137	174	12	240	153	255	698	20	64	483	88
RTOR Reduction (vph)	0	46	0	0	23	0	0	2	0	0	14	0
Lane Group Flow (vph)	117	265	0	12	370	0	255	716	0	64	557	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	34.4	34.4		24.9	24.9		52.0	45.0		49.0	43.5	
Effective Green, g (s)	34.4	34.4		24.9	24.9		52.0	45.0		49.0	43.5	
Actuated g/C Ratio	0.34	0.34		0.25	0.25		0.52	0.45		0.49	0.43	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	191	581		262	432		429	1571		349	1490	
v/s Ratio Prot	c0.03	0.16			c0.21		c0.04	0.20		0.01	0.16	
v/s Ratio Perm	0.18			0.01			c0.26			0.08		
v/c Ratio	0.61	0.46		0.05	0.86		0.59	0.46		0.18	0.37	
Uniform Delay, d1	25.5	25.9		28.9	36.3		15.0	19.4		14.1	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.7	0.6		0.1	15.2		2.2	1.0		0.3	0.7	
Delay (s)	31.3	26.5		29.0	51.5		17.2	20.4		14.4	20.2	
Level of Service	C	C		C	D		B	C		B	C	
Approach Delay (s)		27.8			50.8			19.6			19.6	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			26.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			100.9			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			89.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive

2036 Background Conditions
AM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	WT		WT	TT	TT	WT
Traffic Volume (vph)	42	43	21	940	666	13
Future Volume (vph)	42	43	21	940	666	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	6.0	6.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.93		1.00	1.00	1.00	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1694		1770	3539	3529	
Flt Permitted	0.98		0.34	1.00	1.00	
Satd. Flow (perm)	1694		630	3539	3529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	47	23	1022	724	14
RTOR Reduction (vph)	42	0	0	0	1	0
Lane Group Flow (vph)	51	0	23	1022	737	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	8.2		63.5	63.5	56.7	
Effective Green, g (s)	8.2		63.5	63.5	56.7	
Actuated g/C Ratio	0.10		0.76	0.76	0.68	
Clearance Time (s)	6.0		4.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	165		516	2684	2390	
v/s Ratio Prot	c0.03		0.00	c0.29	0.21	
v/s Ratio Perm			0.03			
v/c Ratio	0.31		0.04	0.38	0.31	
Uniform Delay, d1	35.1		2.7	3.4	5.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.1		0.0	0.4	0.3	
Delay (s)	36.2		2.7	3.8	5.8	
Level of Service	D		A	A	A	
Approach Delay (s)	36.2			3.8	5.8	
Approach LOS	D			A	A	
Intersection Summary						
HCM 2000 Control Delay			6.2	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.39			
Actuated Cycle Length (s)			83.7	Sum of lost time (s)		16.0
Intersection Capacity Utilization			55.0%	ICU Level of Service		B
Analysis Period (min)			15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2036 Background Conditions
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	199	0	48	0	913	128	26	683	0
Future Volume (vph)	0	0	0	199	0	48	0	913	128	26	683	0
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	5.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.23	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	432	3539	
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)	0	0	0	216	0	52	0	992	139	28	742	0
RTOR Reduction (vph)	0	0	0	0	43	0	0	0	35	0	0	0
Lane Group Flow (vph)	0	0	0	216	9	0	0	992	104	28	742	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				20.1	20.1			74.4	74.4	83.0	83.0	
Effective Green, g (s)				20.1	20.1			74.4	74.4	83.0	83.0	
Actuated g/C Ratio				0.17	0.17			0.65	0.65	0.72	0.72	
Clearance Time (s)				6.0	6.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				246	276			2287	1023	353	2552	
v/s Ratio Prot					0.01			c0.28		0.00	c0.21	
v/s Ratio Perm				c0.15					0.07	0.05		
v/c Ratio				0.88	0.03			0.43	0.10	0.08	0.29	
Uniform Delay, d1				46.3	39.4			10.0	7.7	5.7	5.7	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				27.7	0.0			0.6	0.2	0.1	0.1	
Delay (s)				74.0	39.5			10.6	7.9	5.8	5.7	
Level of Service				E	D			B	A	A	A	
Approach Delay (s)		0.0			67.3			10.3			5.7	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.7			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			115.1			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			46.3%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2036 Background Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	307	113	76	464	236	97	598	52	150	440	291
Future Volume (vph)	206	307	113	76	464	236	97	598	52	150	440	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3396		1770	3539	1583	1770	3539	1583	1770	3328	
Flt Permitted	0.27	1.00		0.49	1.00	1.00	0.26	1.00	1.00	0.31	1.00	
Satd. Flow (perm)	503	3396		910	3539	1583	476	3539	1583	571	3328	
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)	224	334	123	83	504	257	105	650	57	163	478	316
RTOR Reduction (vph)	0	45	0	0	0	147	0	0	36	0	115	0
Lane Group Flow (vph)	224	412	0	83	504	110	105	650	21	163	679	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	31.3	23.4		22.2	18.3	18.3	35.6	30.9	30.9	38.2	32.2	
Effective Green, g (s)	31.3	23.4		22.2	18.3	18.3	35.6	30.9	30.9	38.2	32.2	
Actuated g/C Ratio	0.37	0.28		0.26	0.22	0.22	0.42	0.37	0.37	0.45	0.38	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	322	943		279	769	344	273	1298	580	344	1272	
v/s Ratio Prot	c0.07	0.12		0.01	0.14		0.02	0.18		c0.03	c0.20	
v/s Ratio Perm	c0.18			0.06		0.07	0.14		0.01	0.18		
v/c Ratio	0.70	0.44		0.30	0.66	0.32	0.38	0.50	0.04	0.47	0.53	
Uniform Delay, d1	19.7	25.0		23.9	30.1	27.7	15.4	20.7	17.1	14.3	20.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.4	0.3		0.6	2.0	0.5	0.9	1.4	0.1	1.0	1.6	
Delay (s)	26.1	25.3		24.5	32.1	28.3	16.3	22.1	17.2	15.3	21.8	
Level of Service	C	C		C	C	C	B	C	B	B	C	
Approach Delay (s)		25.6			30.2			21.0			20.7	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			24.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			84.2			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			67.8%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2036 Background Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	229	203	36	137	58	169	724	19	97	910	105
Future Volume (vph)	92	229	203	36	137	58	169	724	19	97	910	105
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		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.96		1.00	1.00		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)	1770	1731		1770	1780		1770	3525		1770	3484	
Flt Permitted	0.56	1.00		0.17	1.00		0.13	1.00		0.30	1.00	
Satd. Flow (perm)	1041	1731		312	1780		251	3525		558	3484	
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)	100	249	221	39	149	63	184	787	21	105	989	114
RTOR Reduction (vph)	0	35	0	0	16	0	0	2	0	0	9	0
Lane Group Flow (vph)	100	435	0	39	196	0	184	806	0	105	1094	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.1	26.1		26.1	26.1		52.9	44.3		46.7	41.2	
Effective Green, g (s)	26.1	26.1		26.1	26.1		52.9	44.3		46.7	41.2	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.58	0.48		0.51	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	295	491		88	505		286	1699		356	1561	
v/s Ratio Prot		c0.25			0.11		c0.06	0.23		0.02	c0.31	
v/s Ratio Perm	0.10			0.13			0.31			0.13		
v/c Ratio	0.34	0.89		0.44	0.39		0.64	0.47		0.29	0.70	
Uniform Delay, d1	26.1	31.5		26.9	26.5		13.2	16.0		12.0	20.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	17.2		3.5	0.5		4.9	1.0		0.5	2.7	
Delay (s)	26.8	48.7		30.5	27.0		18.1	16.9		12.5	23.0	
Level of Service	C	D		C	C		B	B		B	C	
Approach Delay (s)		44.8			27.5			17.1			22.1	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			25.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			91.9			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			93.8%			ICU Level of Service			F			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive

2036 Background Conditions

PM Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	31	36	39	976	1207	56
Future Volume (vph)	31	36	39	976	1207	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.0	6.0	6.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.93		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1689		1770	3539	3516	
Flt Permitted	0.98		0.14	1.00	1.00	
Satd. Flow (perm)	1689		261	3539	3516	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	39	42	1061	1312	61
RTOR Reduction (vph)	35	0	0	0	2	0
Lane Group Flow (vph)	38	0	42	1061	1371	0
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	8.0		62.7	62.7	54.5	
Effective Green, g (s)	8.0		62.7	62.7	54.5	
Actuated g/C Ratio	0.10		0.76	0.76	0.66	
Clearance Time (s)	6.0		4.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	163		274	2683	2317	
v/s Ratio Prot	c0.02		0.01	c0.30	c0.39	
v/s Ratio Perm			0.11			
v/c Ratio	0.23		0.15	0.40	0.59	
Uniform Delay, d1	34.5		4.4	3.5	7.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.7		0.3	0.4	1.1	
Delay (s)	35.2		4.7	3.9	9.0	
Level of Service	D		A	A	A	
Approach Delay (s)	35.2			3.9	9.0	
Approach LOS	D			A	A	
Intersection Summary						
HCM 2000 Control Delay			7.6	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			82.7	Sum of lost time (s)		16.0
Intersection Capacity Utilization			55.0%	ICU Level of Service		B
Analysis Period (min)			15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2036 Background Conditions
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↑↑	↔	↔	↑↑	
Traffic Volume (vph)	0	0	0	246	0	37	1	978	312	42	1201	0
Future Volume (vph)	0	0	0	246	0	37	1	978	312	42	1201	0
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	3.0	6.0	
Lane Util. Factor				1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt				1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583		1770	3539	1583	1770	3539	
Flt Permitted				0.76	1.00		0.19	1.00	1.00	0.21	1.00	
Satd. Flow (perm)				1410	1583		347	3539	1583	388	3539	
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)	0	0	0	267	0	40	1	1063	339	46	1305	0
RTOR Reduction (vph)	0	0	0	0	32	0	0	0	77	0	0	0
Lane Group Flow (vph)	0	0	0	267	8	0	1	1063	262	46	1305	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				25.2	25.2		74.3	74.3	74.3	82.5	82.5	
Effective Green, g (s)				25.2	25.2		74.3	74.3	74.3	82.5	82.5	
Actuated g/C Ratio				0.21	0.21		0.62	0.62	0.62	0.69	0.69	
Clearance Time (s)				6.0	6.0		6.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				296	333		215	2196	982	327	2439	
v/s Ratio Prot					0.01			0.30		0.01	c0.37	
v/s Ratio Perm				c0.19			0.00		0.17	0.09		
v/c Ratio				0.90	0.03		0.00	0.48	0.27	0.14	0.54	
Uniform Delay, d1				46.0	37.5		8.6	12.3	10.3	7.3	9.2	
Progression Factor				1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2				28.5	0.0		0.0	0.8	0.7	0.2	0.2	
Delay (s)				74.6	37.5		8.7	13.1	11.0	7.5	9.4	
Level of Service				E	D		A	B	B	A	A	
Approach Delay (s)		0.0			69.8			12.6			9.3	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM 2000 Control Delay			16.9			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			119.7			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			58.5%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2036 Background Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	332	664	198	177	477	179	208	779	122	268	860	320
Future Volume (vph)	332	664	198	177	477	179	208	779	122	268	860	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3417		1770	3539	1583	1770	3539	1583	1770	3395	
Flt Permitted	0.22	1.00		0.16	1.00	1.00	0.09	1.00	1.00	0.16	1.00	
Satd. Flow (perm)	401	3417		291	3539	1583	177	3539	1583	293	3395	
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)	361	722	215	192	518	195	226	847	133	291	935	348
RTOR Reduction (vph)	0	23	0	0	0	129	0	0	86	0	32	0
Lane Group Flow (vph)	361	914	0	192	518	66	226	847	47	291	1251	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	47.6	33.6		35.6	25.6	25.6	54.2	42.2	42.2	61.8	46.0	
Effective Green, g (s)	47.6	33.6		35.6	25.6	25.6	54.2	42.2	42.2	61.8	46.0	
Actuated g/C Ratio	0.40	0.28		0.30	0.21	0.21	0.45	0.35	0.35	0.52	0.38	
Clearance Time (s)	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	365	959		210	757	338	240	1248	558	346	1305	
v/s Ratio Prot	c0.15	0.27		0.08	0.15		0.09	0.24		c0.11	c0.37	
v/s Ratio Perm	c0.24			0.20		0.04	0.33		0.03	0.32		
v/c Ratio	0.99	0.95		0.91	0.68	0.20	0.94	0.68	0.08	0.84	0.96	
Uniform Delay, d1	29.4	42.2		35.3	43.3	38.6	32.8	32.9	25.8	21.4	35.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	43.7	18.6		38.9	2.6	0.3	42.1	3.0	0.3	16.6	16.8	
Delay (s)	73.1	60.9		74.3	45.9	38.8	74.9	35.9	26.1	38.0	52.7	
Level of Service	E	E		E	D	D	E	D	C	D	D	
Approach Delay (s)		64.3			50.4			42.1			50.0	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			51.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			119.6			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			95.0%			ICU Level of Service				F		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2036 Background (w/improvements)
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	307	113	76	464	236	97	598	52	150	440	291
Future Volume (vph)	206	307	113	76	464	236	97	598	52	150	440	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3396		1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.27	1.00		0.49	1.00	1.00	0.48	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	503	3396		910	3539	1583	886	3539	1583	557	3539	1583
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)	224	334	123	83	504	257	105	650	57	163	478	316
RTOR Reduction (vph)	0	45	0	0	0	147	0	0	36	0	0	191
Lane Group Flow (vph)	224	412	0	83	504	110	105	650	21	163	478	125
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	31.3	23.4		22.2	18.3	18.3	34.8	30.9	30.9	39.0	33.0	33.0
Effective Green, g (s)	31.3	23.4		22.2	18.3	18.3	34.8	30.9	30.9	39.0	33.0	33.0
Actuated g/C Ratio	0.37	0.28		0.26	0.22	0.22	0.41	0.37	0.37	0.46	0.39	0.39
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	322	943		279	769	344	407	1298	580	344	1387	620
v/s Ratio Prot	c0.07	0.12		0.01	0.14		0.01	0.18		c0.03	0.14	
v/s Ratio Perm	c0.18			0.06		0.07	0.09		0.01	c0.19		0.08
v/c Ratio	0.70	0.44		0.30	0.66	0.32	0.26	0.50	0.04	0.47	0.34	0.20
Uniform Delay, d1	19.7	25.0		23.9	30.1	27.7	15.4	20.7	17.1	13.9	18.0	16.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.4	0.3		0.6	2.0	0.5	0.3	1.4	0.1	1.0	0.7	0.7
Delay (s)	26.1	25.3		24.5	32.1	28.3	15.7	22.1	17.2	15.0	18.7	17.6
Level of Service	C	C		C	C	C	B	C	B	B	B	B
Approach Delay (s)		25.6			30.2			20.9			17.7	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			23.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			84.2			Sum of lost time (s)				20.0		
Intersection Capacity Utilization			65.7%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2036 Background (w/improvements)

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	332	664	198	177	477	179	208	779	122	268	860	320
Future Volume (vph)	332	664	198	177	477	179	208	779	122	268	860	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3417		1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.22	1.00		0.16	1.00	1.00	0.14	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	407	3417		295	3539	1583	256	3539	1583	219	3539	1583
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)	361	722	215	192	518	195	226	847	133	291	935	348
RTOR Reduction (vph)	0	23	0	0	0	129	0	0	92	0	0	178
Lane Group Flow (vph)	361	914	0	192	518	66	226	847	41	291	935	170
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	49.9	33.8		37.4	25.3	25.3	49.0	35.8	35.8	57.3	40.1	40.1
Effective Green, g (s)	49.9	33.8		37.4	25.3	25.3	49.0	35.8	35.8	57.3	40.1	40.1
Actuated g/C Ratio	0.43	0.29		0.32	0.22	0.22	0.42	0.31	0.31	0.49	0.34	0.34
Clearance Time (s)	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	412	985		246	763	341	277	1081	483	338	1210	541
v/s Ratio Prot	c0.15	c0.27		0.08	0.15		0.09	0.24		c0.13	0.26	
v/s Ratio Perm	0.22			0.17		0.04	0.25		0.03	c0.29		0.11
v/c Ratio	0.88	0.93		0.78	0.68	0.19	0.82	0.78	0.08	0.86	0.77	0.31
Uniform Delay, d1	26.0	40.5		32.2	42.2	37.6	25.5	37.2	29.0	29.4	34.5	28.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.4	14.2		14.8	2.4	0.3	16.7	5.7	0.3	19.5	4.8	1.5
Delay (s)	44.4	54.7		46.9	44.6	37.9	42.2	42.9	29.4	48.9	39.3	29.9
Level of Service	D	D		D	D	D	D	D	C	D	D	C
Approach Delay (s)		51.8			43.7			41.2			39.0	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			43.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			117.2			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			85.9%			ICU Level of Service				E		
Analysis Period (min)			15									

c Critical Lane Group

Appendix E: Truck Turning Assessment

520 & 526 Big Bay Point Road

City of Barrie

Traffic Brief for Morriello Construction Ltd.

Type of Document:
Final Report

Project Number:
JDE – 20114

Date Submitted:
April 13th, 2021



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3 Proposed Development Traffic Generation and Assignment

3.1 Traffic Generation

The traffic generation for the subject site has been based on the Institute of Transportation Engineers [ITE] Trip generation Manual (10th Edition) [ITE Trip Generation Manual]. The following ITE land uses have been applied to estimate the traffic from the subject site:

- ITE land use #220 (Multifamily Housing (Mid-Rise)) – General Urban/Suburban Setting

The estimated trip generation for the proposed development is illustrated below in **Table 2**. The AM and PM peak traffic generation for the proposed development is not expected to exactly align with the AM and PM peak hour in the EMME Model Output; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual.

Table 2 – Estimated Traffic Generation of Proposed Development

Land Use	Size	AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Multifamily Housing (Mid-Rise) ITE Land Use: 221	46 units*	4	13	17	13	8	21

* The proposed development will displace two single-detached units. We have not removed traffic from these two units as the impact to traffic will be negligible

No transportation modal split has been applied to the above-noted traffic generation calculation.

3.2 Traffic Assignment

For the purposes of this study, it has been assumed that all traffic generated by the proposed development will be new traffic and would not be in the study area if the development was not constructed.

The ITE data provides the anticipated percentage of new residential traffic entering and exiting during the peak hour.

The distribution of the proposed development traffic beyond the local area has been calculated based on the 2016 Transportation Tomorrow Survey [TTS] data for zone 8528, retrieved using the Internet Data Retrieval System [IDRS] (result provided in **Appendix B**). TTS data provides surveyed origin and destination trip data for specific zones within the City and the Greater Toronto and Hamilton Area [GTHA].

Traffic distribution for the trips generated by the subject site during the AM and PM peak hour is expected to generally follow commuter travel patterns. Our analysis is based on egress traffic during the AM peak hour. Logically, the distribution of ingress traffic will follow the inverse of the exiting traffic distribution. For each of the individual areas identified in the TTS data, we have selected the probable route of travel, assuming that people will select their route primarily based on travel time.

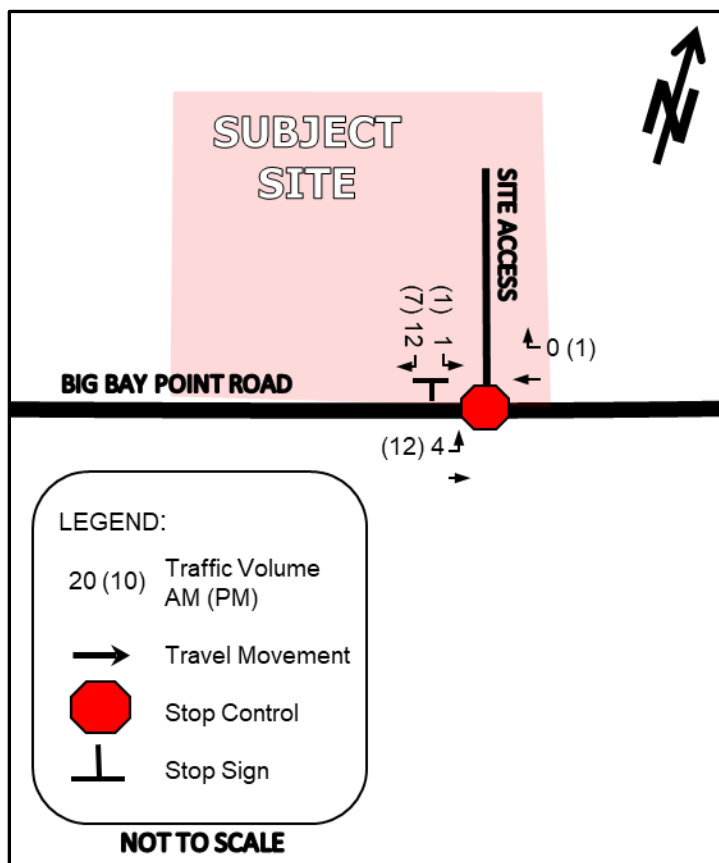
Table 3 summarizes the trip distribution for the proposed development.

Table 3 – Proposed Development Traffic Distribution Summary

Travel Direction (to/from)	Percent of Total Traffic Generation
West via Big Bay Point Road	90%
East via Big Bay Point Road	10%
Total	100%

Using the traffic distributions pattern noted above, the traffic assignment for the proposed development was calculated for the AM and PM peak hour and is illustrated in **Figure 3**.

Figure 3 – Traffic Assignment for Proposed Development



481 Yonge Street

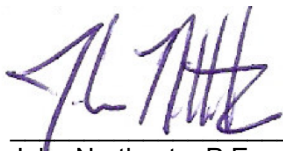
City of Barrie

Traffic Brief for 481 Yonge Developments Inc.

Type of Document:
Final Report

Project Number:
JDE – 19040

Date Submitted:
May 16th, 2019



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ENGINEERING

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Table 2 – Estimated Traffic Generation of Proposed Development

Land Use	Size	AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Multifamily Housing (Mid-Rise) ITE Land Use: 221	67 units	7	18	25	19	12	31

In order to be conservative, no transportation modal split reduction has been applied to the above-noted traffic generation calculation.

3.2 Traffic Assignment

For the purposes of this study, it has been assumed that all traffic generated by the proposed development will be new traffic and would not be in the study area if the development was not constructed.

Beyond the local area the distribution of traffic from the subject site has been estimated based on the 2016 TTS data for the area (excerpt attached as **Appendix E**). TTS data provides historical data for home-based trip origins with a destination in the 2006 GTA Zone – 8582.

The above-noted methodology provides an estimate of the distribution of ingress trips. We have assumed that the distribution of egress trips will follow the inverse of the ingress traffic distribution. For each of the individual areas identified in the TTS data, we have selected the probable route of travel, assuming that people will select their route primarily based on travel time.

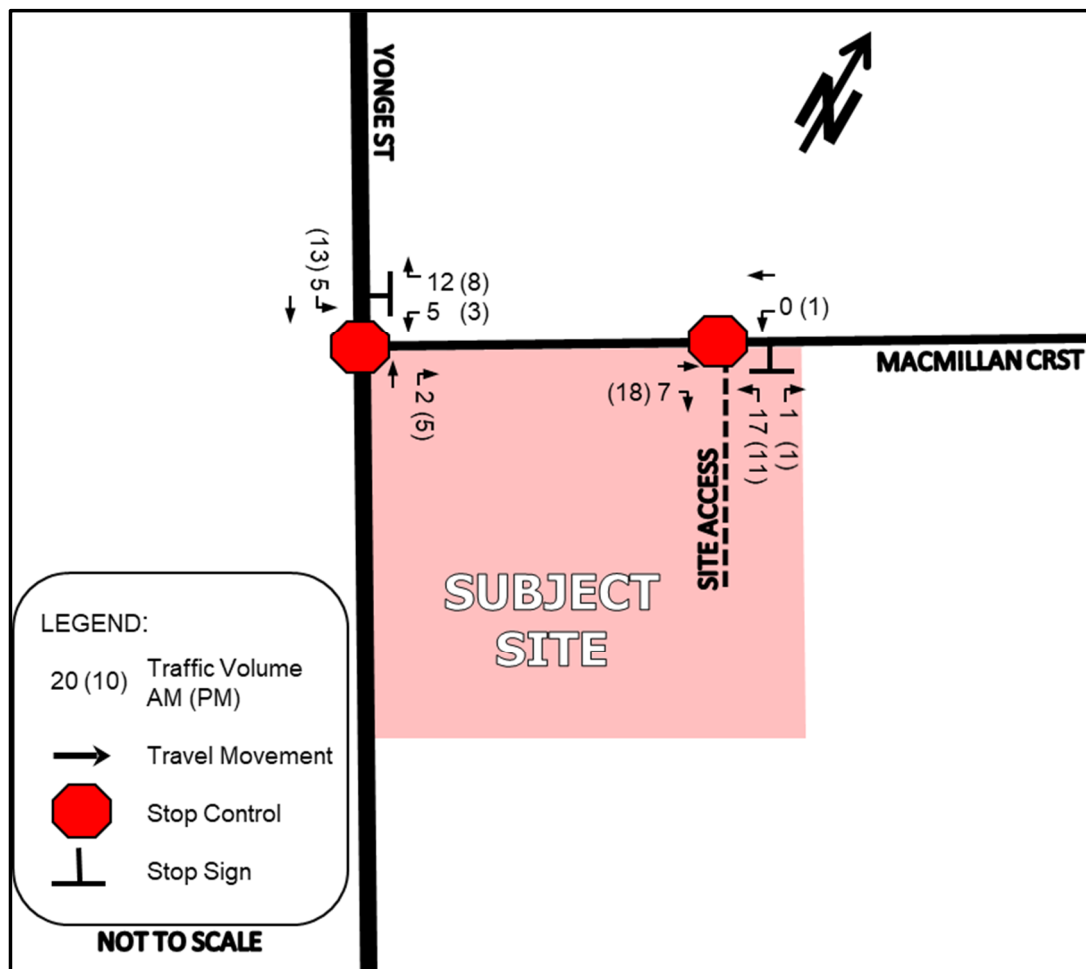
Table 3 summarizes the trip distribution for the proposed development.

Table 3 – Proposed Development Traffic Distribution Summary

Travel Direction (to/from)	Percent of Total Traffic Generation
North via Yonge Street	69%
South via Yonge Street	26%
East via Macmillan Crescent	4%
Total	100%

Figure 4 illustrates the traffic assignment for the proposed development.

Figure 4 – Site Traffic Assignment



4 Intersection Operation with Proposed Development

4.1 Traffic Impact Analysis

The proposed development will add approximately 25 AM and 31 PM peak hour trips on Macmillan Crescent. The additional traffic generated by the proposed development will not adversely affect the traffic capacity on Macmillan Crescent and Yonge Street or result in any traffic safety issues with the study area. The existing road network can accommodate the additional traffic generated by the proposed development.

4.2 Site Access

The Site Access will operate efficiently as a full-movement access, with one-way stop control for northbound movements. A single northbound and southbound lane for the Site Access will provide the necessary capacity to service the proposed development.

TRAFFIC IMPACT STUDY
YONGE STREET AND LITTLE AVENUE
RESIDENTIAL DEVELOPMENT
CITY OF BARRIE

PREPARED FOR:
MASON HOMES INC.

PREPARED BY:
C.F. CROZIER & ASSOCIATES INC.
40 HURON STREET, SUITE 301
COLLINGWOOD, ONTARIO
L9Y 4R3

JULY 2018

CFCA FILE NO. 1509-4851

The material in this report reflects best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. C.F. Crozier & Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.



5 SITE GENERATED TRAFFIC

The proposed development will result in additional vehicles on the boundary road network that previously did not exist. The proposed development will also result in additional turning movements at the boundary road intersections.

5.1 Trip Generation

The trip generation of the townhouse residential lots was forecasted using the fitted curve equations provided in the ITE Trip Generation Manual, 10th Edition, under the Land Use Category 220 "Multifamily Housing (Low-Rise)" and is displayed in **Table 8**.

Table 8: Trip Generation

Use	Trip Type	Peak Hour	Number of Trips		
			Inbound	Outbound	Total
L.U. 220: Multifamily Housing (Low-Rise) (153 Units)	Primary	Weekday A.M.	16	55	71
	Primary	Weekday P.M.	54	32	86

5.2 Trip Distribution and Assignment

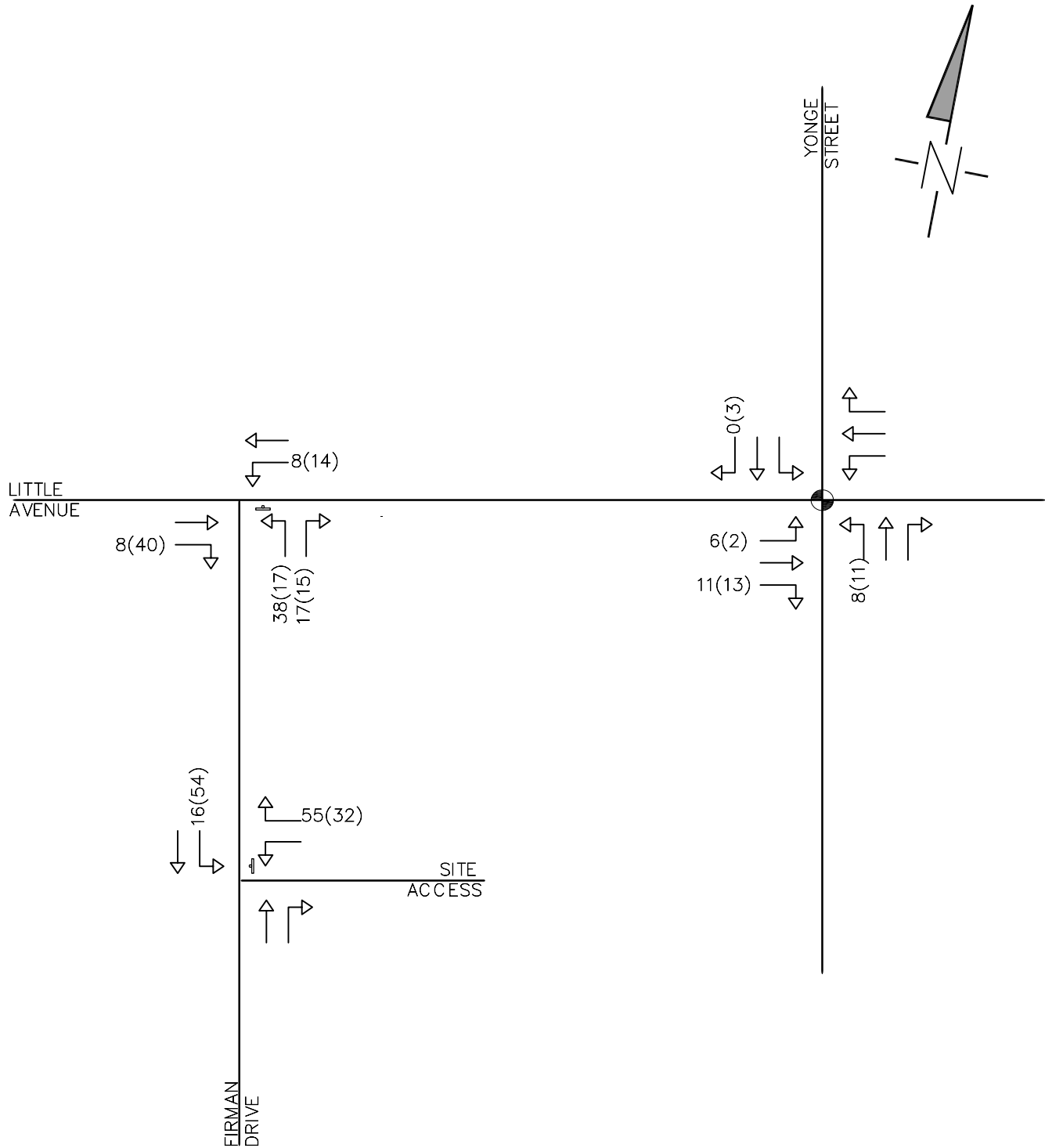
The trips generated by the proposed development were distributed to the boundary road network based on Transportation Tomorrow Survey data, with the trip purpose of "home" selected to represent the residential nature of this development. The trip distribution is described in Table 9 below.

Transportation Tomorrow Survey data did not indicate that trips would travel to or from the east on Little Avenue during the peak hours, accordingly, trips were only distributed to the north, south and west. For most parts of Barrie, outside of the downtown, navigational software directed traffic west on Little Avenue to Highway 400. Furthermore, trips were not expected to travel south on Firman Drive during the weekday a.m. and p.m. peak hours, accordingly all inbound and outbound trips are left and right-turns at the site access, respectively.

Table 9: Trip Distribution

Direction of Travel	Peak Hour	Inbound	Outbound
North (Yonge Street)	Weekday A.M.	48%	10%
	Weekday P.M.	21%	6%
South (Yonge Street)	Weekday A.M.	0%	20%
	Weekday P.M.	6%	40%
West (Little Avenue)	Weekday A.M.	0%	70%
	Weekday P.M.	0%	54%
East (Little Avenue)	Weekday A.M.	52%	0%
	Weekday P.M.	73%	0%

The trips generated by the proposed development were assigned to the boundary road network per the distribution illustrated in **Figure 8**. The corresponding trip assignment is illustrated in **Figure 9**. Transportation Tomorrow Survey data has been included in **Appendix D**.



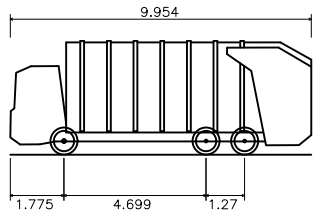
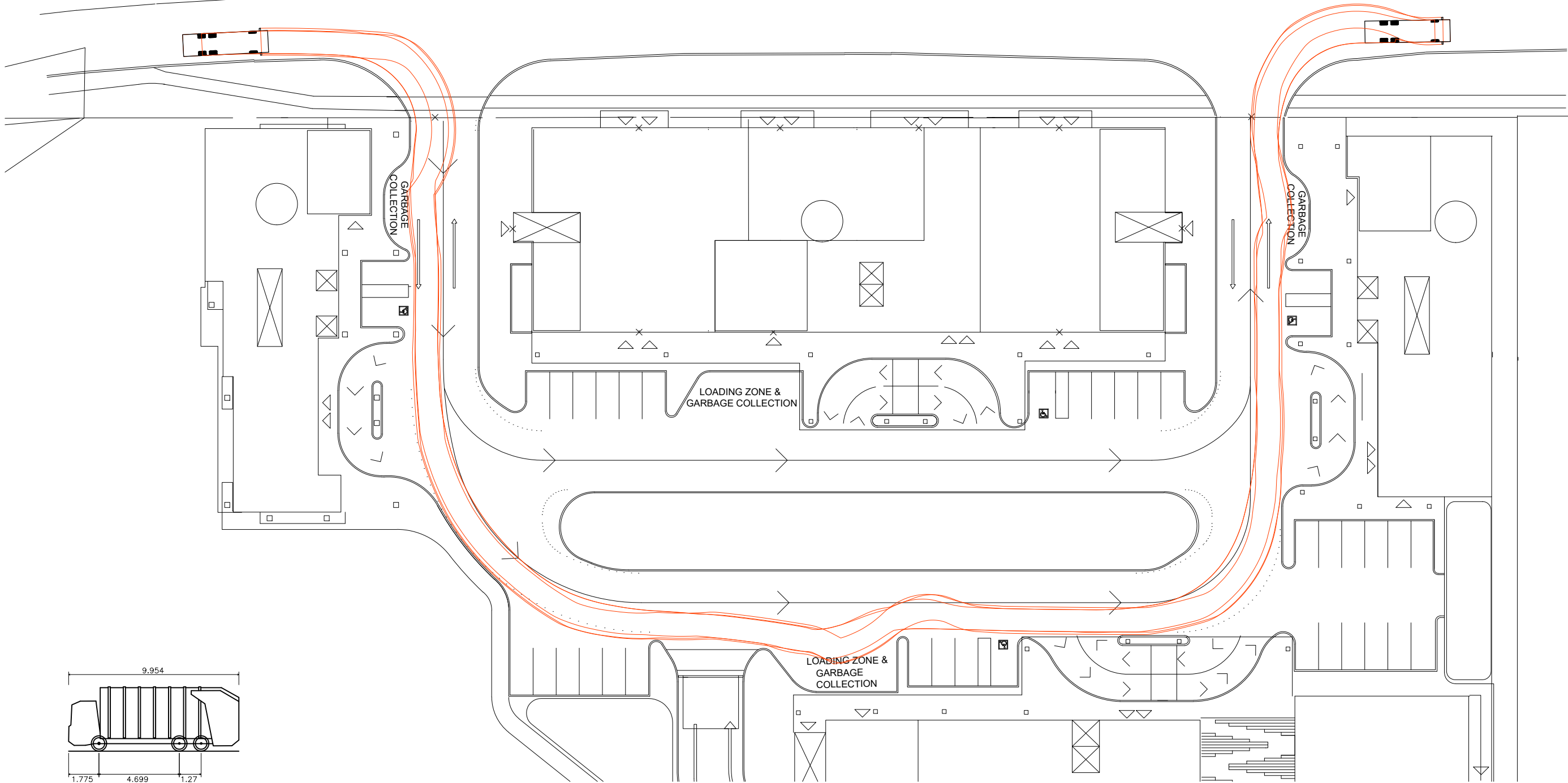
NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend SIGNAL CONTROL STOP CONTROL WEEKDAY AM (WEEKDAY PM)	Project YONGE STREET AND LITTLE AVENUE CITY OF BARRIE	CROZIER & ASSOCIATES Consulting Engineers The HarbourEdge Building, 40 Huron Street, Suite 301, Collingwood, ON L9Y 4R3 705-446-3510 T 705-446-3520 F www.cfcrozier.ca info@cfcrozier.ca Drawn By Design By Project Scale N.T.S. Date JUNE 13, 2018 Check By M.F. Drawing FIG. 9 1509 - 4851
	Drawing TRIP ASSIGNMENT	

Appendix F: Future Total Operations

D'AMBROSIO DRIVE

YONGE STREET



Garbage Truck
Overall Length 9.954m
Overall Width 2.553m
Overall Body Height 3.760m
Min Body Ground Clearance 0.313m
Track Width 2.553m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.436m



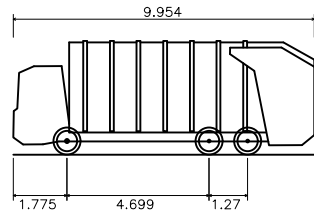
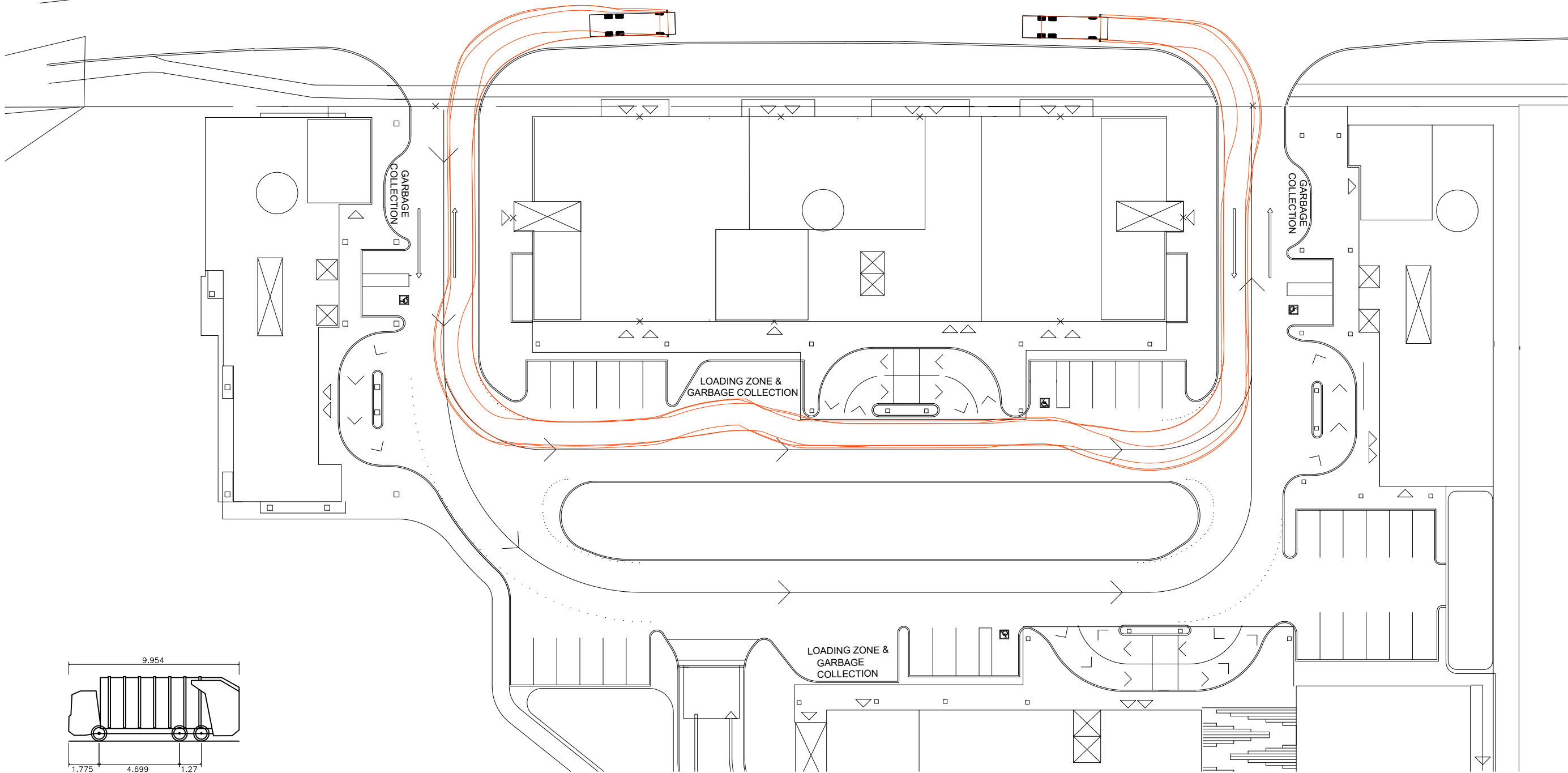
505 TO 533 YONGE ST.
GARBAGE TRUCK TURNING
SOUTH TO NORTH

DWG. No.
FIG. 1

SCALE: 1:500 DRAWN: TP DATE: DEC/2021 JOB NO. 421422

D'AMBROSIO DRIVE

YONGE STREET



Garbage Truck
Overall Length 9.954m
Overall Width 2.553m
Overall Body Height 3.760m
Min Body Ground Clearance 0.313m
Track Width 2.553m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.436m



505 TO 533 YONGE ST.
GARBAGE TRUCK TURNING
NORTH TO SOUTH

DWG. No.

FIG. 2

SCALE: 1:500 | DRAWN: TP | DATE: DEC/2021 | JOB NO. 421422

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2026 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	114	142	9	200	128	218	552	15	54	373	73
Future Volume (vph)	98	114	142	9	200	128	218	552	15	54	373	73
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		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.94		1.00	1.00		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)	1770	1708		1770	1754		1770	3525		1770	3453	
Flt Permitted	0.28	1.00		0.42	1.00		0.43	1.00		0.42	1.00	
Satd. Flow (perm)	520	1708		780	1754		792	3525		777	3453	
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)	107	124	154	10	217	139	237	600	16	59	405	79
RTOR Reduction (vph)	0	52	0	0	27	0	0	2	0	0	15	0
Lane Group Flow (vph)	107	226	0	10	329	0	237	614	0	59	469	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.9	20.9		20.9	20.9		53.1	44.4		46.7	41.2	
Effective Green, g (s)	20.9	20.9		20.9	20.9		53.1	44.4		46.7	41.2	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.61	0.51		0.54	0.47	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	125	411		187	422		582	1803		480	1638	
v/s Ratio Prot		0.13			0.19		c0.04	0.17		0.01	0.14	
v/s Ratio Perm	c0.21			0.01			c0.21			0.06		
v/c Ratio	0.86	0.55		0.05	0.78		0.41	0.34		0.12	0.29	
Uniform Delay, d1	31.5	28.8		25.3	30.8		7.7	12.5		9.6	13.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	40.2	1.5		0.1	9.1		0.5	0.5		0.1	0.4	
Delay (s)	71.7	30.3		25.5	39.9		8.2	13.1		9.7	14.3	
Level of Service	E	C		C	D		A	B		A	B	
Approach Delay (s)		41.8			39.5			11.7			13.8	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay		22.4					HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		86.8					Sum of lost time (s)		16.0			
Intersection Capacity Utilization		90.4%					ICU Level of Service		E			
Analysis Period (min)		15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive/South Access

2026 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1	43	57	1	8	21	771	22	3	555	13
Future Volume (vph)	42	1	43	57	1	8	21	771	22	3	555	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.98		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1589			1756		1770	3524		1770	3527	
Flt Permitted	0.95	1.00			0.72		0.37	1.00		0.33	1.00	
Satd. Flow (perm)	1770	1589			1322		696	3524		612	3527	
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)	46	1	47	62	1	9	23	838	24	3	603	14
RTOR Reduction (vph)	0	43	0	0	5	0	0	1	0	0	1	0
Lane Group Flow (vph)	46	5	0	0	67	0	23	861	0	3	616	0
Turn Type	Split	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	4	4			8		5	2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	7.9	7.9			8.8		66.3	66.3		59.7	59.7	
Effective Green, g (s)	7.9	7.9			8.8		66.3	66.3		59.7	59.7	
Actuated g/C Ratio	0.08	0.08			0.09		0.67	0.67		0.60	0.60	
Clearance Time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	140	126			116		491	2348		367	2116	
v/s Ratio Prot	c0.03	0.00					0.00	c0.24			0.17	
v/s Ratio Perm					c0.05		0.03			0.00		
v/c Ratio	0.33	0.04			0.58		0.05	0.37		0.01	0.29	
Uniform Delay, d1	43.3	42.3			43.6		5.8	7.3		8.0	9.6	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.1			7.2		0.0	0.4		0.0	0.3	
Delay (s)	44.7	42.4			50.8		5.9	7.8		8.0	10.0	
Level of Service	D	D			D		A	A		A	A	
Approach Delay (s)		43.5			50.8			7.7			10.0	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			12.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			99.5				Sum of lost time (s)			20.5		
Intersection Capacity Utilization			55.8%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2026 Total Traffic
AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	0	0	0	180	0	44	0	771	116	24	631	0
Future Volume (vph)	0	0	0	180	0	44	0	771	116	24	631	0
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	5.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.29	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	533	3539	
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)	0	0	0	196	0	48	0	838	126	26	686	0
RTOR Reduction (vph)	0	0	0	0	40	0	0	0	37	0	0	0
Lane Group Flow (vph)	0	0	0	196	8	0	0	838	89	26	686	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				19.1	19.1			74.5	74.5	83.0	83.0	
Effective Green, g (s)				19.1	19.1			74.5	74.5	83.0	83.0	
Actuated g/C Ratio				0.17	0.17			0.65	0.65	0.73	0.73	
Clearance Time (s)				6.0	6.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				236	264			2310	1033	425	2574	
v/s Ratio Prot					0.01			c0.24		0.00	c0.19	
v/s Ratio Perm				c0.14					0.06	0.04		
v/c Ratio				0.83	0.03			0.36	0.09	0.06	0.27	
Uniform Delay, d1				45.9	39.8			9.0	7.3	4.9	5.3	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				21.3	0.0			0.4	0.2	0.1	0.1	
Delay (s)				67.2	39.8			9.4	7.4	5.0	5.3	
Level of Service				E	D			A	A	A	A	
Approach Delay (s)		0.0			61.8			9.2			5.3	
Approach LOS		A			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			14.4			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			114.1			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			41.3%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2026 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	252	92	69	421	198	80	511	47	133	407	272
Future Volume (vph)	180	252	92	69	421	198	80	511	47	133	407	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3397		1770	3539	1583	1770	3539	1583	1770	3326	
Flt Permitted	0.30	1.00		0.53	1.00	1.00	0.30	1.00	1.00	0.36	1.00	
Satd. Flow (perm)	559	3397		986	3539	1583	568	3539	1583	670	3326	
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)	196	274	100	75	458	215	87	555	51	145	442	296
RTOR Reduction (vph)	0	45	0	0	0	144	0	0	32	0	118	0
Lane Group Flow (vph)	196	329	0	75	458	71	87	555	19	145	620	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	29.2	22.8		19.6	17.2	17.2	35.6	30.9	30.9	40.0	33.1	
Effective Green, g (s)	29.2	22.8		19.6	17.2	17.2	35.6	30.9	30.9	40.0	33.1	
Actuated g/C Ratio	0.35	0.27		0.24	0.21	0.21	0.43	0.37	0.37	0.48	0.40	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	313	933		255	733	328	311	1317	589	414	1326	
v/s Ratio Prot	c0.06	0.10		0.01	0.13		0.02	0.16		c0.03	c0.19	
v/s Ratio Perm	c0.16			0.06		0.04	0.10		0.01	0.14		
v/c Ratio	0.63	0.35		0.29	0.62	0.22	0.28	0.42	0.03	0.35	0.47	
Uniform Delay, d1	20.1	24.2		25.3	30.0	27.3	14.4	19.4	16.6	12.4	18.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.9	0.2		0.6	1.7	0.3	0.5	1.0	0.1	0.5	1.2	
Delay (s)	24.0	24.4		26.0	31.6	27.6	14.9	20.4	16.7	12.9	19.6	
Level of Service	C	C		C	C	C	B	C	B	B	B	
Approach Delay (s)		24.3			29.9			19.4			18.5	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			83.0			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			62.7%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

5: Yonge Street & North Site Access

2026 Total Traffic
AM Peak

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	13	565	819	2	6	34
Future Volume (Veh/h)	13	565	819	2	6	34
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)	14	614	890	2	7	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	LT			
Median storage (veh)		2	2			
Upstream signal (m)			179			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	892				1226	446
vC1, stage 1 conf vol					891	
vC2, stage 2 conf vol					335	
vCu, unblocked vol	653				1025	157
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	95
cM capacity (veh/h)	835				392	773
Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	SW 1
Volume Total	14	307	307	593	299	44
Volume Left	14	0	0	0	0	7
Volume Right	0	0	0	0	2	37
cSH	835	1700	1700	1700	1700	670
Volume to Capacity	0.02	0.18	0.18	0.35	0.18	0.07
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.0	1.7
Control Delay (s)	9.4	0.0	0.0	0.0	0.0	10.8
Lane LOS	A					B
Approach Delay (s)	0.2			0.0		10.8
Approach LOS						B
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			32.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2026 Total Traffic
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	207	196	30	124	53	160	614	15	88	778	95
Future Volume (vph)	83	207	196	30	124	53	160	614	15	88	778	95
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		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.95		1.00	1.00		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)	1770	1727		1770	1779		1770	3527		1770	3482	
Flt Permitted	0.59	1.00		0.19	1.00		0.21	1.00		0.36	1.00	
Satd. Flow (perm)	1091	1727		357	1779		389	3527		663	3482	
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)	90	225	213	33	135	58	174	667	16	96	846	103
RTOR Reduction (vph)	0	38	0	0	18	0	0	2	0	0	9	0
Lane Group Flow (vph)	90	400	0	33	175	0	174	681	0	96	940	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.5	24.5		24.5	24.5		51.6	44.6		48.6	43.1	
Effective Green, g (s)	24.5	24.5		24.5	24.5		51.6	44.6		48.6	43.1	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.57	0.49		0.54	0.48	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	295	467		96	481		328	1736		422	1656	
v/s Ratio Prot		c0.23			0.10		c0.04	0.19		0.01	c0.27	
v/s Ratio Perm	0.08			0.09			0.26			0.11		
v/c Ratio	0.31	0.86		0.34	0.36		0.53	0.39		0.23	0.57	
Uniform Delay, d1	26.3	31.4		26.6	26.8		10.8	14.5		10.4	17.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	14.3		2.1	0.5		1.6	0.7		0.3	1.4	
Delay (s)	26.9	45.7		28.7	27.2		12.5	15.1		10.7	18.5	
Level of Service	C	D		C	C		B	B		B	B	
Approach Delay (s)		42.5			27.4			14.6			17.8	
Approach LOS		D			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.5			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			90.6			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			91.7%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive/South Access

2026 Total Traffic
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	2	36	48	2	5	39	805	66	8	998	56
Future Volume (vph)	31	2	36	48	2	5	39	805	66	8	998	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.86			0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1597			1764		1770	3499		1770	3511	
Flt Permitted	0.95	1.00			0.72		0.17	1.00		0.30	1.00	
Satd. Flow (perm)	1770	1597			1329		325	3499		563	3511	
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)	34	2	39	52	2	5	42	875	72	9	1085	61
RTOR Reduction (vph)	0	36	0	0	3	0	0	3	0	0	2	0
Lane Group Flow (vph)	34	5	0	0	56	0	42	944	0	9	1144	0
Turn Type	Split	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	4	4			8		5	2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	7.7	7.7			8.0		65.9	65.9		57.9	57.9	
Effective Green, g (s)	7.7	7.7			8.0		65.9	65.9		57.9	57.9	
Actuated g/C Ratio	0.08	0.08			0.08		0.67	0.67		0.59	0.59	
Clearance Time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	138	125			108		277	2350		332	2072	
v/s Ratio Prot	c0.02	0.00					0.01	c0.27			c0.33	
v/s Ratio Perm					c0.04		0.10			0.02		
v/c Ratio	0.25	0.04			0.52		0.15	0.40		0.03	0.55	
Uniform Delay, d1	42.5	41.8			43.2		7.3	7.2		8.4	12.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.1			4.5		0.3	0.5		0.2	1.1	
Delay (s)	43.4	41.9			47.7		7.5	7.7		8.5	13.3	
Level of Service	D	D			D		A	A		A	B	
Approach Delay (s)		42.6			47.7			7.7			13.2	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			98.1				Sum of lost time (s)			20.5		
Intersection Capacity Utilization			55.2%				ICU Level of Service			B		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2026 Total Traffic
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	223	0	36	1	874	283	40	1041	0
Future Volume (vph)	0	0	0	223	0	36	1	874	283	40	1041	0
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	3.0	6.0	
Lane Util. Factor				1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt				1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583		1770	3539	1583	1770	3539	
Flt Permitted				0.76	1.00		0.24	1.00	1.00	0.25	1.00	
Satd. Flow (perm)				1410	1583		446	3539	1583	461	3539	
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)	0	0	0	242	0	39	1	950	308	43	1132	0
RTOR Reduction (vph)	0	0	0	0	31	0	0	0	77	0	0	0
Lane Group Flow (vph)	0	0	0	242	8	0	1	950	231	43	1132	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				23.7	23.7		74.4	74.4	74.4	82.5	82.5	
Effective Green, g (s)				23.7	23.7		74.4	74.4	74.4	82.5	82.5	
Actuated g/C Ratio				0.20	0.20		0.63	0.63	0.63	0.70	0.70	
Clearance Time (s)				6.0	6.0		6.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				282	317		280	2227	996	378	2470	
v/s Ratio Prot					0.00			0.27		0.00	c0.32	
v/s Ratio Perm				c0.17			0.00		0.15	0.07		
v/c Ratio				0.86	0.02		0.00	0.43	0.23	0.11	0.46	
Uniform Delay, d1				45.6	38.0		8.1	11.1	9.5	6.4	7.9	
Progression Factor				1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2				21.9	0.0		0.0	0.6	0.5	0.1	0.1	
Delay (s)				67.5	38.0		8.2	11.7	10.1	6.5	8.1	
Level of Service				E	D		A	B	B	A	A	
Approach Delay (s)		0.0			63.4			11.3			8.0	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.3			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			118.2			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			55.6%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2026 Total Traffic
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	546	162	161	432	161	171	697	111	232	749	283
Future Volume (vph)	305	546	162	161	432	161	171	697	111	232	749	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3418		1770	3539	1583	1770	3539	1583	1770	3393	
Flt Permitted	0.31	1.00		0.18	1.00	1.00	0.12	1.00	1.00	0.21	1.00	
Satd. Flow (perm)	578	3418		337	3539	1583	223	3539	1583	388	3393	
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)	332	593	176	175	470	175	186	758	121	252	814	308
RTOR Reduction (vph)	0	28	0	0	0	93	0	0	79	0	38	0
Lane Group Flow (vph)	332	741	0	175	470	82	186	758	42	252	1084	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	36.1	25.1		30.1	22.1	22.1	40.4	33.4	33.4	47.8	37.1	
Effective Green, g (s)	36.1	25.1		30.1	22.1	22.1	40.4	33.4	33.4	47.8	37.1	
Actuated g/C Ratio	0.37	0.26		0.31	0.23	0.23	0.42	0.34	0.34	0.49	0.38	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	349	882		222	804	359	204	1216	543	342	1295	
v/s Ratio Prot	c0.11	0.22		0.06	0.13		c0.07	0.21		c0.08	0.32	
v/s Ratio Perm	c0.25			0.18		0.05	c0.31		0.03	0.28		
v/c Ratio	0.95	0.84		0.79	0.58	0.23	0.91	0.62	0.08	0.74	0.84	
Uniform Delay, d1	26.6	34.1		26.7	33.5	30.6	21.6	26.6	21.5	16.7	27.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	35.4	7.1		16.7	1.1	0.3	39.2	2.4	0.3	8.0	6.5	
Delay (s)	62.0	41.2		43.4	34.5	30.9	60.8	29.1	21.8	24.7	33.8	
Level of Service	E	D		D	C	C	E	C	C	C	C	
Approach Delay (s)		47.5			35.7			33.8			32.2	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			37.1				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			97.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			85.1%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Yonge Street & North Site Access

2026 Total Traffic
PM Peak

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	38	1058	835	6	4	27
Future Volume (Veh/h)	38	1058	835	6	4	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)	41	1150	908	7	4	29
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage (veh)		2	2			
Upstream signal (m)			179			
pX, platoon unblocked	0.89				0.89	0.89
vC, conflicting volume	915				1568	458
vC1, stage 1 conf vol					912	
vC2, stage 2 conf vol					657	
vCu, unblocked vol	656				1390	141
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	95				99	96
cM capacity (veh/h)	825				323	783
Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	SW 1
Volume Total	41	575	575	605	310	33
Volume Left	41	0	0	0	0	4
Volume Right	0	0	0	0	7	29
cSH	825	1700	1700	1700	1700	668
Volume to Capacity	0.05	0.34	0.34	0.36	0.18	0.05
Queue Length 95th (m)	1.3	0.0	0.0	0.0	0.0	1.2
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	10.7
Lane LOS	A					B
Approach Delay (s)	0.3			0.0		10.7
Approach LOS						B
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			39.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2031 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	119	161	10	211	134	246	631	18	56	430	77
Future Volume (vph)	103	119	161	10	211	134	246	631	18	56	430	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.94		1.00	1.00		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)	1770	1702		1770	1754		1770	3524		1770	3458	
Flt Permitted	0.19	1.00		0.57	1.00		0.37	1.00		0.33	1.00	
Satd. Flow (perm)	356	1702		1071	1754		692	3524		617	3458	
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)	112	129	175	11	229	146	267	686	20	61	467	84
RTOR Reduction (vph)	0	50	0	0	24	0	0	2	0	0	13	0
Lane Group Flow (vph)	112	254	0	11	351	0	267	704	0	61	538	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	33.4	33.4		23.9	23.9		53.0	45.0		48.0	42.5	
Effective Green, g (s)	33.4	33.4		23.9	23.9		53.0	45.0		48.0	42.5	
Actuated g/C Ratio	0.33	0.33		0.24	0.24		0.53	0.45		0.48	0.43	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	196	569		256	419		453	1587		359	1471	
v/s Ratio Prot	c0.03	0.15			c0.20		c0.05	0.20		0.01	0.16	
v/s Ratio Perm	0.16			0.01			c0.27			0.07		
v/c Ratio	0.57	0.45		0.04	0.84		0.59	0.44		0.17	0.37	
Uniform Delay, d1	25.5	26.0		29.2	36.2		13.6	18.9		14.1	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.0	0.6		0.1	13.7		2.0	0.9		0.2	0.7	
Delay (s)	29.4	26.6		29.3	49.8		15.6	19.8		14.4	20.2	
Level of Service	C	C		C	D		B	B		B	C	
Approach Delay (s)		27.3			49.3			18.6			19.6	
Approach LOS		C			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			25.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			99.9			Sum of lost time (s)				20.0		
Intersection Capacity Utilization			89.8%			ICU Level of Service				E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive/South Access

2031 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1	43	57	1	8	21	897	22	3	640	13
Future Volume (vph)	42	1	43	57	1	8	21	897	22	3	640	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.98		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1589			1756		1770	3526		1770	3529	
Flt Permitted	0.95	1.00			0.72		0.33	1.00		0.28	1.00	
Satd. Flow (perm)	1770	1589			1322		617	3526		525	3529	
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)	46	1	47	62	1	9	23	975	24	3	696	14
RTOR Reduction (vph)	0	43	0	0	5	0	0	1	0	0	1	0
Lane Group Flow (vph)	46	5	0	0	67	0	23	998	0	3	709	0
Turn Type	Split	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	4	4			8		5	2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	7.9	7.9			8.8		66.3	66.3		59.7	59.7	
Effective Green, g (s)	7.9	7.9			8.8		66.3	66.3		59.7	59.7	
Actuated g/C Ratio	0.08	0.08			0.09		0.67	0.67		0.60	0.60	
Clearance Time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	140	126			116		441	2349		315	2117	
v/s Ratio Prot	c0.03	0.00					0.00	c0.28			0.20	
v/s Ratio Perm					c0.05		0.03			0.01		
v/c Ratio	0.33	0.04			0.58		0.05	0.42		0.01	0.34	
Uniform Delay, d1	43.3	42.3			43.6		6.0	7.7		8.0	10.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.1			7.2		0.0	0.6		0.1	0.4	
Delay (s)	44.7	42.4			50.8		6.0	8.3		8.1	10.4	
Level of Service	D	D			D		A	A		A	B	
Approach Delay (s)		43.5			50.8			8.2			10.4	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			99.5				Sum of lost time (s)			20.5		
Intersection Capacity Utilization			55.8%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2031 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	189	0	46	0	894	122	25	715	0
Future Volume (vph)	0	0	0	189	0	46	0	894	122	25	715	0
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	5.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.24	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	446	3539	
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)	0	0	0	205	0	50	0	972	133	27	777	0
RTOR Reduction (vph)	0	0	0	0	42	0	0	0	34	0	0	0
Lane Group Flow (vph)	0	0	0	205	8	0	0	972	99	27	777	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				19.4	19.4			74.5	74.5	83.1	83.1	
Effective Green, g (s)				19.4	19.4			74.5	74.5	83.1	83.1	
Actuated g/C Ratio				0.17	0.17			0.65	0.65	0.73	0.73	
Clearance Time (s)				6.0	6.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				238	268			2302	1029	365	2568	
v/s Ratio Prot					0.01			c0.27		0.00	c0.22	
v/s Ratio Perm				c0.15					0.06	0.05		
v/c Ratio				0.86	0.03			0.42	0.10	0.07	0.30	
Uniform Delay, d1				46.2	39.7			9.6	7.5	5.4	5.5	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				25.8	0.0			0.6	0.2	0.1	0.1	
Delay (s)				72.0	39.8			10.2	7.6	5.5	5.6	
Level of Service				E	D			B	A	A	A	
Approach Delay (s)		0.0			65.7			9.9			5.6	
Approach LOS		A			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			14.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			114.5			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			45.2%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2031 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	292	107	73	442	226	93	583	49	149	452	303
Future Volume (vph)	205	292	107	73	442	226	93	583	49	149	452	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3397		1770	3539	1583	1770	3539	1583	1770	3326	
Flt Permitted	0.28	1.00		0.50	1.00	1.00	0.24	1.00	1.00	0.31	1.00	
Satd. Flow (perm)	530	3397		932	3539	1583	443	3539	1583	582	3326	
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)	223	317	116	79	480	246	101	634	53	162	491	329
RTOR Reduction (vph)	0	44	0	0	0	148	0	0	34	0	118	0
Lane Group Flow (vph)	223	389	0	79	480	98	101	634	19	162	702	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	31.5	23.6		21.5	17.6	17.6	34.6	29.9	29.9	37.2	31.2	
Effective Green, g (s)	31.5	23.6		21.5	17.6	17.6	34.6	29.9	29.9	37.2	31.2	
Actuated g/C Ratio	0.38	0.28		0.26	0.21	0.21	0.41	0.36	0.36	0.45	0.37	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	347	961		279	746	334	258	1268	567	345	1244	
v/s Ratio Prot	c0.08	0.11		0.01	0.14		0.02	0.18		c0.03	c0.21	
v/s Ratio Perm	c0.17			0.06		0.06	0.14		0.01	0.18		
v/c Ratio	0.64	0.40		0.28	0.64	0.29	0.39	0.50	0.03	0.47	0.56	
Uniform Delay, d1	19.1	24.2		24.0	30.0	27.7	15.7	20.9	17.4	14.5	20.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.0	0.3		0.6	1.9	0.5	1.0	1.4	0.1	1.0	1.9	
Delay (s)	23.1	24.5		24.6	31.9	28.2	16.7	22.3	17.5	15.5	22.6	
Level of Service	C	C		C	C	C	B	C	B	B	C	
Approach Delay (s)		24.0			30.1			21.3			21.4	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			24.1									
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			83.4									
Intersection Capacity Utilization			67.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: North Site Access & Yonge Street

2031 Total Traffic
AM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	34	945	2	13	650
Future Volume (Veh/h)	6	34	945	2	13	650
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	37	1027	2	14	707
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage (veh)			2		2	
Upstream signal (m)			179			
pX, platoon unblocked	0.87	0.87			0.87	
vC, conflicting volume	1410	514			1029	
vC1, stage 1 conf vol	1028					
vC2, stage 2 conf vol	382					
vCu, unblocked vol	1171	142			734	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	95			98	
cM capacity (veh/h)	344	765			754	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	44	685	344	14	354	354
Volume Left	7	0	0	14	0	0
Volume Right	37	0	2	0	0	0
cSH	640	1700	1700	754	1700	1700
Volume to Capacity	0.07	0.40	0.20	0.02	0.21	0.21
Queue Length 95th (m)	1.8	0.0	0.0	0.5	0.0	0.0
Control Delay (s)	11.0	0.0	0.0	9.9	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	11.0	0.0		0.2		
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			36.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2031 Total Traffic
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	217	219	35	131	55	179	705	18	92	890	100
Future Volume (vph)	88	217	219	35	131	55	179	705	18	92	890	100
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		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.96		1.00	1.00		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)	1770	1722		1770	1780		1770	3526		1770	3485	
Flt Permitted	0.58	1.00		0.16	1.00		0.14	1.00		0.31	1.00	
Satd. Flow (perm)	1071	1722		301	1780		266	3526		579	3485	
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)	96	236	238	38	142	60	195	766	20	100	967	109
RTOR Reduction (vph)	0	40	0	0	16	0	0	2	0	0	9	0
Lane Group Flow (vph)	96	434	0	38	186	0	195	784	0	100	1067	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.1	26.1		26.1	26.1		53.0	44.3		46.6	41.1	
Effective Green, g (s)	26.1	26.1		26.1	26.1		53.0	44.3		46.6	41.1	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.58	0.48		0.51	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	304	489		85	505		295	1699		364	1558	
v/s Ratio Prot		c0.25			0.10		c0.06	0.22		0.02	0.31	
v/s Ratio Perm	0.09			0.13			c0.32			0.12		
v/c Ratio	0.32	0.89		0.45	0.37		0.66	0.46		0.27	0.68	
Uniform Delay, d1	25.9	31.5		27.0	26.3		13.0	15.9		12.0	20.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	17.4		3.7	0.5		5.5	0.9		0.4	2.5	
Delay (s)	26.5	48.9		30.7	26.8		18.5	16.8		12.4	22.7	
Level of Service	C	D		C	C		B	B		B	C	
Approach Delay (s)		45.1			27.4			17.1			21.8	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			25.2			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			91.9			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			94.7%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive/South Access

2031 Total Traffic
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	2	36	48	2	5	39	937	66	8	1153	56
Future Volume (vph)	31	2	36	48	2	5	39	937	66	8	1153	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.86			0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1597			1764		1770	3504		1770	3515	
Flt Permitted	0.95	1.00			0.72		0.13	1.00		0.26	1.00	
Satd. Flow (perm)	1770	1597			1329		244	3504		479	3515	
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)	34	2	39	52	2	5	42	1018	72	9	1253	61
RTOR Reduction (vph)	0	36	0	0	3	0	0	3	0	0	2	0
Lane Group Flow (vph)	34	5	0	0	56	0	42	1087	0	9	1312	0
Turn Type	Split	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	4	4			8		5	2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	7.7	7.7			8.0		65.9	65.9		57.9	57.9	
Effective Green, g (s)	7.7	7.7			8.0		65.9	65.9		57.9	57.9	
Actuated g/C Ratio	0.08	0.08			0.08		0.67	0.67		0.59	0.59	
Clearance Time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	138	125			108		226	2353		282	2074	
v/s Ratio Prot	c0.02	0.00					0.01	c0.31			c0.37	
v/s Ratio Perm					c0.04		0.12			0.02		
v/c Ratio	0.25	0.04			0.52		0.19	0.46		0.03	0.63	
Uniform Delay, d1	42.5	41.8			43.2		8.5	7.7		8.4	13.1	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.1			4.5		0.4	0.7		0.2	1.5	
Delay (s)	43.4	41.9			47.7		8.9	8.3		8.6	14.6	
Level of Service	D	D			D		A	A		A	B	
Approach Delay (s)		42.6			47.7			8.3			14.6	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			98.1				Sum of lost time (s)			20.5		
Intersection Capacity Utilization			55.2%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2031 Total Traffic
PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	0	0	0	234	0	37	0	1005	297	42	1195	0
Future Volume (vph)	0	0	0	234	0	37	0	1005	297	42	1195	0
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	3.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.20	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	374	3539	
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)	0	0	0	254	0	40	0	1092	323	46	1299	0
RTOR Reduction (vph)	0	0	0	0	32	0	0	0	71	0	0	0
Lane Group Flow (vph)	0	0	0	254	8	0	0	1092	252	46	1299	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				24.4	24.4			74.3	74.3	82.5	82.5	
Effective Green, g (s)				24.4	24.4			74.3	74.3	82.5	82.5	
Actuated g/C Ratio				0.21	0.21			0.62	0.62	0.69	0.69	
Clearance Time (s)				6.0	6.0			6.0	6.0	3.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				289	324			2211	989	320	2455	
v/s Ratio Prot					0.01			0.31		0.01	c0.37	
v/s Ratio Perm				c0.18					0.16	0.09		
v/c Ratio				0.88	0.03			0.49	0.26	0.14	0.53	
Uniform Delay, d1				45.8	37.7			12.1	10.0	7.2	8.8	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				24.6	0.0			0.8	0.6	0.2	0.2	
Delay (s)				70.5	37.8			12.9	10.6	7.4	9.0	
Level of Service				E	D			B	B	A	A	
Approach Delay (s)		0.0			66.0			12.4			9.0	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM 2000 Control Delay			16.0			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			118.9			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			57.9%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2031 Total Traffic
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	341	632	188	169	454	180	198	779	116	263	846	320
Future Volume (vph)	341	632	188	169	454	180	198	779	116	263	846	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3418		1770	3539	1583	1770	3539	1583	1770	3394	
Flt Permitted	0.24	1.00		0.17	1.00	1.00	0.10	1.00	1.00	0.14	1.00	
Satd. Flow (perm)	440	3418		310	3539	1583	193	3539	1583	266	3394	
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)	371	687	204	184	493	196	215	847	126	286	920	348
RTOR Reduction (vph)	0	23	0	0	0	138	0	0	85	0	33	0
Lane Group Flow (vph)	371	868	0	184	493	58	215	847	41	286	1235	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	47.8	32.3		35.5	24.0	24.0	49.7	38.7	38.7	59.1	44.1	
Effective Green, g (s)	47.8	32.3		35.5	24.0	24.0	49.7	38.7	38.7	59.1	44.1	
Actuated g/C Ratio	0.40	0.27		0.30	0.20	0.20	0.42	0.33	0.33	0.50	0.37	
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	398	928		233	714	319	226	1151	515	339	1258	
v/s Ratio Prot	c0.16	c0.25		0.08	0.14		0.09	0.24		c0.12	c0.36	
v/s Ratio Perm	0.22			0.16		0.04	0.31		0.03	0.30		
v/c Ratio	0.93	0.94		0.79	0.69	0.18	0.95	0.74	0.08	0.84	0.98	
Uniform Delay, d1	28.3	42.3		34.0	44.0	39.3	31.0	35.6	27.8	24.3	37.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	28.5	16.0		16.2	2.9	0.3	46.1	4.2	0.3	17.1	21.4	
Delay (s)	56.8	58.3		50.2	46.9	39.6	77.1	39.8	28.1	41.5	58.4	
Level of Service	E	E		D	D	D	E	D	C	D	E	
Approach Delay (s)		57.9			45.9			45.3			55.3	
Approach LOS		E			D			D			E	
Intersection Summary												
HCM 2000 Control Delay			51.9				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			118.9				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			94.1%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Yonge Street & North Site Access

2031 Total Traffic
PM Peak

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	38	1182	967	6	4	27
Future Volume (Veh/h)	38	1182	967	6	4	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)	41	1285	1051	7	4	29
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage (veh)		2	2			
Upstream signal (m)			179			
pX, platoon unblocked	0.86				0.86	0.86
vC, conflicting volume	1058				1779	529
vC1, stage 1 conf vol					1054	
vC2, stage 2 conf vol					724	
vCu, unblocked vol	735				1576	118
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	94				99	96
cM capacity (veh/h)	743				283	781
Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	SW 1
Volume Total	41	642	642	701	357	33
Volume Left	41	0	0	0	0	4
Volume Right	0	0	0	0	7	29
cSH	743	1700	1700	1700	1700	644
Volume to Capacity	0.06	0.38	0.38	0.41	0.21	0.05
Queue Length 95th (m)	1.4	0.0	0.0	0.0	0.0	1.3
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	10.9
Lane LOS	B					B
Approach Delay (s)	0.3			0.0		10.9
Approach LOS						B
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			42.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2036 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	126	168	11	221	141	256	660	18	59	450	81
Future Volume (vph)	108	126	168	11	221	141	256	660	18	59	450	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.94		1.00	1.00		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)	1770	1703		1770	1754		1770	3525		1770	3458	
Flt Permitted	0.18	1.00		0.57	1.00		0.34	1.00		0.32	1.00	
Satd. Flow (perm)	330	1703		1055	1754		638	3525		595	3458	
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)	117	137	183	12	240	153	278	717	20	64	489	88
RTOR Reduction (vph)	0	48	0	0	23	0	0	2	0	0	14	0
Lane Group Flow (vph)	117	272	0	12	370	0	278	735	0	64	563	0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	34.4	34.4		24.9	24.9		54.0	45.0		47.0	41.5	
Effective Green, g (s)	34.4	34.4		24.9	24.9		54.0	45.0		47.0	41.5	
Actuated g/C Ratio	0.34	0.34		0.25	0.25		0.54	0.45		0.47	0.41	
Clearance Time (s)	4.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	191	580		260	432		442	1572		341	1422	
v/s Ratio Prot	c0.03	0.16			c0.21		c0.06	0.21		0.01	0.16	
v/s Ratio Perm	0.18			0.01			c0.28			0.08		
v/c Ratio	0.61	0.47		0.05	0.86		0.63	0.47		0.19	0.40	
Uniform Delay, d1	25.5	26.1		29.0	36.3		13.6	19.6		15.1	20.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.7	0.6		0.1	15.2		2.8	1.0		0.3	0.8	
Delay (s)	31.3	26.7		29.0	51.5		16.4	20.6		15.4	21.7	
Level of Service	C	C		C	D		B	C		B	C	
Approach Delay (s)		27.9			50.8			19.4			21.1	
Approach LOS		C			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			26.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			100.9			Sum of lost time (s)				20.0		
Intersection Capacity Utilization			91.1%			ICU Level of Service				F		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive/South Access

2036 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1	43	57	1	8	21	942	22	3	672	13
Future Volume (vph)	42	1	43	57	1	8	21	942	22	3	672	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.85			0.98		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1589			1756		1770	3527		1770	3529	
Flt Permitted	0.95	1.00			0.72		0.32	1.00		0.26	1.00	
Satd. Flow (perm)	1770	1589			1322		590	3527		491	3529	
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)	46	1	47	62	1	9	23	1024	24	3	730	14
RTOR Reduction (vph)	0	43	0	0	5	0	0	1	0	0	1	0
Lane Group Flow (vph)	46	5	0	0	67	0	23	1047	0	3	743	0
Turn Type	Split	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	4	4			8		5	2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	7.9	7.9			8.8		66.3	66.3		59.7	59.7	
Effective Green, g (s)	7.9	7.9			8.8		66.3	66.3		59.7	59.7	
Actuated g/C Ratio	0.08	0.08			0.09		0.67	0.67		0.60	0.60	
Clearance Time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	140	126			116		423	2350		294	2117	
v/s Ratio Prot	c0.03	0.00					0.00	c0.30			0.21	
v/s Ratio Perm					c0.05		0.03			0.01		
v/c Ratio	0.33	0.04			0.58		0.05	0.45		0.01	0.35	
Uniform Delay, d1	43.3	42.3			43.6		6.0	7.9		8.0	10.1	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.1			7.2		0.1	0.6		0.1	0.5	
Delay (s)	44.7	42.4			50.8		6.1	8.5		8.1	10.5	
Level of Service	D	D			D		A	A		A	B	
Approach Delay (s)		43.5			50.8			8.4			10.5	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			99.5				Sum of lost time (s)			20.5		
Intersection Capacity Utilization			55.8%				ICU Level of Service			B		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2036 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	199	0	49	0	937	128	27	745	0
Future Volume (vph)	0	0	0	199	0	49	0	937	128	27	745	0
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	5.0	6.0	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583			3539	1583	1770	3539	
Flt Permitted				0.76	1.00			1.00	1.00	0.22	1.00	
Satd. Flow (perm)				1410	1583			3539	1583	417	3539	
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)	0	0	0	216	0	53	0	1018	139	29	810	0
RTOR Reduction (vph)	0	0	0	0	44	0	0	0	34	0	0	0
Lane Group Flow (vph)	0	0	0	216	9	0	0	1018	105	29	810	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				20.1	20.1			74.4	74.4	83.0	83.0	
Effective Green, g (s)				20.1	20.1			74.4	74.4	83.0	83.0	
Actuated g/C Ratio				0.17	0.17			0.65	0.65	0.72	0.72	
Clearance Time (s)				6.0	6.0			6.0	6.0	5.0	6.0	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				246	276			2287	1023	343	2552	
v/s Ratio Prot					0.01			c0.29		0.00	c0.23	
v/s Ratio Perm				c0.15					0.07	0.06		
v/c Ratio				0.88	0.03			0.45	0.10	0.08	0.32	
Uniform Delay, d1				46.3	39.4			10.1	7.7	5.8	5.8	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				27.7	0.0			0.6	0.2	0.1	0.1	
Delay (s)				74.0	39.5			10.7	7.9	5.9	5.9	
Level of Service				E	D			B	A	A	A	
Approach Delay (s)		0.0			67.2			10.4			5.9	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.5			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			115.1			Sum of lost time (s)			17.0			
Intersection Capacity Utilization			46.9%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2036 Total Traffic
AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	307	113	76	464	237	97	611	52	155	472	317
Future Volume (vph)	215	307	113	76	464	237	97	611	52	155	472	317
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3396		1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.27	1.00		0.49	1.00	1.00	0.45	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	503	3396		910	3539	1583	837	3539	1583	527	3539	1583
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)	234	334	123	83	504	258	105	664	57	168	513	345
RTOR Reduction (vph)	0	45	0	0	0	148	0	0	37	0	0	198
Lane Group Flow (vph)	234	412	0	83	504	110	105	664	20	168	513	147
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	31.3	23.4		22.2	18.3	18.3	34.6	29.9	29.9	39.2	32.2	32.2
Effective Green, g (s)	31.3	23.4		22.2	18.3	18.3	34.6	29.9	29.9	39.2	32.2	32.2
Actuated g/C Ratio	0.37	0.28		0.26	0.22	0.22	0.41	0.36	0.36	0.47	0.38	0.38
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	322	943		279	769	344	396	1256	562	348	1353	605
v/s Ratio Prot	c0.08	0.12		0.01	0.14		0.01	c0.19		c0.04	0.14	
v/s Ratio Perm	c0.19			0.06		0.07	0.09		0.01	0.18		0.09
v/c Ratio	0.73	0.44		0.30	0.66	0.32	0.27	0.53	0.04	0.48	0.38	0.24
Uniform Delay, d1	19.9	25.0		23.9	30.1	27.7	15.5	21.6	17.7	14.0	18.8	17.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.9	0.3		0.6	2.0	0.5	0.4	1.6	0.1	1.1	0.8	1.0
Delay (s)	27.8	25.3		24.5	32.1	28.3	15.9	23.2	17.9	15.0	19.6	18.6
Level of Service	C	C		C	C	C	B	C	B	B	B	B
Approach Delay (s)		26.2			30.2			21.9			18.5	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			23.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			84.2			Sum of lost time (s)				20.0		
Intersection Capacity Utilization			66.9%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Yonge Street & North Site Access

2036 Total Traffic
AM Peak

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	13	681	990	2	6	34
Future Volume (Veh/h)	13	681	990	2	6	34
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)	14	740	1076	2	7	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage (veh)		2	2			
Upstream signal (m)			179			
pX, platoon unblocked	0.86				0.86	0.86
vC, conflicting volume	1078				1475	539
vC1, stage 1 conf vol					1077	
vC2, stage 2 conf vol					398	
vCu, unblocked vol	762				1225	135
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	95
cM capacity (veh/h)	727				328	764
Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	SW 1
Volume Total	14	370	370	717	361	44
Volume Left	14	0	0	0	0	7
Volume Right	0	0	0	0	2	37
cSH	727	1700	1700	1700	1700	630
Volume to Capacity	0.02	0.22	0.22	0.42	0.21	0.07
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.0	1.8
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	11.1
Lane LOS	B					B
Approach Delay (s)	0.2			0.0		11.1
Approach LOS						B
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			37.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: Yonge Street & Little Avenue

2036 Total Traffic
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	229	227	36	137	58	186	738	19	97	932	105
Future Volume (vph)	92	229	227	36	137	58	186	738	19	97	932	105
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		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.96		1.00	1.00		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)	1770	1724		1770	1780		1770	3526		1770	3486	
Flt Permitted	0.56	1.00		0.15	1.00		0.12	1.00		0.29	1.00	
Satd. Flow (perm)	1045	1724		275	1780		227	3526		543	3486	
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)	100	249	247	39	149	63	202	802	21	105	1013	114
RTOR Reduction (vph)	0	39	0	0	16	0	0	2	0	0	9	0
Lane Group Flow (vph)	100	457	0	39	196	0	202	821	0	105	1118	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	27.1	27.1		27.1	27.1		53.3	44.4		46.5	41.0	
Effective Green, g (s)	27.1	27.1		27.1	27.1		53.3	44.4		46.5	41.0	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.57	0.48		0.50	0.44	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	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)	304	502		80	518		277	1683		344	1536	
v/s Ratio Prot		c0.27			0.11		c0.07	0.23		0.02	0.32	
v/s Ratio Perm	0.10			0.14			c0.35			0.13		
v/c Ratio	0.33	0.91		0.49	0.38		0.73	0.49		0.31	0.73	
Uniform Delay, d1	25.8	31.8		27.2	26.2		14.5	16.6		12.6	21.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	20.6		4.6	0.5		9.2	1.0		0.5	3.1	
Delay (s)	26.5	52.4		31.8	26.7		23.8	17.6		13.1	24.5	
Level of Service	C	D		C	C		C	B		B	C	
Approach Delay (s)		48.1			27.5			18.8			23.5	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			27.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			93.0			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			96.2%			ICU Level of Service				F		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

2: Yonge Street & D'Ambrosio Drive/South Access

2036 Total Traffic
PM Peak

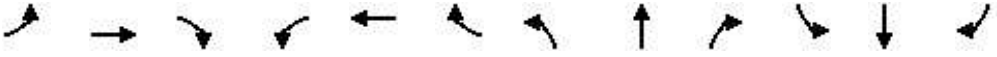
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	2	36	48	2	5	39	984	66	8	1211	56
Future Volume (vph)	31	2	36	48	2	5	39	984	66	8	1211	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.86			0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1597			1764		1770	3506		1770	3516	
Flt Permitted	0.95	1.00			0.72		0.12	1.00		0.24	1.00	
Satd. Flow (perm)	1770	1597			1329		218	3506		446	3516	
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)	34	2	39	52	2	5	42	1070	72	9	1316	61
RTOR Reduction (vph)	0	36	0	0	3	0	0	3	0	0	2	0
Lane Group Flow (vph)	34	5	0	0	56	0	42	1139	0	9	1375	0
Turn Type	Split	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	4	4			8		5	2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	7.7	7.7			8.0		65.9	65.9		57.9	57.9	
Effective Green, g (s)	7.7	7.7			8.0		65.9	65.9		57.9	57.9	
Actuated g/C Ratio	0.08	0.08			0.08		0.67	0.67		0.59	0.59	
Clearance Time (s)	6.0	6.0			4.5		4.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	138	125			108		209	2355		263	2075	
v/s Ratio Prot	c0.02	0.00					0.01	c0.33			c0.39	
v/s Ratio Perm					c0.04		0.13			0.02		
v/c Ratio	0.25	0.04			0.52		0.20	0.48		0.03	0.66	
Uniform Delay, d1	42.5	41.8			43.2		9.0	7.8		8.4	13.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.1			4.5		0.5	0.7		0.2	1.7	
Delay (s)	43.4	41.9			47.7		9.5	8.5		8.6	15.2	
Level of Service	D	D			D		A	A		A	B	
Approach Delay (s)		42.6			47.7			8.6			15.2	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			98.1				Sum of lost time (s)			20.5		
Intersection Capacity Utilization			55.2%				ICU Level of Service			B		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Yonge Street & Cox Mill Road

2036 Total Traffic
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↑↑	↔	↔	↑↑	
Traffic Volume (vph)	0	0	0	246	0	39	1	1050	312	44	1250	0
Future Volume (vph)	0	0	0	246	0	39	1	1050	312	44	1250	0
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	3.0	6.0	
Lane Util. Factor				1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt				1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1770	1583		1770	3539	1583	1770	3539	
Flt Permitted				0.76	1.00		0.17	1.00	1.00	0.19	1.00	
Satd. Flow (perm)				1410	1583		321	3539	1583	345	3539	
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)	0	0	0	267	0	42	1	1141	339	48	1359	0
RTOR Reduction (vph)	0	0	0	0	33	0	0	0	72	0	0	0
Lane Group Flow (vph)	0	0	0	267	9	0	1	1141	267	48	1359	0
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)				25.2	25.2		74.3	74.3	74.3	82.5	82.5	
Effective Green, g (s)				25.2	25.2		74.3	74.3	74.3	82.5	82.5	
Actuated g/C Ratio				0.21	0.21		0.62	0.62	0.62	0.69	0.69	
Clearance Time (s)				6.0	6.0		6.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				296	333		199	2196	982	299	2439	
v/s Ratio Prot					0.01			0.32		0.01	c0.38	
v/s Ratio Perm				c0.19			0.00		0.17	0.10		
v/c Ratio				0.90	0.03		0.01	0.52	0.27	0.16	0.56	
Uniform Delay, d1				46.0	37.5		8.6	12.7	10.4	7.8	9.4	
Progression Factor				1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2				28.5	0.0		0.0	0.9	0.7	0.3	0.3	
Delay (s)				74.6	37.5		8.7	13.6	11.0	8.0	9.7	
Level of Service				E	D		A	B	B	A	A	
Approach Delay (s)		0.0			69.6			13.0			9.6	
Approach LOS		A			E			B			A	
Intersection Summary												
HCM 2000 Control Delay			17.0			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			119.7			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			60.2%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Big Bay Point Road & Yonge Street

2036 Total Traffic
PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	357	664	198	177	477	189	208	815	122	275	886	335
Future Volume (vph)	357	664	198	177	477	189	208	815	122	275	886	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3417		1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.21	1.00		0.16	1.00	1.00	0.12	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	390	3417		303	3539	1583	229	3539	1583	188	3539	1583
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)	388	722	215	192	518	205	226	886	133	299	963	364
RTOR Reduction (vph)	0	24	0	0	0	130	0	0	93	0	0	181
Lane Group Flow (vph)	388	913	0	192	518	75	226	886	40	299	963	183
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	50.0	33.8		36.8	24.6	24.6	49.1	35.7	35.7	57.5	40.1	40.1
Effective Green, g (s)	50.0	33.8		36.8	24.6	24.6	49.1	35.7	35.7	57.5	40.1	40.1
Actuated g/C Ratio	0.43	0.29		0.31	0.21	0.21	0.42	0.30	0.30	0.49	0.34	0.34
Clearance Time (s)	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	417	982		247	740	331	271	1075	480	331	1207	540
v/s Ratio Prot	c0.17	0.27		0.08	0.15		0.09	0.25		c0.14	0.27	
v/s Ratio Perm	c0.23			0.16		0.05	0.25		0.03	c0.31		0.12
v/c Ratio	0.93	0.93		0.78	0.70	0.23	0.83	0.82	0.08	0.90	0.80	0.34
Uniform Delay, d1	26.7	40.7		32.7	43.0	38.6	26.0	38.0	29.2	33.1	35.0	28.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	27.4	14.8		14.2	2.9	0.4	19.3	7.2	0.3	26.5	5.5	1.7
Delay (s)	54.1	55.5		46.9	45.9	38.9	45.3	45.2	29.6	59.6	40.6	30.5
Level of Service	D	E		D	D	D	D	D	C	E	D	C
Approach Delay (s)		55.1			44.6			43.5			41.8	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			46.2				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			117.5				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			87.2%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

5: Yonge Street & North Site Access

2036 Total Traffic
PM Peak

						
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	38	1239	1014	6	4	27
Future Volume (Veh/h)	38	1239	1014	6	4	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)	41	1347	1102	7	4	29
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage (veh)		2	2			
Upstream signal (m)			179			
pX, platoon unblocked	0.85				0.85	0.85
vC, conflicting volume	1109				1861	554
vC1, stage 1 conf vol					1106	
vC2, stage 2 conf vol					756	
vCu, unblocked vol	763				1652	107
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	94				99	96
cM capacity (veh/h)	715				269	783
Direction, Lane #	SE 1	SE 2	SE 3	NW 1	NW 2	SW 1
Volume Total	41	674	674	735	374	33
Volume Left	41	0	0	0	0	4
Volume Right	0	0	0	0	7	29
cSH	715	1700	1700	1700	1700	636
Volume to Capacity	0.06	0.40	0.40	0.43	0.22	0.05
Queue Length 95th (m)	1.5	0.0	0.0	0.0	0.0	1.3
Control Delay (s)	10.3	0.0	0.0	0.0	0.0	11.0
Lane LOS	B					B
Approach Delay (s)	0.3			0.0		11.0
Approach LOS						B
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			44.2%		ICU Level of Service	A
Analysis Period (min)			15			