

125 Simcoe Road

Town of Bradford West Gwillimbury

Traffic Impact and Parking Study for: County of Simcoe

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Executive Summary

This report summarizes the traffic and parking study prepared for the proposed affordable housing development, municipally known as 125 Simcoe Road, located in the northeast corner of the intersection of Simcoe Road / Marshview Boulevard in the Town of Bradford West Gwillimbury [Town], County of Simcoe [County]. The report assesses the impact of traffic related to the development on the adjacent roadway and provides recommendations to accommodate this traffic in a safe and efficient manner.

The proposed development is anticipated to consist of a four-storey, 50-unit affordable housing building, with 315 sq.m. (3,362 sq.ft.) of office space and 269 sq.m. (2,871 sq.ft.) of other leasable space. It is noted that a portion of the leasable space is anticipated to be occupied by a Learning Centre

The proposed development will include one full-movement access driveway onto Simcoe Road [Site Access] and 84 parking spaces.

The scope of this analysis includes a review of the following intersections:

- Simcoe Road / Marshview Boulevard & Luxury Avenue; and
- Simcoe Road / Site Access.

Conclusions

Traffic Study Conclusions

1. The proposed development is expected to generate a total of 30 AM and 34 PM peak hour trips.
2. Detailed turning movement traffic and pedestrian counts for the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection were obtained from the Town.
3. An intersection operation analysis was completed at the study area intersections, using the existing (2022) and background (2024 and 2034) traffic volumes. This enabled a review of the existing and future traffic deficiencies that would be present without the influence of the proposed development. No geometric lane improvements or traffic signal improvements are recommended within the study area.
4. An estimate of the amount of traffic that would be generated by the proposed development was prepared and assigned to the study area streets and intersections.
5. An intersection operation analysis was completed under total (2024 and 2034) traffic volumes with the proposed development operational at the study area intersections. No geometric lane improvements or traffic signal improvements are recommended within the study area.
6. The Site Access driveway will operate efficiently as a full-movement access, with one-way stop control for westbound movements. A single eastbound and westbound lane at the Site Access driveway will provide the necessary capacity to service the proposed development.
7. The sight distance available for the Site Access at Simcoe Road meets the minimum stopping and intersection sight distance requirements.
8. A Steel Beam Guide Rail Type M with long posts and a Steel Beam Energy Attenuator as the end treatment is recommended on the north side of Marshview Boulevard, north of the existing sidewalk, extending a minimum of 10 metres and 15 meters, beyond the transition point of the embankment from a 2:1 slope to a 3:1 slope, on the west and east side respectively.
9. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

Parking Study Conclusions

10. The recommended minimum parking supply for the proposed development is as follows:

- 50 – Resident parking spaces
- 7 – Residential visitor parking spaces
- 16 – Office space parking spaces
- 11 – Other leasable area parking spaces
- 84 – Total parking spaces

11. The proposed 4 accessible parking spaces are in accordance with the minimum requirement provided in the Town's Zoning By-law 2010-050.

12. Based on our parking analysis, the above-noted parking supply is sufficient to accommodate the parking demand for the intended use.

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1 Introduction

1.1 Background

The **County of Simcoe** is proposing an affordable housing development, municipally known as 125 Simcoe Road, located in the northeast corner of the intersection of Simcoe Road / Marshview Boulevard & Luxury Avenue in the Town of Bradford West Gwillimbury [Town], County of Simcoe [County].

The proposed development is anticipated to consist of a four-storey, 50-unit affordable housing building, with 315 sq.m. (3,362 sq.ft.) of office space and 269 sq.m. (2,871 sq.ft.) of other leasable space. It is noted that a portion of the leasable space is anticipated to be occupied by a Learning Centre. It is anticipated that the proposed development will be built-out and occupied by 2024.

The proposed development will include one full-movement access driveway onto Simcoe Road [Site Access] and 84 parking spaces.

The County has retained **JD Northcote Engineering Inc.** [JD Engineering] to prepare this traffic impact and parking study in support of the proposed development.

1.2 Study Area

Figure 1 illustrates the location of the subject site and study area intersections in relation to the surrounding area. The Site Plan by McKnight Charron Limited Architects is shown in **Appendix A**. The subject site is bound by the Bradford and District Community Centre to the north and east, Simcoe Road to the west and Marshview Boulevard to the south.

Based on the pre-consultation comments from the Town, the following intersections are included in the traffic impact study:

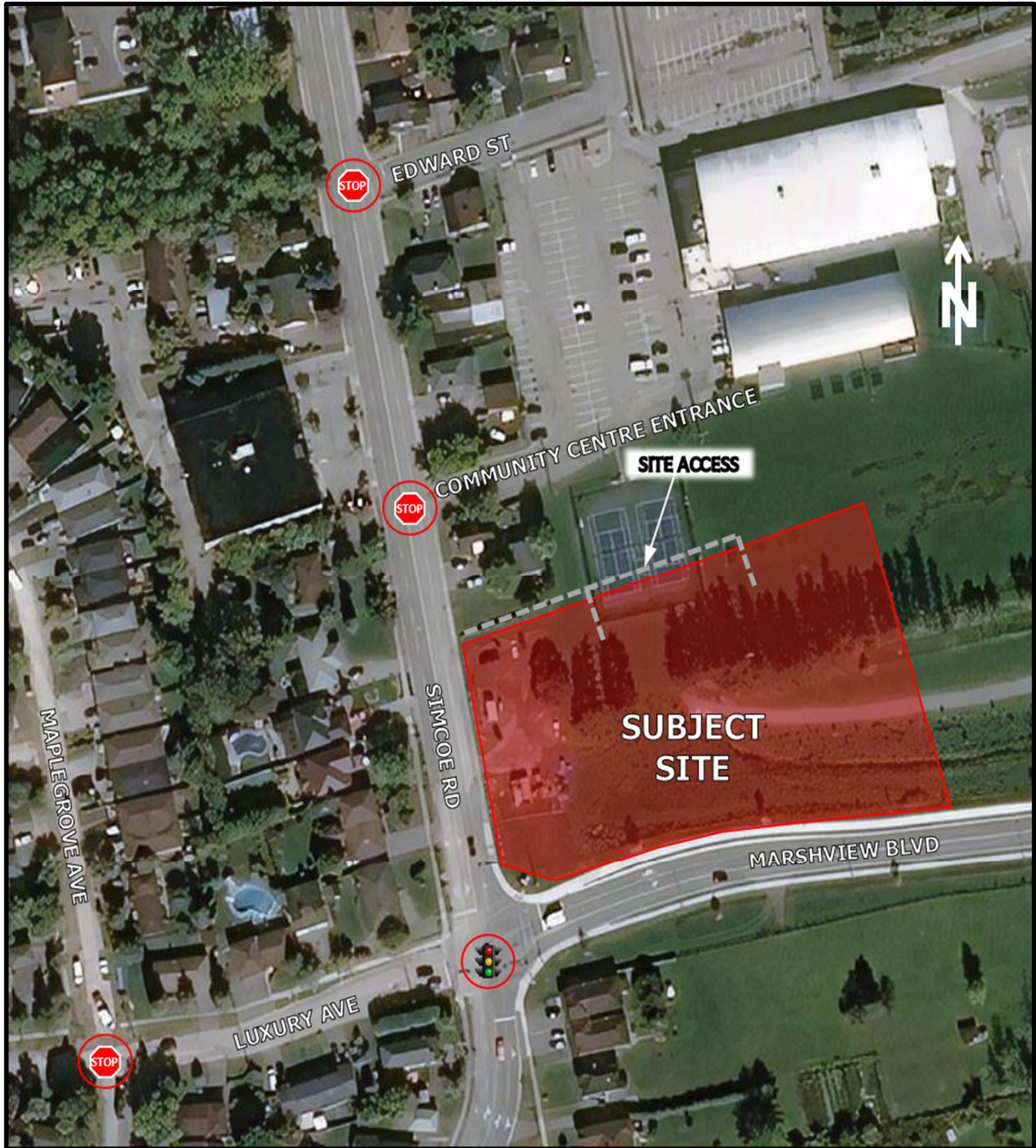
- Simcoe Road / Marshview Boulevard & Luxury Avenue; and
- Simcoe Road / Site Access.

1.3 Study Scope and Objectives

The purpose of this study is to identify the potential impacts to traffic flow at the site access and on the surrounding roadway network. The study analysis includes the following tasks:

- Determine existing traffic volumes and circulation patterns;
- Estimate future traffic volumes if the proposed development was not constructed, including the impact of additional proposed developments in the area;
- Complete level-of-service [LOS] analysis of horizon year (without the proposed development) traffic conditions and identify operational deficiencies;
- Estimate the amount of traffic that would be generated by the proposed development and assign to the roadway network;
- Complete LOS analysis of horizon year (with the proposed development) traffic conditions and
- Identify improvement options to address operational deficiencies;
- Review the available sight distance at the proposed site access driveways;
- Complete a review of the proposed intersection spacing;
- Review the proposed parking supply and assess the suitability for the proposed development;
- Complete a swept path analysis for applicable vehicle types; and
- Document findings and recommendations in a final report.

Figure 1 – Proposed Site Location and Study Area



1.4 Analysis Periods

Traffic scenarios for the existing year (2022), the build-out year (2024), and 10-year post-build-out horizon year (2034) were selected for analysis of traffic operations in the study area. The weekday morning [AM] and weekday afternoon [PM] peak hours have been selected as the analysis periods for this study.

2 Information Gathering

2.1 Street and Intersection Characteristics

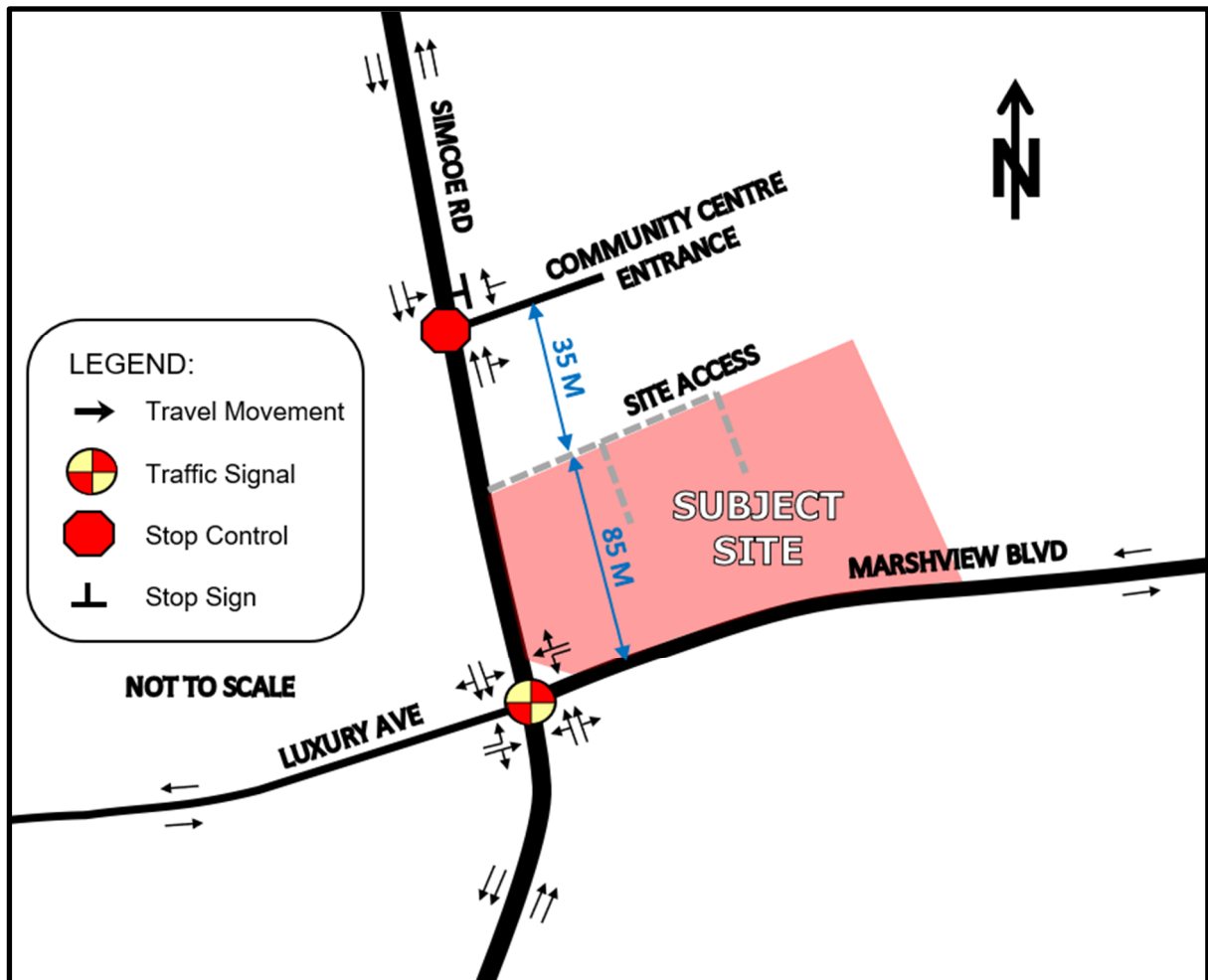
Simcoe Road is a four-lane major arterial road with an urban cross-section and a sidewalk on both sides of the road within the study area. Simcoe Road has a posted speed limit of 50km/h and is under the jurisdiction of the Town within the study area.

Marshview Boulevard is a two-lane minor arterial road with an urban cross-section and a sidewalk on both sides of the road. Marshview Boulevard has a posted speed limit of 50km/h and is under the jurisdiction of the Town.

Luxury Avenue is a collector road east of Maplegrove Avenue and a local road west of Maplegrove Avenue. Luxury Avenue is a two-lane road with an urban cross-section and a sidewalk on the north side of the road. Luxury Avenue has a posted speed limit of 40km/h and is under the jurisdiction of the Town.

The existing intersection spacing and lane configuration within the study area is illustrated in **Figure 2**.

Figure 2 – Existing Lane Configuration within Study Area



2.2 Transit Access

The Town's transit provider, BWG Transit, provides one bus route within the study area; the No. 2 (Around town) bus route. The No.2 bus route is identified separately for the clockwise direction (2A) and the counter-clockwise direction (2B).

The No. 2A bus route operates between 06:08 – 19:03 on Monday to Friday with service every hour, between 09:00 – 16:55 on Saturdays with service every hour and does not operate on Sundays. The closest bus stop to the proposed development for the No. 2A bus route is located in the northwest corner of the Simcoe Road / Marshview Boulevard intersection.

The No. 2B bus route operates between 06:57 – 16:52 on Monday to Friday with service every hour and does not operate on weekends. The closest bus stop to the proposed development for the No. 2B bus route is located in the southeast corner of the Simcoe Road / Marshview Boulevard intersection.

In addition to the above, BWG Transit provides a shared-ride taxi service for commuters to GO Train stations outside the regular transit hours.

2.3 Local Road Improvements

Based on a review of the Town Capital Projects & Construction webpage and the Town’s 2020-2022 Budget, the following improvements are proposed within the study area:

- Resurfacing of Simcoe Road between Holland Street West and Luxury Avenue by 2025

This improvement is not anticipated to have a notable impact on traffic distribution within the study area.

There are no additional infrastructure improvements anticipated within the study area.

2.4 Other Developments within the Study Area

Based on a review of the Town’s Development Projects’ webpage, there are a significant number of developments proposed in the Town; however, there are no planned developments within the study area that will have a significant impact on the local traffic volumes or local transportation infrastructure capacity.

2.5 Background Traffic Growth

Based on a review of the population and employment projections provided in the Town’s Official Plan, a background traffic growth rate of 2.2% per year has been selected for study area roads.

2.6 Traffic Counts

Detailed turning movement traffic and pedestrian counts were obtained from the Town for the Simcoe Road / Marshview Boulevard & Luxury Avenue intersection. **Table 1** summarizes the traffic count data collection information.

Table 1 – Traffic Count Data

Intersection (N-S Street / E-W Street)	Count Date	AM Peak Hour	PM Peak Hour	Source
Simcoe Road / Marshview Boulevard & Luxury Avenue	Thursday, November 16, 2017*	07:15 – 08:15	17:15 – 18:15	Town

*It is noted that the traffic counts obtained for the Simcoe Road / Marshview Boulevard intersection are five years old. Typically, the shelf life for traffic count data is two years; however, based on the current COVID-19 restrictions and the low volume of traffic generated by the proposed development, the traffic counts are considered to be suitable to illustrate the excess capacity within the study area as demonstrated in Section 5.2. It is also noted that the Marshview Boulevard extension was complete and operational at the time of the 2017 traffic counts.

Detailed traffic count data can be found in **Appendix B**. The peak hour of traffic generation for the study area intersections generally aligned with the anticipated peak hour of traffic generation by the proposed development.

Heavy vehicle percentages from the traffic count data have also been included in the Synchro analysis.

The background traffic growth rate discussed in Section 2.5 has been applied to the traffic count data to estimate the existing (2022) horizon year traffic volumes within the study area.

Figure 3 illustrates the existing (2022) traffic volumes within the study area.

2.7 Horizon Year Traffic Volumes

The background traffic growth rate discussed in Section 2.5 have been applied to the existing (2022) traffic volumes to estimate the background (2024 and 2034) horizon year traffic volumes within the study area.

Figures 4 and 5 illustrate the background (2024 and 2034) horizon year AM and PM peak hour traffic volumes in the study area.

Figure 3 – Existing (2022) Traffic Volumes

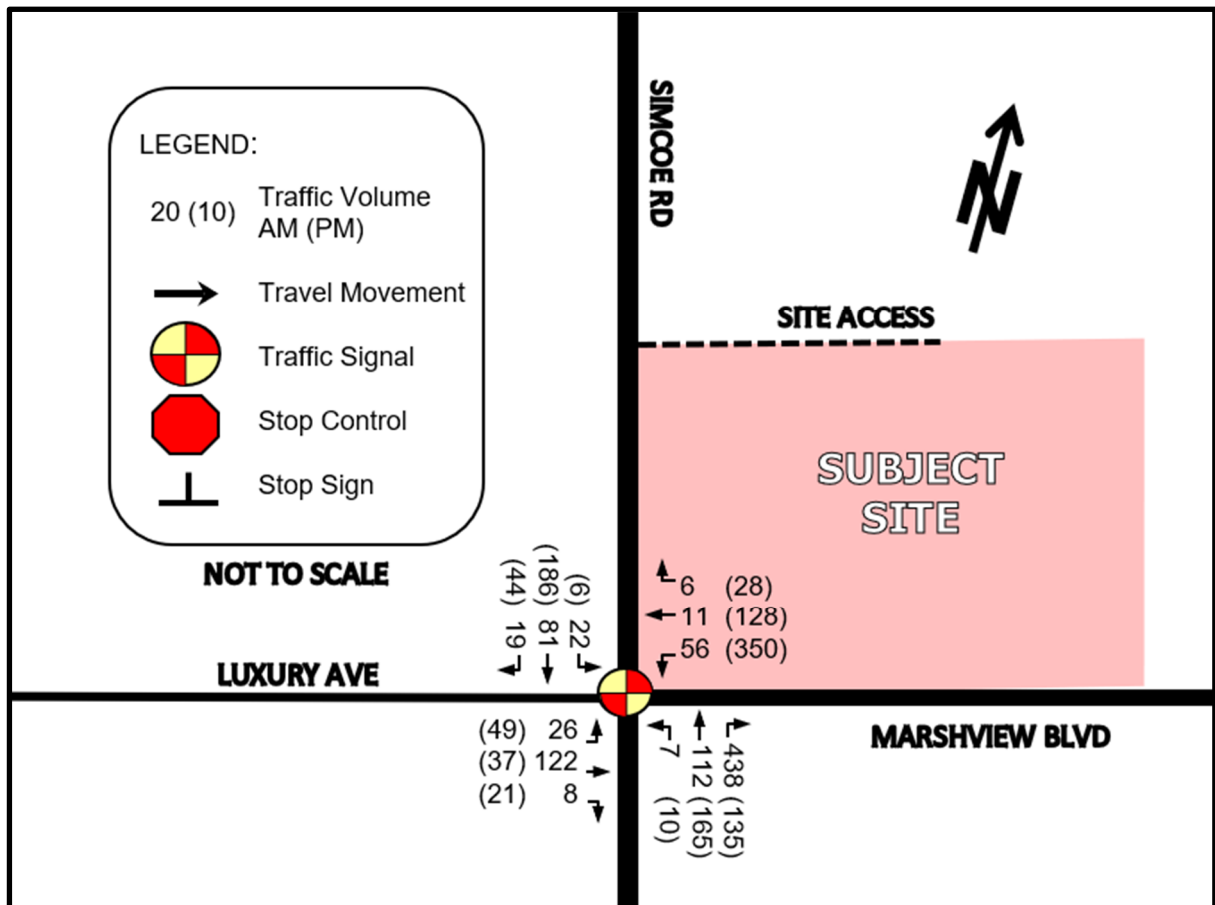


Figure 4 – Background (2024) Traffic Volumes

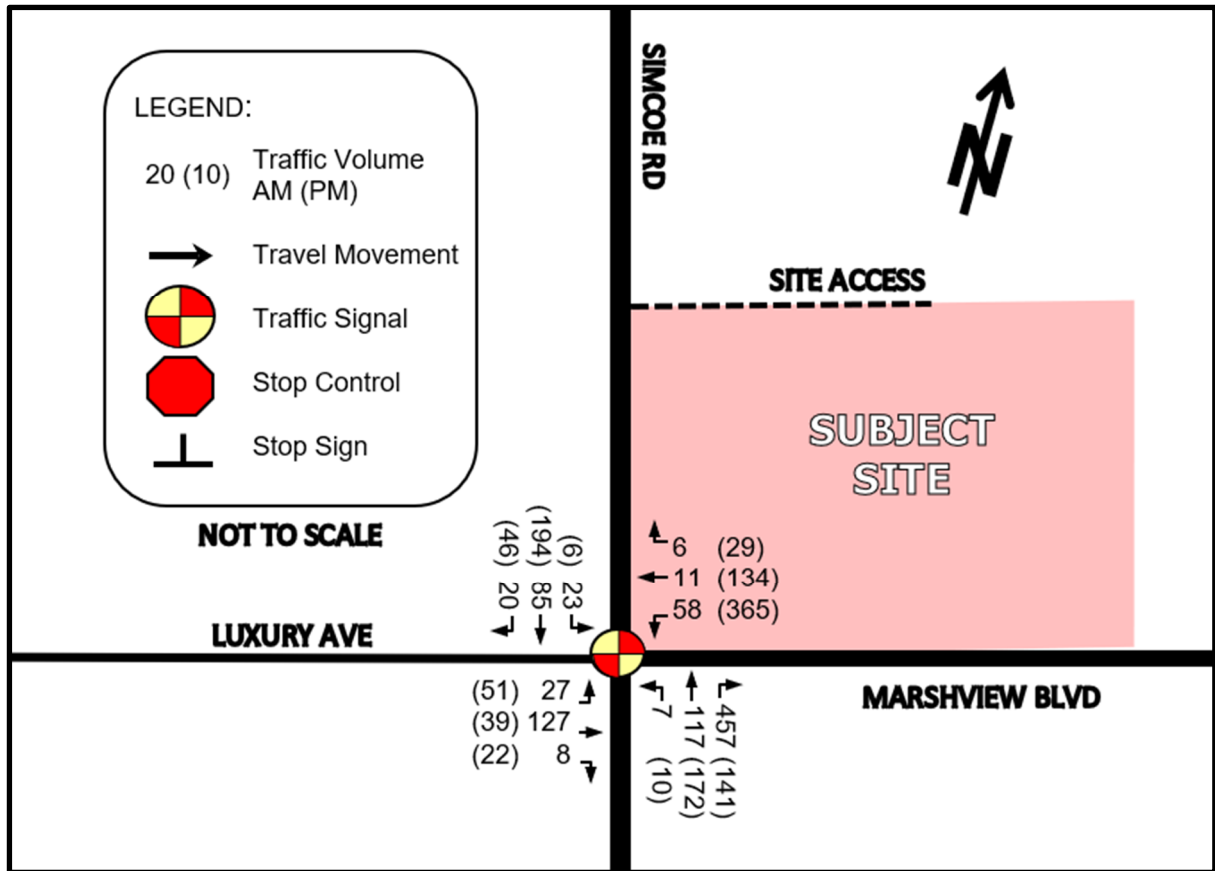
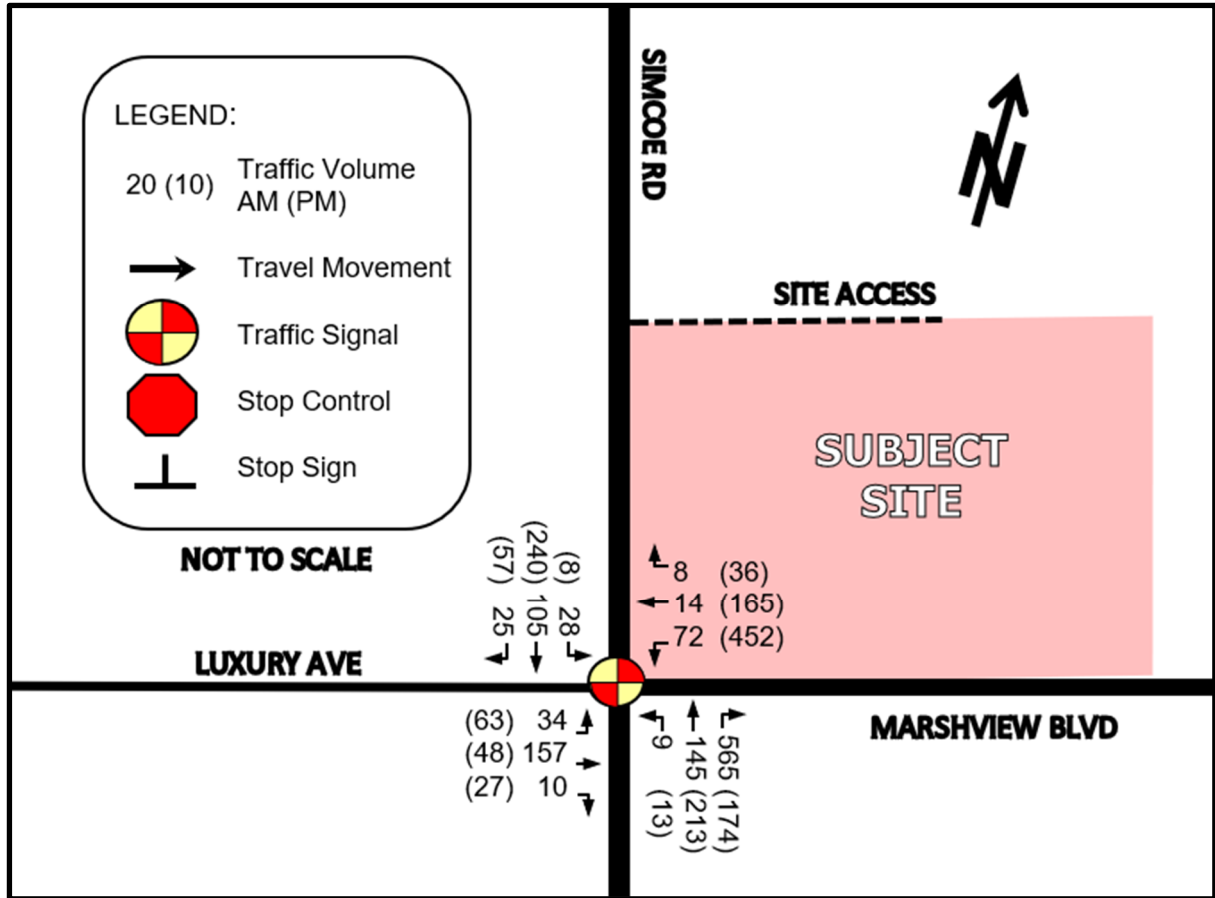


Figure 5 – Background (2034) Traffic Volumes



3 Intersection Operation without Proposed Development

3.1 Introduction

Existing and background horizon operational conditions were established to determine how the street network within the study area is currently functioning without the proposed development. This provides a base case scenario to compare with future development scenarios. Traffic operations within the study area were evaluated using the existing and future background traffic volumes with the existing road configuration and traffic control. The intersection performance was measured using the traffic analysis software, Synchro 11, a deterministic model that employs Highway Capacity Manual and Intersection Capacity Utilization methodologies for analyzing intersection operations. These procedures are accepted by provincial and municipal agencies throughout North America.

Synchro 11 enables the study area to be graphically defined in terms of streets and intersections, along with their geometric and traffic control characteristics. The user is able to evaluate both signalized and unsignalized intersections in relation to each other, thus not only providing level of service for the individual intersections, but also enabling an assessment of the impact the various intersections in a network have on each other in terms of spacing, traffic congestion, delay, and queuing.

Individual turning movements with a volume-to-capacity [V/C] ratio of 0.85 or greater are considered to be critical movements and have been highlighted in the LOS tables.

The intersection operations were also evaluated in terms of the LOS. LOS is a common measure of the quality of performance at an intersection and is defined in terms of vehicular delay. This delay includes deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS is expressed on a scale of A through F, where LOS A represents very little delay (i.e. less than 10 seconds per vehicle) and LOS F represents very high delay (i.e. greater than 50 seconds per vehicle for a stop sign controlled intersection and greater than 80 seconds per vehicle for a signalized intersection).

The LOS criteria for signalized and stop sign-controlled intersections are shown in **Table 2**. A description of traffic performance characteristics is included for each LOS.

Table 2 – Level of Service Criteria for Intersections

LOS	LOS Description	Control Delay (seconds per vehicle)	
		Signalized Intersections	Stop Controlled Intersections
A	Very low delay; most vehicles do not stop (Excellent)	less than 10.0	less than 10.0
B	Higher delay; more vehicles stop (Very Good)	between 10.0 and 20.0	between 10.0 and 15.0
C	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping (Good)	between 20.0 and 35.0	between 15.0 and 25.0
D	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop (Satisfactory)	between 35.0 and 55.0	between 25.0 and 35.0
E	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of acceptable delay	between 55.0 and 80.0	between 35.0 and 50.0
F	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection (Unacceptable)	greater than 80.0	greater than 50.0

3.2 Existing (2022) Intersection Operation

The results of the LOS analysis under existing (2022) traffic volumes during the AM and PM peak hour can be found below in **Table 3**. Existing intersection geometry and traffic control have been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix C**.

Table 3 – Existing (2022) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour					Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)		V/C	Delay (s)	LOS	95% Queue (m)	
				Storage	Model				Storage	Model
Simcoe Road / Luxury Avenue & Marshview Boulevard (signalized)	0.31	11.2	B	-	-	0.49	13.2	B	-	-
EBL	0.14	18.0	B	20	7	0.34	21.8	C	20	13
EBT	0.49	20.1	C	-	24	-	21.0	C	-	12
WBL	0.19	12.6	B	60	7	0.66	14.3	B	60	36
WBT	0.03	11.9	B	-	3	0.21	10.0	B	-	17
NBT	0.26	9.3	A	-	15	0.22	11.8	B	-	16
SBT	0.10	8.3	A	-	9	0.20	11.6	B	-	16

The results of the LOS analysis indicate that Simcoe Road / Luxury Avenue & Marshview Boulevard intersection is operating within the typical design limits noted in Section 3.1.

The anticipated 95th percentile queue for the eastbound thru-right movement for the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection extends beyond the eastbound left turn lane storage length during the AM peak hour; however, no improvements are required as the eastbound left turn movements can access the eastbound left turn lane via the taper length.

The anticipated 95th percentile queues for all other movements at the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection can be accommodated by the existing auxiliary lane storage lengths.

No infrastructure improvements are recommended within the study area.

3.3 Background (2024) Intersection Operation

The results of the LOS analysis under background (2024) traffic volumes during the AM and PM peak hour can be found below in **Table 3**. Existing intersection geometry and traffic control have been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix D**.

Table 4 – Background (2024) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour					Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)		V/C	Delay (s)	LOS	95% Queue (m)	
				Storage	Model				Storage	Model
Simcoe Road / Luxury Avenue & Marshview Boulevard (signalized)	0.32	11.3	B	-	-	0.52	13.6	B	-	-
EBL	0.14	17.9	B	20	7	0.36	21.4	C	20	13
EBT	0.50	20.1	C	-	24	0.20	20.0	C	-	12
WBL	0.19	12.5	B	60	7	0.68	14.6	B	60	38
WBT	0.03	11.8	B	-	3	0.21	9.7	A	-	18
NBT	0.27	9.5	A	-	16	0.24	12.7	B	-	17
SBT	0.11	8.5	A	-	10	0.22	12.6	B	-	17

The results of the LOS analysis indicate that Simcoe Road / Luxury Avenue & Marshview Boulevard intersection is operating within the typical design limits noted in Section 3.1.

The anticipated 95th percentile queue for the eastbound thru-right movement for the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection extends beyond the eastbound left turn lane storage length during the AM peak hour; however, no improvements are required as the eastbound left turn movements can access the eastbound left turn lane via the taper length.

The anticipated 95th percentile queues for all other movements at the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection can be accommodated by the existing auxiliary lane storage lengths.

No infrastructure improvements are recommended within the study area.

3.4 Background (2034) Intersection Operation

The results of the LOS analysis under background (2034) traffic volumes during the AM and PM peak hour can be found below in **Table 3**. Existing intersection geometry and traffic control have been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix D**.

Table 5 – Background (2034) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour					Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)		V/C	Delay (s)	LOS	95% Queue (m)	
				Storage	Model				Storage	Model
Simcoe Road / Luxury Avenue & Marshview Boulevard (signalized)	0.39	12.2	B	-	-	0.64	15.8	B	-	-
EBL	0.16	17.7	B	20	9	0.43	22.2	C	20	16
EBT	0.57	21.2	C	-	30	0.23	20.2	C	-	14
WBL	0.22	12.2	B	60	9	0.81	20.1	C	60	50
WBT	0.03	11.4	B	-	4	0.26	9.70	A	-	21
NBT	0.34	10.6	B	-	19	0.30	13.9	B	-	21
SBT	0.14	9.20	A	-	12	0.29	13.7	B	-	22

The results of the LOS analysis indicate that Simcoe Road / Luxury Avenue & Marshview Boulevard intersection is operating within the typical design limits noted in Section 3.1.

The anticipated 95th percentile queue for the eastbound thru-right movement for the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection extends beyond the eastbound left turn lane storage length during the AM peak hour; however, no improvements are required as the eastbound left turn movements can access the eastbound left turn lane via the taper length.

The anticipated 95th percentile queues for all other movements at the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection can be accommodated by the existing auxiliary lane storage lengths.

No infrastructure improvements are recommended within the study area.

4 Proposed Development

4.1 Traffic Generation

The traffic generation for proposed development has been calculated based on the data provided in the Institute of Transportation Engineers [ITE] *Trip generation Manual* (11th Edition) [ITE Trip Generation Manual]. The following ITE land use has been applied to estimate the traffic for the proposed development:

- ITE land use 221 (Multifamily Housing (Mid-Rise)) – General Urban / Suburban Setting; and
- ITE land use 712 (Small Office Building) – General Urban / Suburban Setting.

It is noted that the ITE Trip Generation Manual includes a land use code for Affordable Housing (ITE land use 223) but cautions the utilization of the land use due to its limited sample size; consequently, we have utilized ITE land use 221 (Multifamily Housing (Mid-Rise)) to provide a robust and conservative estimate of the generated traffic.

The estimated trip generation of the proposed development is illustrated below in **Table 6**. 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 traffic counts; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual.

Table 6 – 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	50 units	4	15	19	12	8	20
Small Office Building ITE Land Use: 710	6233 sq.ft.*	9	2	11	5	9	14
TOTAL TRIP GENERATION		13	17	30	17	17	34

*Includes the office space and other leasable area. It is noted that a portion of the other leasable area is anticipated to include a Learning Centre; however, we have utilized ITE land use 710 as there is no applicable ITE land use for a Learning Centre and as ITE land use 710 is anticipated to best reflect the traffic generation from the leasable area. Alternatively, ITE land use 540 (Junior/Community College) can also be utilized for the Learning Centre; however, this would result in a marginal change in the traffic generation calculations.

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

4.2 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 distribution of traffic for the proposed development has been calculated based on the 2016 Transportation Tomorrow Survey [TTS] data for traffic zone 8564 retrieved using the TTS Internet Data Retrieval System [IDRS] (output attached as **Appendix E**). TTS data provides historical origin and destination work trip percentages for specific areas within the Town and the GTHA. It is noted that the subject site is located within zone 8600; however, zone 8564 was utilized as the subject site is on the edge of zone 8564 and zone 8564 is more representative of the residential use of the subject site.

Traffic distribution for the trips generated by the proposed development is expected to generally follow commuter travel patterns. 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.

Our analysis for the residential component of the proposed development 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.

Our analysis for the office component of the proposed development is based on ingress traffic during the AM peak hour. Logically, the distribution of egress traffic will follow the inverse of the exiting traffic distribution.

The distribution of traffic for the proposed development is illustrated in **Table 7 and 8** using the methodology outlined above.

Table 7 – Proposed Development Traffic Distribution - Residential

Travel Direction (to/from)	Percentage of Total Traffic Generation
North via Simcoe Road	19%
South via Simcoe Road	17%
East via Marshview Boulevard	61%
West via Luxury Avenue	3%
Total	100%

Table 8 – Proposed Development Traffic Distribution – Office

Travel Direction (to/from)	Percentage of Total Traffic Generation
North via Simcoe Road	52%
South via Simcoe Road	15%
East via Marshview Boulevard	30%
West via Luxury Avenue	3%
Total	100%

Using the traffic distributions pattern noted above, the traffic assignment for the residential and office components of the proposed development was calculated for the AM and PM peak hour and is

illustrated in **Figure 6 and 7**. The total traffic assignment of the proposed development is illustrated in **Figure 8**.

4.3 Total Horizon Year Traffic Volumes with the Proposed Development

For the total (2024 and 2034) horizon year traffic volumes, the proposed development traffic was added to the background (2024 and 2034) traffic volumes. The resulting total (2024 and 2034) horizon year traffic volumes for the AM and PM peak hour are illustrated in **Figures 9 and 10**.

Figure 6 – Proposed Development Traffic Assignment – Residential

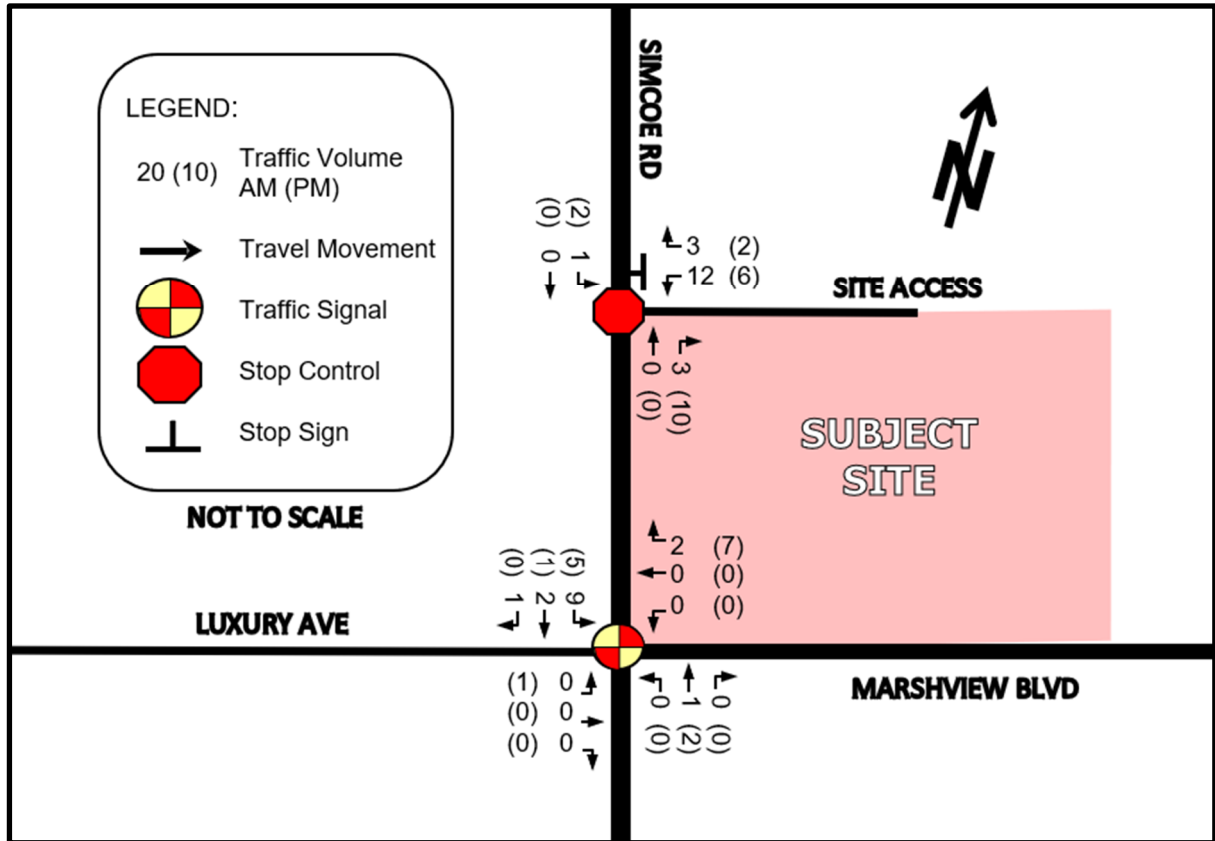


Figure 7 – Proposed Development Traffic Assignment – Office Building

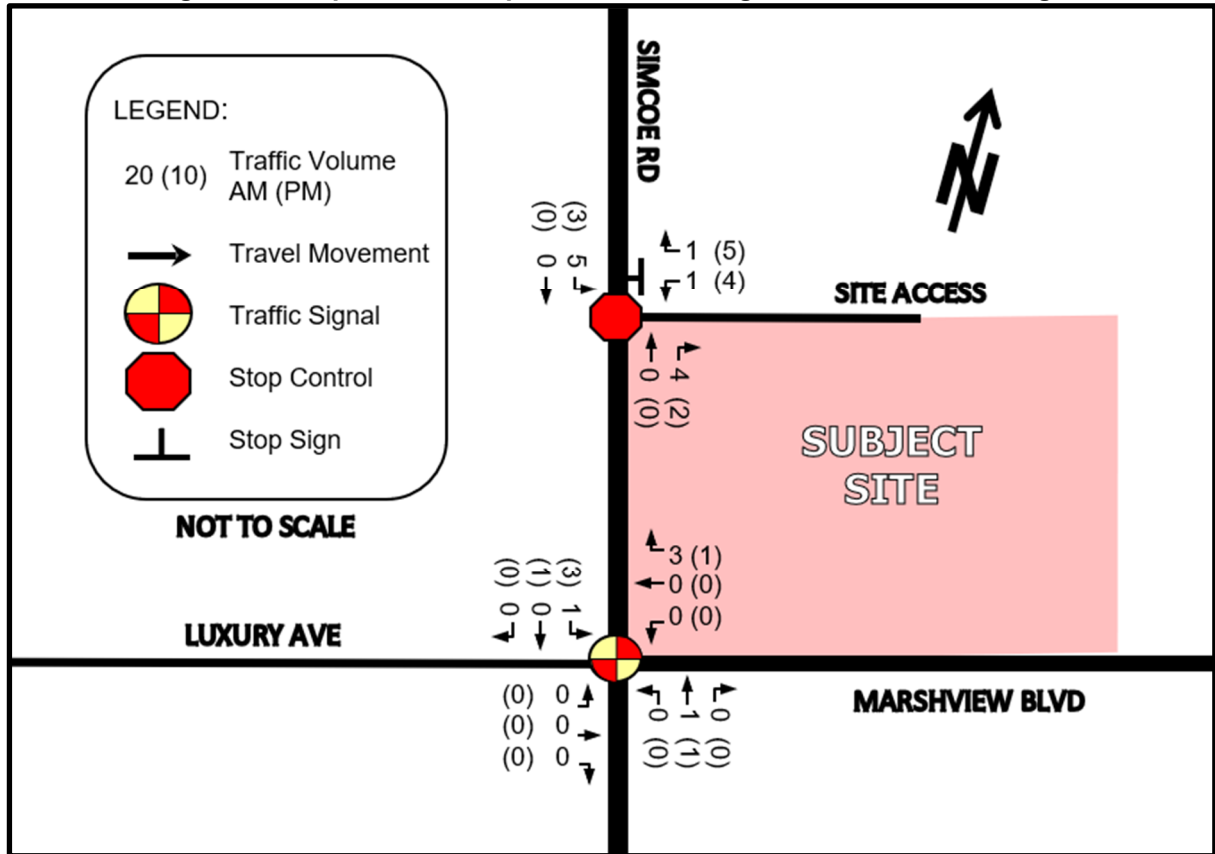


Figure 8 – Proposed Development Total Traffic Assignment

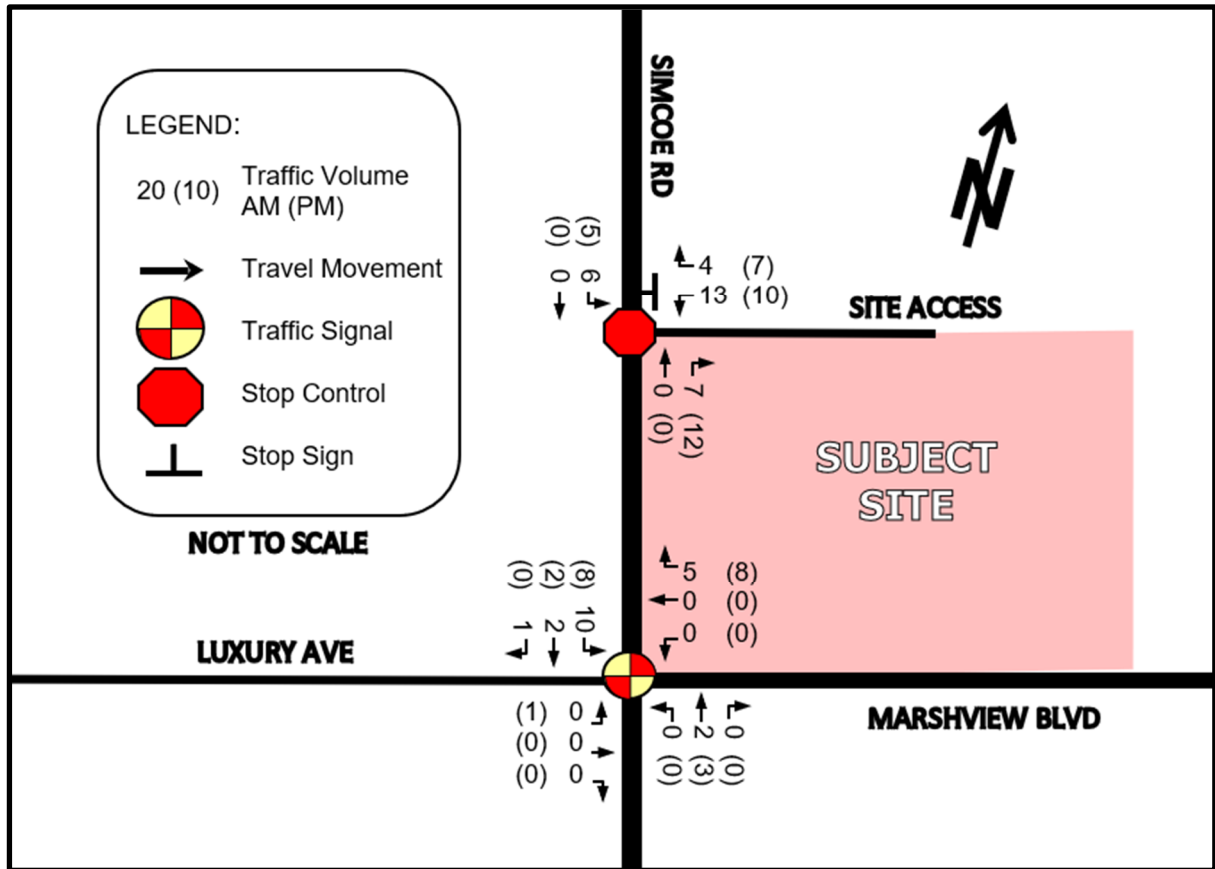


Figure 9 –Total (2024) Traffic Volumes

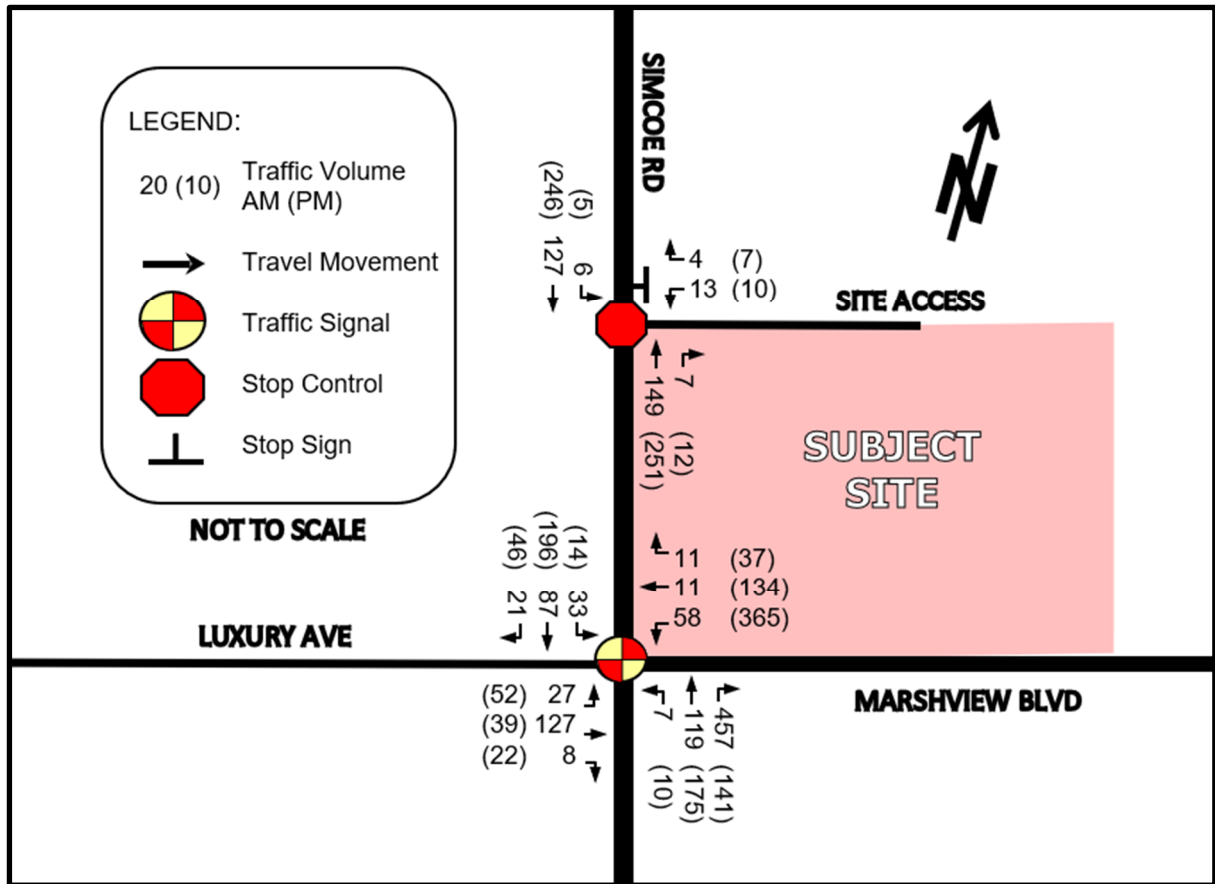
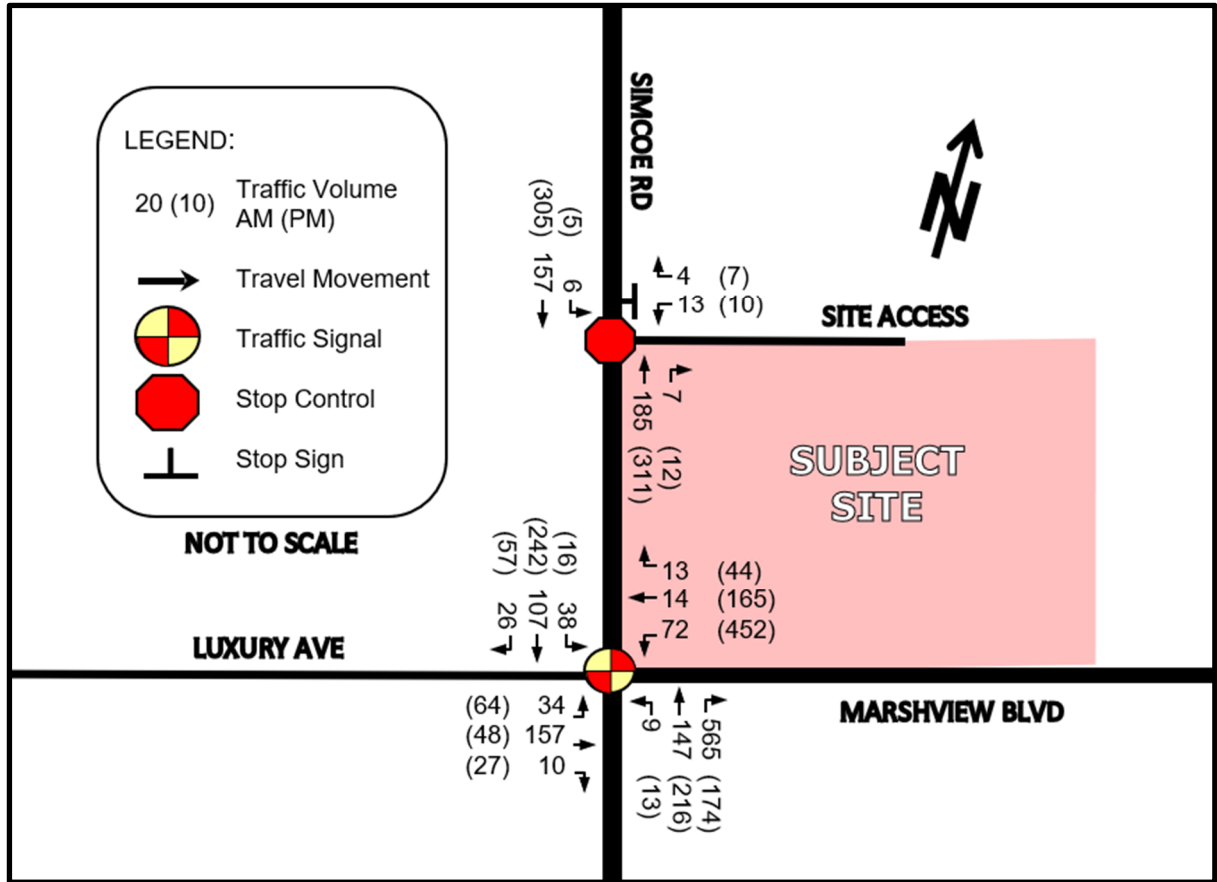


Figure 10 –Total (2034) Traffic Volumes



5 Intersection Operation with Proposed Development

5.1 Total (2024) Intersection Operation

The results of the LOS analysis under total (2024) traffic volumes during the AM and PM peak hour can be found below in **Table 9**. Existing intersection geometry and traffic control have been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix F**.

Table 9 – Total (2024) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour					Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)		V/C	Delay (s)	LOS	95% Queue (m)	
				Storage	Model				Storage	Model
Simcoe Road / Luxury Avenue & Marshview Boulevard (signalized)	0.32	11.3	B	-	-	0.52	13.6	B	-	-
EBL	0.14	17.8	B	20	7	0.37	21.5	C	20	13
EBT	0.50	19.9	B	-	24	0.20	20.0	C	-	12
WBL	0.19	12.4	B	60	7	0.68	14.6	B	60	38
WBT	0.03	11.7	B	-	4	0.22	9.7	A	-	18
NBT	0.28	9.5	A	-	16	0.24	12.8	B	-	17
SBT	0.13	8.6	A	-	11	0.24	12.7	B	-	18
Simcoe Road / Site Access (unsignalized)	-	0.7	A	-	-	-	0.4	A	-	-
WB	0.02	9.9	A	-	-	0.03	10.6	B	-	-

The results of the LOS analysis indicate that the study area intersections are operating within the typical design limits noted in Section 3.1.

The anticipated 95th percentile queue for the eastbound thru-right movement for the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection extends beyond the eastbound left turn lane storage length during the AM peak hour; however, no improvements are required as the eastbound left turn movements can access the eastbound left turn lane via the taper length.

The anticipated 95th percentile queues for all other movements at the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection can be accommodated by the existing auxiliary lane storage lengths.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the unsignalized intersection of Simcoe Road / Site Access (results are provided in **Appendix G**).

A review of the need for auxiliary right lanes at the Simcoe Road / Site Access intersection was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, auxiliary turn lanes are not recommended.

An analysis was completed for left turn movement at the Simcoe Road / Site Access intersection, based on the criteria outlined in Appendix 9A of the Ontario Ministry of Transportation [MTO] Design Supplement for TAC Geometric Design Guide for Canadian Roads June 2017 [MTO DS]. According to the above-noted criteria a left turn lane is not warranted (results are provided in **Appendix H**).

No infrastructure improvements are recommended within the study area.

5.2 Total (2034) Intersection Operation

The results of the LOS analysis under total (2034) traffic volumes during the AM and PM peak hour can be found below in **Table 10**. Existing intersection geometry and traffic control have been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix F**.

Table 10 – Total (2034) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour					Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)		V/C	Delay (s)	LOS	95% Queue (m)	
				Storage	Model				Storage	Model
Simcoe Road / Luxury Avenue & Marshview Boulevard (signalized)	0.39	12.2	B	-	-	0.64	15.8	B	-	-
EBL	0.16	17.7	B	20	9	0.44	22.3	C	20	16
EBT	0.57	21.2	C	-	30	0.23	20.2	C	-	14
WBL	0.22	12.2	B	60	9	0.81	20.1	C	60	50
WBT	0.03	11.4	B	-	4	0.27	9.70	A	-	22
NBT	0.35	10.6	B	-	19	0.31	13.9	B	-	21
SBT	0.16	9.3	A	-	13	0.31	13.8	B	-	23
Simcoe Road / Site Access (unsignalized)	-	0.6	A	-	-	-	0.4	A	-	-
WB	0.03	10.2	B	-	-	0.03	11.3	B	-	-

The results of the LOS analysis indicate that the study area intersections are operating within the typical design limits noted in Section 3.1.

The anticipated 95th percentile queue for the eastbound thru-right movement for the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection extends beyond the eastbound left turn lane storage length during the AM peak hour; however, no improvements are required as the eastbound left turn movements can access the eastbound left turn lane via the taper length.

The anticipated 95th percentile queues for all other movements at the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection can be accommodated by the existing auxiliary lane storage lengths.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the unsignalized intersection of Simcoe Road / Site Access (results are provided in **Appendix G**).

A review of the need for auxiliary right lanes at the Simcoe Road / Site Access intersection was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, auxiliary turn lanes are not recommended.

An analysis was completed for left turn movement at the Simcoe Road / Site Access intersection, based on the criteria outlined in Appendix 9A of the MTO DS. According to the above-noted criteria a left turn lane is not warranted (results are provided in **Appendix H**).

No infrastructure improvements are recommended within the study area.

5.3 Sight Distance Review

A review of the available sight distance for the proposed Site Access was completed as part of this analysis.

The sight distance north (greater than 200 meters) and south (greater than 150 metres) of the Site Access at Simcoe Road is greater than the minimum stopping and intersection sight distance requirements identified in the Transportation Association of Canada *Design Guide for Canadian Roads* (2017) [TAC Guidelines] for a design speed of 70km/h (105 and 150 metres).

There are no issues with the sight distance available for the proposed Site Access.

5.4 Site Access

The Site Access driveway will operate efficiently as a full-movement access, with one-way stop control for westbound movements. No lane improvements are recommended on Simcoe Road at the Site Access. A single eastbound and westbound lane at the Site Access driveway will provide the necessary capacity to service the proposed development.

The proposed spacing (measured edge of driveway to edge of road) between the Site Access and Marshview Boulevard (approximately 75 meters) is in excess of the suggested minimum corner clearance requirements for a driveway as identified in the TAC Guidelines – Figure 8.8.2 (Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections) – 70 metres for signalized condition.

The proposed spacing (measured edge to edge of curb radius) between the Site Access and the existing Community Center entrance to the north (approximately 19 meters) is in excess of the suggested minimum spacing for driveways as identified in the TAC Guidelines – Figure 8.9.2 (Driveway Spacing Guidelines – Locals and Collectors) – 3 metres for commercial driveways.

5.5 Impact to Simcoe Road / Community Centre Entrance Intersection

The proposed spacing between the Site Access and the Community Centre Entrance is in excess of the suggested minimum spacing for driveways as discussed in Section 5.4.

Furthermore, based on the intersection operation analysis for the critical total (2034) scenario, the anticipated queues at the Site Access for the northbound right turn movements and southbound left turn movements are anticipated to be negligible. The turning movements at the Site Access are not anticipated to interact with the traffic utilizing the Community Centre Entrance; consequently, the location of the Site Access is anticipated to have a negligible impact to the Simcoe Road / Community Centre Entrance intersection.

5.6 Truck Turning Analysis

A truck swept path analysis has been provided in **Appendix I** to illustrate that the following vehicles can access the site as intended without any operational issues:

- Passenger vehicles (critical parking spaces only); and
- Front Load Garbage Truck.

5.7 Marshview Boulevard Roadside Safety Audit

Based on the proposed civil engineering design by Pearson Engineering, with the realignment of the watercourse north of Marshview Boulevard, the slopes for the watercourse are critical slopes (2:1) west of the start of the realignment and non-recoverable slopes (3:1) at the start of the realignment. Since the clear zone distance provided prior to the critical slope (approximately 5 metres) is less than the desired clear zone distance recommended per the MTO Road Design Manual (6.5 metres) and TAC Guidelines (6.0 to 6.5 metres), a roadside barrier on Marshview Boulevard is recommended along the realignment of the watercourse.

Based on the MTO Road Design Manual, a Steel Beam Guide Rail Type M with long posts and a Steel Beam Energy Attenuator as the end treatment is recommended on the north side of Marshview Boulevard, north of the existing sidewalk, extending a minimum of 10 metres and 15 meters, beyond the transition point of the embankment from a 2:1 slope to a 3:1 slope, on the west and east side respectively.

6 Parking Analysis

6.1 Scope

The purpose of this analysis is to estimate the minimum parking supply required to adequately service the subject site. The proposed Site Plan includes a total parking supply of 84 spaces, including 4 barrier-free parking spaces.

6.2 Study Area Parking Infrastructure

On-street parking is prohibited on Marshview Boulevard and Edward Street within the study area.

On-street parking is permitted on Simcoe Road and Luxury Avenue within the study area.

There are two large surface parking lots adjacent to the subject site at the Bradford and District Community Centre. There are also various private surface parking lots on Simcoe Road, north of the subject site and on Holland Street.

6.3 Town of Bradford West Gwillimbury By-law

The Town's Zoning By-law 2010-050 [Zoning By-law] provides parking requirements for a variety of building types and land uses. **Table 11** summarizes the parking requirement, according to the Zoning By-law, for the proposed development. The parking supply for the proposed development is 31 spaces less than the Zoning By-law requirement. Accessible parking for the subject site is provided according to the Town Zoning By-law.

Table 11 - Zoning By-law Parking Requirements

Category	Parking Standard	Size	Required	Provided	Net Parking Supply
Dwelling, Apartment	1.5 spaces per unit	50 units	75 spaces	50 spaces	- 25
	0.25 spaces per unit for visitors		13 spaces	7 spaces	- 6
Business Office	1 parking space per 20.0 m ² GFA.	315 m ²	16 spaces	16 spaces	-
All other uses	1 parking space per 25.0 m ² GFA	269 m ²	11 spaces	11 spaces	-
TOTAL PARKING SPACES			115 spaces	84 spaces	- 31 spaces
<i>Barrier-Free Parking</i>	<i>3 accessible spaces for 61-100 parking spaces required, plus 1 additional space for every 30 parking spaces required</i>		<i>4 spaces</i>	<i>4 spaces</i>	<i>-</i>
<i>Bicycle Parking (Institutional Use)</i>	<i>2 spaces + 1 space per 100 m²</i>		<i>8 spaces</i>	<i>28 indoor 16 outdoor 44 spaces</i>	<i>+ 36 spaces</i>

As indicated, the proposed parking supply falls below the calculated requirement by 31 spaces. It should be noted that the parking requirement for the residential portion of the site has been calculated based on the typical residential building use, recognizing that the Town's Zoning By-law does not provide parking standards for affordable housing units. Further investigation into necessary parking provision for the affordable housing portion of the subject site is provided in the proceeding sections.

6.4 Parking Justification

The following justification is provided in support of the parking supply for the proposed affordable housing apartment units.

6.4.1 Site Characteristics

A review of the site has been undertaken to consider the various characteristics of the site and local area that may influence the parking generation of the site.

As noted in Section 2.2, the BWG Transit routes No. 2, provides bus service along Simcoe Road within the study area. Currently, bus stops are located immediately adjacent the subject site in the northwest and southeast corners of the Simcoe Road / Marshview Boulevard intersection.

In consideration of the existing access to transit and proximity to local amenities in the immediate area, there is an opportunity for reduced reliance on the private automobile trips for residents of the proposed affordable housing units. Consequently, a reduced parking supply is justified.

6.4.2 Proxy Parking Data

Resident parking data has been provided by the County for existing sites which include dedicated rent-geared-to-income [RGI] or affordable residential units. Information about the sites is provided in **Table 12** below (raw data from the County of Simcoe is provided in **Appendix J**)¹.

¹ The names and exact locations of the specific buildings have been withheld due to legalities regarding confidentiality of social service recipients.

Table 12 – Proxy Resident Parking Data Details

Building Number	Location	Building Type (Unit Type ²)	Unit Mix	Units	Resident Parking	
					Utilization	Rate
1	Bradford ON	Senior	100% Affordable	25	13	52%
2	Barrie ON	Senior	50% RGI 50% Affordable	107	47	44%
3	Collingwood ON	Apartment (Senior/Family)	17% RGI 83% Affordable	147	75	51%
4	Wasaga Beach ON	Apartment (Family)	100% Affordable	99	55	56%
5	Victoria Harbour ON	Senior	100% Affordable	41	18	44%
Total				419	208	50%

As illustrated in Table 12, the resident parking utilization for the five sites provided is 0.5 spaces per unit.

Based on our correspondence with County staff, the parking management / policies at each site vary slightly. Some sites charge a small fee for an extra vehicle and others have no parking restrictions for additional parking. Some sites have designated parking spaces for residents and others have no designated parking.

In all proxy sites provided above, there was an excess parking supply for resident parking. Consequently, the parking utilization at each site was not limited by supply and thus the utilization of resident parking is considered to be a good representation of the resident parking demand rate.

At all of the above-noted proxy survey locations, units were occupied at a typical saturated rate.

6.4.3 Parking Analysis

6.4.3.1 Residential Parking

As previously noted, the proposed development will provide 84 parking spaces. Removing the proposed parking supply for the non-residential uses (27 spaces for the office and other leasable space), this results in a provision of 57 parking spaces remaining for the 50 affordable housing units, translating to a parking supply 1.14 spaces per unit.

Based on the proxy count data, it is estimated that the parking demand for resident parking spaces for the subject site will be 0.5 parking spaces per unit. As such, the proposed provision of 1.14 spaces per unit is considered sufficient to support the expected parking demand in addition to any variation that may occur.

6.4.3.2 Office and Other Leasable Area Parking

The proposed parking supply for the non-residential uses of the subject site is provided according to the Town Zoning By-law.

6.4.4 Recommendations

The proposed parking supply (84 spaces including 4 barrier-free parking spaces) is considered to be adequate for the proposed development.

² Family sites have a mix of 1, 2 and 3 bedroom units.

7 Summary

The **County of Simcoe** retained **JD Engineering** to prepare this traffic impact and parking study in support of the proposed affordable housing development, municipally known as 125 Simcoe Road, located in the northeast corner of the intersection of Simcoe Road / Marshview Boulevard in the Town of Bradford West Gwillimbury [Town], County of Simcoe [County]. The proposed Site Plan is shown in **Appendix A**. This chapter summarizes the conclusions and recommendations from the study.

The proposed development is anticipated to consist of a four-storey, 50-unit affordable housing building, with 315 sq.m. (3,362 sq.ft.) of office space and 269 sq.m. (2,871 sq.ft.) of other leasable space. It is noted that a portion of the leasable space is anticipated to be occupied by a Learning Centre.

Traffic Study Conclusions

1. The proposed development is expected to generate a total of 30 AM and 34 PM peak hour trips.
2. Detailed turning movement traffic and pedestrian counts for the Simcoe Road / Luxury Avenue & Marshview Boulevard intersection were obtained from the Town.
3. An intersection operation analysis was completed at the study area intersections, using the existing (2022) and background (2024 and 2034) traffic volumes. This enabled a review of the existing and future traffic deficiencies that would be present without the influence of the proposed development. No geometric lane improvements or traffic signal improvements are recommended within the study area.
4. An estimate of the amount of traffic that would be generated by the proposed development was prepared and assigned to the study area streets and intersections.
5. An intersection operation analysis was completed under total (2024 and 2034) traffic volumes with the proposed development operational at the study area intersections. No geometric lane improvements or traffic signal improvements are recommended within the study area.
6. The Site Access driveway will operate efficiently as a full-movement access, with one-way stop control for westbound movements. A single eastbound and westbound lane at the Site Access driveway will provide the necessary capacity to service the proposed development.
7. The sight distance available for the Site Access at Simcoe Road meets the minimum stopping and intersection sight distance requirements.
8. A Steel Beam Guide Rail Type M with long posts and a Steel Beam Energy Attenuator as the end treatment is recommended on the north side of Marshview Boulevard, north of the existing sidewalk, extending a minimum of 10 metres and 15 meters, beyond the transition point of the embankment from a 2:1 slope to a 3:1 slope, on the west and east side respectively..
9. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

Parking Study Conclusions

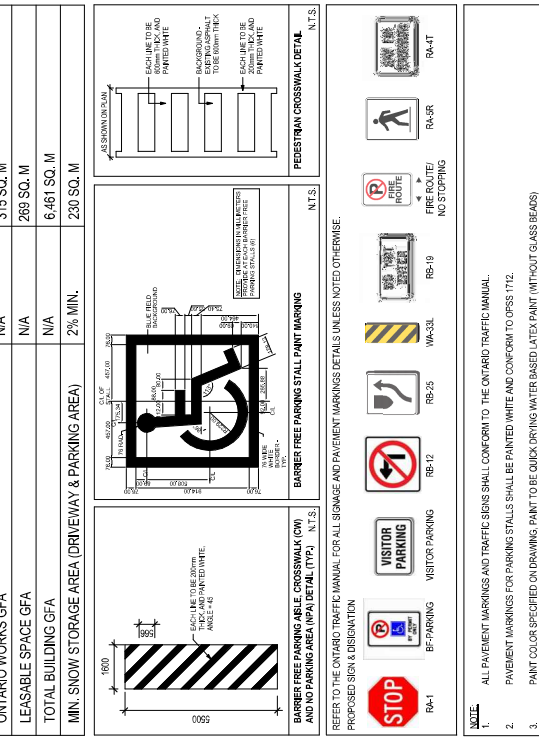
10. The recommended minimum parking supply for the proposed development is as follows:
 - 50 – Resident parking spaces
 - 7 – Residential visitor parking spaces
 - 16 – Office space parking spaces
 - 11 – Other leasable area parking spaces

- 84 – Total parking spaces
11. The proposed 4 accessible parking spaces are in accordance with the minimum requirement provided in the Town's Zoning By-law 2010-050.
 12. Based on our parking analysis, the above-noted parking supply is sufficient to accommodate the parking demand for the intended use.

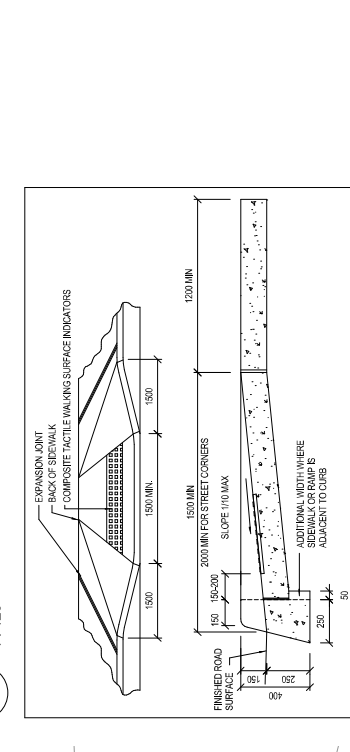
Appendix A – Site Plan

SITE STATISTICS		
REGULATIONS	REQUIRED	PROVIDED
EXISTING ZONING: (I) - INSTITUTIONAL AND (R2-1) - RESIDENTIAL	(I) - INSTITUTIONAL AND (R2-1) - RESIDENTIAL, MULTIPLE UNIT	
MINIMUM LOT AREA: 190 SQ.M/DWELLING UNIT	9,500 SQ.M MIN.	8,863 SQ.M
MINIMUM LOT FRONTAGE	5.7M/UNIT = 285M	62.3M
REQUIRED YARDS	6.0M MIN.	13.65M
FRONT (SIMCOE ROAD)	5.0M MIN.	9.5M
EXTERIOR SIDE (MARSHVIEW BLVD.)	3.0M MIN.	5.2M
INTERIOR SIDE	7.5M MIN.	59.9M
REAR	11M MAX.	13.6 M
BUILDING HEIGHT	40% OF LOT AREA	54%
MIN. LANDSCAPED SPACE	10 SPACES/UNIT	50 SPACES
PARKING SPACES	RESIDENTIAL AFFORDABLE UNITS - (50 UNITS)	15 SPACES
	BUSINESS, PROFESSIONAL OR ADMINISTRATIVE OFFICE - (1 SPACE/20.0m ²)	9 SPACES
	ALL OTHER USES - (1 SPACE/25.0m ²)	13 SPACES
	VISITOR - 25% OF RESIDENTIAL PARKING	87 SPACES
	TOTAL PARKING SPACES	84 SPACES
BARRIER-FREE PARKING SPACE REQUIREMENTS OF TOTAL PARKING	4 SPACES	4 SPACES
BICYCLE PARKING	3 - OUTDOOR 0 - INDOOR 3 - TOTAL BIKE SPACES	16 - OUTDOOR 28 - INDOOR 44 - TOTAL BIKE SPACES
ONTARIO WORKS GFA	N/A	315 SQ. M
LEASABLE SPACE GFA	N/A	269 SQ. M
TOTAL BUILDING GFA	N/A	6,461 SQ. M
MIN. SNOW STORAGE AREA (DRIVEWAY & PARKING AREA)	2% MIN.	230 SQ. M

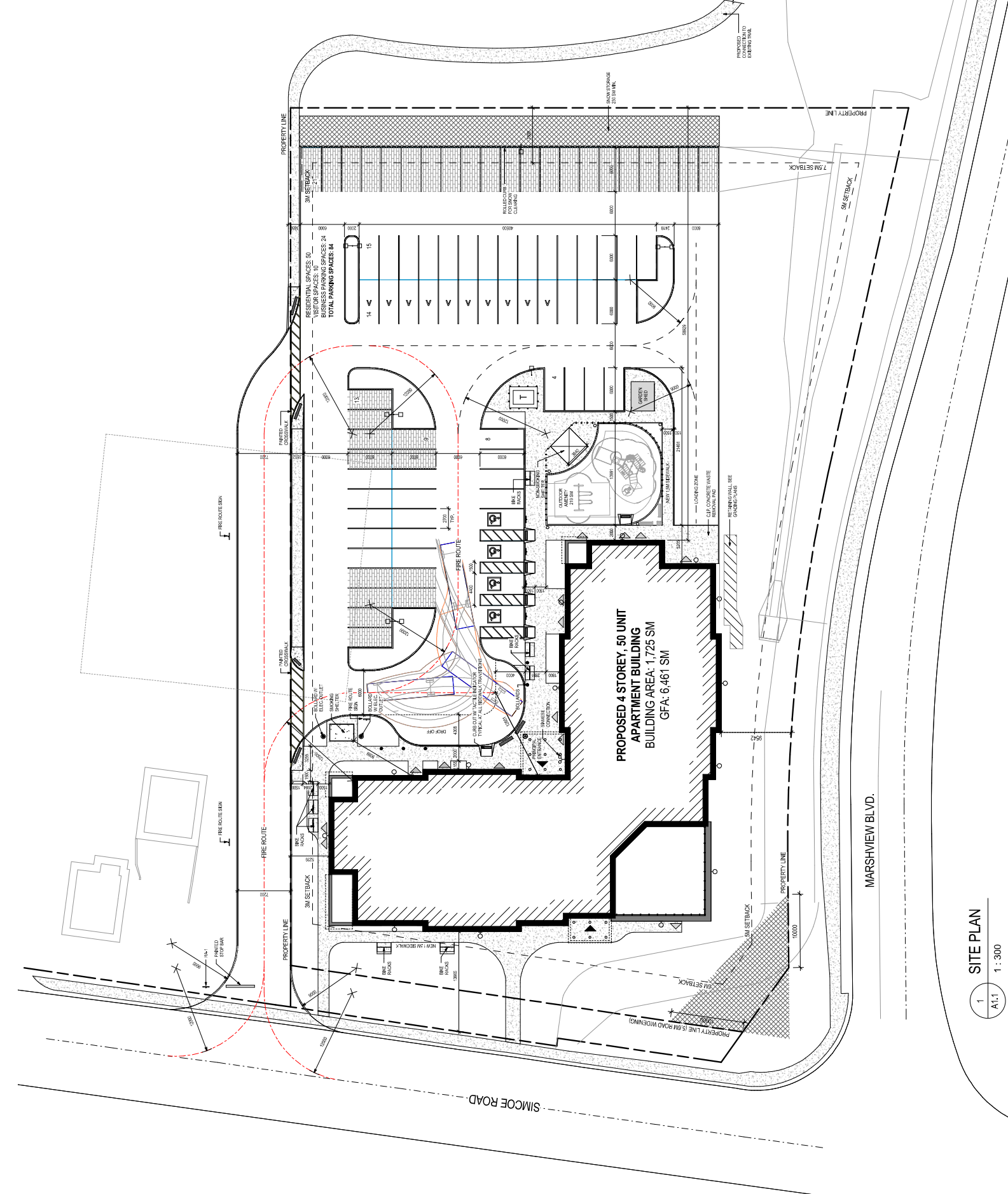
SITE PLAN LEGEND	
	EXISTING SPOT GRADE
	NEW FINISH GRADE
	BORE HOLE (BH)
	TEST PIT (TP)
	YARD HYDRANT
	CATCH-BASIN
	PEDESTRIAN ENTRY DOOR LOCATION
	SERVICE OVERHEAD DOOR LOCATION
	B.F. PARKING STALL
	B.F. CURBSIDE
	B.F. CURBSIDE WITH DETECTABLE GROOVES
	S.S.C.
	SAMESE CONNECTION
	LIGHT STANDARD
	WALL MOUNTED LIGHT FIXTURE
	CONTROL JOINT
	ASPHALT TYPE 1
	TACTILE INDICATOR
	FIRE HYDRANT
	HYDRO POLE
	TRANSFORMER
	PAINTED STOP BAR
	HOSE BB
	LIGHT BOLLARD
	SITE FURNITURE
	SKIN LEGEND
	BARRIER FREE PARKING
	VISITOR PARKING W/ PRIORITY V
	STOP SIGN



B.F. PARKING
1:125



FLUSH CURB
1:20



1 SITE PLAN
1:300

MCLARCHITECTS MCKNIGHT CHARRON LIMITED	
47 ALLIANCE BLVD. UNIT 110 SCARBOROUGH, ONTARIO M1V 4Y4 WWW.MCLARCHITECTS.COM T 416 291 7278 F 416 291 7279	
SITE PLAN	
PROJECT NAME: SIMCOE COUNTY AFFORDABLE HOUSING - BWG 125 SIMCOE RD. BRADFORD WEST GUILDFORD, ON	
PROJECT #: SHEET #: A1.1	
DATE: DECEMBER 20, 2021 DRAWN BY: KC SCALE: As Indicated	
REVISIONS ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON SITE. DISCREPANCIES TO BE REPORTED TO THE ARCHITECT IMMEDIATELY. NO FIELD CHANGES DURING CONSTRUCTION.	
1. SITE PLAN APPLICATION: DECEMBER 15, 2021 REVISION: DATE	

Appendix B – Traffic Count Data

Ontario Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:15:00

To: 8:15:00

Municipality: Bradford
Site #: 1724300020
Intersection: Simcoe Rd & Luxury Ave-Marshvie
TFR File #: 1
Count date: 16-Nov-17

Weather conditions:
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Simcoe Rd runs N/S

North Leg Total: 239
 North Entering: 110
 North Peds: 5
 Peds Cross: \times

Cyclists	0	0	0	0
Trucks	2	2	0	4
Cars	15	71	20	106
Totals	17	73	20	



Cyclists	0
Trucks	3
Cars	126
Totals	129

East Leg Total: 589
 East Entering: 65
 East Peds: 8
 Peds Cross: \times

Cyclists	Trucks	Cars	Totals
0	2	31	33

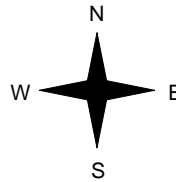


Simcoe Rd

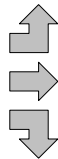
Cars	Trucks	Cyclists	Totals
5	0	0	5
10	0	0	10
47	3	0	50
62	3	0	



Luxury Ave-Marshview Blvd



Cyclists	Trucks	Cars	Totals
0	1	22	23
0	0	110	110
0	2	5	7
0	3	137	



Simcoe Rd

Luxury Ave-Marshview Blvd



Cars	Trucks	Cyclists	Totals
524	0	0	524

Peds Cross: \times
 West Peds: 2
 West Entering: 140
 West Leg Total: 173

Cars	123
Trucks	7
Cyclists	0
Totals	130



Cars	6	99	394	499
Trucks	0	2	0	2
Cyclists	0	0	0	0
Totals	6	101	394	

Peds Cross: \times
 South Peds: 0
 South Entering: 501
 South Leg Total: 631

Comments

Ontario Traffic Inc.

Mid-day Peak Diagram

Specified Period

From: 11:00:00
To: 14:00:00

One Hour Peak

From: 12:45:00
To: 13:45:00

Municipality: Bradford
Site #: 1724300020
Intersection: Simcoe Rd & Luxury Ave-Marshvie
TFR File #: 1
Count date: 16-Nov-17

Weather conditions:
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Simcoe Rd runs N/S

North Leg Total: 281
North Entering: 139
North Peds: 1
Peds Cross: \bowtie

Cyclists	0	1	0	1
Trucks	0	6	0	6
Cars	24	106	2	132
Totals	24	113	2	



Cyclists	1
Trucks	3
Cars	138
Totals	142

East Leg Total: 331
East Entering: 165
East Peds: 8
Peds Cross: \bowtie

Cyclists	Trucks	Cars	Totals
0	0	67	67

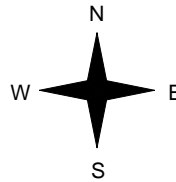


Simcoe Rd

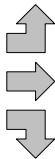
Cars	Trucks	Cyclists	Totals
6	1	0	7
37	0	0	37
118	3	0	121
161	4	0	



Luxury Ave-Marshview Blvd



Cyclists	Trucks	Cars	Totals
0	0	17	17
0	1	37	38
0	0	18	18
0	1	72	



Luxury Ave-Marshview Blvd



Cars	Trucks	Cyclists	Totals
164	2	0	166

Peds Cross: \bowtie
West Peds: 2
West Entering: 73
West Leg Total: 140

Cars	242	Cars	6	115	125	246
Trucks	9	Trucks	0	2	1	3
Cyclists	1	Cyclists	0	1	0	1
Totals	252	Totals	6	118	126	



Simcoe Rd



Peds Cross: \bowtie
South Peds: 1
South Entering: 250
South Leg Total: 502

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period

From: 16:00:00

To: 19:00:00

One Hour Peak

From: 17:15:00

To: 18:15:00

Municipality: Bradford
Site #: 1724300020
Intersection: Simcoe Rd & Luxury Ave-Marshvie
TFR File #: 1
Count date: 16-Nov-17

Weather conditions:
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Simcoe Rd runs N/S

North Leg Total: 429
 North Entering: 212
 North Peds: 7
 Peds Cross: \bowtie

Cyclists	0	1	0	1
Trucks	0	1	1	2
Cars	40	165	4	209
Totals	40	167	5	



Cyclists 1
 Trucks 2
 Cars 214
 Totals 217

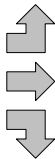
East Leg Total: 614
 East Entering: 455
 East Peds: 10
 Peds Cross: \bowtie

Cyclists	0	Trucks	1	Cars	163	Totals	164
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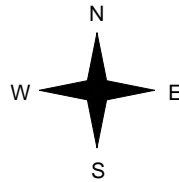


Luxury Ave-Marshview Blvd

Cyclists	0	Trucks	0	Cars	44	Totals	44
	0		0		33		33
	0		0		19		19
	0		0		96		



Simcoe Rd



Cars	24	Trucks	1	Cyclists	0	Totals	25
	115		0		0		115
	315		0		0		315
	454		1		0		

Luxury Ave-Marshview Blvd



Cars	158	Trucks	1	Cyclists	0	Totals	159
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Peds Cross: \bowtie
 West Peds: 4
 West Entering: 96
 West Leg Total: 260

Cars	499	Cars	8	146	121	275
Trucks	1	Trucks	1	1	0	2
Cyclists	1	Cyclists	0	1	0	1
Totals	501	Totals	9	148	121	



Peds Cross: \bowtie
 South Peds: 0
 South Entering: 278
 South Leg Total: 779

Comments

Ontario Traffic Inc.

Total Count Diagram

Municipality: Bradford
Site #: 1724300020
Intersection: Simcoe Rd & Luxury Ave-Marshvie
TFR File #: 1
Count date: 16-Nov-17

Weather conditions:
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Simcoe Rd runs N/S

North Leg Total: 2476
 North Entering: 1243
 North Peds: 22
 Peds Cross: \bowtie

Cyclists	0	6	0	6
Trucks	2	29	2	33
Cars	246	895	63	1204
Totals	248	930	65	

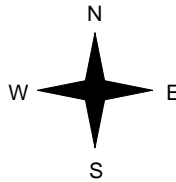


Cyclists	5
Trucks	27
Cars	1201
Totals	1233

East Leg Total: 3664
 East Entering: 1829
 East Peds: 50
 Peds Cross: \bowtie

Cyclists	Trucks	Cars	Totals
0	6	778	784

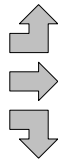
Luxury Ave-Marshview Blvd



Cars	Trucks	Cyclists	Totals
87	3	0	90
450	3	0	453
1269	17	0	1286
1806	23	0	



Cyclists	Trucks	Cars	Totals
0	4	199	203
0	1	407	408
0	2	128	130
0	7	734	



Simcoe Rd



Luxury Ave-Marshview Blvd



Cars	Trucks	Cyclists	Totals
1814	21	0	1835

Peds Cross: \bowtie
 West Peds: 20
 West Entering: 741
 West Leg Total: 1525

Cars	2292
Trucks	48
Cyclists	6
Totals	2346



Cars	82	915	1344	2341
Trucks	1	20	18	39
Cyclists	0	5	0	5
Totals	83	940	1362	

Peds Cross: \bowtie
 South Peds: 8
 South Entering: 2385
 South Leg Total: 4731

Comments

Ontario Traffic Inc. Traffic Count Summary

Intersection: Simcoe Rd & Luxury Ave-Marshvie		Count Date: 16-Nov-17			Municipality: Bradford							
North Approach Totals						South Approach Totals						
Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds	North/South Total Approaches	Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	25	68	17	110	5	606	8:00:00	6	96	394	496	0
9:00:00	11	111	30	152	3	541	9:00:00	15	125	249	389	2
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	4	110	16	130	2	364	12:00:00	14	92	128	234	1
13:00:00	7	95	37	139	0	346	13:00:00	2	105	100	207	0
14:00:00	4	97	26	127	3	368	14:00:00	10	106	125	241	1
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	5	134	47	186	1	456	17:00:00	19	128	123	270	2
18:00:00	5	156	35	196	7	489	18:00:00	11	148	134	293	1
19:00:00	4	159	40	203	1	458	19:00:00	6	140	109	255	1
Totals:	65	930	248	1243	22	3628		83	940	1362	2385	8
East Approach Totals						West Approach Totals						
Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds	East/West Total Approaches	Hour Ending	Includes Cars, Trucks, & Cyclists				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	40	7	4	51	6	190	8:00:00	21	111	7	139	2
9:00:00	67	23	3	93	6	235	9:00:00	34	95	13	142	2
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	91	29	7	127	4	189	12:00:00	17	37	8	62	2
13:00:00	86	30	11	127	5	200	13:00:00	19	33	21	73	1
14:00:00	130	36	5	171	10	233	14:00:00	16	32	14	62	2
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	263	120	14	397	3	483	17:00:00	20	38	28	86	4
18:00:00	305	115	24	444	11	537	18:00:00	41	30	22	93	3
19:00:00	304	93	22	419	5	503	19:00:00	35	32	17	84	4
Totals:	1286	453	90	1829	50	2570		203	408	130	741	20
Calculated Values for Traffic Crossing Major Street												
Hours Ending:	8:00	9:00	12:00	13:00		14:00	17:00	18:00	19:00			
Crossing Values:	177	201	148	138		186	406	469	434			

Ontario Traffic Inc.

Count Date: 16-Nov-17 Site #: 1724300020

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Cyclists - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	7	7	16	16	4	4	0	0	1	1	0	0	0	0	0	0	0	0	1	1
7:30:00	12	5	25	9	6	2	0	0	1	0	1	1	0	0	0	0	0	0	1	0
7:45:00	21	9	40	15	10	4	0	0	2	1	1	0	0	0	0	0	0	0	2	1
8:00:00	25	4	65	25	15	5	0	0	3	1	2	1	0	0	0	0	0	0	5	3
8:15:00	27	2	87	22	19	4	0	0	3	0	2	0	0	0	0	0	0	0	6	1
8:30:00	33	6	110	23	24	5	0	0	7	4	2	0	0	0	0	0	0	0	7	1
8:45:00	35	2	136	26	31	7	0	0	8	1	2	0	0	0	0	0	0	0	7	0
9:00:00	36	1	169	33	45	14	0	0	10	2	2	0	0	0	0	0	0	0	8	1
9:01:41	36	0	169	0	45	0	0	0	10	0	2	0	0	0	0	0	0	0	8	0
11:00:00	36	0	169	0	45	0	0	0	10	0	2	0	0	0	0	0	0	0	8	0
11:15:00	37	1	199	30	49	4	0	0	11	1	2	0	0	0	0	0	0	0	10	2
11:30:00	37	0	225	26	54	5	0	0	11	0	2	0	0	0	0	0	0	0	10	0
11:45:00	37	0	251	26	59	5	0	0	13	2	2	0	0	0	1	1	0	0	10	0
12:00:00	40	3	274	23	61	2	0	0	14	1	2	0	0	0	1	0	0	0	10	0
12:15:00	44	4	299	25	73	12	1	1	15	1	2	0	0	0	1	0	0	0	10	0
12:30:00	45	1	316	17	84	11	1	0	16	1	2	0	0	0	1	0	0	0	10	0
12:45:00	46	1	336	20	92	8	1	0	17	1	2	0	0	0	1	0	0	0	10	0
13:00:00	46	0	366	30	98	6	1	0	17	0	2	0	0	0	1	0	0	0	10	0
13:15:00	48	2	394	28	106	8	1	0	19	2	2	0	0	0	2	1	0	0	10	0
13:30:00	48	0	418	24	108	2	1	0	22	3	2	0	0	0	2	0	0	0	10	0
13:45:00	48	0	442	24	116	8	1	0	23	1	2	0	0	0	2	0	0	0	11	1
14:00:00	50	2	456	14	124	8	1	0	23	0	2	0	0	0	2	0	0	0	13	2
14:00:37	50	0	456	0	124	0	1	0	23	0	2	0	0	0	2	0	0	0	13	0
16:00:00	50	0	456	0	124	0	1	0	23	0	2	0	0	0	2	0	0	0	13	0
16:15:00	50	0	488	32	131	7	1	0	26	3	2	0	0	0	2	0	0	0	13	0
16:30:00	53	3	525	37	145	14	1	0	26	0	2	0	0	0	2	0	0	0	13	0
16:45:00	55	2	553	28	155	10	1	0	26	0	2	0	0	0	3	1	0	0	14	1
17:00:00	55	0	585	32	171	16	1	0	26	0	2	0	0	0	4	1	0	0	14	0
17:15:00	56	1	619	34	182	11	1	0	27	1	2	0	0	0	5	1	0	0	15	1
17:30:00	57	1	652	33	188	6	1	0	28	1	2	0	0	0	5	0	0	0	16	1
17:45:00	58	1	695	43	198	10	2	1	28	0	2	0	0	0	5	0	0	0	20	4
18:00:00	59	1	738	43	206	8	2	0	28	0	2	0	0	0	5	0	0	0	21	1
18:15:00	60	1	784	46	222	16	2	0	28	0	2	0	0	0	6	1	0	0	22	1
18:30:00	60	0	812	28	227	5	2	0	28	0	2	0	0	0	6	0	0	0	22	0
18:45:00	60	0	853	41	234	7	2	0	28	0	2	0	0	0	6	0	0	0	22	0
19:00:00	63	3	895	42	246	12	2	0	29	1	2	0	0	0	6	0	0	0	22	0
19:15:00	63	0	895	0	246	0	2	0	29	0	2	0	0	0	6	0	0	0	22	0
19:16:18	63	0	895	0	246	0	2	0	29	0	2	0	0	0	6	0	0	0	22	0

Ontario Traffic Inc.

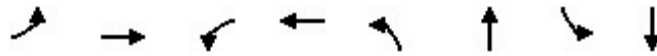
Count Date: 16-Nov-17 Site #: 1724300020

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Cyclists - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	23	23	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	1	0	43	20	205	106	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	4	3	68	25	317	112	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	6	2	95	27	394	77	0	0	1	1	0	0	0	0	0	0	0	0	0	0
8:15:00	7	1	122	27	493	99	0	0	2	1	0	0	0	0	0	0	0	0	0	0
8:30:00	9	2	152	30	540	47	0	0	3	1	1	1	0	0	0	0	0	0	0	0
8:45:00	17	8	182	30	598	58	0	0	3	0	3	2	0	0	0	0	0	0	2	2
9:00:00	21	4	217	35	640	42	0	0	4	1	3	0	0	0	0	0	0	0	2	0
9:01:41	21	0	217	0	640	0	0	0	4	0	3	0	0	0	0	0	0	0	2	0
11:00:00	21	0	217	0	640	0	0	0	4	0	3	0	0	0	0	0	0	0	2	0
11:15:00	24	3	238	21	672	32	0	0	4	0	6	3	0	0	0	0	0	0	2	0
11:30:00	26	2	259	21	715	43	0	0	5	1	7	1	0	0	0	0	0	0	3	1
11:45:00	29	3	282	23	741	26	0	0	6	1	9	2	0	0	0	0	0	0	3	0
12:00:00	35	6	303	21	761	20	0	0	10	4	10	1	0	0	0	0	0	0	3	0
12:15:00	35	0	328	25	779	18	0	0	10	0	11	1	0	0	0	0	0	0	3	0
12:30:00	36	1	340	12	796	17	0	0	10	0	11	0	0	0	0	0	0	0	3	0
12:45:00	36	0	364	24	828	32	0	0	12	2	13	2	0	0	0	0	0	0	3	0
13:00:00	37	1	404	40	858	30	0	0	14	2	13	0	0	0	0	0	0	0	3	0
13:15:00	40	3	436	32	885	27	0	0	14	0	13	0	0	0	1	1	0	0	3	0
13:30:00	42	2	460	24	918	33	0	0	14	0	13	0	0	0	1	0	0	0	3	0
13:45:00	42	0	479	19	953	35	0	0	14	0	14	1	0	0	1	0	0	0	4	1
14:00:00	47	5	509	30	981	28	0	0	14	0	15	1	0	0	1	0	0	0	4	0
14:00:37	47	0	509	0	981	0	0	0	14	0	15	0	0	0	1	0	0	0	4	0
16:00:00	47	0	509	0	981	0	0	0	14	0	15	0	0	0	1	0	0	0	4	0
16:15:00	53	6	541	32	1016	35	0	0	16	2	15	0	0	0	1	0	0	0	5	1
16:30:00	55	2	565	24	1041	25	0	0	18	2	17	2	0	0	1	0	0	0	5	0
16:45:00	58	3	593	28	1068	27	0	0	18	0	17	0	0	0	3	2	0	0	5	0
17:00:00	66	8	631	38	1102	34	0	0	18	0	17	0	0	0	3	0	0	0	6	1
17:15:00	68	2	664	33	1140	38	0	0	18	0	18	1	0	0	3	0	0	0	7	1
17:30:00	73	5	701	37	1169	29	1	1	19	1	18	0	0	0	4	1	0	0	7	0
17:45:00	73	0	740	39	1205	36	1	0	19	0	18	0	0	0	4	0	0	0	7	0
18:00:00	76	3	777	37	1235	30	1	0	19	0	18	0	0	0	4	0	0	0	7	0
18:15:00	76	0	810	33	1261	26	1	0	19	0	18	0	0	0	4	0	0	0	7	0
18:30:00	79	3	842	32	1286	25	1	0	19	0	18	0	0	0	4	0	0	0	8	1
18:45:00	79	0	880	38	1310	24	1	0	19	0	18	0	0	0	4	0	0	0	8	0
19:00:00	82	3	915	35	1344	34	1	0	20	1	18	0	0	0	5	1	0	0	8	0
19:15:00	82	0	915	0	1344	0	1	0	20	0	18	0	0	0	5	0	0	0	8	0
19:16:18	82	0	915	0	1344	0	1	0	20	0	18	0	0	0	5	0	0	0	8	0

Appendix C – Synchro Analysis Output – Existing Traffic Volumes

125 Simcoe Road
 3: Simcoe RD & Luxury AVE/Marshview BLVD

Queues
 Existing (2022) AM Peak Hour

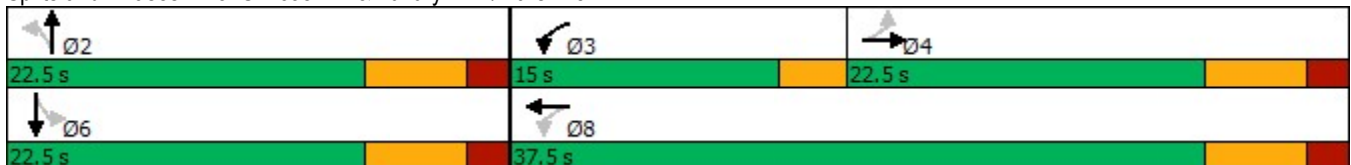


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↔		↔
Traffic Volume (vph)	26	122	56	11	7	112	22	81
Future Volume (vph)	26	122	56	11	7	112	22	81
Lane Group Flow (vph)	28	142	61	19	0	606	0	133
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	8.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	15.0	37.5	22.5	22.5	22.5	22.5
Total Split (%)	37.5%	37.5%	25.0%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	4.5	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5	3.0	6.5		6.5		6.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.11	0.40	0.19	0.05		0.36		0.10
Control Delay	17.2	19.9	14.3	11.1		4.1		10.5
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	17.2	19.9	14.3	11.1		4.1		10.5
Queue Length 50th (m)	2.1	10.8	4.9	1.0		4.1		3.5
Queue Length 95th (m)	7.2	23.6	7.2	3.4		14.9		9.2
Internal Link Dist (m)		59.9		87.7		71.3		54.1
Turn Bay Length (m)	27.0							
Base Capacity (vph)	485	666	505	1303		1695		1380
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.06	0.21	0.12	0.01		0.36		0.10

Intersection Summary

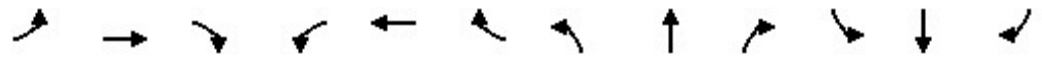
Cycle Length: 60
 Actuated Cycle Length: 45.3
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 3: Simcoe RD & Luxury AVE/Marshview BLVD



125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

HCM Signalized Intersection Capacity Analysis
Existing (2022) AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	26	122	8	56	11	6	7	112	438	22	81	19
Future Volume (vph)	26	122	8	56	11	6	7	112	438	22	81	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99			0.98			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.94			0.88			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1726	1848		1703	1784			3120			3348	
Flt Permitted	0.75	1.00		0.47	1.00			0.95			0.83	
Satd. Flow (perm)	1354	1848		843	1784			2970			2798	
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)	28	133	9	61	12	7	8	122	476	24	88	21
RTOR Reduction (vph)	0	5	0	0	5	0	0	272	0	0	12	0
Lane Group Flow (vph)	28	137	0	61	14	0	0	334	0	0	121	0
Confl. Peds. (#/hr)	6					6	2		9	9		2
Heavy Vehicles (%)	4%	0%	29%	6%	0%	0%	0%	2%	0%	0%	3%	12%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.2	7.2		14.4	14.4			20.6			20.6	
Effective Green, g (s)	7.2	7.2		14.4	14.4			20.6			20.6	
Actuated g/C Ratio	0.15	0.15		0.30	0.30			0.43			0.43	
Clearance Time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	203	277		328	535			1274			1200	
v/s Ratio Prot		c0.07		c0.02	0.01							
v/s Ratio Perm	0.02			0.04				c0.11			0.04	
v/c Ratio	0.14	0.49		0.19	0.03			0.26			0.10	
Uniform Delay, d1	17.7	18.7		12.3	11.9			8.8			8.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	1.4		0.3	0.0			0.5			0.2	
Delay (s)	18.0	20.1		12.6	11.9			9.3			8.3	
Level of Service	B	C		B	B			A			A	
Approach Delay (s)		19.8			12.4			9.3			8.3	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

125 Simcoe Road
 3: Simcoe RD & Luxury AVE/Marshview BLVD

Queues
 Existing (2022) PM Peak Hour

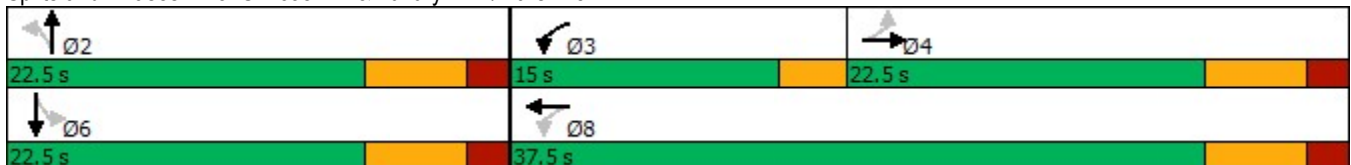


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↔		↔
Traffic Volume (vph)	49	37	350	128	10	165	6	186
Future Volume (vph)	49	37	350	128	10	165	6	186
Lane Group Flow (vph)	53	63	376	168	0	333	0	253
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	8.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	15.0	37.5	22.5	22.5	22.5	22.5
Total Split (%)	37.5%	37.5%	25.0%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	4.5	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5	3.0	6.5		6.5		6.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.20	0.20	0.61	0.26		0.27		0.21
Control Delay	20.5	15.1	13.4	8.9		8.4		11.1
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	20.5	15.1	13.4	8.9		8.4		11.1
Queue Length 50th (m)	4.6	3.5	20.6	7.8		6.8		7.6
Queue Length 95th (m)	12.5	11.8	36.3	16.9		16.2		16.2
Internal Link Dist (m)		59.9		87.7		71.3		54.1
Turn Bay Length (m)	27.0							
Base Capacity (vph)	583	667	665	1296		1223		1210
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.09	0.09	0.57	0.13		0.27		0.21

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 45.8
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 3: Simcoe RD & Luxury AVE/Marshview BLVD



125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

HCM Signalized Intersection Capacity Analysis
Existing (2022) PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	37	21	350	128	28	10	165	135	6	186	44
Future Volume (vph)	49	37	21	350	128	28	10	165	135	6	186	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.97			0.93			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1795	1796		1805	1830			3307			3444	
Flt Permitted	0.85	1.00		0.52	1.00			0.94			0.94	
Satd. Flow (perm)	1608	1796		987	1830			3113			3253	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	53	40	23	376	138	30	11	177	145	6	200	47
RTOR Reduction (vph)	0	21	0	0	17	0	0	95	0	0	30	0
Lane Group Flow (vph)	53	42	0	376	152	0	0	238	0	0	223	0
Confl. Peds. (#/hr)	8					8	4		11	11		4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	11%	1%	0%	20%	1%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	4.7	4.7		18.9	18.9			16.7			16.7	
Effective Green, g (s)	4.7	4.7		18.9	18.9			16.7			16.7	
Actuated g/C Ratio	0.10	0.10		0.39	0.39			0.34			0.34	
Clearance Time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	155	173		572	711			1069			1117	
v/s Ratio Prot		0.02		c0.15	0.08							
v/s Ratio Perm	0.03			c0.10				c0.08			0.07	
v/c Ratio	0.34	0.24		0.66	0.21			0.22			0.20	
Uniform Delay, d1	20.5	20.3		11.6	9.9			11.3			11.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.3	0.7		2.7	0.2			0.5			0.4	
Delay (s)	21.8	21.0		14.3	10.0			11.8			11.6	
Level of Service	C	C		B	B			B			B	
Approach Delay (s)		21.4			13.0			11.8			11.6	
Approach LOS		C			B			B			B	

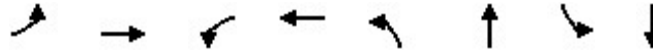
Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	48.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Appendix D – Synchro Analysis Output – Background Traffic Volumes

125 Simcoe Road
 3: Simcoe RD & Luxury AVE/Marshview BLVD

Queues
 BG (2024) AM Peak Hour

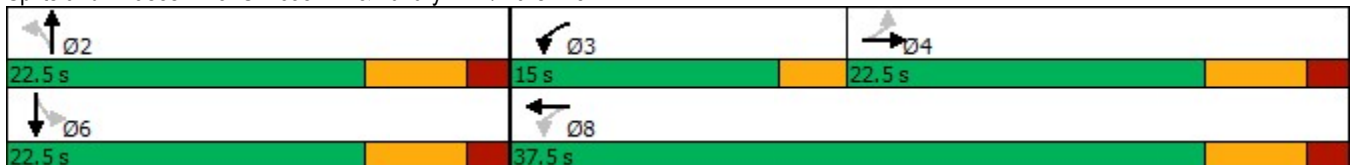


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	27	127	58	11	7	117	22	85
Future Volume (vph)	27	127	58	11	7	117	22	85
Lane Group Flow (vph)	29	147	63	19	0	632	0	138
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	8.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	15.0	37.5	22.5	22.5	22.5	22.5
Total Split (%)	37.5%	37.5%	25.0%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	4.5	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5	3.0	6.5		6.5		6.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.11	0.40	0.20	0.05		0.37		0.10
Control Delay	17.1	20.0	14.3	11.1		4.1		10.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	17.1	20.0	14.3	11.1		4.1		10.6
Queue Length 50th (m)	2.2	11.3	5.1	1.0		4.3		3.6
Queue Length 95th (m)	7.4	24.4	7.4	3.3		15.5		9.5
Internal Link Dist (m)		59.9		87.7		71.3		54.1
Turn Bay Length (m)	27.0							
Base Capacity (vph)	486	669	507	1307		1696		1369
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.06	0.22	0.12	0.01		0.37		0.10

Intersection Summary

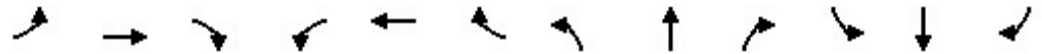
Cycle Length: 60
 Actuated Cycle Length: 45.3
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 3: Simcoe RD & Luxury AVE/Marshview BLVD



125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

HCM Signalized Intersection Capacity Analysis
BG (2024) AM Peak Hour



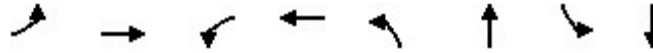
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	27	127	8	58	11	6	7	117	457	22	85	20
Future Volume (vph)	27	127	8	58	11	6	7	117	457	22	85	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99			0.98			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.94			0.88			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1726	1850		1703	1784			3120			3347	
Flt Permitted	0.75	1.00		0.47	1.00			0.95			0.83	
Satd. Flow (perm)	1354	1850		846	1784			2970			2793	
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)	29	138	9	63	12	7	8	127	497	24	92	22
RTOR Reduction (vph)	0	4	0	0	5	0	0	285	0	0	13	0
Lane Group Flow (vph)	29	143	0	63	14	0	0	347	0	0	125	0
Confl. Peds. (#/hr)	6					6	2		9	9		2
Heavy Vehicles (%)	4%	0%	29%	6%	0%	0%	0%	2%	0%	0%	3%	12%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.4	7.4		14.6	14.6			20.5			20.5	
Effective Green, g (s)	7.4	7.4		14.6	14.6			20.5			20.5	
Actuated g/C Ratio	0.15	0.15		0.30	0.30			0.43			0.43	
Clearance Time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	208	284		331	541			1265			1190	
v/s Ratio Prot		c0.08		c0.02	0.01							
v/s Ratio Perm	0.02			0.04				c0.12			0.04	
v/c Ratio	0.14	0.50		0.19	0.03			0.27			0.11	
Uniform Delay, d1	17.6	18.7		12.2	11.8			9.0			8.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	1.4		0.3	0.0			0.5			0.2	
Delay (s)	17.9	20.1		12.5	11.8			9.5			8.5	
Level of Service	B	C		B	B			A			A	
Approach Delay (s)		19.7			12.3			9.5			8.5	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	48.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

125 Simcoe Road
 3: Simcoe RD & Luxury AVE/Marshview BLVD

Queues
 BG (2024) PM Peak Hour

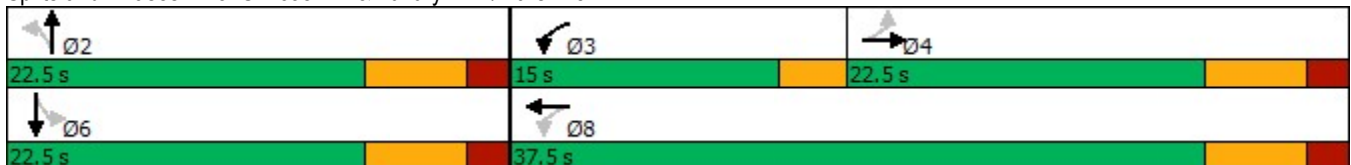


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	51	39	365	134	10	172	6	194
Future Volume (vph)	51	39	365	134	10	172	6	194
Lane Group Flow (vph)	55	66	392	175	0	348	0	264
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	8.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	15.0	37.5	22.5	22.5	22.5	22.5
Total Split (%)	37.5%	37.5%	25.0%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	4.5	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5	3.0	6.5		6.5		6.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.28	0.21	0.63	0.24		0.30		0.23
Control Delay	23.2	15.3	13.2	8.5		8.9		12.0
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	23.2	15.3	13.2	8.5		8.9		12.0
Queue Length 50th (m)	4.9	3.7	21.8	8.2		7.2		8.1
Queue Length 95th (m)	13.3	12.1	38.1	17.6		16.8		16.8
Internal Link Dist (m)		59.9		87.7		71.3		54.1
Turn Bay Length (m)	27.0							
Base Capacity (vph)	414	624	665	1210		1154		1132
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.13	0.11	0.59	0.14		0.30		0.23

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 48.6
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 3: Simcoe RD & Luxury AVE/Marshview BLVD



125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

HCM Signalized Intersection Capacity Analysis
BG (2024) PM Peak Hour



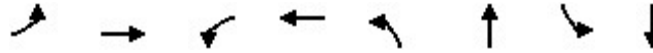
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	51	39	22	365	134	29	10	172	141	6	194	46
Future Volume (vph)	51	39	22	365	134	29	10	172	141	6	194	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.97			0.93			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1794	1796		1805	1830			3306			3445	
Flt Permitted	0.65	1.00		0.48	1.00			0.94			0.94	
Satd. Flow (perm)	1222	1796		919	1830			3112			3253	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	55	42	24	392	144	31	11	185	152	6	209	49
RTOR Reduction (vph)	0	21	0	0	16	0	0	102	0	0	30	0
Lane Group Flow (vph)	55	45	0	392	159	0	0	246	0	0	234	0
Confl. Peds. (#/hr)	8					8	4		11	11		4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	11%	1%	0%	20%	1%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.3	6.3		20.5	20.5			16.5			16.5	
Effective Green, g (s)	6.3	6.3		20.5	20.5			16.5			16.5	
Actuated g/C Ratio	0.13	0.13		0.41	0.41			0.33			0.33	
Clearance Time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	153	226		575	750			1026			1073	
v/s Ratio Prot		0.03		c0.15	0.09							
v/s Ratio Perm	0.05			c0.13				c0.08			0.07	
v/c Ratio	0.36	0.20		0.68	0.21			0.24			0.22	
Uniform Delay, d1	20.0	19.6		11.2	9.5			12.2			12.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.4	0.4		3.3	0.1			0.6			0.5	
Delay (s)	21.4	20.0		14.6	9.7			12.7			12.6	
Level of Service	C	C		B	A			B			B	
Approach Delay (s)		20.7			13.1			12.7			12.6	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

125 Simcoe Road
 3: Simcoe RD & Luxury AVE/Marshview BLVD

Queues
 BG (2034) AM Peak Hour

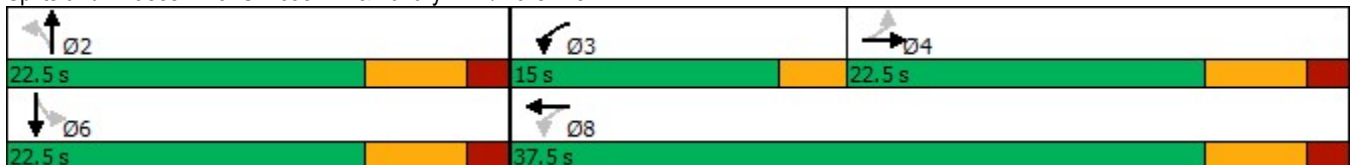


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	34	157	72	14	9	145	28	105
Future Volume (vph)	34	157	72	14	9	145	28	105
Lane Group Flow (vph)	37	182	78	24	0	782	0	171
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	8.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	15.0	37.5	22.5	22.5	22.5	22.5
Total Split (%)	37.5%	37.5%	25.0%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	4.5	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5	3.0	6.5		6.5		6.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.13	0.46	0.23	0.07		0.45		0.13
Control Delay	17.1	20.5	14.9	11.2		4.5		11.3
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	17.1	20.5	14.9	11.2		4.5		11.3
Queue Length 50th (m)	2.9	14.7	6.5	1.3		5.7		4.8
Queue Length 95th (m)	8.8	29.6	8.5	3.8		18.8		12.0
Internal Link Dist (m)		59.9		87.7		71.3		54.1
Turn Bay Length (m)	27.0							
Base Capacity (vph)	481	664	508	1297		1723		1277
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.08	0.27	0.15	0.02		0.45		0.13

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 46
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 3: Simcoe RD & Luxury AVE/Marshview BLVD



125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

HCM Signalized Intersection Capacity Analysis
BG (2034) AM Peak Hour



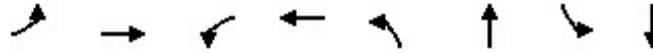
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	34	157	10	72	14	8	9	145	565	28	105	25
Future Volume (vph)	34	157	10	72	14	8	9	145	565	28	105	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99			0.98			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.94			0.88			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1726	1850		1703	1781			3120			3349	
Flt Permitted	0.74	1.00		0.47	1.00			0.95			0.79	
Satd. Flow (perm)	1348	1850		843	1781			2968			2675	
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)	37	171	11	78	15	9	10	158	614	30	114	27
RTOR Reduction (vph)	0	4	0	0	6	0	0	361	0	0	16	0
Lane Group Flow (vph)	37	178	0	78	18	0	0	421	0	0	155	0
Confl. Peds. (#/hr)	6					6	2		9	9		2
Heavy Vehicles (%)	4%	0%	29%	6%	0%	0%	0%	2%	0%	0%	3%	12%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.2	8.2		15.6	15.6			20.1			20.1	
Effective Green, g (s)	8.2	8.2		15.6	15.6			20.1			20.1	
Actuated g/C Ratio	0.17	0.17		0.32	0.32			0.41			0.41	
Clearance Time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	226	311		347	570			1224			1104	
v/s Ratio Prot		c0.10		c0.02	0.01							
v/s Ratio Perm	0.03			0.05				c0.14			0.06	
v/c Ratio	0.16	0.57		0.22	0.03			0.34			0.14	
Uniform Delay, d1	17.3	18.6		11.9	11.4			9.8			8.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	2.5		0.3	0.0			0.8			0.3	
Delay (s)	17.7	21.2		12.2	11.4			10.6			9.2	
Level of Service	B	C		B	B			B			A	
Approach Delay (s)		20.6			12.0			10.6			9.2	
Approach LOS		C			B			B			A	

Intersection Summary		
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.39	B
Actuated Cycle Length (s)	48.7	Sum of lost time (s)
Intersection Capacity Utilization	57.2%	16.0
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

125 Simcoe Road
 3: Simcoe RD & Luxury AVE/Marshview BLVD

Queues
 BG (2034) PM Peak Hour

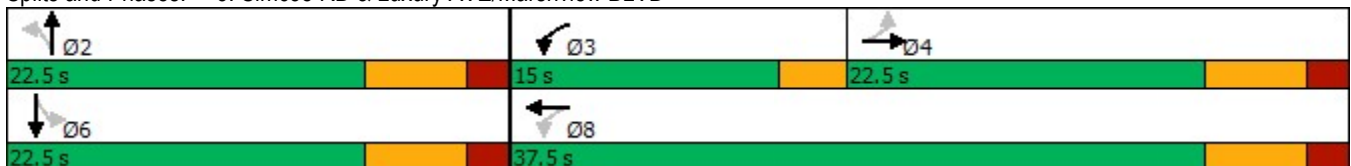


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	63	48	452	165	13	213	8	240
Future Volume (vph)	63	48	452	165	13	213	8	240
Lane Group Flow (vph)	68	81	486	216	0	430	0	328
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	8.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	15.0	37.5	22.5	22.5	22.5	22.5
Total Split (%)	37.5%	37.5%	25.0%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	4.5	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5	3.0	6.5		6.5		6.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.34	0.25	0.75	0.29		0.37		0.30
Control Delay	24.3	15.4	17.3	8.9		9.5		13.3
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	24.3	15.4	17.3	8.9		9.5		13.3
Queue Length 50th (m)	6.1	4.5	28.8	10.8		9.3		11.0
Queue Length 95th (m)	15.5	13.8	#49.8	21.4		20.8		21.6
Internal Link Dist (m)		59.9		87.7		71.3		54.1
Turn Bay Length (m)	27.0							
Base Capacity (vph)	387	612	667	1178		1147		1094
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.18	0.13	0.73	0.18		0.37		0.30

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 49.8
 Natural Cycle: 60
 Control Type: Semi Act-Uncoord
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Simcoe RD & Luxury AVE/Marshview BLVD



125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

HCM Signalized Intersection Capacity Analysis
BG (2034) PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	48	27	452	165	36	13	213	174	8	240	57
Future Volume (vph)	63	48	27	452	165	36	13	213	174	8	240	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.97			0.93			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1795	1798		1805	1829			3306			3441	
Flt Permitted	0.62	1.00		0.49	1.00			0.94			0.94	
Satd. Flow (perm)	1177	1798		933	1829			3098			3227	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	68	52	29	486	177	39	14	229	187	9	258	61
RTOR Reduction (vph)	0	25	0	0	16	0	0	127	0	0	31	0
Lane Group Flow (vph)	68	56	0	486	200	0	0	303	0	0	297	0
Confl. Peds. (#/hr)	8					8	4		11	11		4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	11%	1%	0%	20%	1%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.9	6.9		21.7	21.7			16.4			16.4	
Effective Green, g (s)	6.9	6.9		21.7	21.7			16.4			16.4	
Actuated g/C Ratio	0.14	0.14		0.42	0.42			0.32			0.32	
Clearance Time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	158	242		597	776			994			1035	
v/s Ratio Prot		0.03		c0.19	0.11							
v/s Ratio Perm	0.06			c0.16				c0.10			0.09	
v/c Ratio	0.43	0.23		0.81	0.26			0.30			0.29	
Uniform Delay, d1	20.3	19.7		11.7	9.5			13.1			13.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.9	0.5		8.4	0.2			0.8			0.7	
Delay (s)	22.2	20.2		20.1	9.7			13.9			13.7	
Level of Service	C	C		C	A			B			B	
Approach Delay (s)		21.1			16.9			13.9			13.7	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix E – Transportation Tomorrow Survey – Excerpt



TTS Cross Tabulation

Cross Tabulation Query Form - Trip - 2016 v1.1

Filter Variables

2006 GTA zone of desti... x 2006 GTA zone of hous... x (Optional) Table Attribute

Group Attributes

Row Grouping Column Grouping Table Grouping
Grouping file: Choose File No file chosen

Filter Selection +

2006 GTA zone of household In 8564
And
Start time of trip In 0700-0900
And
Trip purpose of destination In w,r

Add Delete

Output

Comma-delimited table Column format Expansion Factor On Click to Select Load Load

Execute Query Select All Save As

Tue Feb 01 2022 14:04:48 GMT-0500 (Eastern Standard Time) - Run Time: 2602ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of household - gta06_hhld

Filters:
(2006 GTA zone of household - gta06_hhld In 8564
and
Start time of trip - start_time In 0700-0900
and
Trip purpose of destination - purp_dest In w,r)

Trip 2016
Table:

,8564
56,6
312,5
379,29
2003,18
2053,14
2071,22
2083,60
2112,20
2142,21
2210,11
2271,46
2559,88
2560,52
2606,54
2611,11
2617,13
2619,28
2620,96
2621,20
2624,16
2672,37
2752,10
2763,21
2772,11
2776,14
3332,17
3611,14
3707,14
8514,14
8527,17
8564,30
8565,58
8599,17
8620,34
8627,18
8631,20
8635,20



TTS Cross Tabulation

Cross Tabulation Query Form - Trip - 2016 v1.1

Filter Variables

Group Attributes

Grouping file: No file chosen

Filter Selection +

2006 GTA zone of destination In 8564
 And
 Start time of trip In 0700-0900
 And
 Trip purpose of destination In w,r.

Output

Comma-delimited table
 Column format

Tue Feb 01 2022 14:02:40 GMT-0500 (Eastern Standard Time) - Run Time: 2448ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of household - gta06_hhld
Column: 2006 GTA zone of destination - gta06_dest

Filters:
 (2006 GTA zone of destination - gta06_dest In 8564
 and
 Start time of trip - start_time In 0700-0900
 and
 Trip purpose of destination - purp_dest In w,r,)

Trip 2016
Table:

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,8564
2610,41
2774,26
2873,36
8526,13
8530,24
8560,14
8564,30
8565,49
8585,26
8597,17
8635,21
8640,35
8641,12

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Appendix F – Synchro Analysis Output – Total Traffic Volumes

125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

Queues
Total (2024) AM Peak Hour

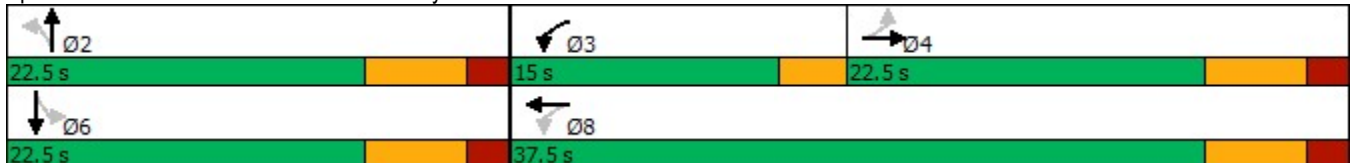


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	27	127	58	11	7	119	33	88
Future Volume (vph)	27	127	58	11	7	119	33	88
Lane Group Flow (vph)	29	147	63	24	0	634	0	154
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	8.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	15.0	37.5	22.5	22.5	22.5	22.5
Total Split (%)	37.5%	37.5%	25.0%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	4.5	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5	3.0	6.5		6.5		6.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.11	0.40	0.20	0.07		0.37		0.12
Control Delay	17.1	19.9	14.3	10.1		4.1		10.8
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	17.1	19.9	14.3	10.1		4.1		10.8
Queue Length 50th (m)	2.2	11.3	5.1	1.0		4.3		4.2
Queue Length 95th (m)	7.4	24.4	7.4	3.7		15.6		10.6
Internal Link Dist (m)		59.9		87.7		71.3		54.1
Turn Bay Length (m)	27.0							
Base Capacity (vph)	486	671	509	1282		1693		1296
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.06	0.22	0.12	0.02		0.37		0.12

Intersection Summary

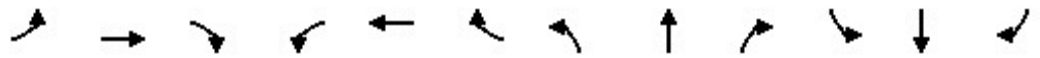
Cycle Length: 60
 Actuated Cycle Length: 45.2
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 3: Simcoe RD & Luxury AVE/Marshview BLVD



125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

HCM Signalized Intersection Capacity Analysis
Total (2024) AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	27	127	8	58	11	11	7	119	457	33	88	20
Future Volume (vph)	27	127	8	58	11	11	7	119	457	33	88	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99			0.98			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.93			0.88			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1727	1850		1703	1742			3121			3357	
Flt Permitted	0.74	1.00		0.47	1.00			0.95			0.78	
Satd. Flow (perm)	1348	1850		846	1742			2971			2650	
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)	29	138	9	63	12	12	8	129	497	36	96	22
RTOR Reduction (vph)	0	4	0	0	8	0	0	286	0	0	13	0
Lane Group Flow (vph)	29	143	0	63	16	0	0	348	0	0	141	0
Confl. Peds. (#/hr)	6					6	2		9	9		2
Heavy Vehicles (%)	4%	0%	29%	6%	0%	0%	0%	2%	0%	0%	3%	12%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.4	7.4		14.5	14.5			20.3			20.3	
Effective Green, g (s)	7.4	7.4		14.5	14.5			20.3			20.3	
Actuated g/C Ratio	0.15	0.15		0.30	0.30			0.42			0.42	
Clearance Time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	208	286		330	528			1261			1125	
v/s Ratio Prot		c0.08		c0.02	0.01							
v/s Ratio Perm	0.02			0.04				c0.12			0.05	
v/c Ratio	0.14	0.50		0.19	0.03			0.28			0.13	
Uniform Delay, d1	17.4	18.5		12.1	11.7			9.0			8.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	1.4		0.3	0.0			0.5			0.2	
Delay (s)	17.8	19.9		12.4	11.7			9.5			8.6	
Level of Service	B	B		B	B			A			A	
Approach Delay (s)		19.5			12.2			9.5			8.6	
Approach LOS		B			B			A			A	











Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	47.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

125 Simcoe Road
6: Simcoe RD & Site Access

HCM Unsignalized Intersection Capacity Analysis

Total (2024) AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	13	4	149	7	6	127
Future Volume (Veh/h)	13	4	149	7	6	127
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)	14	4	162	8	7	138
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	249	85			170	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	249	85			170	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	714	957			1405	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	18	108	62	53	92	
Volume Left	14	0	0	7	0	
Volume Right	4	0	8	0	0	
cSH	757	1700	1700	1405	1700	
Volume to Capacity	0.02	0.06	0.04	0.00	0.05	
Queue Length 95th (m)	0.6	0.0	0.0	0.1	0.0	
Control Delay (s)	9.9	0.0	0.0	1.0	0.0	
Lane LOS	A			A		
Approach Delay (s)	9.9	0.0		0.4		
Approach LOS	A					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			17.9%		ICU Level of Service	A
Analysis Period (min)			15			

125 Simcoe Road
 3: Simcoe RD & Luxury AVE/Marshview BLVD

Queues
 Total (2024) PM Peak Hour

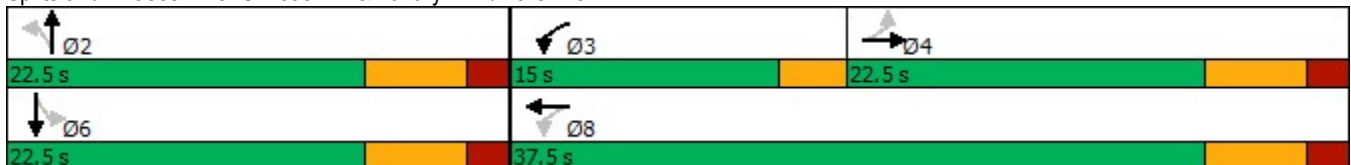


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	52	39	365	134	10	175	14	196
Future Volume (vph)	52	39	365	134	10	175	14	196
Lane Group Flow (vph)	56	66	392	184	0	351	0	275
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	8.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	15.0	37.5	22.5	22.5	22.5	22.5
Total Split (%)	37.5%	37.5%	25.0%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	4.5	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5	3.0	6.5		6.5		6.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.29	0.21	0.63	0.25		0.30		0.25
Control Delay	23.3	15.3	13.2	8.3		9.0		12.4
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	23.3	15.3	13.2	8.3		9.0		12.4
Queue Length 50th (m)	5.0	3.7	21.8	8.4		7.3		8.7
Queue Length 95th (m)	13.4	12.1	38.1	17.9		17.1		17.9
Internal Link Dist (m)		59.9		87.7		71.3		54.1
Turn Bay Length (m)	27.0							
Base Capacity (vph)	409	624	665	1201		1154		1098
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.14	0.11	0.59	0.15		0.30		0.25

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 48.7
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 3: Simcoe RD & Luxury AVE/Marshview BLVD



125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

HCM Signalized Intersection Capacity Analysis
Total (2024) PM Peak Hour













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	52	39	22	365	134	37	10	175	141	14	196	46
Future Volume (vph)	52	39	22	365	134	37	10	175	141	14	196	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.97			0.94			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1795	1796		1805	1815			3308			3423	
Flt Permitted	0.64	1.00		0.48	1.00			0.94			0.92	
Satd. Flow (perm)	1212	1796		919	1815			3113			3164	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	56	42	24	392	144	40	11	188	152	15	211	49
RTOR Reduction (vph)	0	21	0	0	20	0	0	102	0	0	28	0
Lane Group Flow (vph)	56	45	0	392	164	0	0	249	0	0	247	0
Confl. Peds. (#/hr)	8					8	4		11	11		4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	11%	1%	0%	20%	1%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.3	6.3		20.5	20.5			16.5			16.5	
Effective Green, g (s)	6.3	6.3		20.5	20.5			16.5			16.5	
Actuated g/C Ratio	0.13	0.13		0.41	0.41			0.33			0.33	
Clearance Time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	152	226		575	744			1027			1044	
v/s Ratio Prot		0.03		c0.15	0.09							
v/s Ratio Perm	0.05			c0.13				c0.08			0.08	
v/c Ratio	0.37	0.20		0.68	0.22			0.24			0.24	
Uniform Delay, d1	20.0	19.6		11.2	9.6			12.2			12.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.5	0.4		3.3	0.2			0.6			0.5	
Delay (s)	21.5	20.0		14.6	9.7			12.8			12.7	
Level of Service	C	C		B	A			B			B	
Approach Delay (s)		20.7			13.0			12.8			12.7	
Approach LOS		C			B			B			B	

Intersection Summary

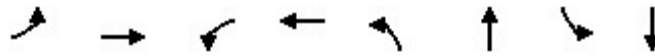
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	7	251	12	5	246
Future Volume (Veh/h)	10	7	251	12	5	246
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)	11	8	273	13	5	267
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh						
Upstream signal (m)			78			
pX, platoon unblocked						
vC, conflicting volume	423	143			286	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	423	143			286	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	557	879			1273	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	19	182	104	94	178	
Volume Left	11	0	0	5	0	
Volume Right	8	0	13	0	0	
cSH	658	1700	1700	1273	1700	
Volume to Capacity	0.03	0.11	0.06	0.00	0.10	
Queue Length 95th (m)	0.7	0.0	0.0	0.1	0.0	
Control Delay (s)	10.6	0.0	0.0	0.4	0.0	
Lane LOS	B			A		
Approach Delay (s)	10.6	0.0			0.2	
Approach LOS	B					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			20.4%		ICU Level of Service	A
Analysis Period (min)			15			

125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

Queues
Total (2034) PM Peak Hour

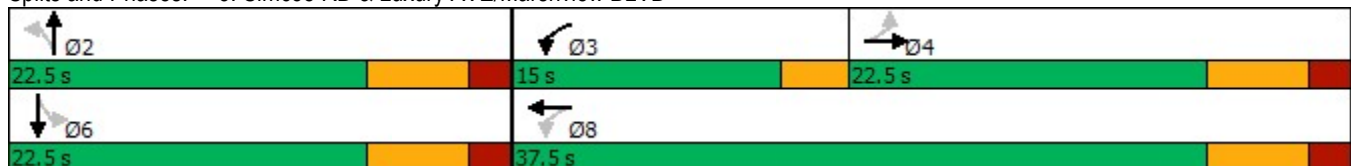


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	64	48	452	165	13	216	16	242
Future Volume (vph)	64	48	452	165	13	216	16	242
Lane Group Flow (vph)	69	81	486	224	0	433	0	338
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	8.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	15.0	37.5	22.5	22.5	22.5	22.5
Total Split (%)	37.5%	37.5%	25.0%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	4.5	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5	3.0	6.5		6.5		6.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.35	0.25	0.75	0.30		0.38		0.32
Control Delay	24.5	15.4	17.3	8.8		9.5		13.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	24.5	15.4	17.3	8.8		9.5		13.6
Queue Length 50th (m)	6.2	4.5	28.8	10.9		9.4		11.5
Queue Length 95th (m)	15.7	13.8	#49.8	21.9		21.0		22.6
Internal Link Dist (m)		59.9		87.7		71.3		54.1
Turn Bay Length (m)	27.0							
Base Capacity (vph)	385	611	667	1173		1145		1066
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.18	0.13	0.73	0.19		0.38		0.32

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 49.8
 Natural Cycle: 60
 Control Type: Semi Act-Uncoord
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Simcoe RD & Luxury AVE/Marshview BLVD



125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

HCM Signalized Intersection Capacity Analysis
Total (2034) PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	48	27	452	165	44	13	216	174	16	242	57
Future Volume (vph)	64	48	27	452	165	44	13	216	174	16	242	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.97			0.94			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1795	1798		1805	1817			3308			3425	
Flt Permitted	0.62	1.00		0.49	1.00			0.94			0.92	
Satd. Flow (perm)	1169	1798		933	1817			3099			3149	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	69	52	29	486	177	47	14	232	187	17	260	61
RTOR Reduction (vph)	0	25	0	0	19	0	0	127	0	0	29	0
Lane Group Flow (vph)	69	56	0	486	205	0	0	306	0	0	309	0
Confl. Peds. (#/hr)	8					8	4		11	11		4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	4%	11%	1%	0%	20%	1%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.9	6.9		21.7	21.7			16.4			16.4	
Effective Green, g (s)	6.9	6.9		21.7	21.7			16.4			16.4	
Actuated g/C Ratio	0.14	0.14		0.42	0.42			0.32			0.32	
Clearance Time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	157	242		597	771			994			1010	
v/s Ratio Prot		0.03		c0.19	0.11							
v/s Ratio Perm	0.06			c0.16				c0.10			0.10	
v/c Ratio	0.44	0.23		0.81	0.27			0.31			0.31	
Uniform Delay, d1	20.3	19.7		11.7	9.5			13.1			13.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.0	0.5		8.4	0.2			0.8			0.8	
Delay (s)	22.3	20.2		20.1	9.7			13.9			13.8	
Level of Service	C	C		C	A			B			B	
Approach Delay (s)		21.2			16.8			13.9			13.8	
Approach LOS		C			B			B			B	

Intersection Summary












HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

125 Simcoe Road
6: Simcoe RD & Site Access

HCM Unsignalized Intersection Capacity Analysis

Total (2034) PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	10	7	311	12	5	305
Future Volume (Veh/h)	10	7	311	12	5	305
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)	11	8	338	13	5	332
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
			None			None
Median storage veh						
Upstream signal (m)						
			78			
pX, platoon unblocked						
vC, conflicting volume	520	176			351	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	520	176			351	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	483	837			1204	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	19	225	126	116	221	
Volume Left	11	0	0	5	0	
Volume Right	8	0	13	0	0	
cSH	588	1700	1700	1204	1700	
Volume to Capacity	0.03	0.13	0.07	0.00	0.13	
Queue Length 95th (m)	0.8	0.0	0.0	0.1	0.0	
Control Delay (s)	11.3	0.0	0.0	0.4	0.0	
Lane LOS	B			A		
Approach Delay (s)	11.3	0.0		0.1		
Approach LOS	B					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			22.0%		ICU Level of Service	A
Analysis Period (min)			15			

125 Simcoe Road
 3: Simcoe RD & Luxury AVE/Marshview BLVD

Queues
 Total (2034) AM Peak Hour

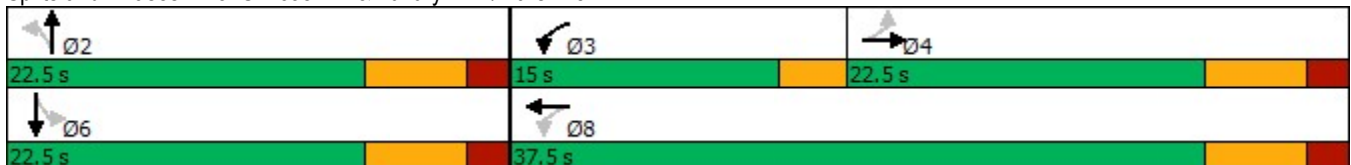


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↕		↕
Traffic Volume (vph)	34	157	72	14	9	147	38	108
Future Volume (vph)	34	157	72	14	9	147	38	108
Lane Group Flow (vph)	37	182	78	29	0	784	0	185
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.5	22.5	8.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	15.0	37.5	22.5	22.5	22.5	22.5
Total Split (%)	37.5%	37.5%	25.0%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.5	4.5	3.0	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.5	6.5	3.0	6.5		6.5		6.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.13	0.46	0.23	0.08		0.45		0.15
Control Delay	17.1	20.5	14.9	10.2		4.6		11.5
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	17.1	20.5	14.9	10.2		4.6		11.5
Queue Length 50th (m)	2.9	14.7	6.5	1.3		5.7		5.4
Queue Length 95th (m)	8.8	29.6	8.5	4.1		18.9		13.0
Internal Link Dist (m)		59.9		87.7		71.3		54.1
Turn Bay Length (m)	27.0							
Base Capacity (vph)	478	664	508	1274		1724		1214
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.08	0.27	0.15	0.02		0.45		0.15

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 46
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

Splits and Phases: 3: Simcoe RD & Luxury AVE/Marshview BLVD



125 Simcoe Road
3: Simcoe RD & Luxury AVE/Marshview BLVD

HCM Signalized Intersection Capacity Analysis
Total (2034) AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Volume (vph)	34	157	10	72	14	13	9	147	565	38	108	25
Future Volume (vph)	34	157	10	72	14	13	9	147	565	38	108	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99			0.98			1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.93			0.88			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1726	1850		1703	1748			3121			3356	
Flt Permitted	0.74	1.00		0.47	1.00			0.95			0.75	
Satd. Flow (perm)	1342	1850		843	1748			2969			2543	
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)	37	171	11	78	15	14	10	160	614	41	117	27
RTOR Reduction (vph)	0	4	0	0	10	0	0	361	0	0	16	0
Lane Group Flow (vph)	37	178	0	78	19	0	0	423	0	0	169	0
Confl. Peds. (#/hr)	6					6	2		9	9		2
Heavy Vehicles (%)	4%	0%	29%	6%	0%	0%	0%	2%	0%	0%	3%	12%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.2	8.2		15.6	15.6			20.1			20.1	
Effective Green, g (s)	8.2	8.2		15.6	15.6			20.1			20.1	
Actuated g/C Ratio	0.17	0.17		0.32	0.32			0.41			0.41	
Clearance Time (s)	6.5	6.5		3.0	6.5			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	225	311		347	559			1225			1049	
v/s Ratio Prot		c0.10		c0.02	0.01							
v/s Ratio Perm	0.03			0.05				c0.14			0.07	
v/c Ratio	0.16	0.57		0.22	0.03			0.35			0.16	
Uniform Delay, d1	17.3	18.6		11.9	11.4			9.8			9.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	2.5		0.3	0.0			0.8			0.3	
Delay (s)	17.7	21.2		12.2	11.4			10.6			9.3	
Level of Service	B	C		B	B			B			A	
Approach Delay (s)		20.6			12.0			10.6			9.3	
Approach LOS		C			B			B			A	












Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	48.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

125 Simcoe Road
6: Simcoe RD & Site Access

HCM Unsignalized Intersection Capacity Analysis

Total (2034) AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	13	4	185	7	6	157
Future Volume (Veh/h)	13	4	185	7	6	157
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)	14	4	201	8	7	171
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage veh						
Upstream signal (m)			78			
pX, platoon unblocked						
vC, conflicting volume	304	104			209	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	304	104			209	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			99	
cM capacity (veh/h)	660	930			1359	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	18	134	75	64	114	
Volume Left	14	0	0	7	0	
Volume Right	4	0	8	0	0	
cSH	705	1700	1700	1359	1700	
Volume to Capacity	0.03	0.08	0.04	0.01	0.07	
Queue Length 95th (m)	0.6	0.0	0.0	0.1	0.0	
Control Delay (s)	10.2	0.0	0.0	0.9	0.0	
Lane LOS	B		A			
Approach Delay (s)	10.2	0.0	0.3			
Approach LOS	B					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			18.7%		ICU Level of Service	A
Analysis Period (min)			15			

Appendix G – OTM Signal Justification Sheets

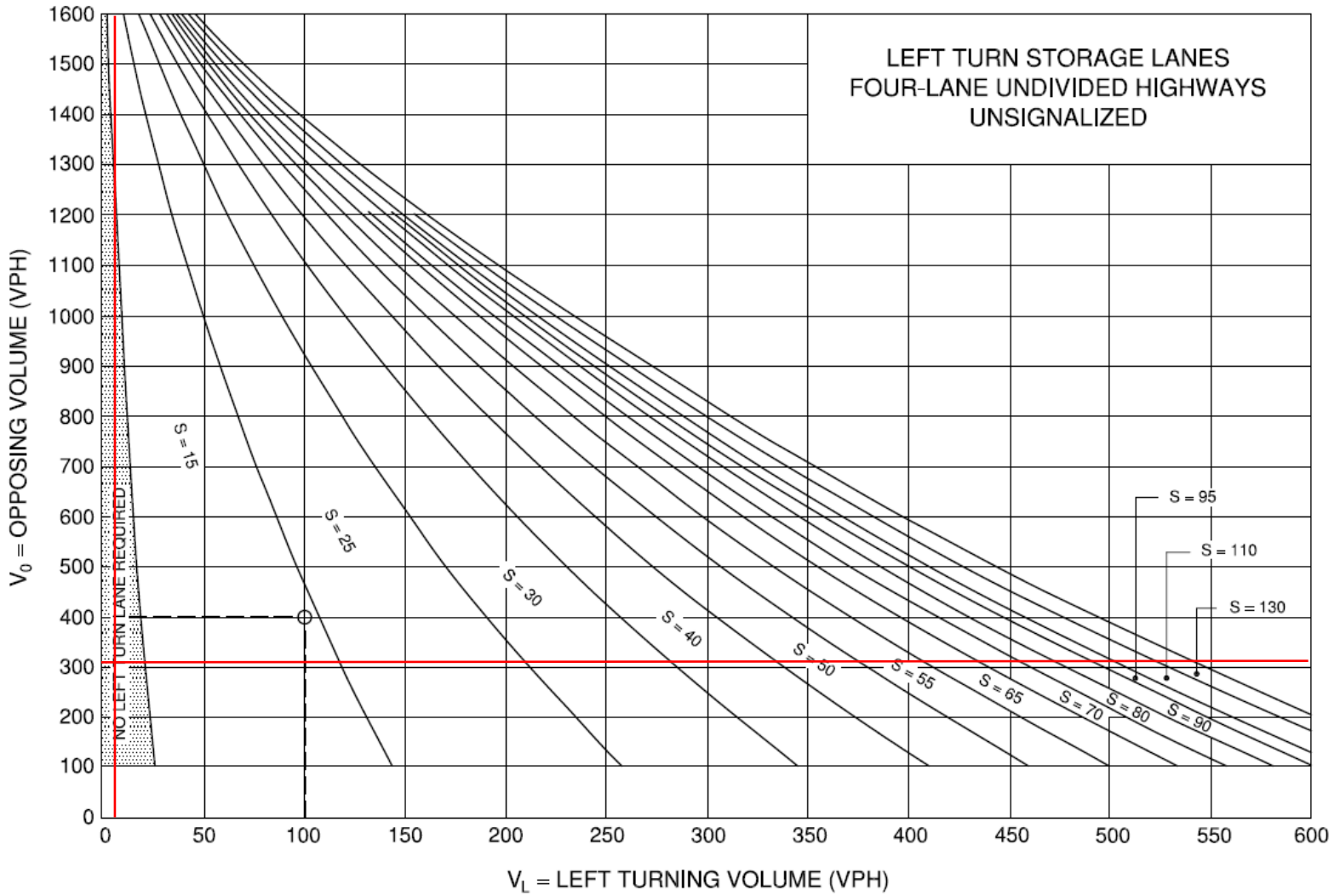
Justification No. 7 - 2034 Total Traffic (Critical Case)

Site Access / Simcoe Road

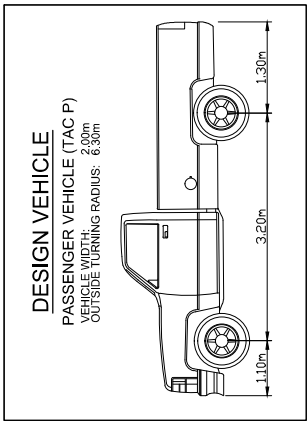
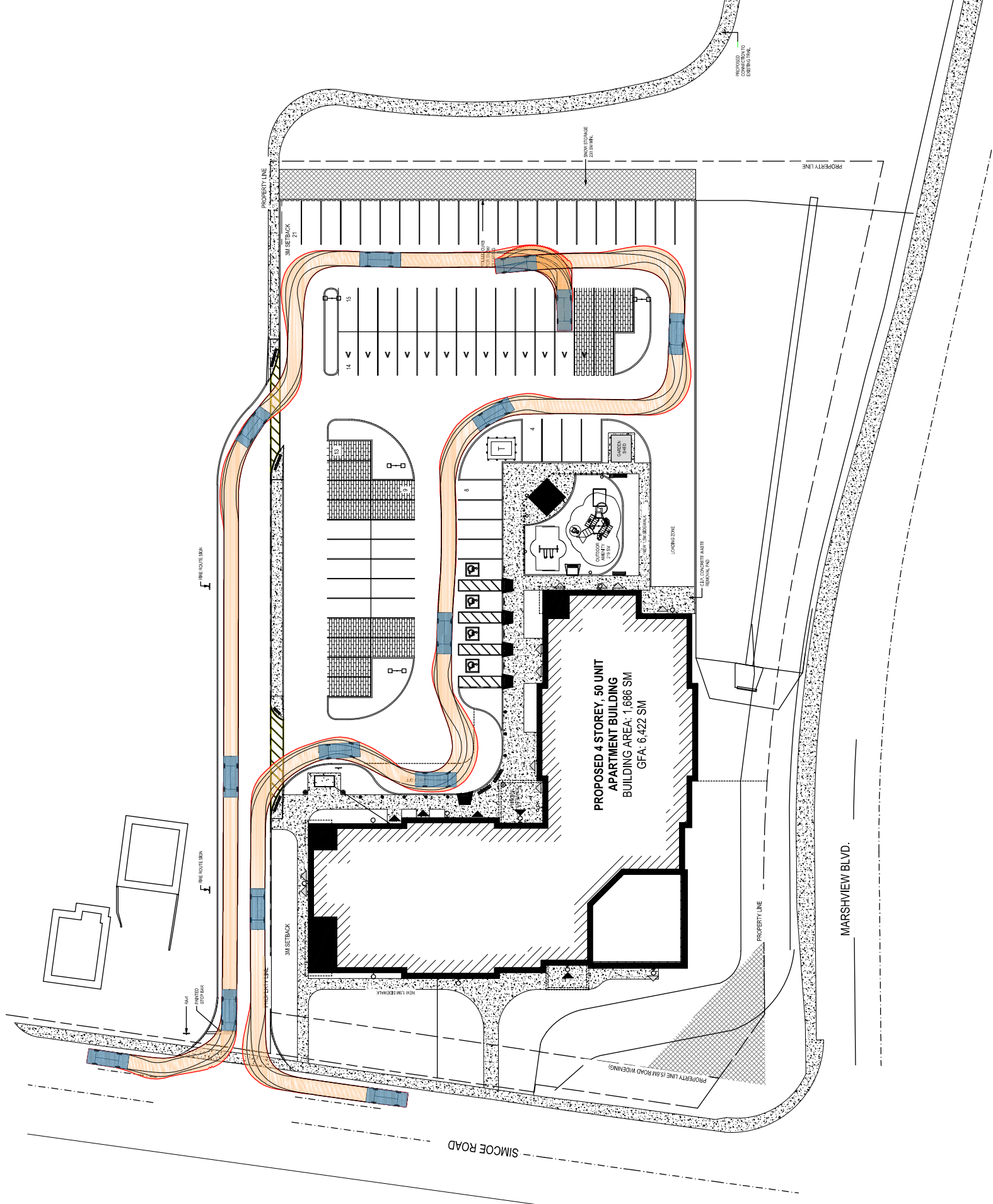
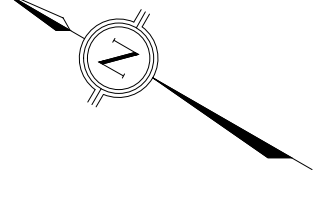
Justification	Description	Compliance			Signal Warrant	Underground Provisions Warrant
		Rest. Flow	Sectional			
			Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	900	255	28%	2%	NO
	B. Vehicle volume, along minor streets (average hour)	255	9	3%		NO
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	900	242	27%	2%	NO
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	170	6	3%		NO

Appendix H – MTO Left Turn Warrant Analysis

Simcoe Road / Site Access
Total (2034) - Southbound
PM Peak Hour (Critical Scenario)



Appendix I – Swept Path Analysis



GENERAL NOTES
 1. THIS DRAWING IS NOT INTENDED FOR CONSTRUCTION.
 2. THIS DRAWING IS THE PROPERTY OF JD ENGINEERING AND MUST BE RETURNED ON COMPLETION OF THE PROJECT.
 3. THE DRAWINGS ARE THE PROPERTY OF MCKNIGHT CHARRON LIMITED ARCHITECTS ON DECEMBER 8th, 2021
 4. BASE DRAWING PROVIDED BY MCKNIGHT CHARRON LIMITED ARCHITECTS ON DECEMBER 8th, 2021

NO.	DATE	APPROVED	REVISIONS
1.	JAN 2022	JN	FIRST SUBMISSION

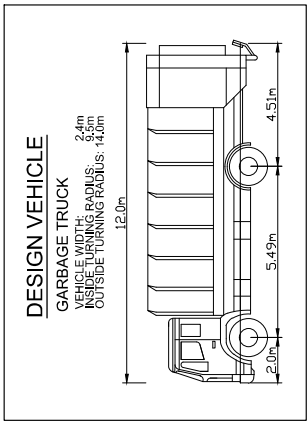
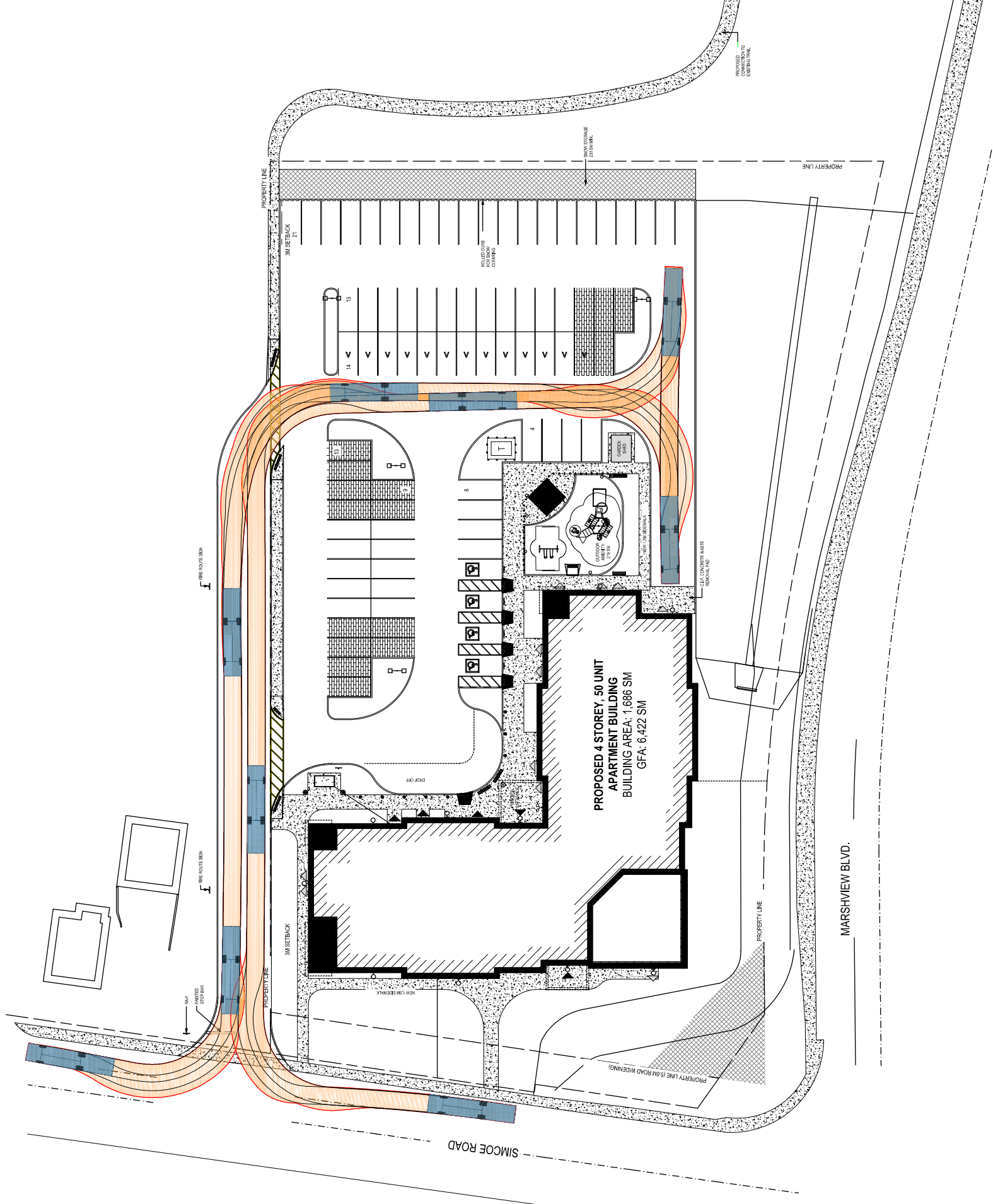
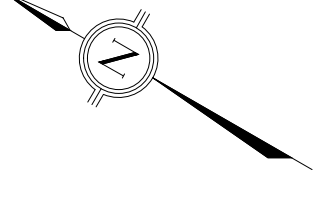
JD Northcote Engineering Inc.
 Phone: 705.726.4005
 88 Cumberland Street
 Barrie, ON L4N 2P8
 www.JDEngineering.ca

125 SIMCOE STREET
 AFFORDABLE HOUSING

TOWN OF BRADFORD

PASSENGER VEHICLE
 TURNING MOVEMENT ANALYSIS

DESIGN:	JN	DATE:	01/22
DRAWN:	JN	DATE:	01/22
REVIEWED:	JN	DATE:	01/22
SCALE HOR:	1:300	SCALE VERT:	N/A
SHEET NO.	21169 - TURN 1		



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NO.	DATE	APPROVED	REVISIONS
1.	JAN 2022	JN	FIRST SUBMISSION

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AREA MUNICIPALITY
TOWN OF BRADFORD

125 SIMCOE STREET
AFFORDABLE HOUSING
 SOLID WASTE COLLECTION VEHICLE
 TURNING MOVEMENT ANALYSIS

DESIGN:	JN	DATE:	01/22
DRAWN:	JN	DATE:	01/22
REVIEWED:	JN	DATE:	01/22
SCALE HOR:	1:300	SCALE VERT:	N/A
SHEET NO.	21169 - TURN 2		

Appendix J – Proxy Parking Data

Simcoe County Housing Corporation

Affordable Housing Parking Ratio Summary
as of September 16/20

Building	No. Units	Residential Parking Spaces	Current Cars	Actual Cars/unit
██████████, Bradford	25	27	13	0.52
██████████, Barrie	107	86	47	0.44
██████████, Collingwood	147	132	75	0.51
██████████ Wasaga Beach	99	95	55	0.56
██████████, Victoria Harbour	41	67	18	0.44