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10249 Hunsden Sideroad

Residential Development Transportation Impact Study and Access and Circulation Review

Paradigm Transportation Solutions Limited

April 2024
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Project Summary

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Bolton, ON L7E1C1

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10249 Hunsden Sideroad

Residential Development Transportation Impact Study and Access and Circulation Review



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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) has been retained by Carringwood Homes to prepare this Transportation Impact Study (TIS), and Access and Circulation Review for a proposed residential development at 10249 Hunsden Sideroad in the Town of Caledon.

The TIS provides an assessment of the existing transportation network and analyzes existing and future traffic conditions (with and without the proposed development). It also includes an Access and Circulation Review (ACR) to assess planned site access and circulation conditions.

Development Concept

The subject site is located at 10249 Hunsden Sideroad in the Town of Caledon. The site is currently an agricultural lot with a small amount of low-density residential housing. The surrounding area is also predominantly agricultural, along with some low-density residential housing. Highway 9 is located north of the subject site and provides access to nearby areas. There is a large retail centre in Bolton approximately 18 minutes driving distance from the subject site.

The property owner is planning to redevelop a part of the existing lot into 13 new estate residential lots. Vehicle access is planned via the public road network (Street ‘A’ and Street ‘B’). Street ‘A’ is to connect to Hunsden Sideroad, while Steet ‘B’ is to connect to Stinson Street to the west of the subject site.

The access via Street ‘B’ is planned for a future date and is not considered in this analysis as accurate details to model its impacts are not yet known. The intersection of Hunsden Sideroad and Street ‘A’ is planned to operate as a full-moves intersection, with the minor road under stop control. Plans include vehicle parking at each individual lot. The build-out year is estimated to be 2024.

Conclusions

Based on the investigations carried out, it is concluded that:

- **Existing Traffic Conditions**: The study intersections operate with acceptable levels of service and within capacity during both the AM and PM peak hours.

- **Development Trip Generation**: The development is estimated to generate 16 trips in the AM peak hour and 21 trips in the PM peak hour. The addition of new trips from the site will, in part, be applying trips that were generated by the previous residential houses.
- **Roadway Improvements**: No roadway improvements are identified.
- **Background Traffic Conditions**: The study area intersections are forecast to operate with acceptable levels of service and within capacity under both 2024 and 2029 analysis scenarios.
- **Total Traffic Conditions**: The redevelopment of the subject site is forecast to have a negligible impact on traffic operations. The study intersections are forecast to operate at very similar levels of service as under background traffic conditions. All traffic movements are forecast to operate with acceptable levels of service and within capacity.
- **Site Circulation**: The site circulation assessment indicates that a TAC Heavy Single Unit truck, Pumper Firetruck and a Town of Caledon Snow Plough can enter, exit, and traverse Street 'A' without conflict.
- **Sight Access Assessment**: The site access assessment indicates adequate corner clearance, access spacing and throat length for this site Sight distances do not meet requirements for a 80 km/h design speed due to the existing road geometry of Hunsden Sideroad. This issue can be addressed through tree trimming on the north side of Hunsden Sideroad, east of the Street 'A' intersection and installing intersection warning signs east and west of the intersection.

Recommendations

Based on the findings of this study, it is recommended that:

- The contents of the report be considered;
- A Wa-13 intersection warning sign along with a Wa-18t hidden intersection sign be installed on both the eastern and western approaches to Street 'A', 225 metres from the intersection; and
- The development proceeds without further updates to the studied transportation network at this time.

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1 Introduction

1.1 Overview

Carringwood Homes retained Paradigm Transportation Solutions Limited (Paradigm) to prepare this Transportation Impact Study (TIS) and Access and Circulation Review for a proposed residential development in the Town of Caledon.

Paradigm submitted a finalized TIS in December 2022, based on plans for the site at that time. Since the submission, the site plan has been modified. The Draft Plan has been prepared by Mackitecture Inc. and is dated 26 October 2023. The traffic impacts related to the site modifications are observed to be very minor and there are no tangible impacts expected to study results and conclusions. The reduction of units on the site results in slightly less traffic impacts than initially concluded in this study. As such, the traffic analysis for this study has not been updated to account for the modifications. Other aspects, including dates, the site plan Figure 3.1, and the site circulation analysis have been updated to reflect the updated site conditions.

Figure 1.1 illustrates the site location. The subject site is located at 10249 Hunsden Sideroad in the Town of Caledon. The site is currently an agricultural lot with a small amount of low-density residential housing. The surrounding area is also predominantly agricultural, along with some low-density residential houses. Highway 9 is located north of the subject site and provides access to nearby areas. There is a large retail centre in Bolton at approximately 18 minutes driving distance from the subject site.

1.2 Purpose and Scope

The purpose of this report is to identify and assess the potential transportation impacts, if any, resulting from the proposed development. This study has been completed in accordance with the Town of Caledon *Transportation Impact Studies (2017) Terms of Reference and Guidelines*.[1]

The scope of this study, developed in consultation with the Town of Caledon in October 2022, includes the following:

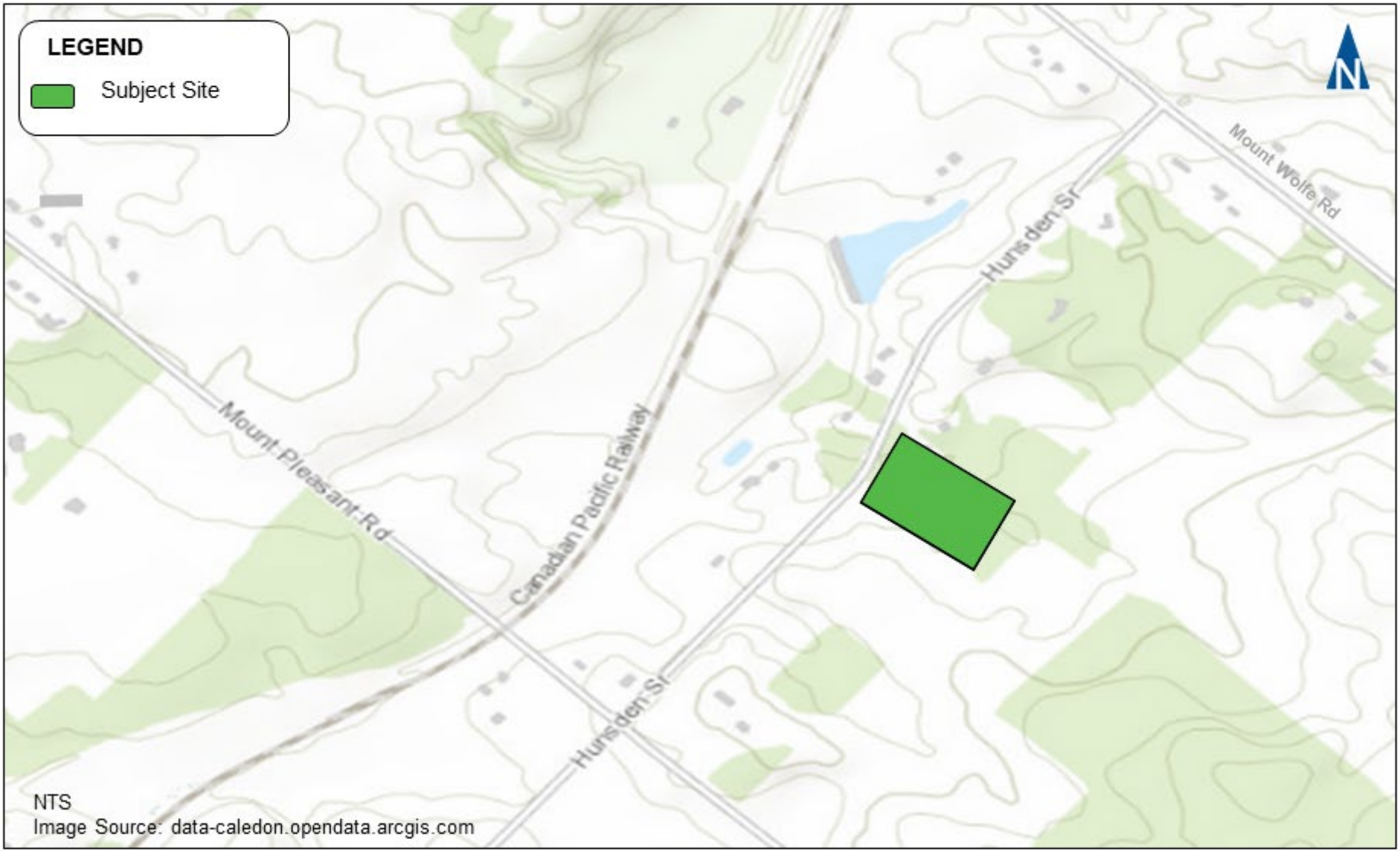
[1] Town of Caledon. *Transportation Impact Studies Terms of Reference and Guidelines*, 2017

- A review and description of the existing transportation network, including roads, intersection control and active transportation;
- A review and description of the proposed development;
- Vehicular trip generation estimates for the proposed development based on the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition), land use code (LUC) 210 (Single-Family Detached Housing);[2]
- An assessment of current traffic and site conditions within the following study area:
  - Mount Pleasant Road and Hunsden Sideroad (unsignalized);
  - Mount Wolfe Road and Hunsden Sideroad (unsignalized); and
  - Hunsden Sideroad and Street 'A' (planned).
- An estimate of background traffic growth for the build-out year of the development, and five years after build-out;
- An analysis of the impacts of future traffic on the surrounding road network;
- Identification of off-site road improvements, if required, to mitigate the site generated trips in a satisfactory manner;
- A review of site access operations, including sight distance, corner clearance and access spacing requirements in accordance with the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads (GDGCR)*[3]; and
- A review of site circulation to ensure design vehicles can navigate through the site without conflicts.

A pre-study consultation was undertaken with Town of Caledon staff during the month of October 2022. The consultation established the work plan, general assumptions, and requirements for the study.

Appendix A contains the pre-study consultation material and comments provided by the Town staff.

[2] Institute of Transportation Engineers, *Trip Generation Manual,* 11th ed., (Washington, DC: ITE, 2021)
[3] Transportation Association of Canada, *Geometric Design Guide for Canadian Roads*, (Ottawa: TAC, 2017),16-71.



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Subject Site Location

10249 Hunsden Sideroad TIS and ACR
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Figure 1.1

2 Existing Conditions

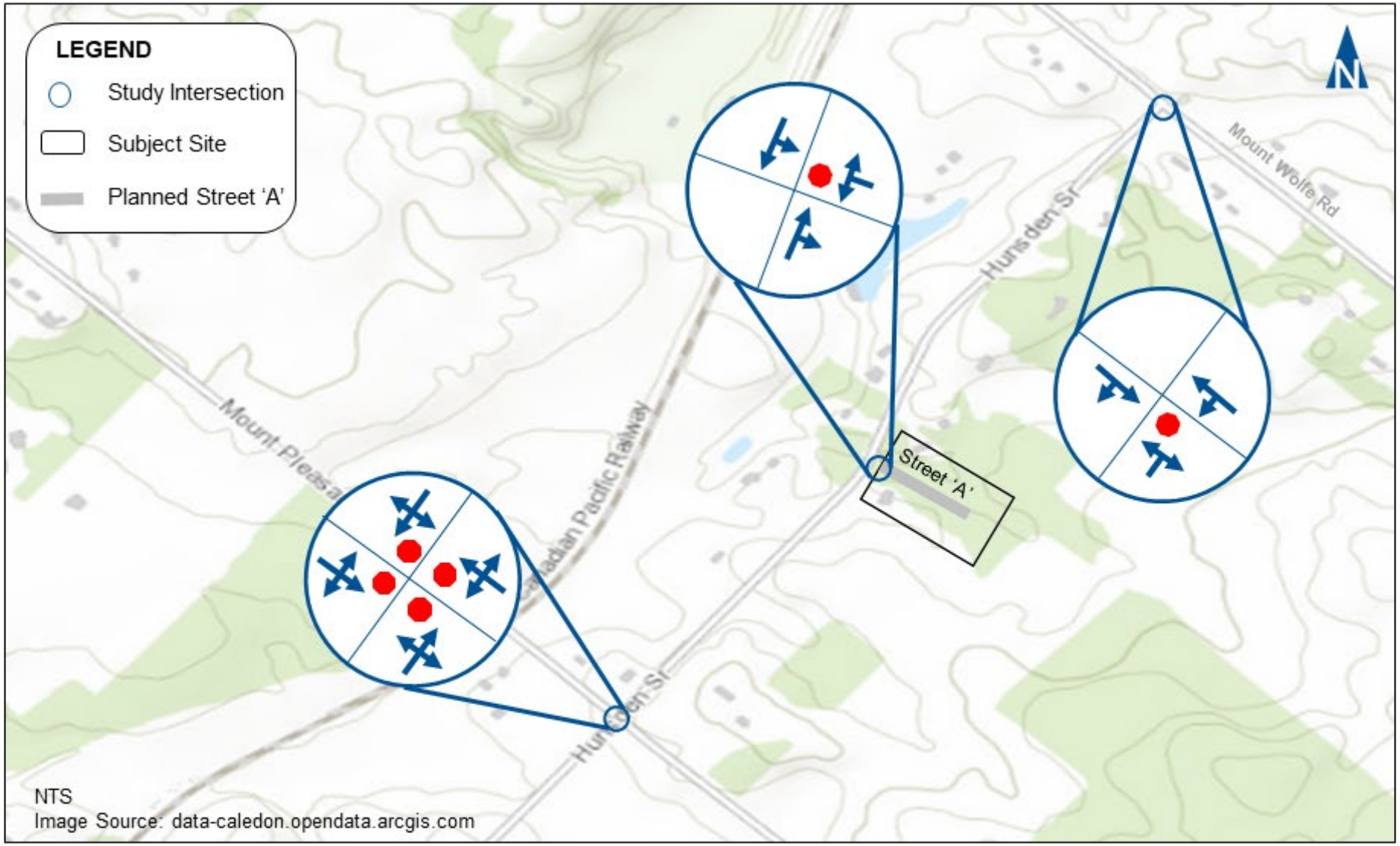
2.1 Roads

The characteristics of the roadways in the vicinity of the subject site are described in **Table 2.1** below.

TABLE 2.1: ROADWAY CHARACTERISTICS

Characteristics	Mount Pleasant Road	Mount Wolfe Road	Hunsden Sideroad
Direction	North-south	North-south	East-west
Jurisdiction	Town of Caledon	Town of Caledon	Town of Caledon
Road Classification	Collector	Collector	Local
Cross-Section	Two-lane rural	Two-lane rural	Two-lane rural
Posted Speed Limit	60 km/h	60 km/h	60 km/h
Surrounding Land Use	Farmland and low-density residential	Farmland and low-density residential	Farmland and low-density residential

Figure 2.1 illustrates the existing lane configuration and traffic control at the study area intersections.



Existing Lane Configurations and Traffic Control

2.2 Alternate Modes of Transportation

2.2.1 Public Transit

There is currently no public transit operating in the study area. It is expected that if the subject area develops with higher density, public transit operators will consider deploying transit routes to serve users in the area.

2.2.2 Walking

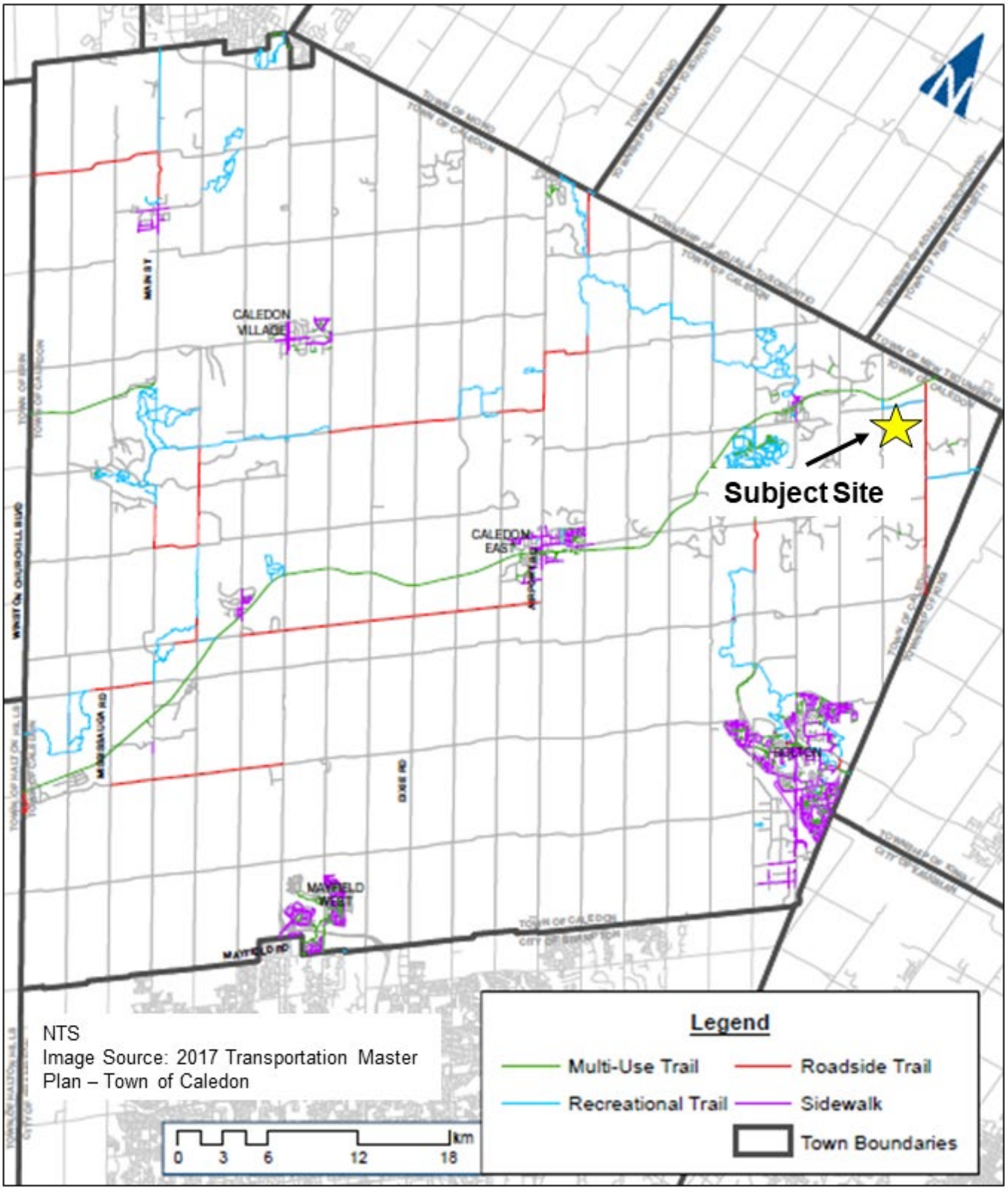
Pedestrian access and mobility are important to provide safe and effective access to and from the site for non-vehicle users. The *Caledon Transportation Master Plan (2017) (TMP)* identifies a recreation trail on Hunsden Sideroad between Mount Pleasant Road and Mount Wolfe Road.[4] In addition to this trail, there is a roadside trail along Mount Wolfe Road.

There are no sidewalks in the study area. Mount Pleasant Road has narrow unpaved shoulders on both sides of the road (approximately 1.2 metres in width), thereby making it less feasible for walking. Mount Wolfe Road has narrow 1.2 metre paved shoulders on both sides of the road. The shoulders can provide some refuge for stopping vehicles but is not an entirely desirable space to walk. There are no shoulders on Hunsden Sideroad.

The site is located at a fair distance from any major employment, retail, cultural and recreational destinations, thus reducing the demand for commuter walking trips. Some recreational and non-commuter pedestrian trips may occur. Most of the prospective residents of the planned development are expected to use a motor vehicle to access their respective destinations.

Figure 2.2 illustrates the existing pedestrian network as depicted in the Caledon TMP.

[4] Town of Caledon, *Transportation Master Plan*, (Caledon: Town of Caledon, 2017)



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Existing Pedestrian Facilities

2.2.3 Cycling

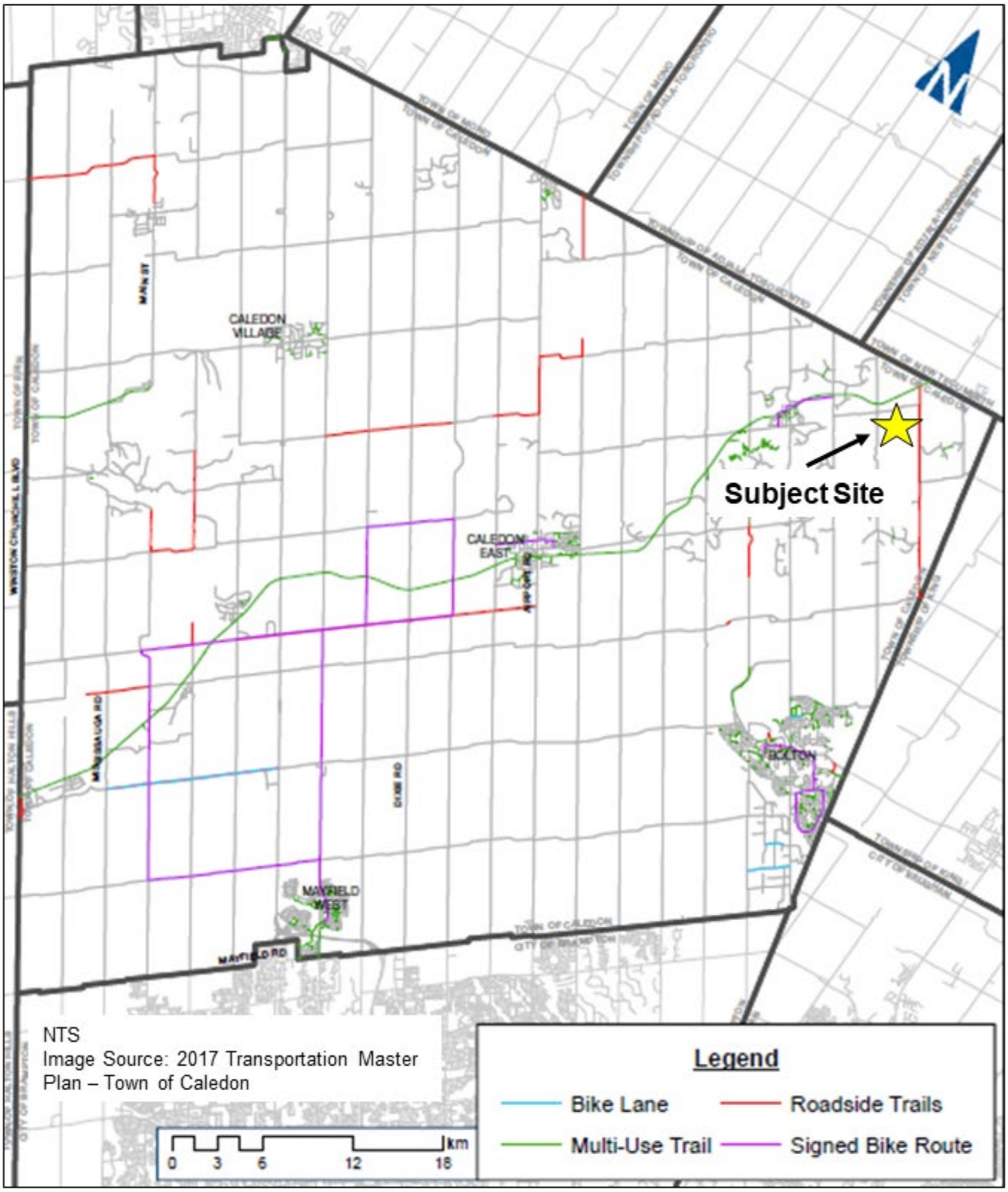
The Town of Caledon promotes healthy living through active transportation. The Town has developed a designated Active Transportation Task Force to create a safer community through the development of infrastructure such as sidewalks, cycling lanes, crosswalks and complete streets.[5] The Town is also developing an Active Transportation Master Plan to provide a framework for developing and managing a more physically active transportation community in a cost-effective manner. The network is planned to connect, integrate, enhance, and expand on existing facilities. It is expected that the initiatives taken by the Town will provide safe, accessible, and connected active transportation throughout the Town of Caledon.

The provision of cycling infrastructure allows trips to be made via the cycling mode rather than automobile. The *Caledon TMP* identifies a roadside trail suitable for biking along Mount Wolfe Road.[5] Mount Wolfe Road has 1.2 metre narrow paved shoulders on both sides of the road which can be used by cyclists. However, there are no designated cycling lanes in any of the study area roads. Hunsden Sideroad does not have any shoulders which makes it less feasible for cycling. Mount Pleasant Road has a narrow unpaved shoulder, making it less feasible for cycling.

The site is located far from any major employment, retail, cultural and recreational opportunities, thus reducing the demand for commuter cycling trips. Most of the prospective residents of the planned development are expected to drive to their respective destinations.

Figure 2.3 illustrates the existing cycling network as depicted in the *Caledon TMP*.

[5] Town of Caledon, *Transportation Master Plan*, (Caledon: Town of Caledon, 2017)



Existing Cycling Facilities

10249 Hunsden Sideroad TIS and ACR
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Figure 2.3

2.3 Existing Land Use

The existing property is an agricultural lot with a one residential home, spread across a total area of 20.37 hectares. The existing residential home on the lot is planned to be maintained in its current form. In addition to the existing home, plans include the development of 13 new estate residential lots at the subject site.

Redevelopment of the site would modify the existing land uses and trips to and from the site. To estimate traffic generated by current land uses, the Institute of Transportation Engineers (ITE) *Trip Generation Manual (11th Edition)* was utilized.[6]

The two residential houses are estimated to generate 2 vehicular trips during the AM peak hour and 3 vehicular trips during the PM peak hour. **Table 2.2** summarizes the trip generation estimates for the existing land use based on the ITE data.

TABLE 2.2: EXISTING SITE TRIP GENERATION – VEHICLE TRIPS

Land Use	Units/ GFA	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
LUC 210 Single-Family Detached Housing[3]	2 Units	0	2	2	2	1	3

2.4 Traffic Volumes

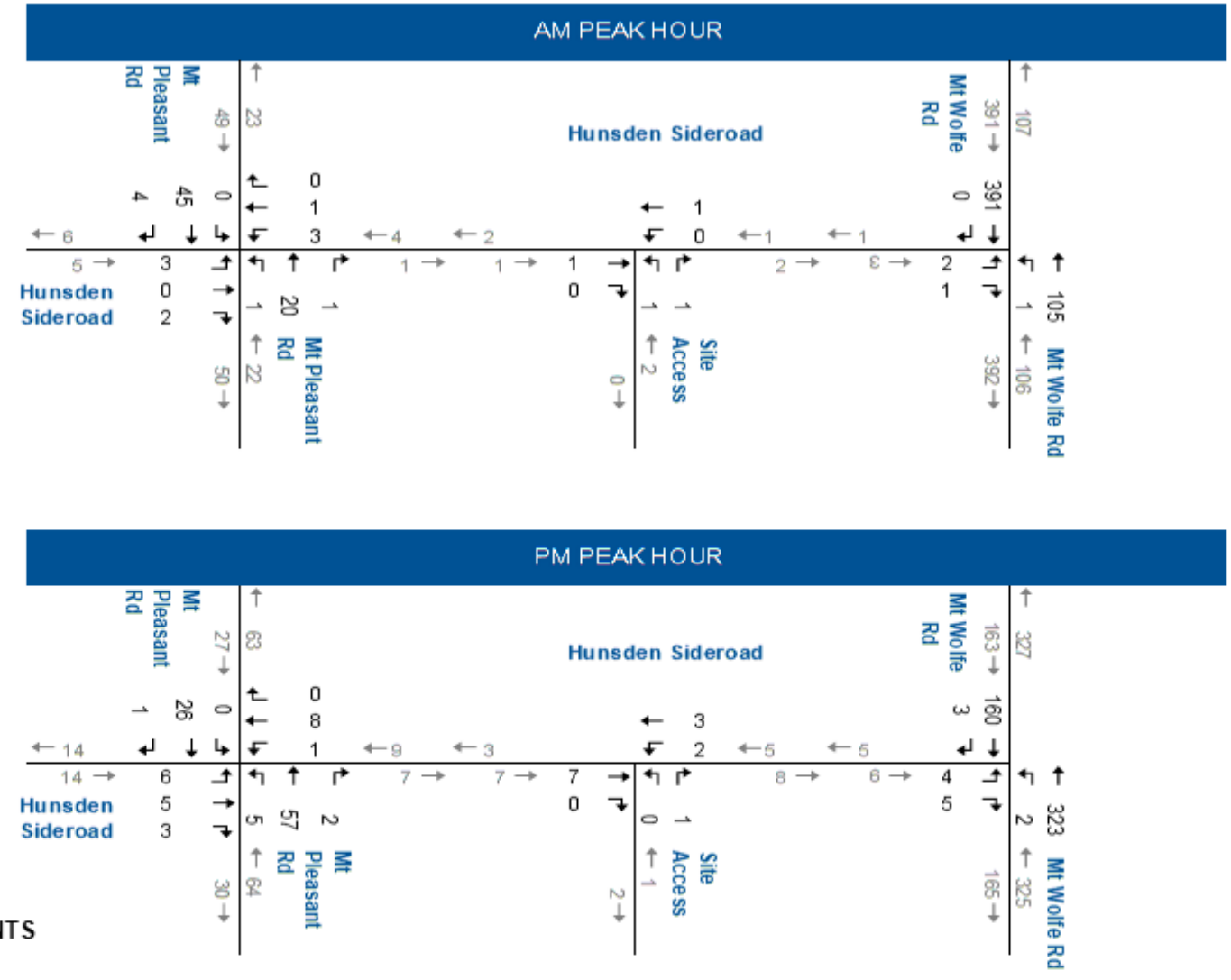
To assess intersection operations, turning movement counts (TMCs) are used to quantify the movement of vehicles, pedestrians, trucks, buses, and cyclists through an intersection. Existing traffic data at an intersection or on a road section forms the foundation for operational analyses. The counts are usually collected during peak periods to complete level of service (LOS) analysis under its worst-case operating conditions.

Paradigm collected the TMCs at all study area intersections on 01 November 2022. The data was counted in 15-minute intervals and vehicles were classified by type. The 2022 counts were reviewed and are considered suitable to use as base year volumes for this study.

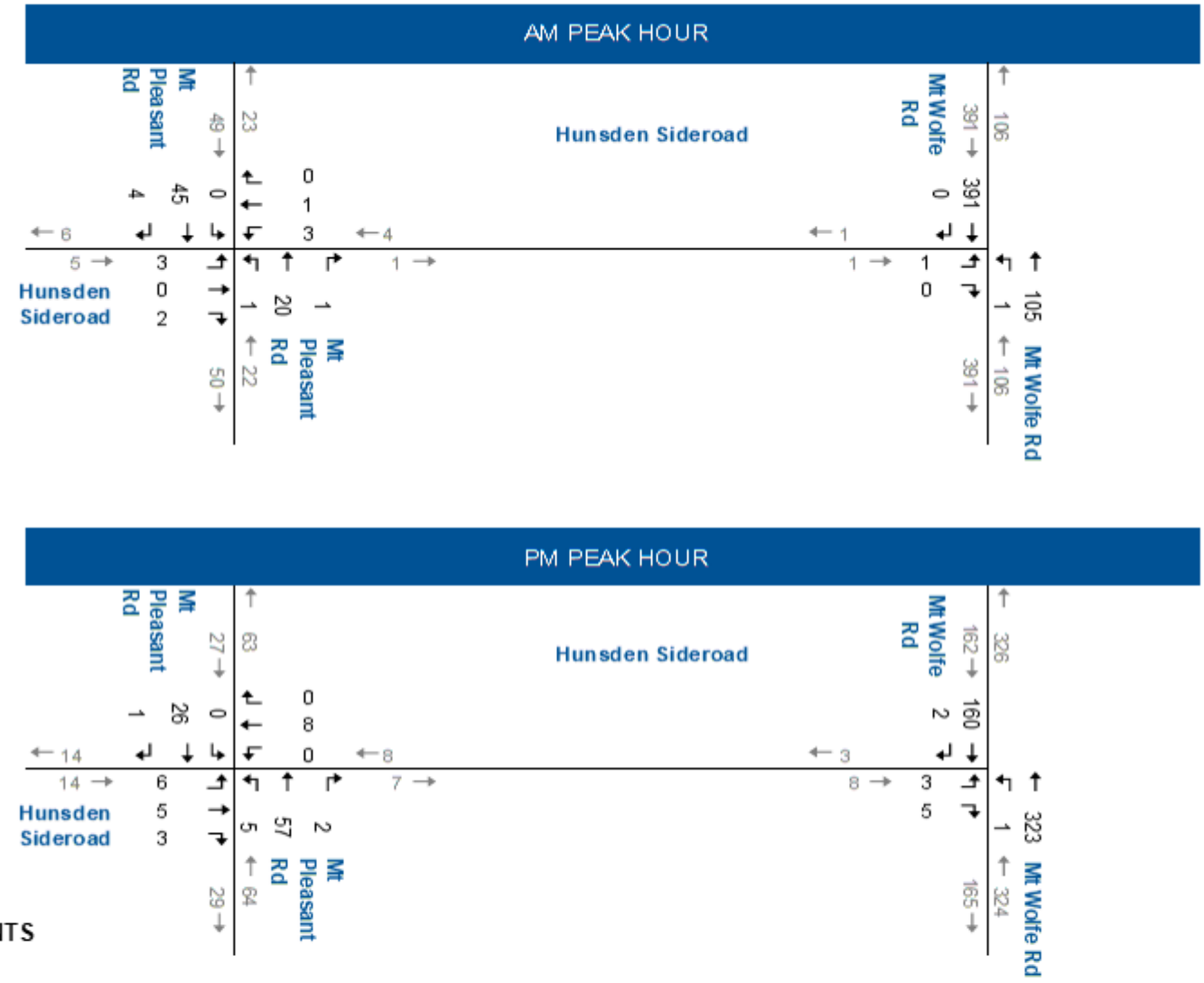
Appendix B contains the raw TMC data. **Figure 2.4** and **Figure 2.5** illustrate the base year traffic volumes, with and without the existing

[6] Institute of Transportation Engineers. *Trip Generation Manual (11th Edition)*. September 2021.

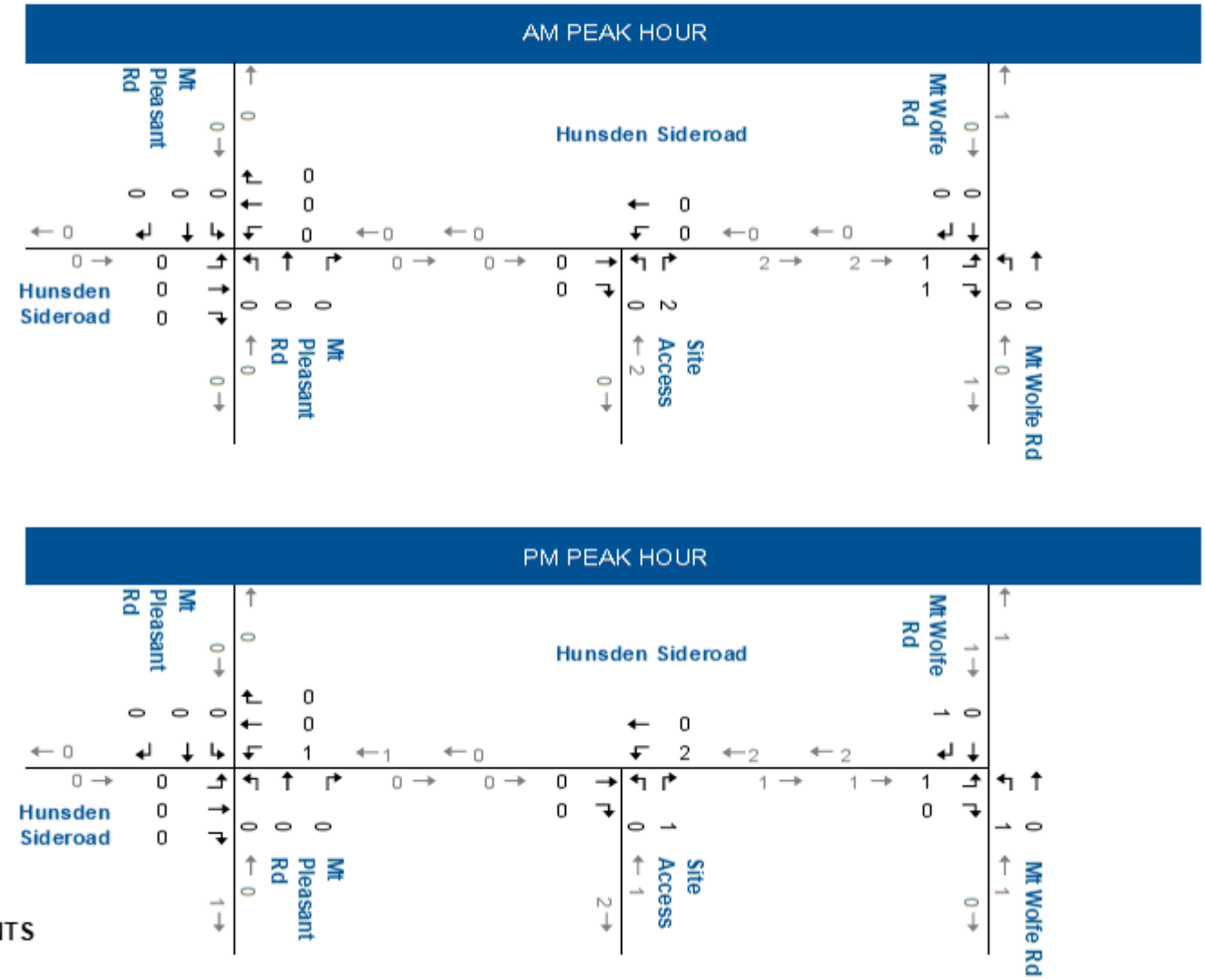
land use traffic, respectively. **Figure 2.6** illustrates the estimated site traffic to and from the existing land uses.



Base Year Traffic Volumes including Existing Site Volumes



Base Year Traffic Volumes without Existing Site Volumes



Existing Site Traffic Volumes

10249 Hunsden Sideroad TIS and ACR
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Figure 2.6

2.5 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles intending to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to opposing traffic flows, intersection geometry, and at signalized intersections, signal timing.

The highest possible rating is LOS A, under which the average total delay is equal or less than 10 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections or when the volume to capacity ratio is greater than 1.00, the movement is classed as LOS F, and remedial measures are usually implemented if they are feasible.

The Town of Caledon *Transportation Impact Studies Terms of Reference and Guidelines (2017)* identifies critical movements at unsignalized intersections as those that operate with a LOS E or worse.[7]

To assess the existing peak hour automobile conditions, an operational analysis was conducted for the weekday AM and PM peak hour traffic volumes at the study area intersections using Synchro software, which implements the methods of the Highway Capacity Manual 6th Edition. The key parameters used in the analysis include:

- Existing lane configurations;
- An intersection peak hour factor (PHF) of one, which aligns with the Town of Caledon TIS guidelines and facilitates an assessment of the busiest 15-minute period within the peak hour; and
- Synchro default values for all other inputs.

Table 2.3 summarizes the operational analysis results including the level of service (LOS), average delay in seconds, volume-to-capacity (v/c) ratio, and 95th percentile queue length in metres for the AM and PM peak hours. Any critical movements (if any) are highlighted in yellow in the result table. **Appendix C** contains the Synchro analysis outputs for reference.

[7] Town of Caledon. *Transportation Impact Studies Terms of Reference and Guidelines*, 2017

The analysis of existing conditions indicates all intersections and vehicle movements are currently operating at acceptable levels of service. The subject site is located in a rural area with stop control intersections. The majority of traffic volume is present on Mount Wolfe Road and direct towards Highway 9. The volume of traffic on Hunsden Sideroad and Mount Pleasant Road was observed to be very low. Hence, there is no major conflict or hindrance to traffic movement at the intersections in the study area.

The 95th percentile queue lengths were reviewed for all turning and through movements. No spillback issues were found. The Level of Service (LOS) is calculated as LOS A for all the approaches under the existing conditions. The only exception includes the eastbound shared left/right movement operating at a LOS B for the Hunsden Sideroad and Mount Wolfe Road intersection. A maximum delay of 11 seconds was observed for all the approaches.

The analyses indicate that all study area intersections are operating with overall acceptable levels of service and within capacity during the peak hours.

TABLE 2.3: EXISTING TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach															
				Eastbound				Westbound				Northbound				Southbound			
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach
AM Peak Hour	Mt Pleasant Road & Hunsden Sideroad	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**
			V/C	<	0.01	>		<	0.00	>		<	0.02	>		<	0.05	>	
			Q	<	0	>		<	0	>		<	0.1	>		<	0.2	>	
	Mt Wolfe Road & Hunsden Sideroad	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**
			Delay	11		>	**11**					8	0		**0**		0	0	**0**
			V/C	0.01		>						0.00	0.00				0.00	0.00	
			Q	0		>						0	0				0	0	
	Driveway & Hunsden Sideroad	TWSC	LOS		A	A	**A**	A	A		**A**	A		>	**A**				
			Delay		0	0	**0**	0	0		**0**	8		>	**8**				
			V/C		0.00	0.00		0.00	0.00			0.00		>					
			Q		0	0		0	0			0		>					
PM Peak Hour	Mt Pleasant Road & Hunsden Sideroad	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**
			V/C	<	0.02	>		<	0.01	>		<	0.07	>		<	0.03	>	
			Q	<	0	>		<	0	>		<	0.2	>		<	0.1	>	
	Mt Wolfe Road & Hunsden Sideroad	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**
			Delay	10		>	**10**					8	0		**0**		0	0	**0**
			V/C	0.01		>						0.00	0.00				0.00	0.00	
			Q	0		>						0	0				0	0	
	Driveway & Hunsden Sideroad	TWSC	LOS		A	A	**A**	A	A		**A**	A		>	**A**				
			Delay		0	0	**0**	7	0		**3**	8		>	**8**				
			V/C		0.00	0.00		0.00	0.00			0.00		>					
			Q		0	0		0	0			0		>					

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

3 Development Concept

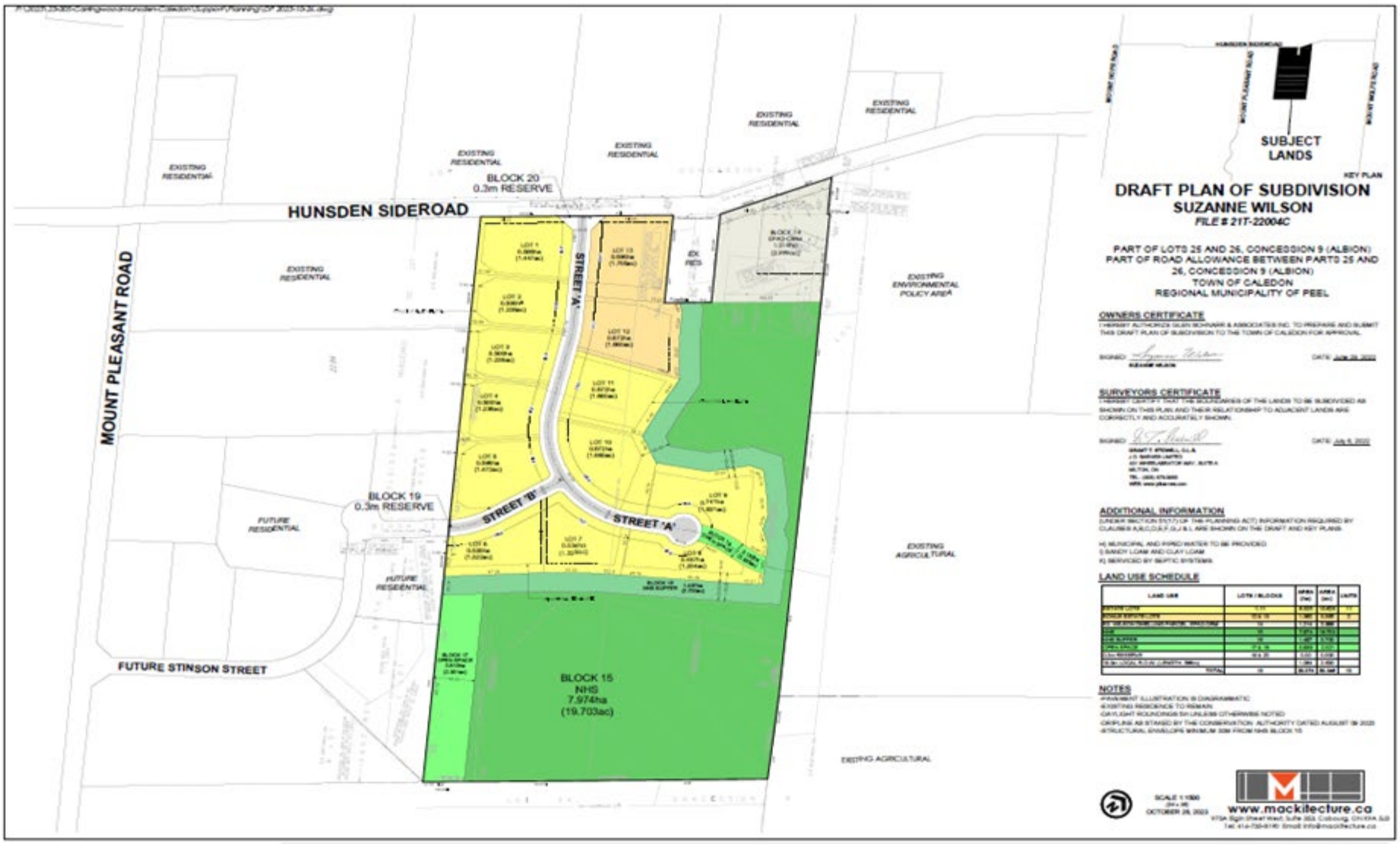
3.1 Development Description

The subject site is located at 10249 Hunsden Sideroad in the Town of Caledon. The site is located north of community of Bolton and directly south of Highway 9. The surrounding area is predominantly farmland, along with some low-density residential housing. There is a large retail centre in Bolton approximately 18 minutes driving distance from the subject site.

The existing property is an agricultural lot with a small amount of low-density residential housing, spread across a total area of 20.51 hectares. The property owner proposes to develop 13 estate residential lots across 7.707 hectares. There is an existing lot (Wilson Dwelling Parcel) on the northeast corner of the property that will be maintained as is. The remaining area would be used as buffer and open space.

Vehicle access is proposed via an all-moves access at Hunsden Sideroad. The Hunsden Sideroad and Street ‘A’ intersection is planned to operate unsignalized, with the minor road (Street ‘A’) operating under stop control. A secondary access via Street ‘B’ is also planned that would connect to Mount Pleasant Road via the future extension of Stinson Street. One-way stop control is planned for the intersection of Street ‘A’ and Street ‘B’, with the minor road (Street ‘A’) operating under stop control. As the plans for Street ‘B’ and the associated development are unconfirmed at the time of writing this report, access via Street ‘B’ is currently not in the scope of the review. Plans include vehicle parking at each individual lot. The build-out year is estimated to be 2024.

Figure 3.1 illustrates the proposed development concept. The Draft Plan has changed slightly, based on the plan prepared by Mackitecture Inc., dated 26 October 2023. An additional open space of 0.939 hectares has been added in front of Street ‘A’, on the east side. There are no tangible impacts expected to the existing study results and conclusions.



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Proposed Site Plan

10249 Hunsden Sideroad TIS and ACR
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Figure 3.1

3.2 Site Trip Forecasts

3.2.1 Trip Generation

The analysis remains unchanged and is based on the 19 residential lots that were included in the previous site plan prepared by Glen Schnarr & Associates Inc., dated 27 June 2022. There are no tangible impacts expected from the updated site plan.

The planned development consists of 19 estate residential lots across the existing lot. This information was used to assess the trips generated by the site. The estimates are based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual (11th Edition)* Land Use Code (LUC) 210, Single-Family Detached Housing.[8] The addition of new trips from the site will, in part, be applying trips that were generated by the previous residential houses.

Trip generation was found to be 16 trips in AM peak hour (7:00 AM-9:00 AM) and 21 trips in the PM peak hour (4:00 PM-6:00 PM). It is expected that 26% of the trips generated will be inbound during the AM peak hour and 74% will be outbound. During the PM peak hour, it was found that 63% of the trips will be inbound, and 37% will be outbound trips. These estimates are in line with what is expected, as majority of residents would be returning home from work during the PM peak hour.

Table 3.1 summarizes the number of trips forecast to be generated by the planned development. The site is expected to generate approximately 16 trips during AM peak hour and 21 trips during PM peak hour.

TABLE 3.1: TRIP GENERATION

Land Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
19 Proposed estate residential lots	4	12	**16**	13	8	**21**

Appendix D contains the ITE trip generation reports.

[8] Institute of Transportation Engineers, *Trip Generation Manual,* 11th ed., (Washington, DC: ITE, 2021)

3.2.2 Trip Distribution and Assignment

The site trip distribution of vehicle trips is based on existing traffic patterns as evidenced through the collected TMC data.

Table 3.2 summarizes the estimated trip distribution. The distribution reflects the route choice within the study area (derived from the existing travel patterns).

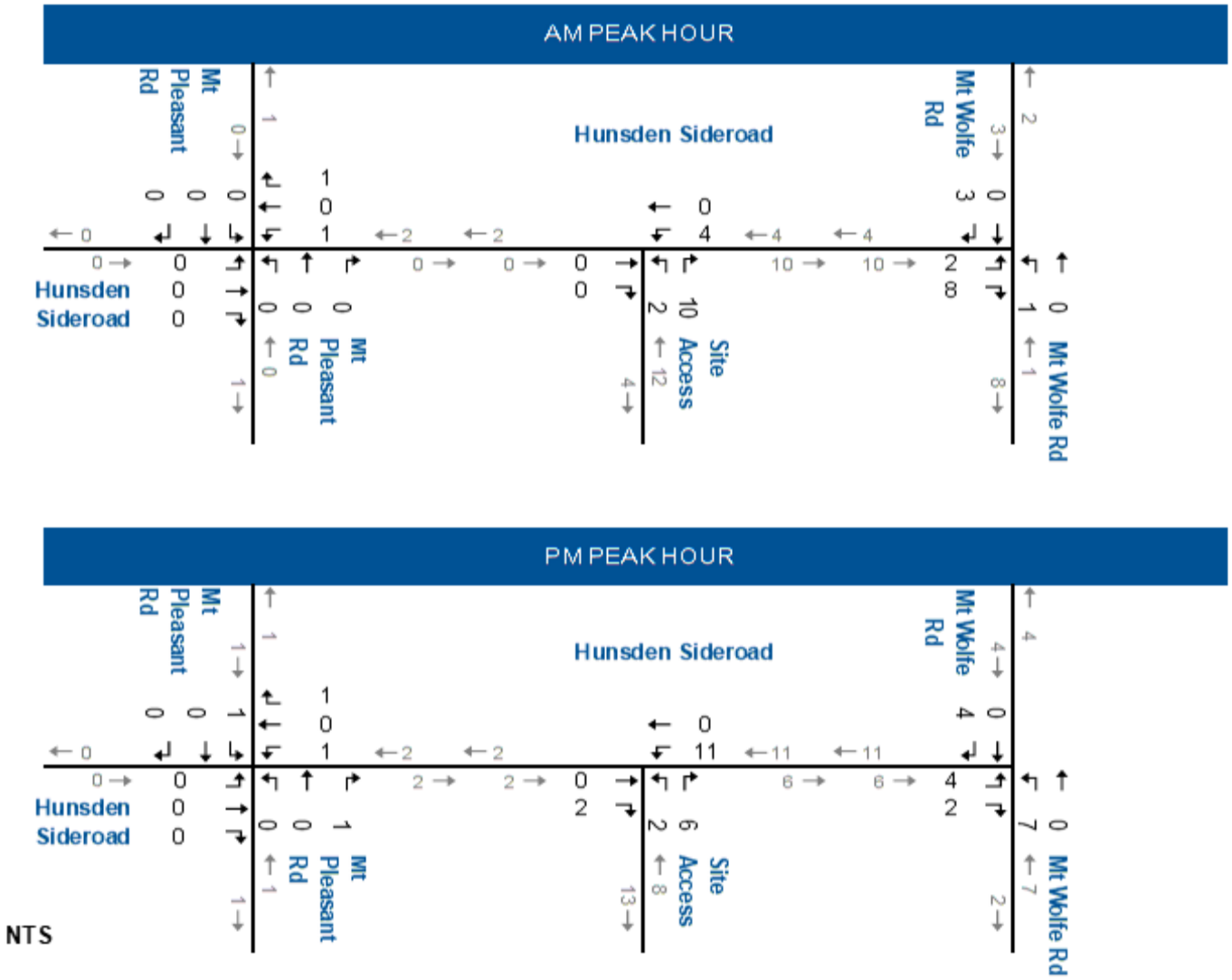
TABLE 3.2: ESTIMATED TRIP DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North via Mount Wolfe Road	68%	18%	27%	55%
North via Mount Pleasant Road	9%	4%	5%	10%
South via Mount Wolfe Road	18%	68%	55%	28%
South via Mount Pleasant Road	4%	9%	11%	5%
West via Hunsden Sideroad	1%	1%	2%	2%
Total	**100%**	**100%**	**100%**	**100%**

The site trips were assigned to the study area roads based on logical route choice in accordance with the above trip distribution. The following is noted:

- The majority of the site generated trips are assigned to Mount Wolfe Road because it provides a continuous connection to Highway 9 as well as nearby activity centres; and
- A relatively smaller number of site generated trips are assigned to Mount Pleasant Road. Mount Pleasant Road is a narrow two-lane rural road which is further from Highway 9 compared to Mount Wolfe Road, which makes it less likely route for any trips.

Figure 3.2 illustrates the site generated traffic assignments for the weekday AM and PM peak hours.



Site Generated Traffic Volumes

Figure 3.2

4 Future Conditions

4.1 Horizon Years

Consistent with the Town of Caledon *Transportation Impact Studies Terms of Reference and Guidelines (2017)* and the established terms of reference, traffic forecasts and analyses have been completed for 2024 and 2029, representing the estimated build-out year and five years beyond the build-out year.[9]

4.2 Future Roadway Improvements

Through pre-study consultation, Town staff confirmed that there are no road network improvements planned within the study area under the future horizon years. Therefore, the existing road network and intersection lane configurations are applied to all future traffic operational analyses.

It is expected that Stinson Street will be extended in the future to provide a secondary access to the subject site via the planned Street 'B'. The details regarding the intersection of Street 'B' and the future Stinson Street are unconfirmed at the time of writing this report and are outside the development site. As such, only the one site access, located at the intersection of Street 'A' and Hunsden Sideroad, has been analyzed using Synchro software. Given the low anticipated vehicular volumes on Stinson Street, Town Staff have recognized that a detailed Synchro analysis is not required for Street 'B'. A qualitative analysis of Street 'B' traffic impacts is provided in **Section 4.9**.

One-way stop control is planned at the intersection of Street 'A' and Hunsden Sideroad, and the intersection of Street 'B' and Street 'A'. Both intersections will have stop signs on their minor road approaches.

4.3 General Background Growth

General background traffic reflects increases in traffic unrelated to development within the immediate vicinity of the subject site. This background traffic growth has been estimated using a compounded per annum growth rate.

A conservative estimated growth rate of 2% per annum has been applied to the initial traffic volumes. This growth rate also takes into account any potential background developments that were not

[9] Town of Caledon. *Transportation Impact Studies Terms of Reference and Guidelines*, 2017

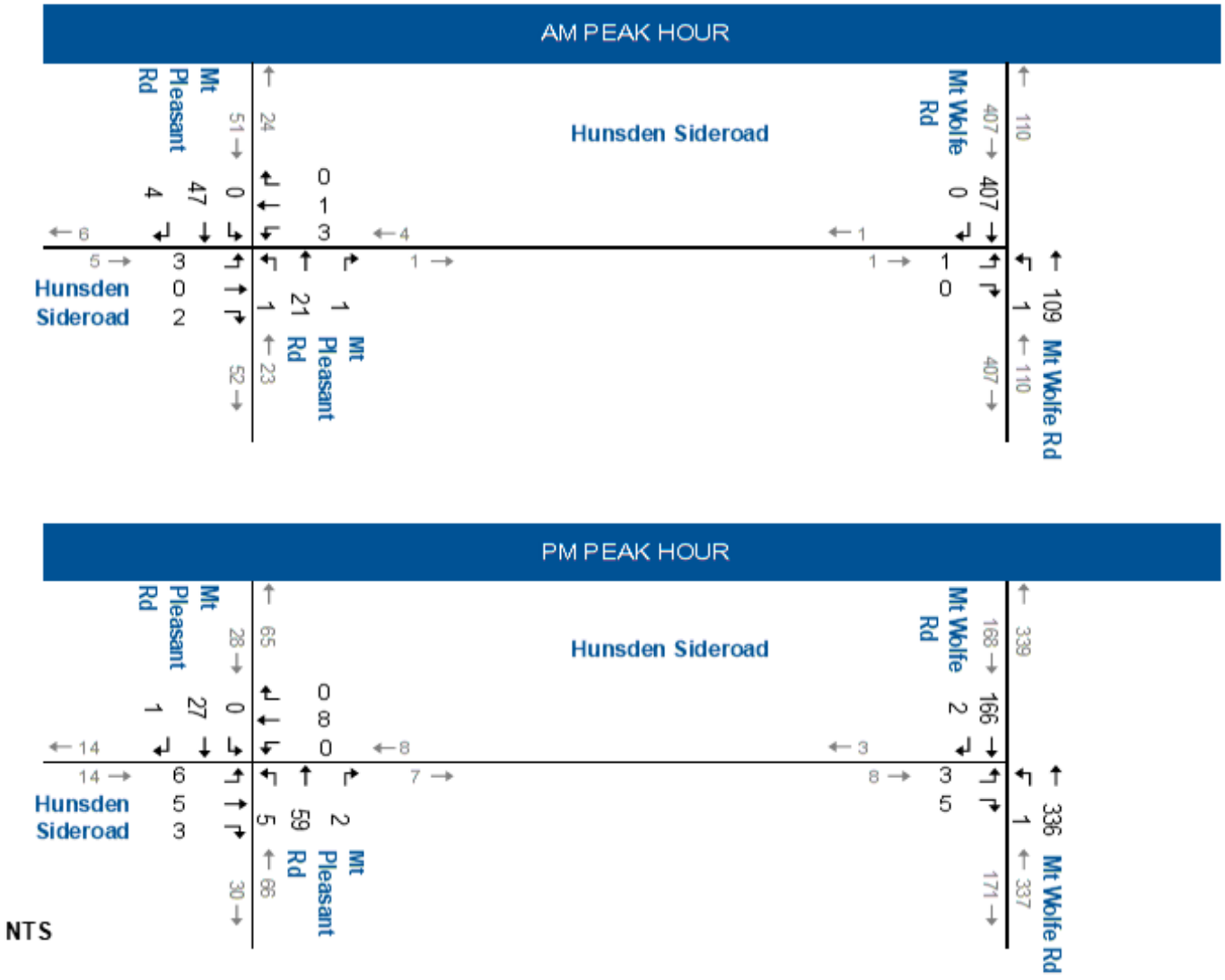
captured at the time of writing this report. The growth rate was confirmed by Town staff during pre-study consultation (see **Appendix A**).

4.4 Background Development

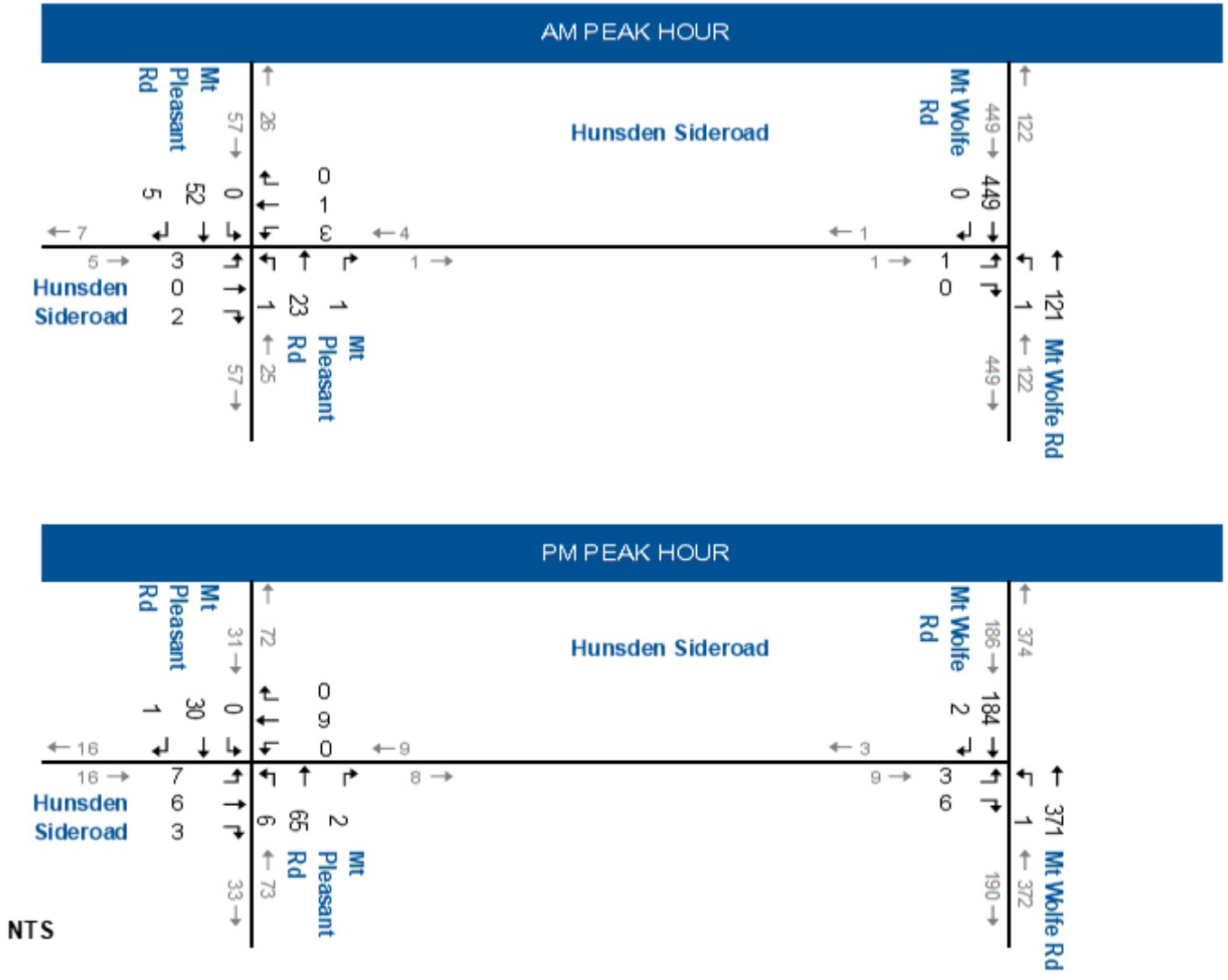
As per the direction received from Town staff, there are no background developments in the vicinity of the study area that would impact the planned development.

Figure 4.1 and **Figure 4.2** illustrate the future background traffic forecasts accounting for general background growth for the 2024 and 2029 horizon years, respectively.





2024 Background Traffic Volumes

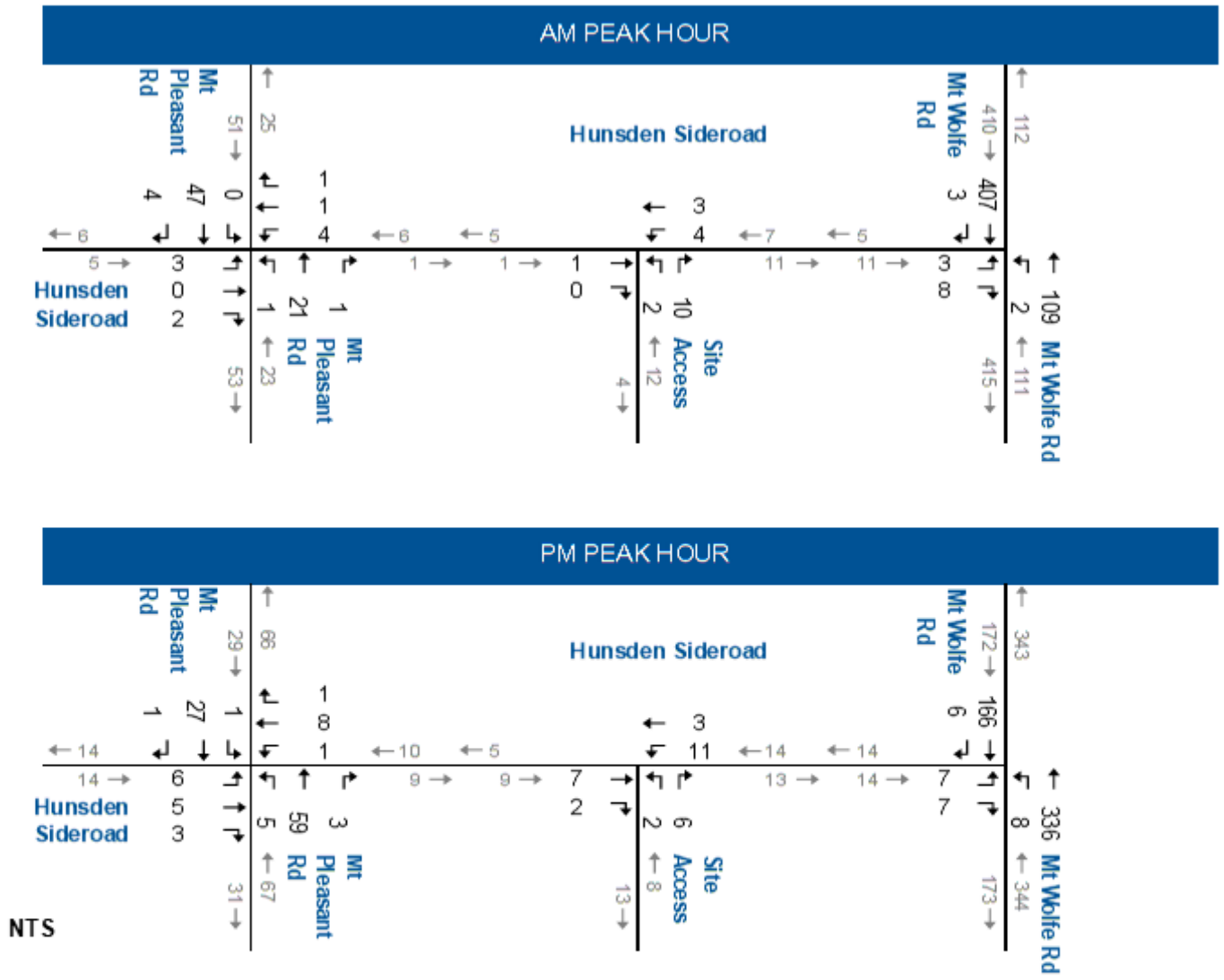


2029 Background Traffic Volumes

4.5 Forecast Total Traffic

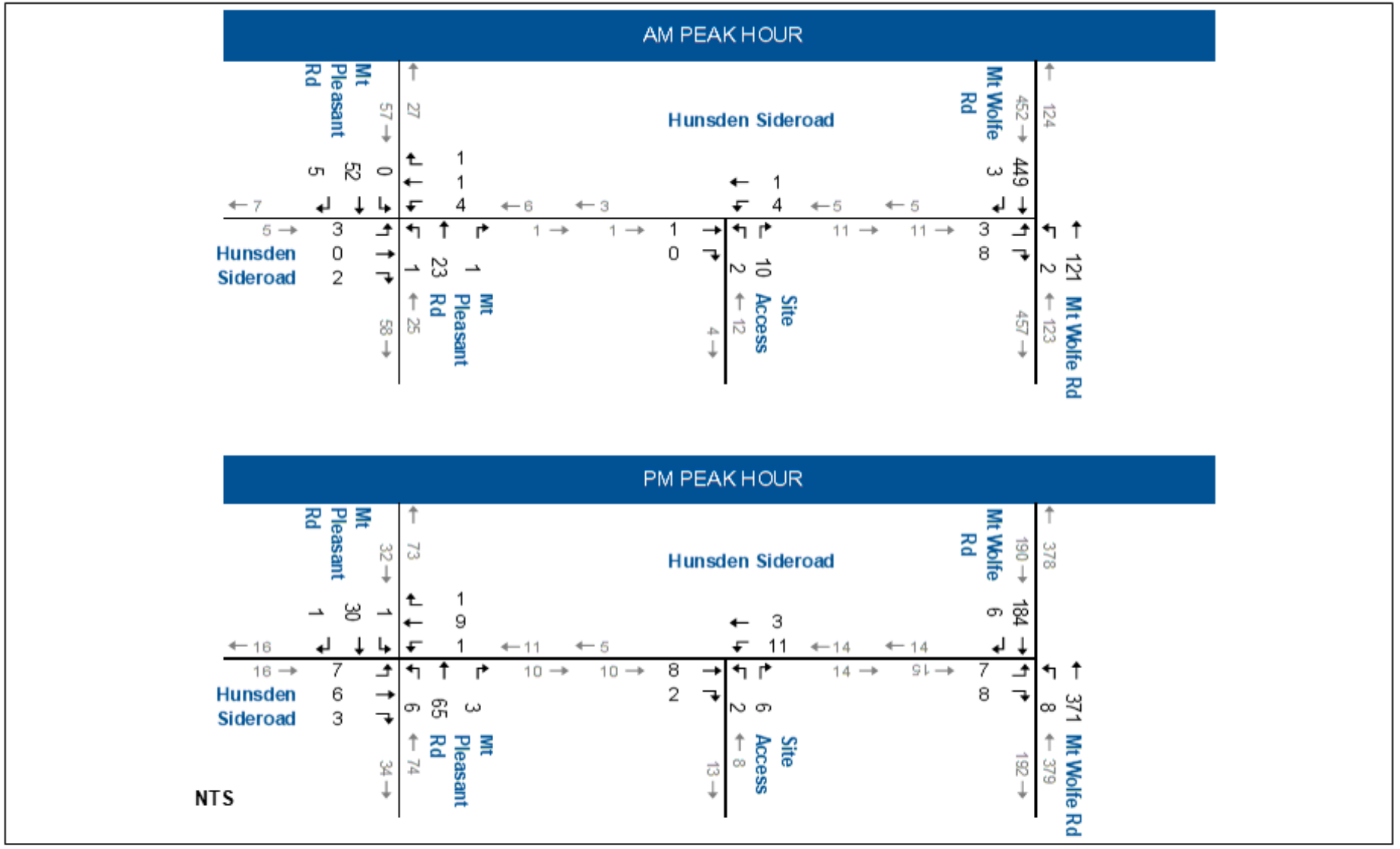
The forecast total traffic volumes are estimated as the summation of the forecast site generated traffic volumes and the forecast background traffic volumes.

Figure 4.3 and **Figure 4.4** illustrate the 2024 and 2029 forecast total traffic volumes in the AM and PM peak hours, respectively.



2024 Total Traffic Volumes

Figure 4.3



2029 Total Traffic Volumes

4.6 Future Background Traffic Operations

The study area intersections under the 2024 and 2029 background traffic conditions (without the subject development) were analyzed using Synchro.

Table 4.1 and **Table 4.2** summarize the background peak hour traffic intersection operations including level of service (LOS), average vehicle delay in seconds, volume-to-capacity (v/c) ratio, and 95th percentile queue length in metres for the 2024 and 2029 horizon years, respectively. Any movements identified as critical movements (if any) are highlighted within the results table. **Appendix E** contains the detailed analysis reports for reference.

The 95th percentile queue lengths were reviewed for all turn and through movements. No spillback issues were identified for the existing conditions. The Level of Service (LOS) is estimated as LOS A for all the approaches for all the future background years. The only exception includes the eastbound shared left/right movement operating at a LOS B for the Hunsden Sideroad and Mount Wolfe Road intersection. A maximum delay of 12 seconds was observed for all the approaches.

Analysis of background conditions (without the subject development) indicates that all intersection movements would operate at acceptable level of service and within capacity. There is no significant change in traffic volume expected in the future horizon years as the subject site is located in a rural area with farmland and low-density residential housing.

TABLE 4.1: 2024 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach															
				Eastbound				Westbound				Northbound				Southbound			
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach
AM Peak Hour	Mt Pleasant Road & Hunsden Sideroad	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**
			V/C	<	0.01	>		<	0.00	>		<	0.03	>		<	0.06	>	
			Q	<	0	>		<	0	>		<	0.1	>		<	0.2	>	
	Mt Wolfe Road & Hunsden Sideroad	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**
			Delay	12		>	**12**					8	0		**0**		0	0	**0**
			V/C	0.00		>						0.00	0.00				0.00	0.00	
			Q	0		>						0	0				0	0	
PM Peak Hour	Mt Pleasant Road & Hunsden Sideroad	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**
			V/C	<	0.02	>		<	0.01	>		<	0.07	>		<	0.03	>	
			Q	<	0	>		<	0	>		<	0.2	>		<	0.1	>	
	Mt Wolfe Road & Hunsden Sideroad	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**
			Delay	10		>	**10**					8	0		**0**		0	0	**0**
			V/C	0.01		>						0.00	0.00				0.00	0.00	
			Q	0		>						0	0				0	0	

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

TABLE 4.2: 2029 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach															
				Eastbound				Westbound				Northbound				Southbound			
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach
AM Peak Hour	Mt Pleasant Road & Hunsden Sideroad	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**
			V/C	<	0.01	>		<	0.00	>		<	0.03	>		<	0.06	>	
			Q	<	0	>		<	0	>		<	0.1	>		<	0.2	>	
	Mt Wolfe Road & Hunsden Sideroad	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**
			Delay	12		>	**12**					8	0		**0**		0	0	**0**
			V/C	0.00		>						0.00	0.00				0.00	0.00	
			Q	0		>						0	0				0	0	
PM Peak Hour	Mt Pleasant Road & Hunsden Sideroad	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**
			V/C	<	0.02	>		<	0.01	>		<	0.08	>		<	0.03	>	
			Q	<	0.1	>		<	0	>		<	0.3	>		<	0.1	>	
	Mt Wolfe Road & Hunsden Sideroad	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**
			Delay	10		>	**10**					8	0		**0**		0	0	**0**
			V/C	0.01		>						0.00	0.00				0.00	0.00	
			Q	0		>						0	0				0	0	

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.7 Future Total Traffic Operations

To assess the traffic operating conditions for the future weekday AM and PM total traffic forecasts, an operational analysis was undertaken using the same methodology, parameters, lane arrangements and traffic control devices as in the analysis of background conditions.

Table 4.3 and **Table 4.4** summarize the peak hour total traffic intersection operations including level of service (LOS), average vehicle delay in seconds, volume-to-capacity (v/c) ratio, and 95th percentile queue length in metres for the 2024 and 2029 horizon years, respectively. Any movements identified as critical movements (if any) are highlighted within the results table. **Appendix F** contains the detailed analysis reports for reference.

The 95th percentile queue lengths were reviewed for all turn and through movements. No spillback issues were identified for the existing conditions. The Level of Service (LOS) is estimated as LOS A for all the approaches for all the future total years. The only exception includes the eastbound shared left/right movement operating at a LOS B for the Hunsden Sideroad and Mount Wolfe Road intersection. A maximum delay of 12 seconds was observed for all the approaches.

Analysis of total conditions (with the subject development) indicates that the study area intersections would continue to operate at acceptable conditions, albeit slightly exacerbated with the inclusion of the site generated traffic. All intersection movements are forecast to continue operating at acceptable levels of service and within capacity. The addition of site traffic to the nearby intersections would result in a nominal volume increase. The additional traffic would be less than the daily traffic variations typically experienced at these locations. Given the relatively low trip generation rates, the subject development would result in imperceptible impacts to the studied transportation network.



TABLE 4.3: 2024 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach															
				Eastbound				Westbound				Northbound				Southbound			
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach
AM Peak Hour	Mt Pleasant Road & Hunsden Sideroad	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**
			V/C	<	0.01	>		<	0.01	>		<	0.03	>		<	0.06	>	
			Q	<	0	>		<	0	>		<	0.1	>		<	0.2	>	
	Mt Wolfe Road & Hunsden Sideroad	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**
			Delay	11		>	**11**					8	0		**0**		0	0	**0**
			V/C	0.02		>						0.00	0.00				0.00	0.00	
			Q	1		>						0	0				0	0	
	Driveway & Hunsden Sideroad	TWSC	LOS		A	A	**A**	A	A		**A**	A		>	**A**				
			Delay		0	0	**0**	7	0		**4**	8		>	**8**				
			V/C		0.00	0.00		0.00	0.00			0.01		>					
			Q		0	0		0	0			0		>					
PM Peak Hour	Mt Pleasant Road & Hunsden Sideroad	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**
			V/C	<	0.02	>		<	0.01	>		<	0.07	>		<	0.03	>	
			Q	<	0	>		<	0	>		<	0.2	>		<	0.1	>	
	Mt Wolfe Road & Hunsden Sideroad	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**
			Delay	11		>	**11**					8	0		**0**		0	0	**0**
			V/C	0.02		>						0.01	0.00				0.00	0.00	
			Q	1		>						0	0				0	0	
	Driveway & Hunsden Sideroad	TWSC	LOS		A	A	**A**	A	A		**A**	A		>	**A**				
			Delay		0	0	**0**	7	0		**6**	8		>	**8**				
			V/C		0.00	0.00		0.01	0.00			0.01		>					
			Q		0	0		0	0			0		>					

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LOS - Level of Service
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V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

TABLE 4.4: 2029 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach															
				Eastbound				Westbound				Northbound				Southbound			
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach
AM Peak Hour	Mt Pleasant Road & Hunsden Sideroad	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**
			V/C	<	0.01	>		<	0.01	>		<	0.03	>		<	0.06	>	
			Q	<	0	>		<	0	>		<	0.1	>		<	0.2	>	
	Mt Wolfe Road & Hunsden Sideroad	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**
			Delay	12		>	**12**					8	0		**0**		0	0	**0**
			V/C	0.02		>						0.00	0.00				0.00	0.00	
			Q	1		>						0	0				0	0	
	Driveway & Hunsden Sideroad	TWSC	LOS		A	A	**A**	A	A		**A**	A		>	**A**				
			Delay		0	0	**0**	7	0		**6**	8		>	**8**				
			V/C		0.00	0.00		0.00	0.00			0.01		>					
			Q		0	0		0	0			0		>					
PM Peak Hour	Mt Pleasant Road & Hunsden Sideroad	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**
			V/C	<	0.02	>		<	0.01	>		<	0.08	>		<	0.04	>	
			Q	<	0.1	>		<	0	>		<	0.3	>		<	0.1	>	
	Mt Wolfe Road & Hunsden Sideroad	TWSC	LOS	B		>	**B**					A	A		**A**		A	A	**A**
			Delay	11		>	**11**					8	0		**0**		0	0	**0**
			V/C	0.02		>						0.01	0.00				0.00	0.00	
			Q	1		>						0	0				0	0	
	Driveway & Hunsden Sideroad	TWSC	LOS		A	A	**A**	A	A		**A**	A		>	**A**				
			Delay		0	0	**0**	7	0		**6**	8		>	**8**				
			V/C		0.00	0.00		0.01	0.00			0.01		>					
			Q		0	0		0	0			0		>					

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.8 Alternate Modes of Transportation

4.8.1 Public Transit

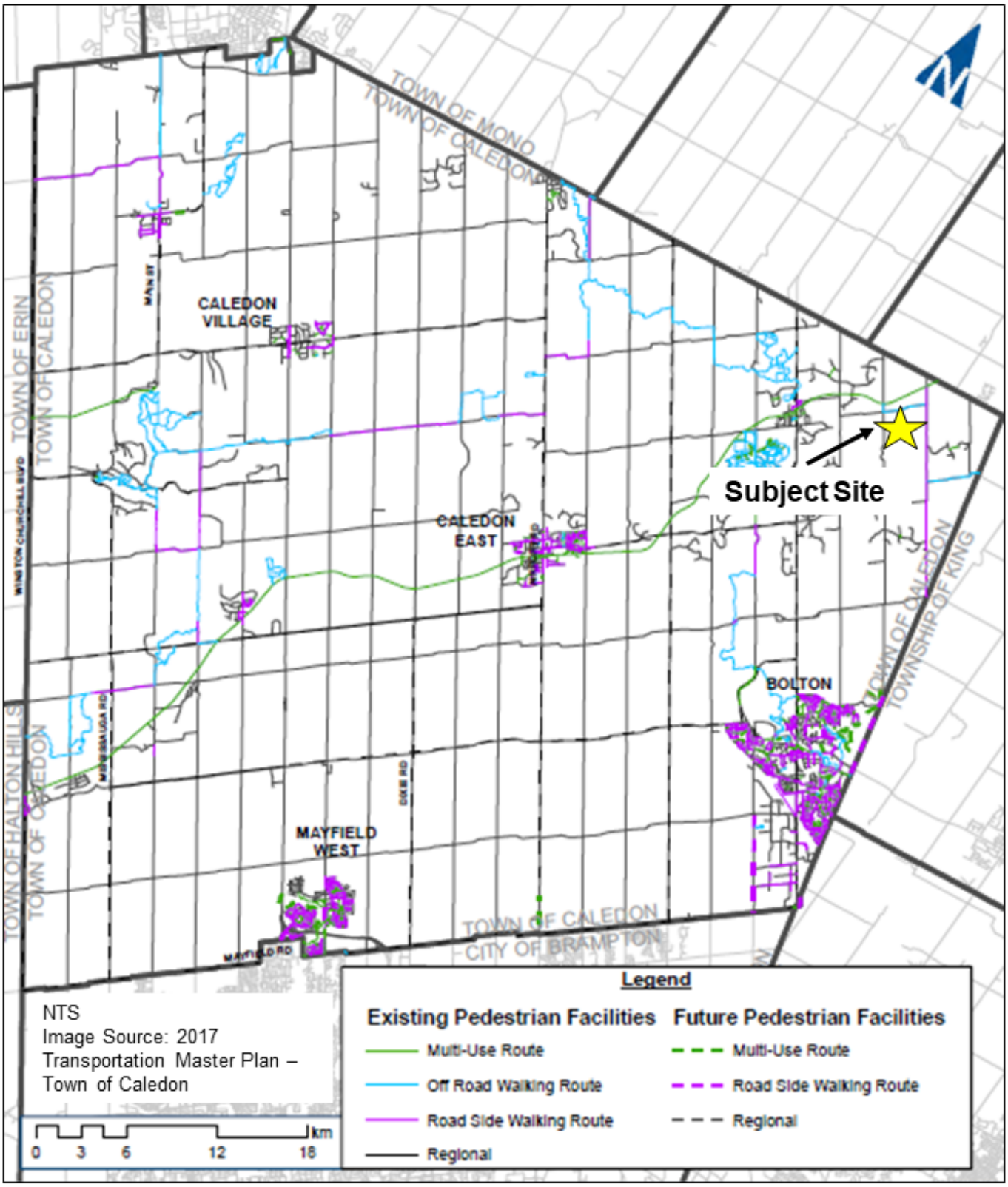
There is currently no public transit operating in the study area. Hence, no changes to the transit service or routes are required to accommodate the forecast site generated trips. It is expected that if the study area develops with higher density, the Town may consider deploying a dedicated transit route connecting the area to the nearby activity centres.

4.8.2 Walking

Pedestrian facilities connected to the site are essential to helping ensure safe and effective access and mobility to and from the site. Given the rural location, there are no dedicated pedestrian sidewalks connecting to the subject site. The *Caledon Transportation Master Plan (TMP) (2017)* identifies plans to upgrade Mount Wolfe Road and construct paved shoulders between Highway 9 and Castlederg Side Road.[10] Once these wider shoulders are provided, pedestrians may use this space to walk to and from Hunsden Sideroad. However, the planned development is not expected to generate a significant number of pedestrian trips.

Figure 4.5 illustrates the planned pedestrian network as depicted in the *Caledon TMP*.

[10] Town of Caledon, *Transportation Master Plan*, (Caledon: Town of Caledon, 2017)



Planned Pedestrian Facilities

10249 Hunsden Sideroad TIS and ACR
220678

Figure 4.5

4.8.3 Cycling

There are currently no dedicated cycling facilities connecting to the site. Cyclists are currently required to share the road with motor vehicles. This is a common practice given the low volume and rural nature of Hunsden Sideroad. The Caledon Transportation Master Plan (2017) (TMP) identifies plans to develop a shared on-road cycling route along Hunsden Sideroad between Mount Hope Road and Mount Wolfe Road.[11] This would enable the cyclists access the site safely and efficiently. However, the planned development is not expected to generate a significant number of cycling trips.

Figure 4.6 illustrates the planned cycling network as depicted in the Caledon TMP.

4.9 Street 'B' Traffic Impacts

Complete plans for Street 'B', Stinson Street and its associated development are unconfirmed at the time of writing this report and hence a detailed traffic impact analysis cannot be conducted at this stage.

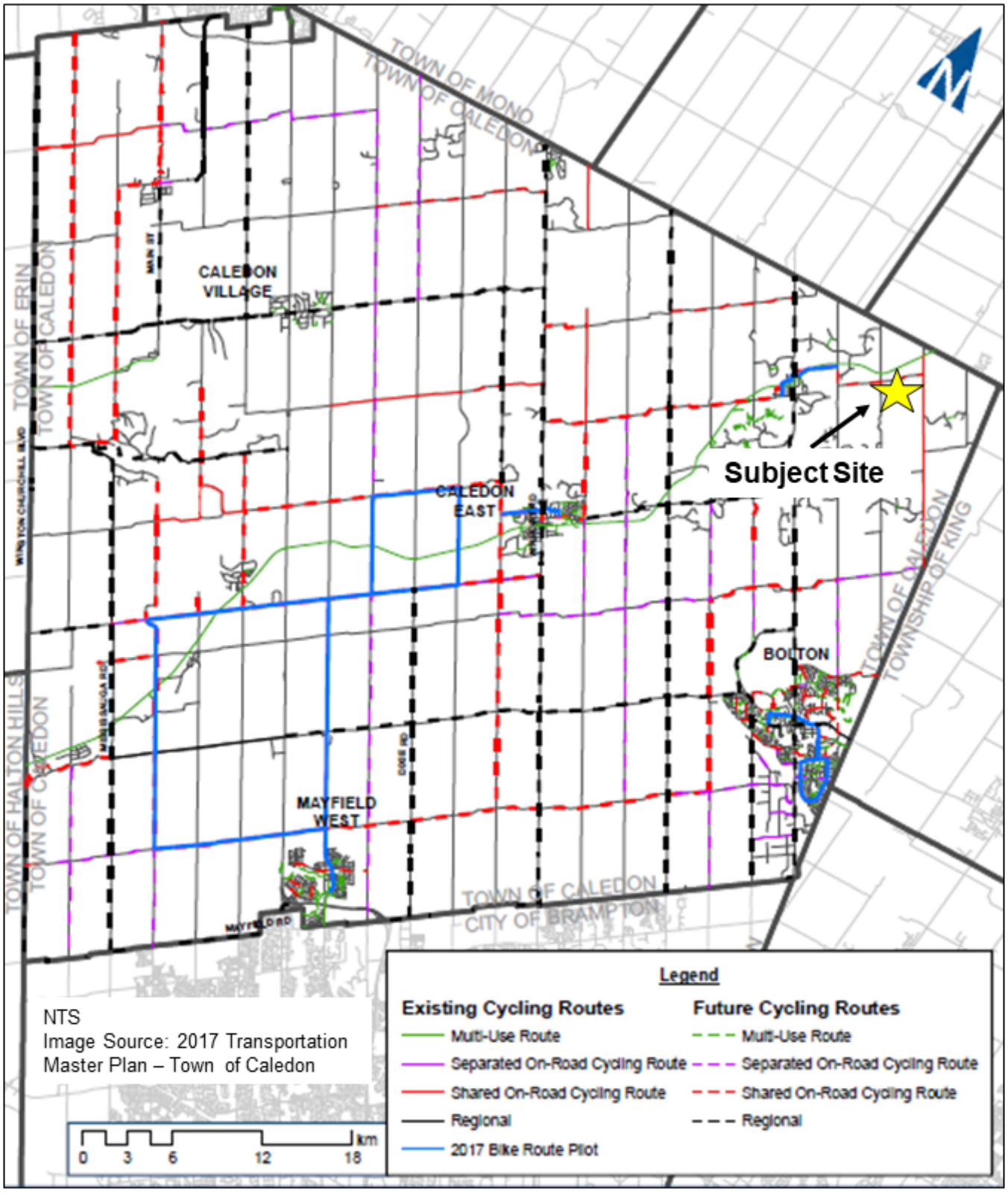
Street 'B' is a planned secondary access that will connect to Mount Pleasant Road via the future extension of Stinson Street. In the context of this planned development, the implementation of a secondary access route can serve as a supplementary access point in the case of emergencies or road construction.

Street 'B' is strategically positioned to serve as a secondary access point located at the southwestern periphery of the subject site, specifically catering to traffic destined for Mount Pleasant Road. Analysis from **Table 3.2** indicates that traffic distribution on Mount Pleasant Road peaks at a maximum of 16% during both AM and PM peak hours. With this relatively low volume of anticipated trips, the impact of Street 'B' on the surrounding network is expected to be low, with minimal traffic volumes. This suggests that Street 'B' will seamlessly integrate into the existing transportation infrastructure, effectively enhancing accessibility without significantly impacting traffic flow in the surrounding area.

By providing an alternative entry and exit point, the secondary access not only distributes traffic more evenly, but also reduces congestion on Street 'A', thereby improving overall traffic flow within the development. Additionally, a secondary access route through Street 'B'

[11] Town of Caledon, *Transportation Master Plan*, (Caledon: Town of Caledon, 2017)

will enhance safety by offering redundancy in case of emergencies or incidents that may block access via Street ‘A’.



Planned Cycling Facilities

10249 Hunsden Sideroad TIS and ACR
220678

Figure 4.6

5 Remedial Measures

Overall, the incremental impact of the proposed development site trips is considered minor. The additional vehicle volumes generated by the site would be less than the daily traffic variations (approximately 3%) typically experienced on the transportation network. The additional vehicle volumes can be managed by the existing/future planned transportation network without the need for any modifications to the existing transportation network. The addition of new trips from the site will, in part, be reapplying trips that were generated by the previous residential houses.

No off-site modifications such as geometric roadway or intersection improvements are required to support the proposed residential apartment redevelopment based on the following reasons:

- All study area intersections are reported to operate with good levels of service and within capacity under existing and future conditions; and
- The site generated traffic is minor and not expected to materially impact the existing road network.

6 Access and Circulation Review

The site circulation assessment has been carried out using AutoTURN swept path analysis software. The following vehicle types are considered as they apply to the land use:

- A TAC Heavy Single Unit (HSU);
- A Pumper Firetruck; and
- A Town of Caledon Snow Plough.

The analysis indicates that all vehicles can navigate the site as necessary.

Appendix G contains the swept path analysis for the design vehicles.

7 Site Access Assessment

The planned site access is located on the south side of Hunsden Sideroad via a public road called Street ‘A’. A secondary access via Street ‘B’ is also planned that would connect to Mount Pleasant Road via the future extension of Stinson Street. This link is not considered in this study because details are unconfirmed at the time of writing this report. The Hunsden Sideroad and Street ‘A’ intersection will be used as both an entry and exit point for the trips from the estate residential lots. The following section review this intersection to ensure that there no anticipated operational issues.

7.1 Corner Clearance

According to the Geometric Design Guide for Canadian Roads (GDGCR) 2017, corner clearance is the measured distance between the near curb of an intersection and the near edge of a driveway throat.[12] For the subject site, the distances were measured based on the corner clearance components shown in Figure 8.9.2 in the GDGCR. The distance from west end of the planned Street ‘A’ to the curb line of the nearest public road intersection (Mount Pleasant Road) was estimated for corner clearance calculations. The corner clearance for residential site requires a minimum tangent section (C) of two metres (measured from the end of the driveway/road curb radius) and a minimum driveway curb radius of three metres as shown in Figure 8.9.2 in the GDGCR.

Table 7.1 highlights the recommended values for the corner clearance in comparison to measurements of the existing road conditions.

[12] Transportation Association of Canada, *Geometric Design Guide for Canadian Roads*, (Ottawa: TAC, 2017),16-71.

TABLE 7.1: CORNER CLEARANCE

Measurement	TAC Guide Distance (m)	Road Measurement (m)	Requirement Satisfied
Tangent section	2	~410	Yes
Curb radius for Hunsden Sideroad	6	~9	Yes
Site access curb radius	3	~7.5	Yes

7.2 Access Spacing

The minimum spacing between driveways must be considered when considering the location of any given driveway.[12] For adjacent low volume driveways for residential areas, a minimum spacing of one metre is defined. The subject site has access via Street 'A', which can be treated as the access driveway.

Table 7.2 highlights the recommended values for the minimum spacing in comparison to measurements of the existing road conditions.

TABLE 7.2: ACCESS SPACING

Measurement	TAC Guide Distance (m)	Road Measurement (m)	Requirement Satisfied
Distance between the Planned Street 'A' and adjacent driveway east of the subject site	1	~349	Yes

All planned driveways are anticipated to connect to either Street 'A' or Street 'B'. None of the driveways are planned to connect to Hunsden Sideroad. Adequate spacing will be provided between the driveways, where available. The access spacing is planned in accordance with regulatory standards and best practices. This will ensure smooth traffic flow and safety within the site vicinity.

7.3 Throat Length

To increase operational efficiency for vehicle entering and exiting the driveway, a no conflict and storage zone is recommended within the driveway. The clear throat length or set-back distance is used to prevent frequent blocking of on-site circulation roads and the queueing

of entering vehicles. Table 8.9.3 in the GDGCR provides a guideline for suggested minimum clear throat lengths for various developments.[12] **Table 7.3** highlights the recommended values for the minimum clear throat length for apartments with less than 100 units (similar land use as a residential development) connecting to a local road in comparison to measurements of the existing road conditions. A minimum clear throat length of eight metres is recommended for apartments with less than 100 units. The subject site has access via Street 'A' and Street 'B', which can be treated as the access driveways. The throat lengths of Street 'A' and Street 'B' are planned to be around 240 metres and 100 metres, respectively, which satisfy this requirement.

TABLE 7.3: THROAT LENGTH

Measurement	TAC Guide Distance (m)	Street 'A' Throat Length Measurement (m)	Street 'B' Throat Length Measurement (m)	Requirement Satisfied
Driveway Throat Length for Apartment with <100 units connecting to a Local Road	8	~240	~100	Yes

Adequate throat lengths are planned for both Street 'A' and Street 'B' access driveways. The throat length for Street 'B' access is currently tentative because details of the future Stinson Street connection are unconfirmed at the time of writing this report.

7.4 Sight Distance Assessment

The necessary sight distances at the subject intersection were reviewed in accordance with the TAC GDGCR.[12] The analyzed case was assumed to be an intersection with stop control on the minor road. The components for the sight distance are measured as shown in Figure 9.9.2 in the GDGCR. The recommended sight distance values were determined using Table 9.9.4 and Table 9.9.6.

The assessment uses the following parameters:

- Object Height (vehicle tail or brake light): 0.60 metres;
- Driver Eye Height: 1.08 metres; and

- Top of Car: 1.30 metres.

Paradigm staff carried out a site visit to confirm the sightline assessment measurements.

Appendix H shows the sightline assessment diagrams.

The measurements for outbound traffic exiting the site were estimated at 5.4 metres from the existing edge of pavement, representing the typical position of a driver performing a turning movement. The measurements for inbound traffic were taken from the centre of the travel lane on Hunsden Sideroad from which the turning movement would occur.

Table 7.4 summarizes the recommended sight distances for the Hunsden Sideroad and Street 'A' intersection based on an 80 km/h design speed (20 km/h above the posted speed limit) for the major road and 20 km/h design speed for Street 'A'.

TABLE 7.4: SITE ACCESS SIGHT DISTANCE ASSESSMENT

Measurement	TAC Guide Distance (m)	Road Measurement (m)	Requirement Satisfied
Minimum Stopping Sight Distance (Westbound) – Driver Approaching the Site Access from the East	130	~	No
Minimum Stopping Sight Distance (Eastbound) – Driver Approaching the Site Access from the West	130	~102	No
Departure Sight Distance (Left Turn from Stop) – Driver Facing North and Looking West	170	~86	No
Departure Sight Distance (Left Turn from Stop) – Driver Facing North and Looking East	170	~	No

Departure Sight Distance (Right Turn from Stop) – Driver Facing North and Looking West	145	~86	No

The results of the sight distance assessment indicate that the sight distance requirements are currently not met.

If feasible, Street 'A' could be moved east to better align with sight distance requirements. Given the existing and planned residential lot, moving the Street 'A' access to the east does not appear feasible. As such, there are alternative measures that can be taken to address sight distance concerns.

There is vegetation at the horizontal curve on the north side of Hunsden Sideroad east of the site access. It is recommended that this vegetation me trimmed and maintained such that it does not obstruct motorist sight distances for the site access and the other existing residential lots along Hunsden Sideroad. The portion of vegetation that needs to be trimmed is within the public right-of-way. Further details can be observed in Appendix H.

In the event that vegetation cannot be fully cleared of there is regrowth, a Wa-13R intersection warning sign (60 cm x 60 cm) be installed on Hunsden Sideroad, 225 metres east of the planned Street 'A' intersection. This sign should be accompanied by a Wa-18t hidden intersection tab sign (30 cm x 60 cm).

To the west of the site access, the vertical alignment of Hunsden Sideroad is not completely level. There is a slight elevation west of the planned Hunsden Sideroad and Street 'A' intersection that impacts sight distance. If there are plans to upgrade Hunsden Sideroad in the near future, it is recommended that adjustments to the vertical alignment be considered to address this sight distance issue for the planned site access as well as the other existing residential lots that currently exist in the area. In the absence of modifications to the vertical alignment, the sight distance issue can be addressed by installing a Wa-13L intersection warning sign (60 cm x 60 cm) along with a Wa-18t hidden intersection tab sign (30 cm x 60 cm) on Hunsden Sideroad, 225 metres west of the planned Street 'A' intersection.

7.5 Conclusions

- The results of the site access assessment indicate that the Hunsden Sideroad and Street 'A' intersection, as currently

planned, satisfies TAC *GDGCR guidance, including* corner clearance, access spacing and throat length requirements. The exception to this is the sight distance requirements at the intersection of Hunsden Sideroad and Street ‘A’. A number of recommendations have been made to address this matter most notably vegetation trimming and signage. Specifically: Clearing vegetation on the side of Hunsden Sideroad, east of the Street ‘A’ intersection; and

- Installing intersection warning signs on both sides of the Hunsden Sideroad and Street ‘A’ intersection.

8 Conclusions and Recommendations

8.1 Conclusions

Based on the investigations carried out, it is concluded that:

- **Existing Traffic Conditions**: The study intersections operate with acceptable levels of service and within capacity during both the AM and PM peak hours.
- **Development Trip Generation**: The development is estimated to generate 16 trips in the AM peak hour and 21 trips in the PM peak hour. The addition of new trips from the site will, in part, be applying trips that were generated by the previous residential houses.
- **Roadway Improvements**: No roadway improvements are identified.
- **Background Traffic Conditions**: The study area intersections are forecast to operate with acceptable levels of service and within capacity under both 2024 and 2029 analysis scenarios.
- **Total Traffic Conditions**: The redevelopment of the subject site is forecast to have a negligible impact on traffic operations. The study intersections are forecast to operate at very similar levels of service as under background traffic conditions. All traffic movements are forecast to operate with acceptable levels of service and within capacity.
- **Site Circulation**: The site circulation assessment indicates that a TAC Heavy Single Unit truck, Pumper Firetruck and a Town of Caledon Snow Plough can enter, exit, and traverse Street ‘A’ without conflict.
- **Sight Access Assessment**: The site access assessment indicates adequate corner clearance, access spacing and throat length at the intersection of Street ‘A’ and Hunsden Sideroad. However, sight distances are currently inadequate. This can be addressed by installing a Wa-13 intersection warning sign and a Wa-18t hidden intersection tab sign on both the eastern and western approaches to Street ‘A’, positioned 225 metres from the intersection.

8.2 Recommendations

Based on the findings of this study, it is recommended that:

- The contents of the report be considered;

- A Wa-13 intersection warning sign along with a Wa-18t hidden intersection sign be installed on both the eastern and western approaches to Street ‘A’, 225 metres from the intersection; and
- The development proceeds without further updates to the studied transportation network at this time.

Appendix A

Pre-Study Consultation

From: Jillian Britto < Jillian.Britto@caledon.ca>
Sent: October 20, 2022 3:31 PM
To: Josh de Boer < jdeboer@ptsl.com>
Cc: Arash Olia < Arash.Olia@caledon.ca>
Subject: RE: 10249 Hunsden Sideroad Residential Development - Terms of Reference

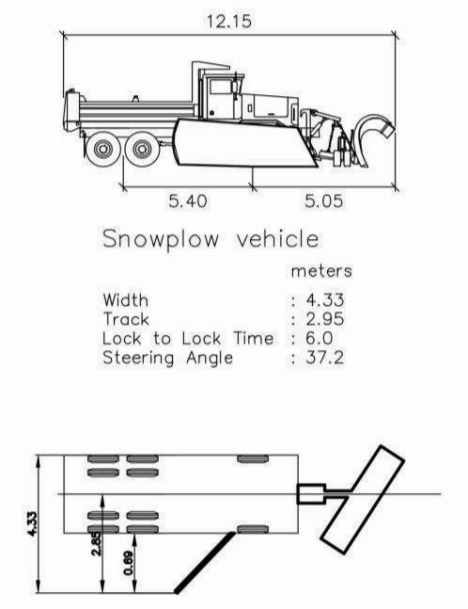
Hi Josh,

Thank you for providing us an opportunity to review the terms of reference for a TIS for the above-noted development.

As discussed over the phone this morning, the scope of work noted in the TOR is generally acceptable with the following additions and comments:

- Please confirm the discussions regarding a Traffic Impact Memo and TIS submission with the Town 's lead planner on the file, Adam Wendland. The comments provided below apply to the scope of work required for the comprehensive study.
    - Office: 905.584.2272 x.4024; Email: adam.wendland@caledon.ca
- The Town does not have any data in this area; please obtain 2022 TMCs for the proposed study intersections.
- The proposed 2% annual growth rate is acceptable.
- There are no background developments in the area that will add significant traffic to the proposed study intersections.
- There are currently no planned roadway improvements within the study area.
- Please also include the following items in the TIS:
    - Active Transportation Provisions and Network Connections:
        - Identify existing and future planned active transportation within the study area, the proposed connections from the site to the future network, and all active transportation provisions within the site. Please note that all cycling facilities should comply with OTM Book 18.

        - Please see Town ’s Trails and Cycling Routes map: https://maps.caledon.ca/h5/index.html?viewer=Trails.Trails
    - Road Network Review:
        - Road design adheres to the Town ’s Development Standards Manual (https://www.caledon.ca/en/town-services/standards-policies-and-guidelines.aspx#Development-Standards-Manual);
        - Curb radii are noted throughout the development; and
        - Sightline assessment for Street A at Hunsden Sideroad.
    - Circulation Review using AutoTURN software for:
        - Fire and garbage trucks; and
        - Snow ploughs (please see attached dimensions for Town ’s snow plough vehicles and template below).



Please let me know if you have any questions or require any further information.

Regards,

Jillian Britto, P.Eng.
Transportation Engineer
Engineering Services

Office: 905.584.2272 x 4108
Email: Jillian.Britto@caledon.ca

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From: Josh de Boer < jdeboer@ptsl.com >
Sent: Thursday, October 20, 2022 11:10 AM
To: Arash Olia < Arash.Olia@caledon.ca >
Cc: Jillian Britto < Jillian.Britto@caledon.ca >
Subject: RE: 10249 Hunsden Sideroad Residential Development - Terms of Reference

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Thanks

Josh de Boer, M.Eng., P.Eng., PTOE

Project Manager, Associate
(he/him)

Paradigm Transportation Solutions Limited
c: 905.807.2420
p: 416.479.9684 x505

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From: Arash Olia < Arash.Olia@caledon.ca >
Sent: October 20, 2022 11:08 AM
To: Josh de Boer < jdeboer@ptsl.com >
Cc: Jillian Britto < Jillian.Britto@caledon.ca >
Subject: Re: 10249 Hunsden Sideroad Residential Development - Terms of Reference

Hi Josh,

Thanks for reaching out. Jillian from my team will review and advise.

Regards,

Arash Olia, P.Eng. , Ph.D.
Manager, Transportation Engineering
Engineering Services Department

Office: 905.584.2272 x.4073
Email: arash.olia@caledon.ca

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From: Josh de Boer < jdeboer@ptsl.com >
Sent: Thursday, October 20, 2022 10:58:03 AM
To: Arash Olia < Arash.Olia@caledon.ca >
Subject: 10249 Hunsden Sideroad Residential Development - Terms of Reference

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Good morning Arash,

I 'm not sure if you remember me, but I believe we went to school together about 10 years ago. Hope all is well in Caledon. Paradigm has a client that is looking to development some property in northeast section of the Town. I believe he 's already been in discussions with the Town regarding transportation needs, with the result being that he needs to provide a traffic letter in relatively shorter order, and a TIS to follow. My office has prepared the following terms of reference below for your review. Please let us know of any feedback.

Paradigm Transportation Solutions Limited (Paradigm) has been retained by Hillview Estates Limited to prepare a Traffic Impact Memo and Transportation Impact Study (TIS) for a residential development at 10249 Hunsden Sideroad in the Town of Caledon. The TIS will be preceded by the Traffic Impact Memo that will be submitted as a separate

document. The Memo and TIS are required to satisfy the 2017 Town of Caledon Transportation Impact Studies Terms of Reference and Guidelines.

The purpose of this email is to establish a Terms of Reference (ToR) for both the Memo and TIS. We are seeking confirmation on our proposed scope of work that is discussed below.

Background

The subject site is located at 10249 Hunsden Sideroad in the Town of Caledon. The property owner proposes to develop 19 detached residential lots. The existing property is a wooded lot with low density residential and farmland. Vehicle access is proposed via a local road network that would connect to the Town 's existing road network. Plans include vehicle parking at each individual lot.

Analysis

- The study area intersection traffic operations will be analyzed using standard Highway Capacity Manual (HCM) methodologies and Synchro software.
- The analysis will determine if there are any operational deficiencies during the AM and PM peak hours and the subsequent mitigation measures required.
- The study will follow the 2017 Town of Caledon Transportation Impact Studies Terms of Reference and Guidelines.
- Trip generation will be based on the ITE Trip Generation Manual (11 th Edition), land use code (LUC) 210 (Single-Family Detached Housing) .
- Trip distribution will be based on current travel patterns.
- The weekday AM and PM peak hours will be analyzed.
- The build-out year is estimated to be 2024. In addition to analyzing the 2024 build-out year, a 5-year horizon from the build-out year will be analyzed as well.

Study Intersections

- Hunsden Sideroad and Mt Wolfe Road (unsignalized)
- Hunsden Sideroad and Mt Pleasant Road (unsignalized)
- Hunsden Sideroad and Street 'A ' (proposed unsignalized)

Requested Information

1. **Trip volume data.** Any data that may be pertinent to the analysis, including TMCs, AADTs, ATRs, PCSs, pedestrian studies and/or cycling counts.
2. **Growth rate.** A growth rate of 2% will be applied to through movement volumes on all study roadways. If an alternate rate is required, please advise.
3. **Background developments.** Information on planned background developments that will impact the identified road network.
4. **Future road improvements.** Information on future roads and/or network improvements that will impact the identified road network.

Thank you for reviewing project details and providing information where available. If there are any questions, please do not hesitate to contact me. We look forward to your response.

Regards,

Josh de Boer, M.Eng., P.Eng., PTOE
Project Manager, Associate
(he/him)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
c: 905.807.2420
p: 416.479.9684 x505
e: jdeboer@ptsl.com
w: www.ptsl.com

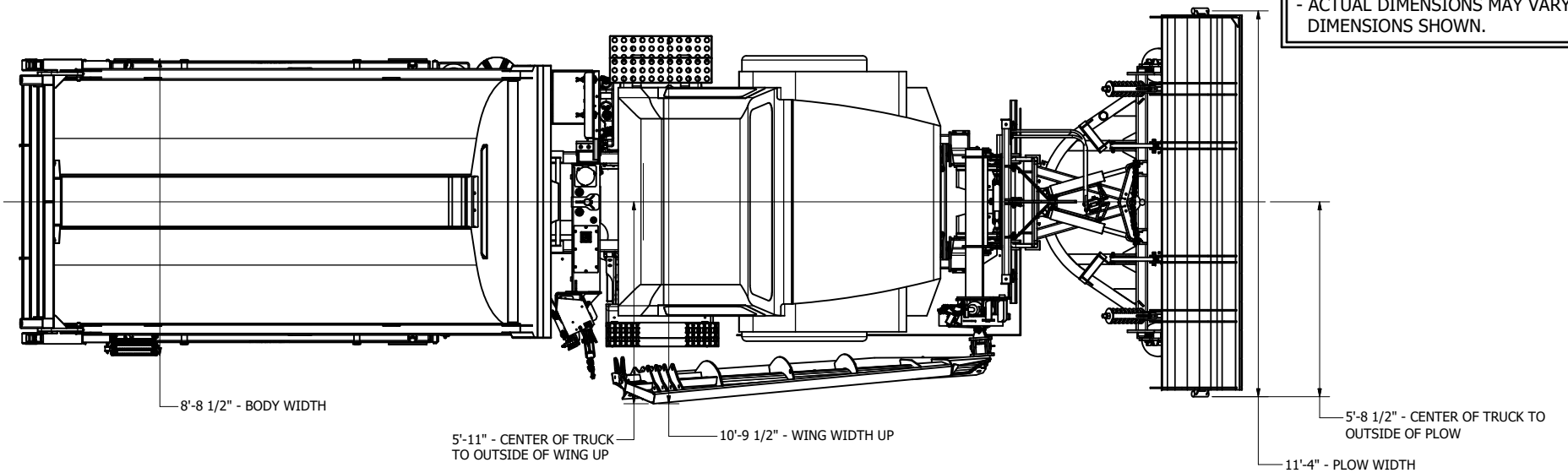
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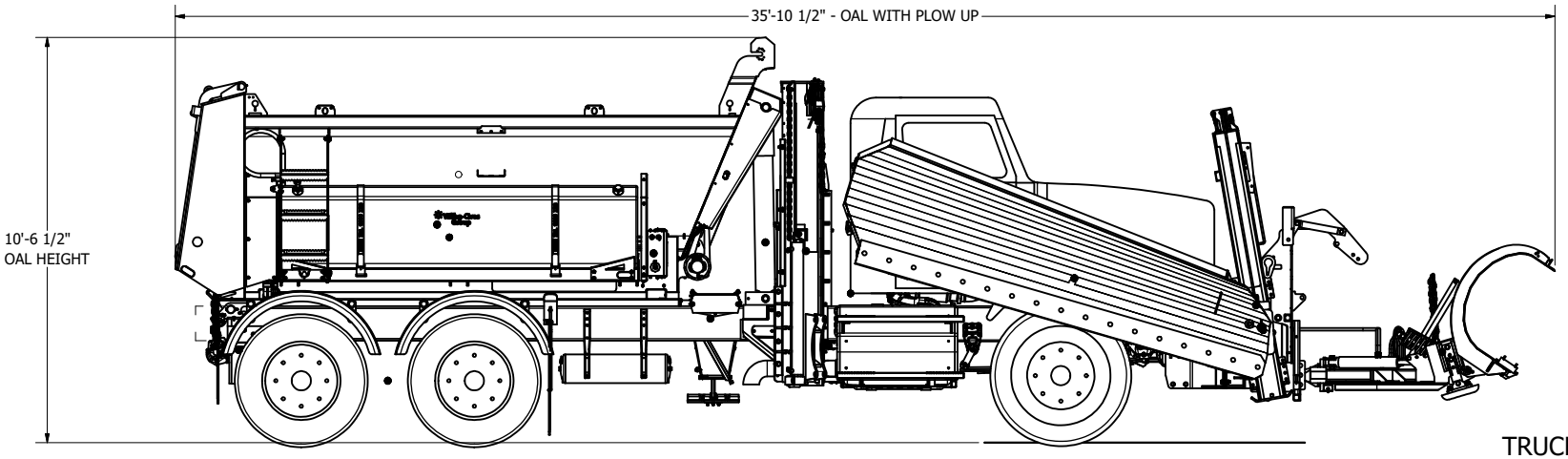
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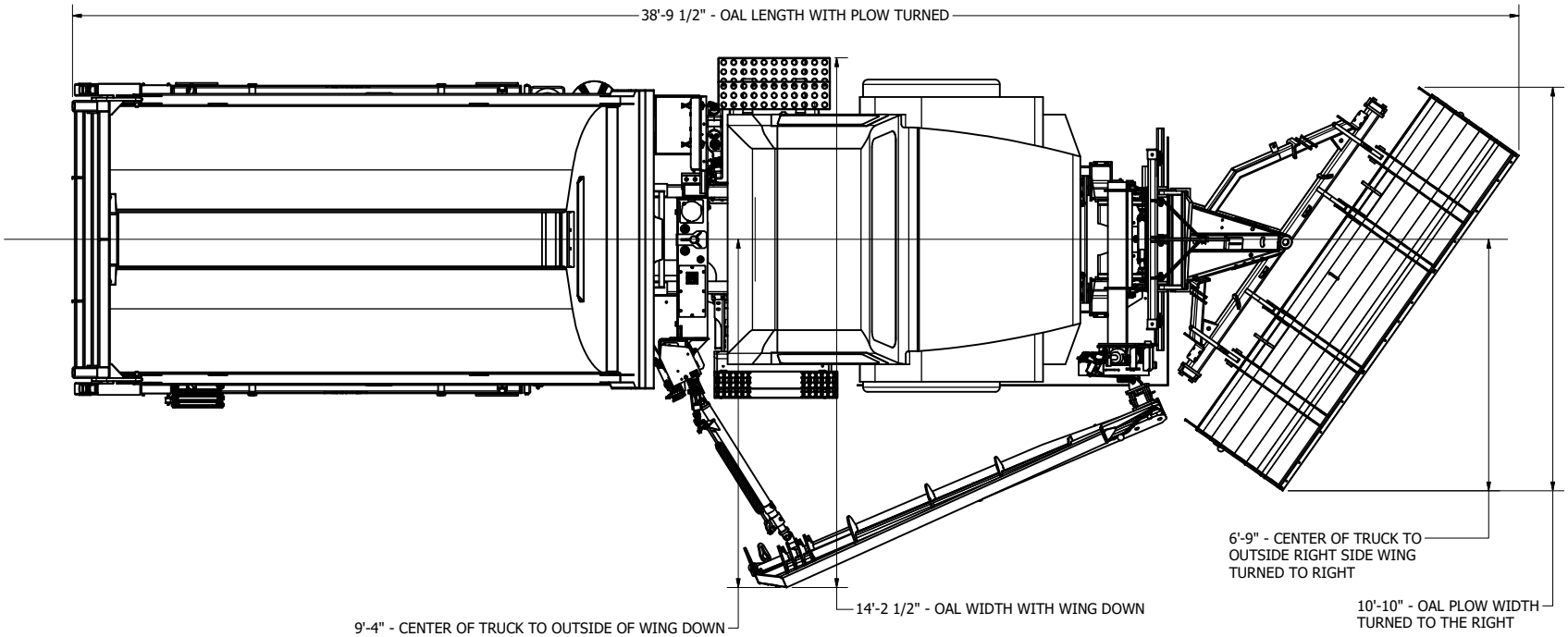
TOWN OF CALEDON
TRUCK LAYOUT # WTD03233-02
FREIGHTLINER 114SD SBA
PRELIMINARY TRUCK LAYOUT

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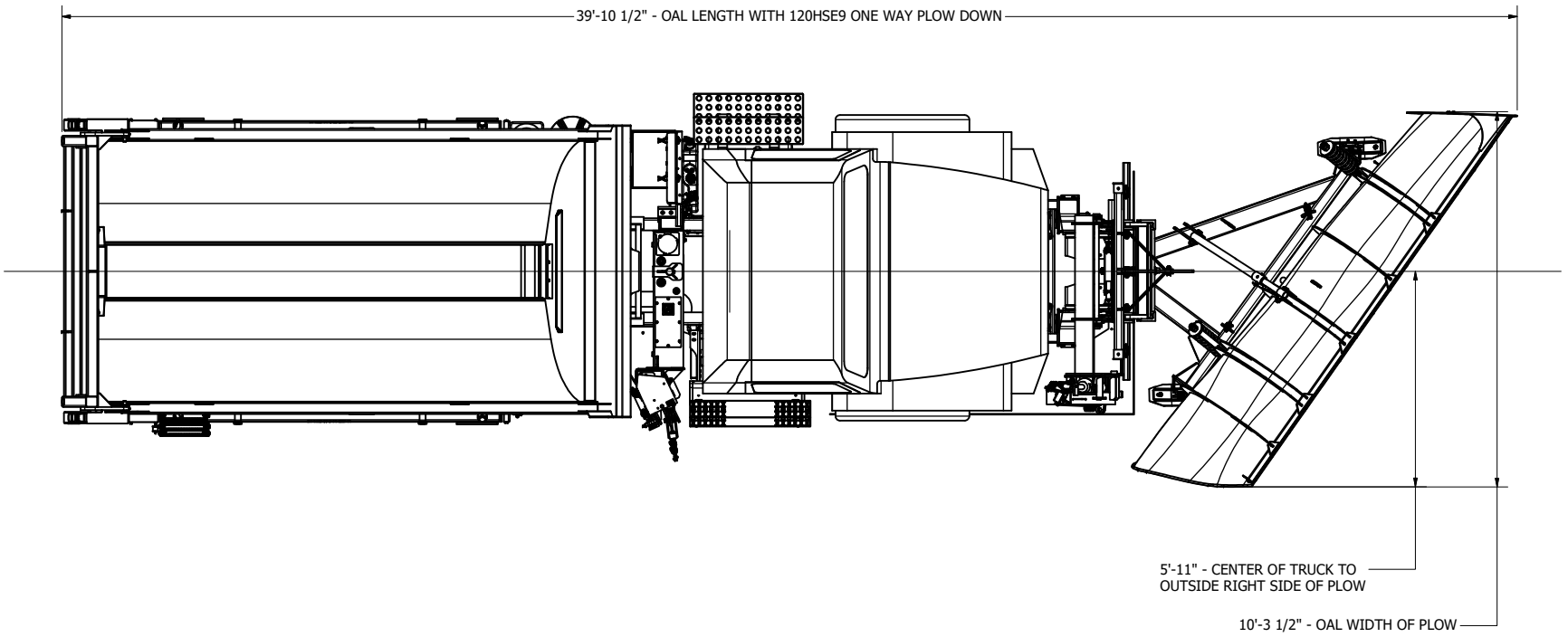
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Appendix B

Traffic Data

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Pleasant Road
Site Code: 220678
Start Date: 11/01/2022

Turning Movement Data

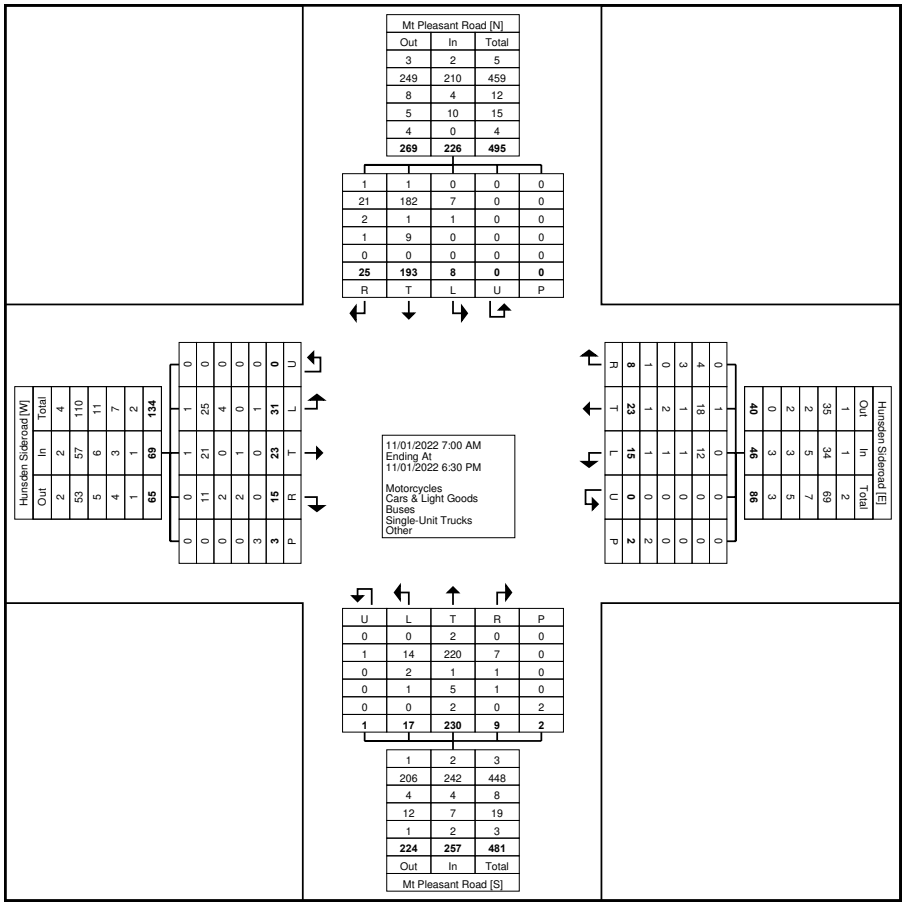
Start Time	Hunsden Sideroad Eastbound						Hunsden Sideroad Westbound						Mt Pleasant Road Northbound						Mt Pleasant Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	1	0	2	0	0	3	1	0	1	0	0	2	0	1	0	0	0	1	0	5	0	0	0	5	11
7:15 AM	1	1	0	0	0	2	0	1	0	0	0	1	0	3	0	0	0	3	0	11	0	0	0	11	17
7:30 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	1	0	0	3	0	15	1	0	0	16	20
7:45 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	6	0	0	0	6	0	9	1	0	0	10	17
Hourly Total	2	1	3	0	0	6	2	1	1	0	0	4	0	12	1	0	0	13	0	40	2	0	0	42	65
8:00 AM	2	0	0	0	0	2	1	0	0	0	0	1	0	6	0	0	0	6	0	13	0	0	0	13	22
8:15 AM	1	0	1	0	0	2	1	1	0	0	0	2	1	6	0	1	0	8	0	8	2	0	0	10	22
8:30 AM	1	2	0	0	0	3	0	1	1	0	0	2	1	8	0	0	0	9	0	5	1	0	0	6	20
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	6	0	0	0	6	9
Hourly Total	4	2	1	0	0	7	2	2	1	0	0	5	2	23	0	1	0	26	0	32	3	0	0	35	73
9:00 AM	1	1	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	3	0	7	1	0	0	8	13
9:15 AM	0	1	1	0	0	2	1	0	0	0	0	1	1	4	1	0	0	6	1	7	1	0	0	9	18
9:30 AM	0	0	0	0	0	0	1	1	1	0	0	3	0	4	1	0	0	5	0	5	1	0	0	6	14
9:45 AM	1	2	0	0	0	3	0	1	1	0	0	2	0	4	0	0	0	4	0	2	2	0	0	4	13
Hourly Total	2	4	1	0	0	7	2	2	2	0	0	6	1	15	2	0	0	18	1	21	5	0	0	27	58
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	1	0	1	0	0	2	0	1	0	0	0	1	0	3	0	0	0	3	0	7	2	0	0	9	15
11:45 AM	4	0	0	0	0	4	0	0	1	0	0	1	1	2	0	0	0	3	0	5	0	0	0	5	13
Hourly Total	5	0	1	0	0	6	0	1	1	0	0	2	1	5	0	0	0	6	0	12	2	0	0	14	28
12:00 PM	0	0	0	0	2	0	2	0	0	0	2	2	0	4	0	0	0	4	1	4	1	0	0	6	12
12:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	8	0	0	0	8	0	7	2	0	0	9	18
12:30 PM	0	0	0	0	0	0	0	1	0	0	0	1	2	6	0	0	0	8	0	5	1	0	0	6	15
12:45 PM	0	4	1	0	0	5	0	1	0	0	0	1	1	3	0	0	0	4	0	4	0	0	0	4	14
Hourly Total	0	4	1	0	2	5	2	3	0	0	2	5	3	21	0	0	0	24	1	20	4	0	0	25	59
1:00 PM	1	0	1	0	0	2	1	1	0	0	0	2	0	3	0	0	0	3	1	4	0	0	0	5	12
1:15 PM	2	0	0	0	0	2	0	1	2	0	0	3	0	5	0	0	0	5	1	4	1	0	0	6	16
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	3	0	1	0	0	4	1	2	2	0	0	5	0	8	0	0	0	8	2	8	1	0	0	11	28
3:30 PM	1	0	1	0	0	2	0	0	1	0	0	1	1	18	1	0	0	20	0	3	0	0	0	3	26
3:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	8	1	0	0	9	1	4	0	0	0	5	15
Hourly Total	1	1	1	0	0	3	0	0	1	0	0	1	1	26	2	0	0	29	1	7	0	0	0	8	41
4:00 PM	2	1	0	0	0	3	1	2	0	0	0	3	2	13	2	0	0	17	2	6	4	0	0	12	35
4:15 PM	1	1	3	0	0	5	0	0	0	0	0	0	1	10	0	0	0	11	0	7	1	0	0	8	24
4:30 PM	1	0	0	0	0	1	0	0	0	0	0	0	1	14	0	0	0	15	1	5	1	0	0	7	23
4:45 PM	3	0	0	0	0	3	1	1	0	0	0	2	0	4	0	0	0	4	0	1	0	0	0	1	10

Hourly Total	7	2	3	0	0	12	2	3	0	0	0	5	4	41	2	0	0	47	3	19	6	0	0	28	92
5:00 PM	2	0	2	0	0	4	1	1	0	0	0	2	0	17	2	0	0	19	0	9	0	0	0	9	34
5:15 PM	1	1	0	0	0	2	0	3	0	0	0	3	1	12	0	0	0	13	0	6	0	0	0	6	24
5:30 PM	1	1	0	0	1	2	0	1	0	0	0	1	3	18	0	0	0	21	0	8	0	0	0	8	32
5:45 PM	2	3	1	0	0	6	0	3	0	0	0	3	1	10	0	0	0	11	0	3	1	0	0	4	24
Hourly Total	6	5	3	0	1	14	1	8	0	0	0	9	5	57	2	0	0	64	0	26	1	0	0	27	114
6:00 PM	1	1	0	0	0	2	2	0	0	0	0	2	0	12	0	0	0	12	0	2	0	0	0	2	18
6:15 PM	0	3	0	0	0	3	1	1	0	0	0	2	0	10	0	0	2	10	0	6	1	0	0	7	22
Grand Total	31	23	15	0	3	69	15	23	8	0	2	46	17	230	9	1	2	257	8	193	25	0	0	226	598
Approach %	44.9	33.3	21.7	0.0	-	-	32.6	50.0	17.4	0.0	-	-	6.6	89.5	3.5	0.4	-	-	3.5	85.4	11.1	0.0	-	-	-
Total %	5.2	3.8	2.5	0.0	-	11.5	2.5	3.8	1.3	0.0	-	7.7	2.8	38.5	1.5	0.2	-	43.0	1.3	32.3	4.2	0.0	-	37.8	-
Motorcycles	1	1	0	0	-	2	0	1	0	0	-	1	0	2	0	0	-	2	0	1	1	0	-	2	7
% Motorcycles	3.2	4.3	0.0	-	-	2.9	0.0	4.3	0.0	-	-	2.2	0.0	0.9	0.0	0.0	-	0.8	0.0	0.5	4.0	-	-	0.9	1.2
Cars & Light Goods	25	21	11	0	-	57	12	18	4	0	-	34	14	220	7	1	-	242	7	182	21	0	-	210	543
% Cars & Light Goods	80.6	91.3	73.3	-	-	82.6	80.0	78.3	50.0	-	-	73.9	82.4	95.7	77.8	100.0	-	94.2	87.5	94.3	84.0	-	-	92.9	90.8
Buses	4	0	2	0	-	6	1	1	3	0	-	5	2	1	1	0	-	4	1	1	2	0	-	4	19
% Buses	12.9	0.0	13.3	-	-	8.7	6.7	4.3	37.5	-	-	10.9	11.8	0.4	11.1	0.0	-	1.6	12.5	0.5	8.0	-	-	1.8	3.2
Single-Unit Trucks	0	1	2	0	-	3	1	2	0	0	-	3	1	5	1	0	-	7	0	9	1	0	-	10	23
% Single-Unit Trucks	0.0	4.3	13.3	-	-	4.3	6.7	8.7	0.0	-	-	6.5	5.9	2.2	11.1	0.0	-	2.7	0.0	4.7	4.0	-	-	4.4	3.8
Articulated Trucks	0	0	0	0	-	0	1	0	1	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	3
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	6.7	0.0	12.5	-	-	4.3	0.0	0.4	0.0	0.0	-	0.4	0.0	0.0	0.0	-	-	0.0	0.5
Bicycles on Road	1	0	0	0	-	1	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	3
% Bicycles on Road	3.2	0.0	0.0	-	-	1.4	0.0	4.3	0.0	-	-	2.2	0.0	0.4	0.0	0.0	-	0.4	0.0	0.0	0.0	-	-	0.0	0.5
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Pleasant Road
Site Code: 220678
Start Date: 11/01/2022



Turning Movement Data Plot

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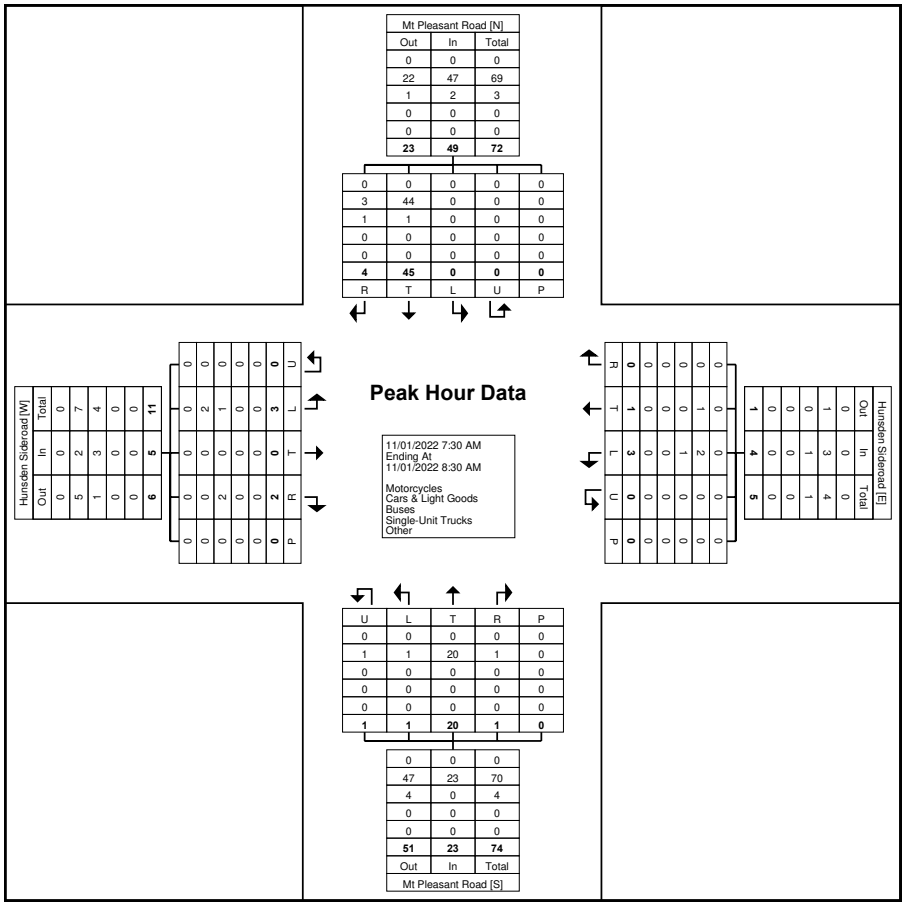
Turning Movement Peak Hour Data (7:30 AM)

Start Time	Hunsden Sideroad Eastbound						Hunsden Sideroad Westbound						Mt Pleasant Road Northbound						Mt Pleasant Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:30 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	2	1	0	0	3	0	15	1	0	0	16	20
7:45 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	6	0	0	0	6	0	9	1	0	0	10	17
8:00 AM	2	0	0	0	0	2	1	0	0	0	0	1	0	6	0	0	0	6	0	13	0	0	0	13	22
8:15 AM	1	0	1	0	0	2	1	1	0	0	0	2	1	6	0	1	0	8	0	8	2	0	0	10	22
Total	3	0	2	0	0	5	3	1	0	0	0	4	1	20	1	1	0	23	0	45	4	0	0	49	81
Approach %	60.0	0.0	40.0	0.0	-	-	75.0	25.0	0.0	0.0	-	-	4.3	87.0	4.3	4.3	-	-	0.0	91.8	8.2	0.0	-	-	-
Total %	3.7	0.0	2.5	0.0	-	6.2	3.7	1.2	0.0	0.0	-	4.9	1.2	24.7	1.2	1.2	-	28.4	0.0	55.6	4.9	0.0	-	60.5	-
PHF	0.375	0.000	0.500	0.000	-	0.625	0.750	0.250	0.000	0.000	-	0.500	0.250	0.833	0.250	0.250	-	0.719	0.000	0.750	0.500	0.000	-	0.766	0.920
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	2	0	0	0	-	2	2	1	0	0	-	3	1	20	1	1	-	23	0	44	3	0	-	47	75
% Cars & Light Goods	66.7	-	0.0	-	-	40.0	66.7	100.0	-	-	-	75.0	100.0	100.0	100.0	100.0	-	100.0	-	97.8	75.0	-	-	95.9	92.6
Buses	1	0	2	0	-	3	1	0	0	0	-	1	0	0	0	0	-	0	0	1	1	0	-	2	6
% Buses	33.3	-	100.0	-	-	60.0	33.3	0.0	-	-	-	25.0	0.0	0.0	0.0	0.0	-	0.0	-	2.2	25.0	-	-	4.1	7.4
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Single-Unit Trucks	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	-	0.0	0.0
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Pleasant Road
Site Code: 220678
Start Date: 11/01/2022



Turning Movement Peak Hour Data Plot (7:30 AM)

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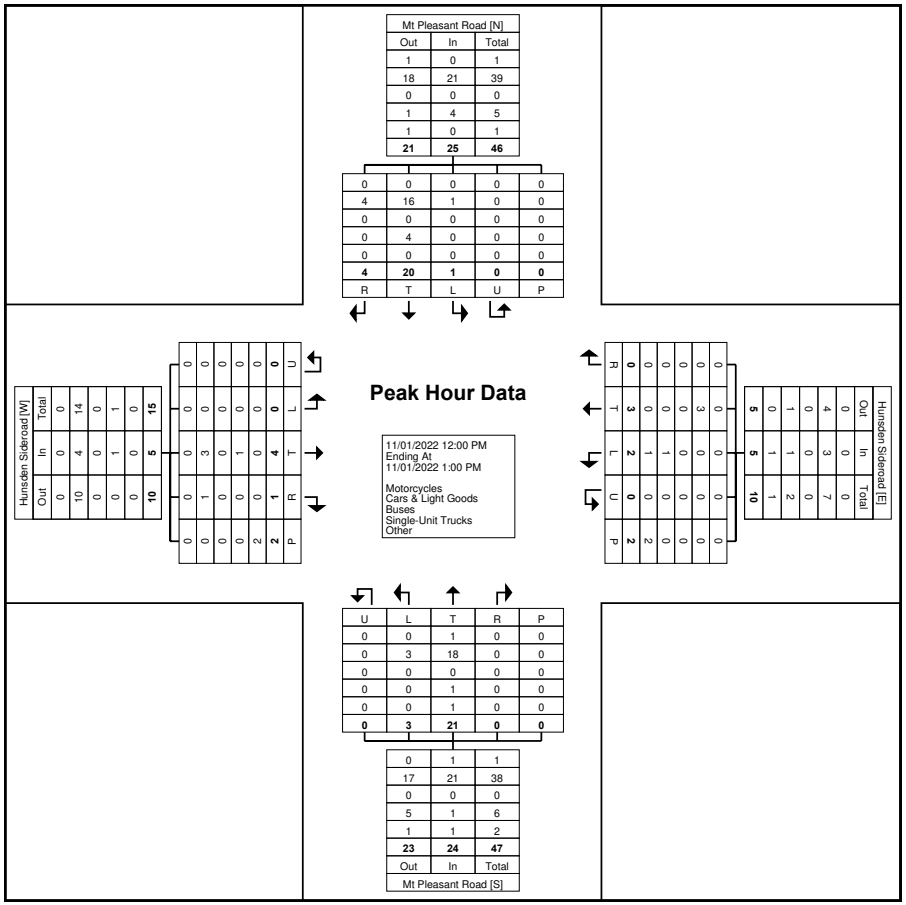
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Hunsden Sideroad Eastbound						Hunsden Sideroad Westbound						Mt Pleasant Road Northbound						Mt Pleasant Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	0	0	0	0	2	0	2	0	0	0	2	2	0	4	0	0	0	4	1	4	1	0	0	6	12
12:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	8	0	0	0	8	0	7	2	0	0	9	18
12:30 PM	0	0	0	0	0	0	0	1	0	0	0	1	2	6	0	0	0	8	0	5	1	0	0	6	15
12:45 PM	0	4	1	0	0	5	0	1	0	0	0	1	1	3	0	0	0	4	0	4	0	0	0	4	14
Total	0	4	1	0	2	5	2	3	0	0	2	5	3	21	0	0	0	24	1	20	4	0	0	25	59
Approach %	0.0	80.0	20.0	0.0	-	-	40.0	60.0	0.0	0.0	-	-	12.5	87.5	0.0	0.0	-	-	4.0	80.0	16.0	0.0	-	-	-
Total %	0.0	6.8	1.7	0.0	-	8.5	3.4	5.1	0.0	0.0	-	8.5	5.1	35.6	0.0	0.0	-	40.7	1.7	33.9	6.8	0.0	-	42.4	-
PHF	0.000	0.250	0.250	0.000	-	0.250	0.250	0.750	0.000	0.000	-	0.625	0.375	0.656	0.000	0.000	-	0.750	0.250	0.714	0.500	0.000	-	0.694	0.819
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Motorcycles	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	4.8	-	-	-	4.2	0.0	0.0	0.0	-	-	0.0	1.7
Cars & Light Goods	0	3	1	0	-	4	0	3	0	0	-	3	3	18	0	0	-	21	1	16	4	0	-	21	49
% Cars & Light Goods	-	75.0	100.0	-	-	80.0	0.0	100.0	-	-	-	60.0	100.0	85.7	-	-	-	87.5	100.0	80.0	100.0	-	-	84.0	83.1
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	1	0	0	-	1	1	0	0	0	-	1	0	1	0	0	-	1	0	4	0	0	-	4	7
% Single-Unit Trucks	-	25.0	0.0	-	-	20.0	50.0	0.0	-	-	-	20.0	0.0	4.8	-	-	-	4.2	0.0	20.0	0.0	-	-	16.0	11.9
Articulated Trucks	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	-	0.0	0.0	-	-	0.0	50.0	0.0	-	-	-	20.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.7
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Bicycles on Road	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	4.8	-	-	-	4.2	0.0	0.0	0.0	-	-	0.0	1.7
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Turning Movement Peak Hour Data Plot (12:00 PM)

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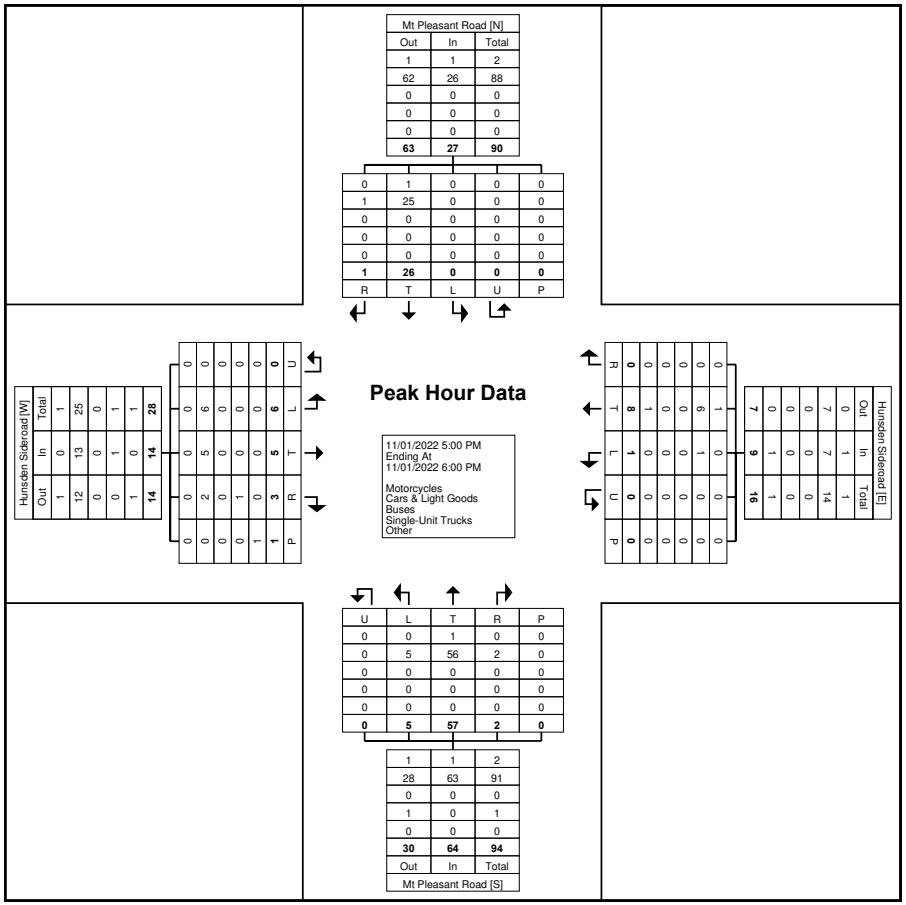
Turning Movement Peak Hour Data (5:00 PM)

Start Time	Hunsden Sideroad Eastbound						Hunsden Sideroad Westbound						Mt Pleasant Road Northbound						Mt Pleasant Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
5:00 PM	2	0	2	0	0	4	1	1	0	0	0	2	0	17	2	0	0	19	0	9	0	0	0	9	34
5:15 PM	1	1	0	0	0	2	0	3	0	0	0	3	1	12	0	0	0	13	0	6	0	0	0	6	24
5:30 PM	1	1	0	0	1	2	0	1	0	0	0	1	3	18	0	0	0	21	0	8	0	0	0	8	32
5:45 PM	2	3	1	0	0	6	0	3	0	0	0	3	1	10	0	0	0	11	0	3	1	0	0	4	24
Total	6	5	3	0	1	14	1	8	0	0	0	9	5	57	2	0	0	64	0	26	1	0	0	27	114
Approach %	42.9	35.7	21.4	0.0	-	-	11.1	88.9	0.0	0.0	-	-	7.8	89.1	3.1	0.0	-	-	0.0	96.3	3.7	0.0	-	-	-
Total %	5.3	4.4	2.6	0.0	-	12.3	0.9	7.0	0.0	0.0	-	7.9	4.4	50.0	1.8	0.0	-	56.1	0.0	22.8	0.9	0.0	-	23.7	-
PHF	0.750	0.417	0.375	0.000	-	0.583	0.250	0.667	0.000	0.000	-	0.750	0.417	0.792	0.250	0.000	-	0.762	0.000	0.722	0.250	0.000	-	0.750	0.838
Motorcycles	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	0	1	0	0	-	1	3
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	12.5	-	-	-	11.1	0.0	1.8	0.0	-	-	1.6	-	3.8	0.0	-	-	3.7	2.6
Cars & Light Goods	6	5	2	0	-	13	1	6	0	0	-	7	5	56	2	0	-	63	0	25	1	0	-	26	109
% Cars & Light Goods	100.0	100.0	66.7	-	-	92.9	100.0	75.0	-	-	-	77.8	100.0	98.2	100.0	-	-	98.4	-	96.2	100.0	-	-	96.3	95.6
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Single-Unit Trucks	0.0	0.0	33.3	-	-	7.1	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.9
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	12.5	-	-	-	11.1	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.9
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Pleasant Road
Site Code: 220678
Start Date: 11/01/2022



Turning Movement Peak Hour Data Plot (5:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Wolfe Road
Site Code: 220678
Start Date: 11/01/2022

Turning Movement Data

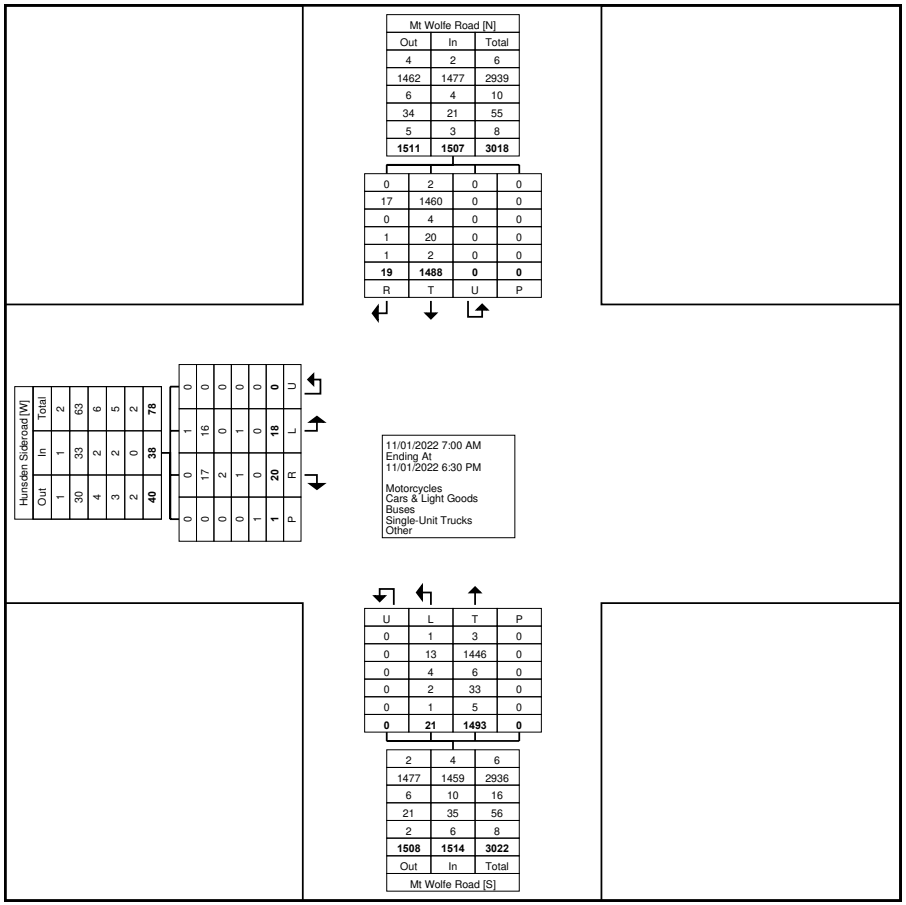
Start Time	Hunsden Sideroad Eastbound					Mt Wolfe Road Northbound					Mt Wolfe Road Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	1	0	0	1	1	26	0	0	27	77	0	0	0	77	105
7:15 AM	1	0	0	0	1	0	21	0	0	21	115	0	0	0	115	137
7:30 AM	1	1	0	0	2	0	34	0	0	34	106	0	0	0	106	142
7:45 AM	0	0	0	0	0	0	34	0	0	34	75	0	0	0	75	109
Hourly Total	2	2	0	0	4	1	115	0	0	116	373	0	0	0	373	493
8:00 AM	0	0	0	0	0	1	16	0	0	17	95	0	0	0	95	112
8:15 AM	0	0	0	0	0	0	30	0	0	30	84	1	0	0	85	115
8:30 AM	0	1	0	1	1	2	33	0	0	35	59	0	0	0	59	95
8:45 AM	1	1	0	0	2	0	26	0	0	26	55	0	0	0	55	83
Hourly Total	1	2	0	1	3	3	105	0	0	108	293	1	0	0	294	405
9:00 AM	0	1	0	0	1	0	28	0	0	28	28	0	0	0	28	57
9:15 AM	1	2	0	0	3	1	35	0	0	36	57	1	0	0	58	97
9:30 AM	1	2	0	0	3	1	22	0	0	23	42	0	0	0	42	68
9:45 AM	2	0	0	0	2	0	18	0	0	18	33	2	0	0	35	55
Hourly Total	4	5	0	0	9	2	103	0	0	105	160	3	0	0	163	277
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	0	2	0	0	2	1	27	0	0	28	29	1	0	0	30	60
11:45 AM	0	0	0	0	0	0	30	0	0	30	27	0	0	0	27	57
Hourly Total	0	2	0	0	2	1	57	0	0	58	56	1	0	0	57	117
12:00 PM	1	0	0	0	1	0	24	0	0	24	25	2	0	0	27	52
12:15 PM	0	0	0	0	0	1	33	0	0	34	29	0	0	0	29	63
12:30 PM	0	0	0	0	0	1	30	0	0	31	32	1	0	0	33	64
12:45 PM	2	0	0	0	2	0	22	0	0	22	30	0	0	0	30	54
Hourly Total	3	0	0	0	3	2	109	0	0	111	116	3	0	0	119	233
1:00 PM	0	2	0	0	2	1	29	0	0	30	19	2	0	0	21	53
1:15 PM	2	0	0	0	2	0	25	0	0	25	35	0	0	0	35	62
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	2	2	0	0	4	1	54	0	0	55	54	2	0	0	56	115
3:30 PM	0	1	0	0	1	0	71	0	0	71	48	0	0	0	48	120
3:45 PM	2	0	0	0	2	1	93	0	0	94	41	1	0	0	42	138
Hourly Total	2	1	0	0	3	1	164	0	0	165	89	1	0	0	90	258
4:00 PM	1	3	0	0	4	0	66	0	0	66	34	2	0	0	36	106
4:15 PM	1	1	0	0	2	1	93	0	0	94	37	0	0	0	37	133
4:30 PM	1	0	0	0	1	1	73	0	0	74	40	0	0	0	40	115
4:45 PM	0	0	0	0	0	1	75	0	0	76	44	1	0	0	45	121
Hourly Total	3	4	0	0	7	3	307	0	0	310	155	3	0	0	158	475

5:00 PM	0	0	0	0	0	2	95	0	0	97	29	2	0	0	31	128
5:15 PM	1	1	0	0	2	1	85	0	0	86	31	1	0	0	32	120
5:30 PM	0	0	0	0	0	1	82	0	0	83	34	1	0	0	35	118
5:45 PM	0	0	0	0	0	1	89	0	0	90	33	1	0	0	34	124
Hourly Total	1	1	0	0	2	5	351	0	0	356	127	5	0	0	132	490
6:00 PM	0	1	0	0	1	1	73	0	0	74	36	0	0	0	36	111
6:15 PM	0	0	0	0	0	1	55	0	0	56	29	0	0	0	29	85
Grand Total	18	20	0	1	38	21	1493	0	0	1514	1488	19	0	0	1507	3059
Approach %	47.4	52.6	0.0	-	-	1.4	98.6	0.0	-	-	98.7	1.3	0.0	-	-	-
Total %	0.6	0.7	0.0	-	1.2	0.7	48.8	0.0	-	49.5	48.6	0.6	0.0	-	49.3	-
Motorcycles	1	0	0	-	1	1	3	0	-	4	2	0	0	-	2	7
% Motorcycles	5.6	0.0	-	-	2.6	4.8	0.2	-	-	0.3	0.1	0.0	-	-	0.1	0.2
Cars & Light Goods	16	17	0	-	33	13	1446	0	-	1459	1460	17	0	-	1477	2969
% Cars & Light Goods	88.9	85.0	-	-	86.8	61.9	96.9	-	-	96.4	98.1	89.5	-	-	98.0	97.1
Buses	0	2	0	-	2	4	6	0	-	10	4	0	0	-	4	16
% Buses	0.0	10.0	-	-	5.3	19.0	0.4	-	-	0.7	0.3	0.0	-	-	0.3	0.5
Single-Unit Trucks	1	1	0	-	2	2	33	0	-	35	20	1	0	-	21	58
% Single-Unit Trucks	5.6	5.0	-	-	5.3	9.5	2.2	-	-	2.3	1.3	5.3	-	-	1.4	1.9
Articulated Trucks	0	0	0	-	0	0	5	0	-	5	1	1	0	-	2	7
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.3	-	-	0.3	0.1	5.3	-	-	0.1	0.2
Bicycles on Road	0	0	0	-	0	1	0	0	-	1	1	0	0	-	1	2
% Bicycles on Road	0.0	0.0	-	-	0.0	4.8	0.0	-	-	0.1	0.1	0.0	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Wolfe Road
Site Code: 220678
Start Date: 11/01/2022



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Wolfe Road
Site Code: 220678
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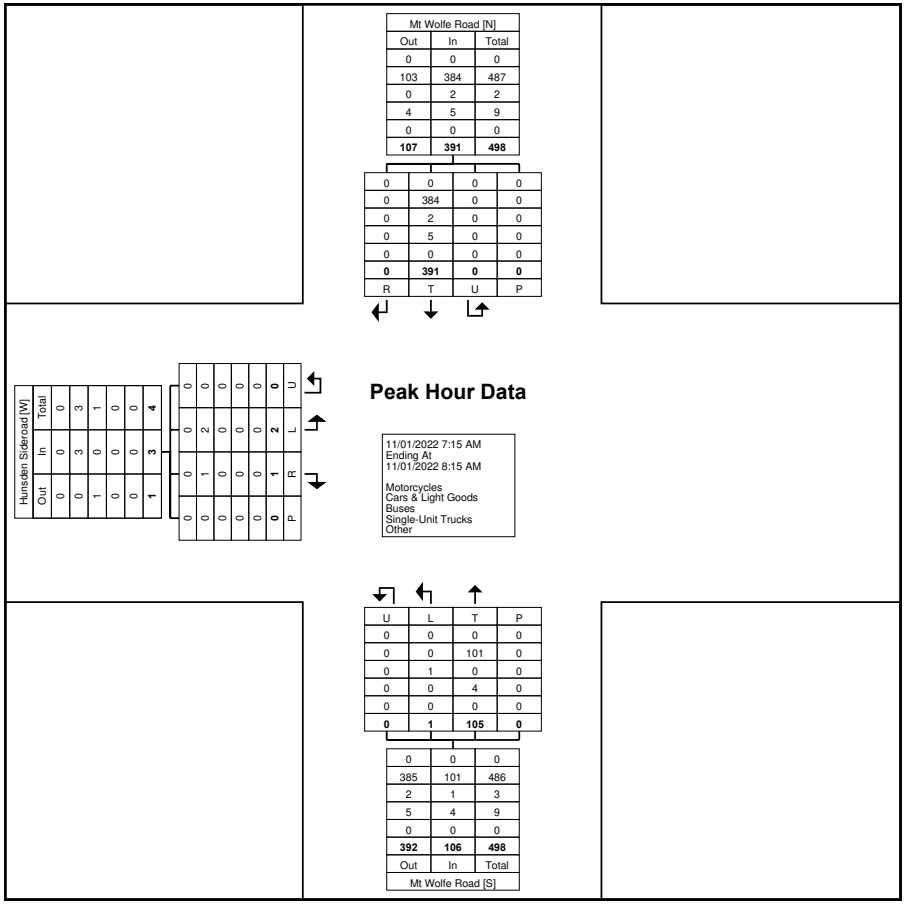
Turning Movement Peak Hour Data (7:15 AM)

Start Time	Hunsden Sideroad Eastbound					Mt Wolfe Road Northbound					Mt Wolfe Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:15 AM	1	0	0	0	1	0	21	0	0	21	115	0	0	0	115	137
7:30 AM	1	1	0	0	2	0	34	0	0	34	106	0	0	0	106	142
7:45 AM	0	0	0	0	0	0	34	0	0	34	75	0	0	0	75	109
8:00 AM	0	0	0	0	0	1	16	0	0	17	95	0	0	0	95	112
Total	2	1	0	0	3	1	105	0	0	106	391	0	0	0	391	500
Approach %	66.7	33.3	0.0	-	-	0.9	99.1	0.0	-	-	100.0	0.0	0.0	-	-	-
Total %	0.4	0.2	0.0	-	0.6	0.2	21.0	0.0	-	21.2	78.2	0.0	0.0	-	78.2	-
PHF	0.500	0.250	0.000	-	0.375	0.250	0.772	0.000	-	0.779	0.850	0.000	0.000	-	0.850	0.880
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0
Cars & Light Goods	2	1	0	-	3	0	101	0	-	101	384	0	0	-	384	488
% Cars & Light Goods	100.0	100.0	-	-	100.0	0.0	96.2	-	-	95.3	98.2	-	-	-	98.2	97.6
Buses	0	0	0	-	0	1	0	0	-	1	2	0	0	-	2	3
% Buses	0.0	0.0	-	-	0.0	100.0	0.0	-	-	0.9	0.5	-	-	-	0.5	0.6
Single-Unit Trucks	0	0	0	-	0	0	4	0	-	4	5	0	0	-	5	9
% Single-Unit Trucks	0.0	0.0	-	-	0.0	0.0	3.8	-	-	3.8	1.3	-	-	-	1.3	1.8
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Wolfe Road
Site Code: 220678
Start Date: 11/01/2022



Turning Movement Peak Hour Data Plot (7:15 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Wolfe Road
Site Code: 220678
Start Date: 11/01/2022

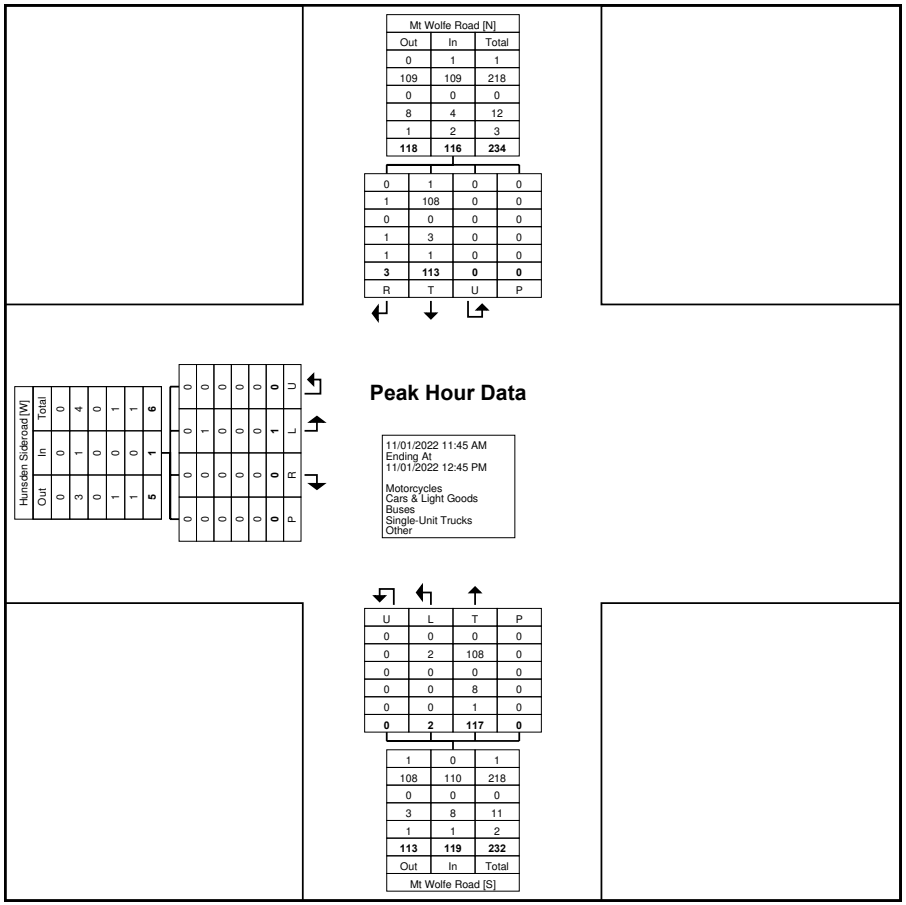
Turning Movement Peak Hour Data (11:45 AM)

Start Time	Hunsden Sideroad Eastbound					Mt Wolfe Road Northbound					Mt Wolfe Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
11:45 AM	0	0	0	0	0	0	30	0	0	30	27	0	0	0	27	57
12:00 PM	1	0	0	0	1	0	24	0	0	24	25	2	0	0	27	52
12:15 PM	0	0	0	0	0	1	33	0	0	34	29	0	0	0	29	63
12:30 PM	0	0	0	0	0	1	30	0	0	31	32	1	0	0	33	64
Total	1	0	0	0	1	2	117	0	0	119	113	3	0	0	116	236
Approach %	100.0	0.0	0.0	-	-	1.7	98.3	0.0	-	-	97.4	2.6	0.0	-	-	-
Total %	0.4	0.0	0.0	-	0.4	0.8	49.6	0.0	-	50.4	47.9	1.3	0.0	-	49.2	-
PHF	0.250	0.000	0.000	-	0.250	0.500	0.886	0.000	-	0.875	0.883	0.375	0.000	-	0.879	0.922
Motorcycles	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Motorcycles	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.9	0.0	-	-	0.9	0.4
Cars & Light Goods	1	0	0	-	1	2	108	0	-	110	108	1	0	-	109	220
% Cars & Light Goods	100.0	-	-	-	100.0	100.0	92.3	-	-	92.4	95.6	33.3	-	-	94.0	93.2
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	0	0	-	0	0	8	0	-	8	3	1	0	-	4	12
% Single-Unit Trucks	0.0	-	-	-	0.0	0.0	6.8	-	-	6.7	2.7	33.3	-	-	3.4	5.1
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	1	0	-	1	2
% Articulated Trucks	0.0	-	-	-	0.0	0.0	0.9	-	-	0.8	0.0	33.3	-	-	0.9	0.8
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Bicycles on Road	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.9	0.0	-	-	0.9	0.4
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Wolfe Road
Site Code: 220678
Start Date: 11/01/2022



Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Wolfe Road
Site Code: 220678
Start Date: 11/01/2022

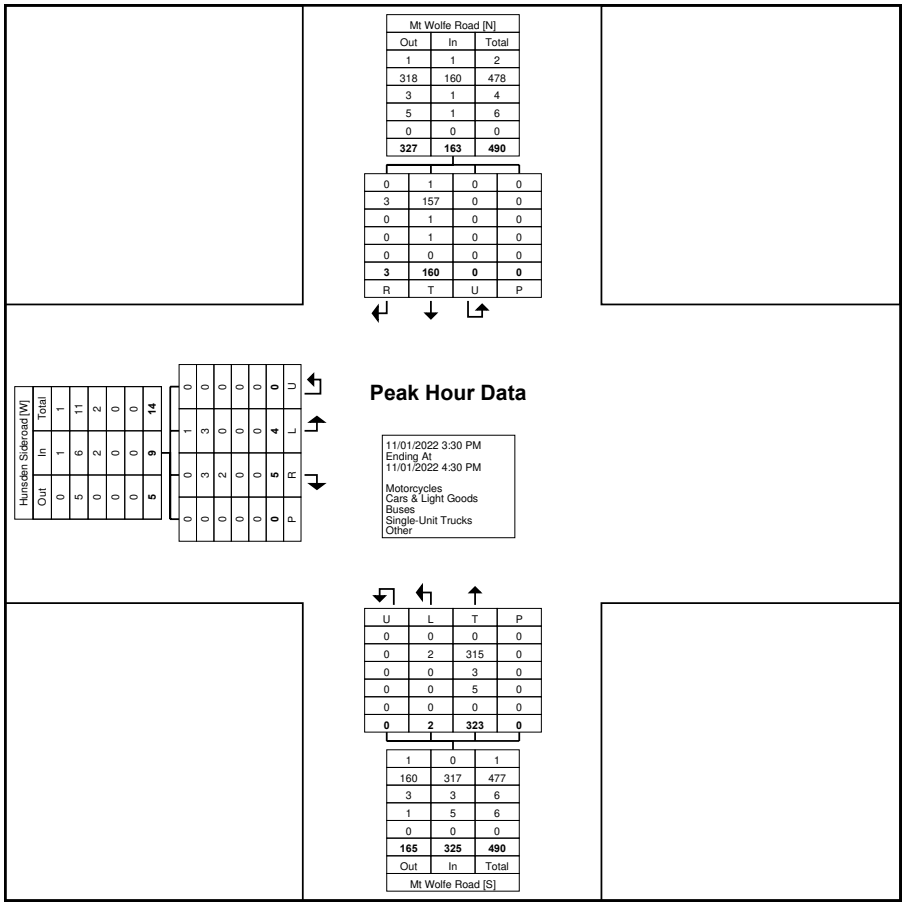
Turning Movement Peak Hour Data (3:30 PM)

Start Time	Hunsden Sideroad Eastbound					Mt Wolfe Road Northbound					Mt Wolfe Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
3:30 PM	0	1	0	0	1	0	71	0	0	71	48	0	0	0	48	120
3:45 PM	2	0	0	0	2	1	93	0	0	94	41	1	0	0	42	138
4:00 PM	1	3	0	0	4	0	66	0	0	66	34	2	0	0	36	106
4:15 PM	1	1	0	0	2	1	93	0	0	94	37	0	0	0	37	133
Total	4	5	0	0	9	2	323	0	0	325	160	3	0	0	163	497
Approach %	44.4	55.6	0.0	-	-	0.6	99.4	0.0	-	-	98.2	1.8	0.0	-	-	-
Total %	0.8	1.0	0.0	-	1.8	0.4	65.0	0.0	-	65.4	32.2	0.6	0.0	-	32.8	-
PHF	0.500	0.417	0.000	-	0.563	0.500	0.868	0.000	-	0.864	0.833	0.375	0.000	-	0.849	0.900
Motorcycles	1	0	0	-	1	0	0	0	-	0	1	0	0	-	1	2
% Motorcycles	25.0	0.0	-	-	11.1	0.0	0.0	-	-	0.0	0.6	0.0	-	-	0.6	0.4
Cars & Light Goods	3	3	0	-	6	2	315	0	-	317	157	3	0	-	160	483
% Cars & Light Goods	75.0	60.0	-	-	66.7	100.0	97.5	-	-	97.5	98.1	100.0	-	-	98.2	97.2
Buses	0	2	0	-	2	0	3	0	-	3	1	0	0	-	1	6
% Buses	0.0	40.0	-	-	22.2	0.0	0.9	-	-	0.9	0.6	0.0	-	-	0.6	1.2
Single-Unit Trucks	0	0	0	-	0	0	5	0	-	5	1	0	0	-	1	6
% Single-Unit Trucks	0.0	0.0	-	-	0.0	0.0	1.5	-	-	1.5	0.6	0.0	-	-	0.6	1.2
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Hunsden Sideroad & Mt Wolfe Road
Site Code: 220678
Start Date: 11/01/2022



Turning Movement Peak Hour Data Plot (3:30 PM)

Appendix C

Existing Traffic Operations Reports



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	2	3	1	0	1	20	1	0	45	4
Future Volume (vph)	3	0	2	3	1	0	1	20	1	0	45	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.946						0.994			0.989	
Flt Protected		0.971			0.964			0.998				
Satd. Flow (prot)	0	1711	0	0	1796	0	0	1848	0	0	1842	0
Flt Permitted		0.971			0.964			0.998				
Satd. Flow (perm)	0	1711	0	0	1796	0	0	1848	0	0	1842	0
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		524.5			438.0			522.9			756.9	
Travel Time (s)		31.5			26.3			31.4			45.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	0	2	3	1	0	1	20	1	0	45	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	4	0	0	22	0	0	49	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	2	3	1	0	1	20	1	0	45	4
Future Vol, veh/h	3	0	2	3	1	0	1	20	1	0	45	4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	2	3	1	0	1	20	1	0	45	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	7.3	7.1	7.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	60%	75%	0%
Vol Thru, %	91%	0%	25%	92%
Vol Right, %	5%	40%	0%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	22	5	4	49
LT Vol	1	3	3	0
Through Vol	20	0	1	45
RT Vol	1	2	0	4
Lane Flow Rate	22	5	4	49
Geometry Grp	1	1	1	1
Degree of Util (X)	0.024	0.005	0.005	0.053
Departure Headway (Hd)	3.968	3.942	4.212	3.917
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	905	907	849	918
Service Time	1.98	1.968	2.239	1.925
HCM Lane V/C Ratio	0.024	0.006	0.005	0.053
HCM Control Delay	7.1	7	7.3	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	1	1	105	391	0
Future Volume (vph)	2	1	1	105	391	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.955					
Flt Protected	0.968					
Satd. Flow (prot)	1722	0	0	1863	1863	0
Flt Permitted	0.968					
Satd. Flow (perm)	1722	0	0	1863	1863	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	944.5			435.8	462.4	
Travel Time (s)	56.7			26.1	27.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	1	1	105	391	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	0	0	106	391	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	1	1	105	391	0
Future Vol, veh/h	2	1	1	105	391	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	1	1	105	391	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	498	391	391	0	-	0
Stage 1	391	-	-	-	-	-
Stage 2	107	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	532	658	1168	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	917	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	531	658	1168	-	-	-
Mov Cap-2 Maneuver	531	-	-	-	-	-
Stage 1	682	-	-	-	-	-
Stage 2	917	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1168	-	568	-	-
HCM Lane V/C Ratio	0.001	-	0.005	-	-
HCM Control Delay (s)	8.1	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1	0	0	1	1	1
Future Volume (vph)	1	0	0	1	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.932	
Flt Protected					0.976	
Satd. Flow (prot)	1863	0	0	1863	1694	0
Flt Permitted					0.976	
Satd. Flow (perm)	1863	0	0	1863	1694	0
Link Speed (k/h)	60			60	20	
Link Distance (m)	438.0			944.5	233.9	
Travel Time (s)	26.3			56.7	42.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	0	1	1	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	0	1	2	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	1	1	1
Future Vol, veh/h	1	0	0	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	0	1	1	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	2	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1021	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	1021	1084
Mov Cap-2 Maneuver	-	-	-	-	1021	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1022	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1052	-	-	1622	-
HCM Lane V/C Ratio	0.002	-	-	-	-
HCM Control Delay (s)	8.4	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	5	3	1	8	0	5	57	2	0	26	1
Future Volume (vph)	6	5	3	1	8	0	5	57	2	0	26	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971						0.996			0.995	
Flt Protected		0.979			0.994			0.996				
Satd. Flow (prot)	0	1771	0	0	1852	0	0	1848	0	0	1853	0
Flt Permitted		0.979			0.994			0.996				
Satd. Flow (perm)	0	1771	0	0	1852	0	0	1848	0	0	1853	0
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		524.5			438.0			522.9			756.9	
Travel Time (s)		31.5			26.3			31.4			45.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	5	3	1	8	0	5	57	2	0	26	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	0	0	9	0	0	64	0	0	27	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	5	3	1	8	0	5	57	2	0	26	1
Future Vol, veh/h	6	5	3	1	8	0	5	57	2	0	26	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	5	3	1	8	0	5	57	2	0	26	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.2	7.3	7.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	43%	11%	0%
Vol Thru, %	89%	36%	89%	96%
Vol Right, %	3%	21%	0%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	64	14	9	27
LT Vol	5	6	1	0
Through Vol	57	5	8	26
RT Vol	2	3	0	1
Lane Flow Rate	64	14	9	27
Geometry Grp	1	1	1	1
Degree of Util (X)	0.071	0.016	0.01	0.03
Departure Headway (Hd)	3.99	4.056	4.125	3.999
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	899	879	864	895
Service Time	2.007	2.096	2.167	2.023
HCM Lane V/C Ratio	0.071	0.016	0.01	0.03
HCM Control Delay	7.3	7.2	7.2	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0	0	0.1



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	4	5	2	323	160	3
Future Volume (vph)	4	5	2	323	160	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.925				0.998	
Flt Protected	0.978					
Satd. Flow (prot)	1685	0	0	1863	1859	0
Flt Permitted	0.978					
Satd. Flow (perm)	1685	0	0	1863	1859	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	944.5			435.8	462.4	
Travel Time (s)	56.7			26.1	27.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	4	5	2	323	160	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	0	325	163	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	5	2	323	160	3
Future Vol, veh/h	4	5	2	323	160	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	5	2	323	160	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	489	162	163	0	-	0
Stage 1	162	-	-	-	-	-
Stage 2	327	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	538	883	1416	-	-	-
Stage 1	867	-	-	-	-	-
Stage 2	731	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	537	883	1416	-	-	-
Mov Cap-2 Maneuver	537	-	-	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	731	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1416	-	686	-	-
HCM Lane V/C Ratio	0.001	-	0.013	-	-
HCM Control Delay (s)	7.5	0	10.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	7	0	2	3	0	1
Future Volume (vph)	7	0	2	3	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected				0.980		
Satd. Flow (prot)	1863	0	0	1825	1611	0
Flt Permitted				0.980		
Satd. Flow (perm)	1863	0	0	1825	1611	0
Link Speed (k/h)	60			60	20	
Link Distance (m)	438.0			944.5	233.9	
Travel Time (s)	26.3			56.7	42.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	0	2	3	0	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	0	0	5	1	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	7	0	2	3	0	1
Future Vol, veh/h	7	0	2	3	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	0	2	3	0	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	7	0	14	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	7	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1614	-	1005	1075
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	1016	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1614	-	1004	1075
Mov Cap-2 Maneuver	-	-	-	-	1004	-
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	1015	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1075	-	-	1614	-
HCM Lane V/C Ratio	0.001	-	-	0.001	-
HCM Control Delay (s)	8.4	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix D

ITE Trip Generation Reports

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
210

LAND USE GROUP:
(200-299) Residential

LAND USE :
210 - Single-Family Detached Housing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

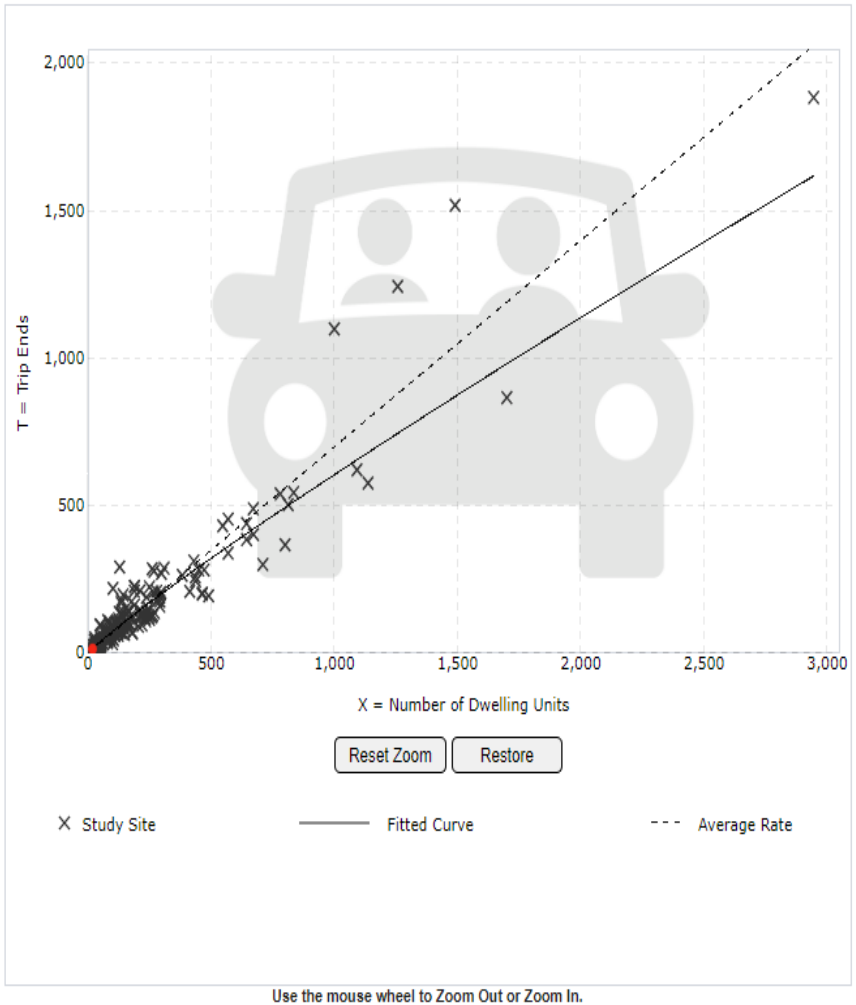
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
19 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Single-Family Detached Housing (210) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
192

Avg. Num. of Dwelling Units:
226

Average Rate:
0.70

Range of Rates:
0.27 - 2.27

Standard Deviation:
0.24

Fitted Curve Equation:
Ln(T) = 0.91 Ln(X) + 0.12

R^2:
0.90

Directional Distribution:
26% entering, 74% exiting

Calculated Trip Ends:
Average Rate: 13 (Total), 3 (Entry), 10 (Exit)
Fitted Curve: 16 (Total), 4 (Entry), 12 (Exit)

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
210

LAND USE GROUP:
(200-299) Residential

LAND USE :
210 - Single-Family Detached Housing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

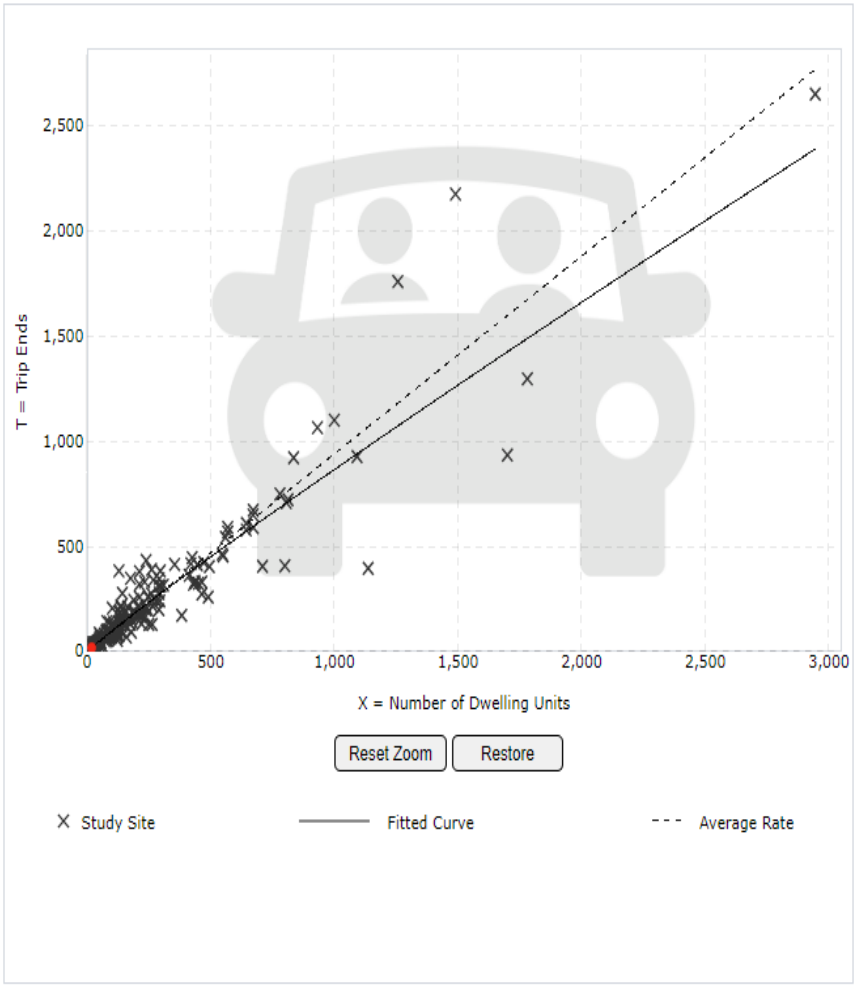
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
19 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Single-Family Detached Housing (210) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
208

Avg. Num. of Dwelling Units:
248

Average Rate:
0.94

Range of Rates:
0.35 - 2.98

Standard Deviation:
0.31

Fitted Curve Equation:
Ln(T) = 0.94 Ln(X) + 0.27

R^2:
0.92

Directional Distribution:
63% entering, 37% exiting

Calculated Trip Ends:
Average Rate: 18 (Total), 11 (Entry), 7 (Exit)
Fitted Curve: 21 (Total), 13 (Entry), 8 (Exit)

Appendix E

Future Background Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	2	3	1	0	1	21	1	0	47	4
Future Volume (vph)	3	0	2	3	1	0	1	21	1	0	47	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.946						0.994			0.989	
Flt Protected		0.971			0.964			0.998				
Satd. Flow (prot)	0	1711	0	0	1796	0	0	1848	0	0	1842	0
Flt Permitted		0.971			0.964			0.998				
Satd. Flow (perm)	0	1711	0	0	1796	0	0	1848	0	0	1842	0
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		524.5			1389.1			522.9			756.9	
Travel Time (s)		31.5			83.3			31.4			45.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	0	2	3	1	0	1	21	1	0	47	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	4	0	0	23	0	0	51	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service A	
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	2	3	1	0	1	21	1	0	47	4
Future Vol, veh/h	3	0	2	3	1	0	1	21	1	0	47	4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	2	3	1	0	1	21	1	0	47	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	7.3	7.1	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	60%	75%	0%
Vol Thru, %	91%	0%	25%	92%
Vol Right, %	4%	40%	0%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	23	5	4	51
LT Vol	1	3	3	0
Through Vol	21	0	1	47
RT Vol	1	2	0	4
Lane Flow Rate	23	5	4	51
Geometry Grp	1	1	1	1
Degree of Util (X)	0.025	0.005	0.005	0.056
Departure Headway (Hd)	3.97	3.944	4.214	3.919
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	904	905	848	917
Service Time	1.983	1.976	2.246	1.927
HCM Lane V/C Ratio	0.025	0.006	0.005	0.056
HCM Control Delay	7.1	7	7.3	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1	0	1	109	407	0
Future Volume (vph)	1	0	1	109	407	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1863	1863	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1863	1863	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	1389.1			435.8	462.4	
Travel Time (s)	83.3			26.1	27.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	1	109	407	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	0	110	407	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	1	109	407	0
Future Vol, veh/h	1	0	1	109	407	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	1	109	407	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	518	407	407	0	-	0
Stage 1	407	-	-	-	-	-
Stage 2	111	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	518	644	1152	-	-	-
Stage 1	672	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	517	644	1152	-	-	-
Mov Cap-2 Maneuver	517	-	-	-	-	-
Stage 1	671	-	-	-	-	-
Stage 2	914	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1152	-	517	-	-
HCM Lane V/C Ratio	0.001	-	0.002	-	-
HCM Control Delay (s)	8.1	0	12	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	5	3	0	8	0	5	59	2	0	27	1
Future Volume (vph)	6	5	3	0	8	0	5	59	2	0	27	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971						0.996			0.995	
Flt Protected		0.979						0.996				
Satd. Flow (prot)	0	1771	0	0	1863	0	0	1848	0	0	1853	0
Flt Permitted		0.979						0.996				
Satd. Flow (perm)	0	1771	0	0	1863	0	0	1848	0	0	1853	0
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		524.5			1389.1			522.9			756.9	
Travel Time (s)		31.5			83.3			31.4			45.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	5	3	0	8	0	5	59	2	0	27	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	0	0	8	0	0	66	0	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	20.0%	ICU Level of Service A	
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	5	3	0	8	0	5	59	2	0	27	1
Future Vol, veh/h	6	5	3	0	8	0	5	59	2	0	27	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	5	3	0	8	0	5	59	2	0	27	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.2	7.3	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	43%	0%	0%
Vol Thru, %	89%	36%	100%	96%
Vol Right, %	3%	21%	0%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	66	14	8	28
LT Vol	5	6	0	0
Through Vol	59	5	8	27
RT Vol	2	3	0	1
Lane Flow Rate	66	14	8	28
Geometry Grp	1	1	1	1
Degree of Util (X)	0.073	0.016	0.009	0.031
Departure Headway (Hd)	3.989	4.061	4.108	3.999
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	900	878	868	895
Service Time	2.006	2.101	2.15	2.023
HCM Lane V/C Ratio	0.073	0.016	0.009	0.031
HCM Control Delay	7.3	7.2	7.2	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0	0	0.1



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	5	1	336	166	2
Future Volume (vph)	3	5	1	336	166	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.916				0.998	
Flt Protected	0.982					
Satd. Flow (prot)	1676	0	0	1863	1859	0
Flt Permitted	0.982					
Satd. Flow (perm)	1676	0	0	1863	1859	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	1389.1			435.8	462.4	
Travel Time (s)	83.3			26.1	27.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	5	1	336	166	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	0	337	168	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	5	1	336	166	2
Future Vol, veh/h	3	5	1	336	166	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	5	1	336	166	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	505	167	168	0	-	0
Stage 1	167	-	-	-	-	-
Stage 2	338	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	527	877	1410	-	-	-
Stage 1	863	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	526	877	1410	-	-	-
Mov Cap-2 Maneuver	526	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	722	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1410	-	701	-	-
HCM Lane V/C Ratio	0.001	-	0.011	-	-
HCM Control Delay (s)	7.6	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	2	3	1	0	1	23	1	0	52	5
Future Volume (vph)	3	0	2	3	1	0	1	23	1	0	52	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.946						0.995			0.988	
Flt Protected		0.971			0.964			0.998				
Satd. Flow (prot)	0	1711	0	0	1796	0	0	1850	0	0	1840	0
Flt Permitted		0.971			0.964			0.998				
Satd. Flow (perm)	0	1711	0	0	1796	0	0	1850	0	0	1840	0
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		524.5			1389.1			522.9			756.9	
Travel Time (s)		31.5			83.3			31.4			45.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	0	2	3	1	0	1	23	1	0	52	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	4	0	0	25	0	0	57	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	2	3	1	0	1	23	1	0	52	5
Future Vol, veh/h	3	0	2	3	1	0	1	23	1	0	52	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	2	3	1	0	1	23	1	0	52	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	7.3	7.1	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	60%	75%	0%
Vol Thru, %	92%	0%	25%	91%
Vol Right, %	4%	40%	0%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	5	4	57
LT Vol	1	3	3	0
Through Vol	23	0	1	52
RT Vol	1	2	0	5
Lane Flow Rate	25	5	4	57
Geometry Grp	1	1	1	1
Degree of Util (X)	0.028	0.006	0.005	0.062
Departure Headway (Hd)	3.976	3.96	4.23	3.915
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	903	902	844	918
Service Time	1.991	1.993	2.265	1.926
HCM Lane V/C Ratio	0.028	0.006	0.005	0.062
HCM Control Delay	7.1	7	7.3	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1	0	1	121	449	0
Future Volume (vph)	1	0	1	121	449	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1863	1863	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1863	1863	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	1389.1			435.8	462.4	
Travel Time (s)	83.3			26.1	27.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	1	121	449	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	0	122	449	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	1	121	449	0
Future Vol, veh/h	1	0	1	121	449	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	1	121	449	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	572	449	449	0	-	0
Stage 1	449	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	482	610	1111	-	-	-
Stage 1	643	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	482	610	1111	-	-	-
Mov Cap-2 Maneuver	482	-	-	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	902	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1111	-	482	-	-
HCM Lane V/C Ratio	0.001	-	0.002	-	-
HCM Control Delay (s)	8.2	0	12.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	6	3	0	9	0	6	65	2	0	30	1
Future Volume (vph)	7	6	3	0	9	0	6	65	2	0	30	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975						0.996			0.996	
Flt Protected		0.979						0.996				
Satd. Flow (prot)	0	1778	0	0	1863	0	0	1848	0	0	1855	0
Flt Permitted		0.979						0.996				
Satd. Flow (perm)	0	1778	0	0	1863	0	0	1848	0	0	1855	0
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		524.5			1389.1			522.9			756.9	
Travel Time (s)		31.5			83.3			31.4			45.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	6	3	0	9	0	6	65	2	0	30	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	9	0	0	73	0	0	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	22.1%	ICU Level of Service A	
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	6	3	0	9	0	6	65	2	0	30	1
Future Vol, veh/h	7	6	3	0	9	0	6	65	2	0	30	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	6	3	0	9	0	6	65	2	0	30	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.2	7.4	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	44%	0%	0%
Vol Thru, %	89%	38%	100%	97%
Vol Right, %	3%	19%	0%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	73	16	9	31
LT Vol	6	7	0	0
Through Vol	65	6	9	30
RT Vol	2	3	0	1
Lane Flow Rate	73	16	9	31
Geometry Grp	1	1	1	1
Degree of Util (X)	0.081	0.018	0.01	0.035
Departure Headway (Hd)	4.001	4.097	4.127	4.012
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	897	869	862	892
Service Time	2.018	2.143	2.175	2.038
HCM Lane V/C Ratio	0.081	0.018	0.01	0.035
HCM Control Delay	7.4	7.2	7.2	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0	0.1

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	6	1	371	184	2
Future Volume (vph)	3	6	1	371	184	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.910				0.999	
Flt Protected	0.984					
Satd. Flow (prot)	1668	0	0	1863	1861	0
Flt Permitted	0.984					
Satd. Flow (perm)	1668	0	0	1863	1861	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	1389.1			435.8	462.4	
Travel Time (s)	83.3			26.1	27.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	6	1	371	184	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	0	372	186	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	6	1	371	184	2
Future Vol, veh/h	3	6	1	371	184	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	6	1	371	184	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	558	185	186	0	-	0
Stage 1	185	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	491	857	1388	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	491	857	1388	-	-	-
Mov Cap-2 Maneuver	491	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	696	-	-	-	-	-

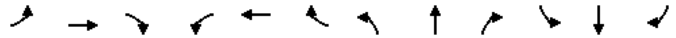
Approach	EB	NB	SB
HCM Control Delay, s	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1388	-	686	-	-
HCM Lane V/C Ratio	0.001	-	0.013	-	-
HCM Control Delay (s)	7.6	0	10.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Appendix F

Future Total Traffic Operations Reports





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	2	4	1	1	1	21	1	0	47	4
Future Volume (vph)	3	0	2	4	1	1	1	21	1	0	47	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.946			0.977			0.994			0.989	
Flt Protected		0.971			0.968			0.998				
Satd. Flow (prot)	0	1711	0	0	1762	0	0	1848	0	0	1842	0
Flt Permitted		0.971			0.968			0.998				
Satd. Flow (perm)	0	1711	0	0	1762	0	0	1848	0	0	1842	0
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		524.5			438.0			522.9			756.9	
Travel Time (s)		31.5			26.3			31.4			45.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	0	2	4	1	1	1	21	1	0	47	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	6	0	0	23	0	0	51	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	2	4	1	1	1	21	1	0	47	4
Future Vol, veh/h	3	0	2	4	1	1	1	21	1	0	47	4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	2	4	1	1	1	21	1	0	47	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	7.2	7.1	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	60%	67%	0%
Vol Thru, %	91%	0%	17%	92%
Vol Right, %	4%	40%	17%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	23	5	6	51
LT Vol	1	3	4	0
Through Vol	21	0	1	47
RT Vol	1	2	1	4
Lane Flow Rate	23	5	6	51
Geometry Grp	1	1	1	1
Degree of Util (X)	0.025	0.005	0.007	0.056
Departure Headway (Hd)	3.972	3.945	4.098	3.921
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	903	905	872	916
Service Time	1.987	1.978	2.13	1.931
HCM Lane V/C Ratio	0.025	0.006	0.007	0.056
HCM Control Delay	7.1	7	7.2	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	8	2	109	407	3
Future Volume (vph)	3	8	2	109	407	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.902				0.999	
Flt Protected	0.987			0.999		
Satd. Flow (prot)	1658	0	0	1861	1861	0
Flt Permitted	0.987			0.999		
Satd. Flow (perm)	1658	0	0	1861	1861	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	944.5			435.8	462.4	
Travel Time (s)	56.7			26.1	27.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	8	2	109	407	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	0	111	410	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	8	2	109	407	3
Future Vol, veh/h	3	8	2	109	407	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	8	2	109	407	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	522	409	410	0	-	0
Stage 1	409	-	-	-	-	-
Stage 2	113	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	515	642	1149	-	-	-
Stage 1	671	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	514	642	1149	-	-	-
Mov Cap-2 Maneuver	514	-	-	-	-	-
Stage 1	670	-	-	-	-	-
Stage 2	912	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1149	-	601	-	-
HCM Lane V/C Ratio	0.002	-	0.018	-	-
HCM Control Delay (s)	8.1	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1	0	4	3	2	10
Future Volume (vph)	1	0	4	3	2	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.887	
Flt Protected				0.972	0.992	
Satd. Flow (prot)	1863	0	0	1811	1639	0
Flt Permitted				0.972	0.992	
Satd. Flow (perm)	1863	0	0	1811	1639	0
Link Speed (k/h)	60			60	20	
Link Distance (m)	438.0			944.5	233.9	
Travel Time (s)	26.3			56.7	42.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	4	3	2	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	0	7	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	6.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	0	4	3	2	10
Future Vol, veh/h	1	0	4	3	2	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	4	3	2	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	12	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	11	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1008	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1012	-
Platoon blocked, %	-	-			-	
Mov Cap-1 Maneuver	-	-	1622	-	1006	1084
Mov Cap-2 Maneuver	-	-	-	-	1006	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1010	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.1	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1070	-	-	1622	-
HCM Lane V/C Ratio	0.011	-	-	0.002	-
HCM Control Delay (s)	8.4	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	5	3	1	8	1	5	59	3	1	27	1
Future Volume (vph)	6	5	3	1	8	1	5	59	3	1	27	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.986			0.994			0.995	
Flt Protected		0.979			0.995			0.996			0.998	
Satd. Flow (prot)	0	1771	0	0	1827	0	0	1844	0	0	1850	0
Flt Permitted		0.979			0.995			0.996			0.998	
Satd. Flow (perm)	0	1771	0	0	1827	0	0	1844	0	0	1850	0
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		524.5			438.0			522.9			756.9	
Travel Time (s)		31.5			26.3			31.4			45.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	5	3	1	8	1	5	59	3	1	27	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	14	0	0	10	0	0	67	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	15.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	5	3	1	8	1	5	59	3	1	27	1
Future Vol, veh/h	6	5	3	1	8	1	5	59	3	1	27	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	5	3	1	8	1	5	59	3	1	27	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.2	7.3	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	43%	10%	3%
Vol Thru, %	88%	36%	80%	93%
Vol Right, %	4%	21%	10%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	67	14	10	29
LT Vol	5	6	1	1
Through Vol	59	5	8	27
RT Vol	3	3	1	1
Lane Flow Rate	67	14	10	29
Geometry Grp	1	1	1	1
Degree of Util (X)	0.074	0.016	0.011	0.032
Departure Headway (Hd)	3.985	4.066	4.072	4.012
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	900	877	875	892
Service Time	2.002	2.107	2.114	2.036
HCM Lane V/C Ratio	0.074	0.016	0.011	0.033
HCM Control Delay	7.3	7.2	7.2	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0	0	0.1

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	7	7	8	336	166	6
Future Volume (vph)	7	7	8	336	166	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.995	
Flt Protected	0.976			0.999		
Satd. Flow (prot)	1694	0	0	1861	1853	0
Flt Permitted	0.976			0.999		
Satd. Flow (perm)	1694	0	0	1861	1853	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	944.5			435.8	462.4	
Travel Time (s)	56.7			26.1	27.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	7	8	336	166	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	0	344	172	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	7	8	336	166	6
Future Vol, veh/h	7	7	8	336	166	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	7	8	336	166	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	521	169	172	0	-	0
Stage 1	169	-	-	-	-	-
Stage 2	352	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	516	875	1405	-	-	-
Stage 1	861	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	512	875	1405	-	-	-
Mov Cap-2 Maneuver	512	-	-	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	712	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1405	-	646	-	-
HCM Lane V/C Ratio	0.006	-	0.022	-	-
HCM Control Delay (s)	7.6	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	7	2	11	3	2	6
Future Volume (vph)	7	2	11	3	2	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.970				0.899	
Flt Protected				0.962	0.988	
Satd. Flow (prot)	1807	0	0	1792	1655	0
Flt Permitted				0.962	0.988	
Satd. Flow (perm)	1807	0	0	1792	1655	0
Link Speed (k/h)	60			60	20	
Link Distance (m)	438.0			944.5	233.9	
Travel Time (s)	26.3			56.7	42.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	2	11	3	2	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	0	14	8	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		

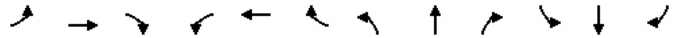
Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	7	2	11	3	2	6
Future Vol, veh/h	7	2	11	3	2	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	2	11	3	2	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	9	0	33	8
Stage 1	-	-	-	-	8	-
Stage 2	-	-	-	-	25	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1611	-	980	1074
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	998	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1611	-	973	1074
Mov Cap-2 Maneuver	-	-	-	-	973	-
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	991	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.7	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1047	-	-	1611	-
HCM Lane V/C Ratio	0.008	-	-	0.007	-
HCM Control Delay (s)	8.5	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	2	4	1	1	1	23	1	0	52	5
Future Volume (vph)	3	0	2	4	1	1	1	23	1	0	52	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.946			0.977			0.995			0.988	
Flt Protected		0.971			0.968			0.998				
Satd. Flow (prot)	0	1711	0	0	1762	0	0	1850	0	0	1840	0
Flt Permitted		0.971			0.968			0.998				
Satd. Flow (perm)	0	1711	0	0	1762	0	0	1850	0	0	1840	0
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		524.5			438.0			522.9			756.9	
Travel Time (s)		31.5			26.3			31.4			45.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	0	2	4	1	1	1	23	1	0	52	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	6	0	0	25	0	0	57	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	2	4	1	1	1	23	1	0	52	5
Future Vol, veh/h	3	0	2	4	1	1	1	23	1	0	52	5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	2	4	1	1	1	23	1	0	52	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7	7.2	7.1	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	60%	67%	0%
Vol Thru, %	92%	0%	17%	91%
Vol Right, %	4%	40%	17%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	5	6	57
LT Vol	1	3	4	0
Through Vol	23	0	1	52
RT Vol	1	2	1	5
Lane Flow Rate	25	5	6	57
Geometry Grp	1	1	1	1
Degree of Util (X)	0.028	0.006	0.007	0.062
Departure Headway (Hd)	3.978	3.961	4.113	3.917
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	902	901	868	917
Service Time	1.995	1.995	2.148	1.93
HCM Lane V/C Ratio	0.028	0.006	0.007	0.062
HCM Control Delay	7.1	7	7.2	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0.2

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	3	8	2	121	449	3
Future Volume (vph)	3	8	2	121	449	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.902				0.999	
Flt Protected	0.987			0.999		
Satd. Flow (prot)	1658	0	0	1861	1861	0
Flt Permitted	0.987			0.999		
Satd. Flow (perm)	1658	0	0	1861	1861	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	944.5			435.8	462.4	
Travel Time (s)	56.7			26.1	27.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	8	2	121	449	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	0	123	452	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	8	2	121	449	3
Future Vol, veh/h	3	8	2	121	449	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	8	2	121	449	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	576	451	452	0	-	0
Stage 1	451	-	-	-	-	-
Stage 2	125	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	479	608	1109	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	478	608	1109	-	-	-
Mov Cap-2 Maneuver	478	-	-	-	-	-
Stage 1	641	-	-	-	-	-
Stage 2	901	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1109	-	566	-	-
HCM Lane V/C Ratio	0.002	-	0.019	-	-
HCM Control Delay (s)	8.3	0	11.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1	0	4	1	2	10
Future Volume (vph)	1	0	4	1	2	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.887	
Flt Protected				0.962	0.992	
Satd. Flow (prot)	1863	0	0	1792	1639	0
Flt Permitted				0.962	0.992	
Satd. Flow (perm)	1863	0	0	1792	1639	0
Link Speed (k/h)	60			60	20	
Link Distance (m)	438.0			944.5	233.9	
Travel Time (s)	26.3			56.7	42.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	4	1	2	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	0	5	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	7.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1	0	4	1	2	10
Future Vol, veh/h	1	0	4	1	2	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	4	1	2	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	10	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	9	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1010	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1014	-
Platoon blocked, %	-	-			-	
Mov Cap-1 Maneuver	-	-	1622	-	1008	1084
Mov Cap-2 Maneuver	-	-	-	-	1008	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1012	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.8	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1071	-	-	1622	-
HCM Lane V/C Ratio	0.011	-	-	0.002	-
HCM Control Delay (s)	8.4	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	6	3	1	9	1	6	65	3	1	30	1
Future Volume (vph)	7	6	3	1	9	1	6	65	3	1	30	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.988			0.995			0.996	
Flt Protected		0.979			0.995			0.996			0.998	
Satd. Flow (prot)	0	1778	0	0	1831	0	0	1846	0	0	1852	0
Flt Permitted		0.979			0.995			0.996			0.998	
Satd. Flow (perm)	0	1778	0	0	1831	0	0	1846	0	0	1852	0
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		524.5			438.0			522.9			756.9	
Travel Time (s)		31.5			26.3			31.4			45.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	6	3	1	9	1	6	65	3	1	30	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	11	0	0	74	0	0	32	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	16.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	6	3	1	9	1	6	65	3	1	30	1
Future Vol, veh/h	7	6	3	1	9	1	6	65	3	1	30	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	6	3	1	9	1	6	65	3	1	30	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.2	7.4	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	44%	9%	3%
Vol Thru, %	88%	38%	82%	94%
Vol Right, %	4%	19%	9%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	74	16	11	32
LT Vol	6	7	1	1
Through Vol	65	6	9	30
RT Vol	3	3	1	1
Lane Flow Rate	74	16	11	32
Geometry Grp	1	1	1	1
Degree of Util (X)	0.082	0.018	0.013	0.036
Departure Headway (Hd)	3.996	4.101	4.093	4.024
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	898	868	869	889
Service Time	2.017	2.15	2.143	2.052
HCM Lane V/C Ratio	0.082	0.018	0.013	0.036
HCM Control Delay	7.4	7.2	7.2	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0	0.1



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	7	8	8	371	184	6
Future Volume (vph)	7	8	8	371	184	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.928				0.996	
Flt Protected	0.977			0.999		
Satd. Flow (prot)	1689	0	0	1861	1855	0
Flt Permitted	0.977			0.999		
Satd. Flow (perm)	1689	0	0	1861	1855	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	944.5			435.8	462.4	
Travel Time (s)	56.7			26.1	27.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	7	8	8	371	184	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	15	0	0	379	190	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	8	8	371	184	6
Future Vol, veh/h	7	8	8	371	184	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	8	8	371	184	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	574	187	190	0	-	0
Stage 1	187	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	480	855	1384	-	-	-
Stage 1	845	-	-	-	-	-
Stage 2	686	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	477	855	1384	-	-	-
Mov Cap-2 Maneuver	477	-	-	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	686	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1384	-	624	-	-
HCM Lane V/C Ratio	0.006	-	0.024	-	-
HCM Control Delay (s)	7.6	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	8	2	11	3	2	6
Future Volume (vph)	8	2	11	3	2	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.973				0.899	
Flt Protected				0.962	0.988	
Satd. Flow (prot)	1812	0	0	1792	1655	0
Flt Permitted				0.962	0.988	
Satd. Flow (perm)	1812	0	0	1792	1655	0
Link Speed (k/h)	60			60	20	
Link Distance (m)	438.0			944.5	233.9	
Travel Time (s)	26.3			56.7	42.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	2	11	3	2	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	0	0	14	8	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	8	2	11	3	2	6
Future Vol, veh/h	8	2	11	3	2	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	2	11	3	2	6

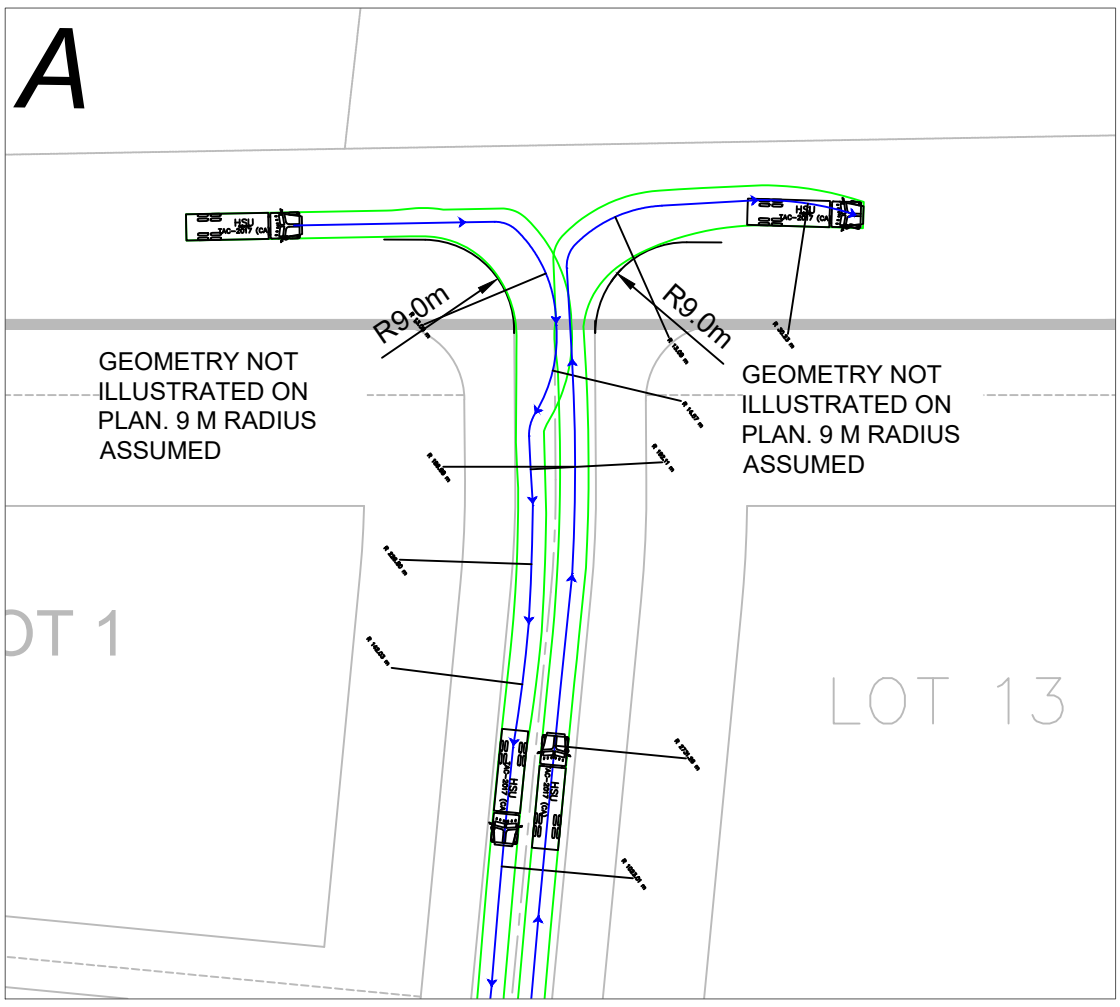
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	10	0	34	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	25	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1610	-	979	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	998	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1610	-	972	1073
Mov Cap-2 Maneuver	-	-	-	-	972	-
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	991	-

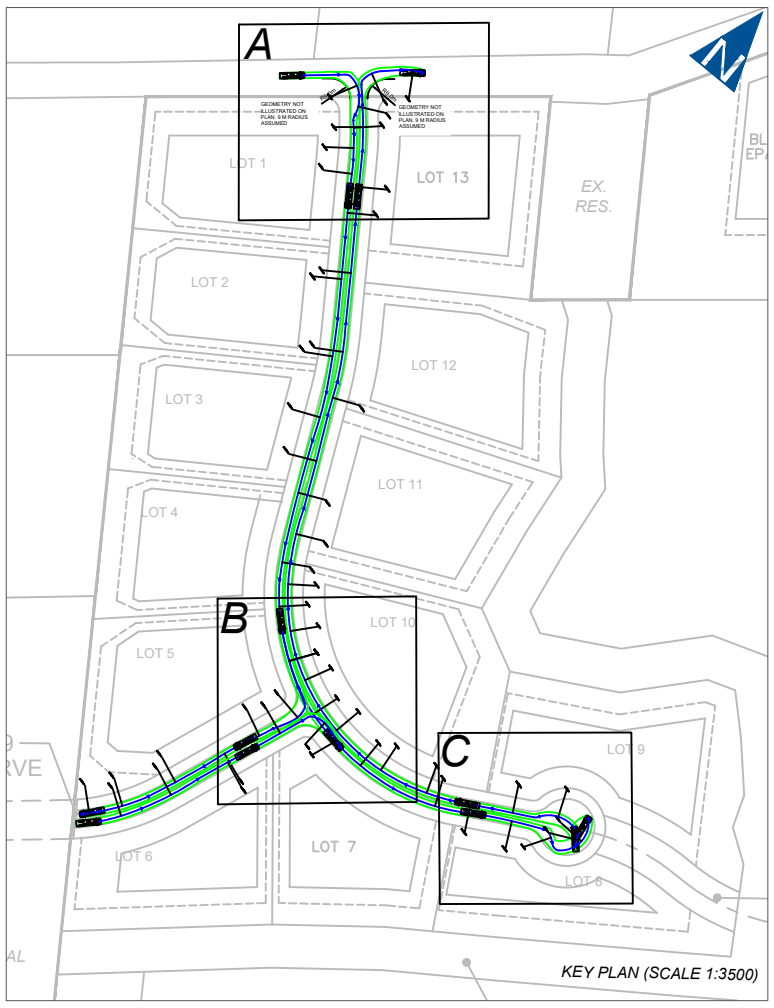
Approach	EB	WB	NB
HCM Control Delay, s	0	5.7	8.5
HCM LOS			A

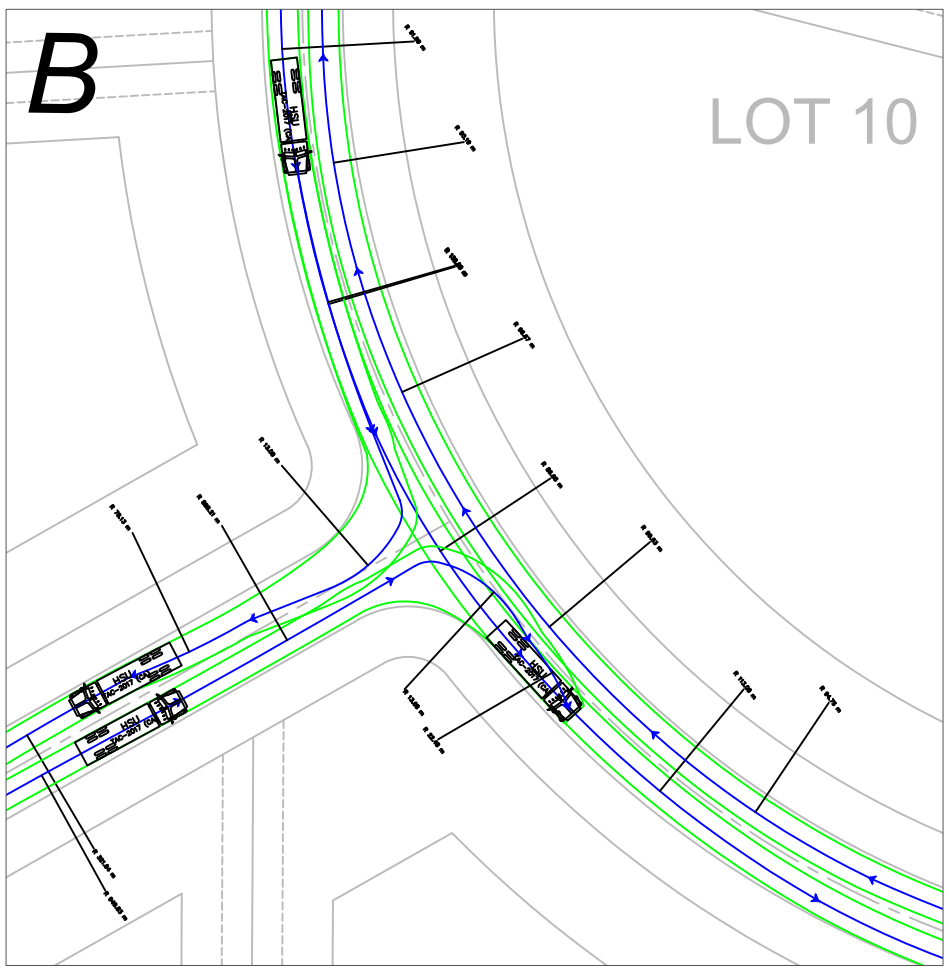
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1046	-	-	1610	-
HCM Lane V/C Ratio	0.008	-	-	0.007	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

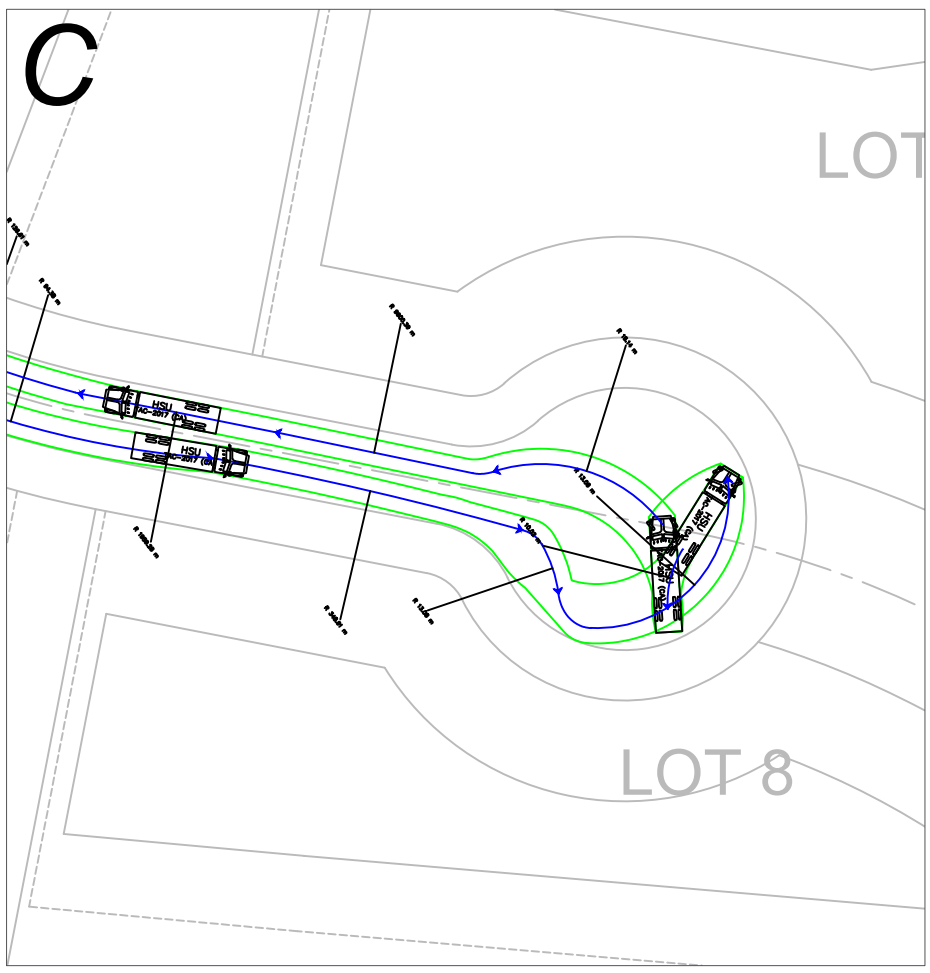
Appendix G

AutoTURN Vehicle Turning Diagrams





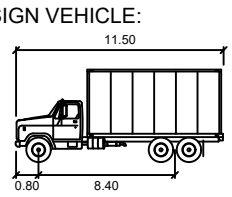




THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

NO.	DATE	INITIAL	REVISION DETAIL

DESIGN VEHICLE:

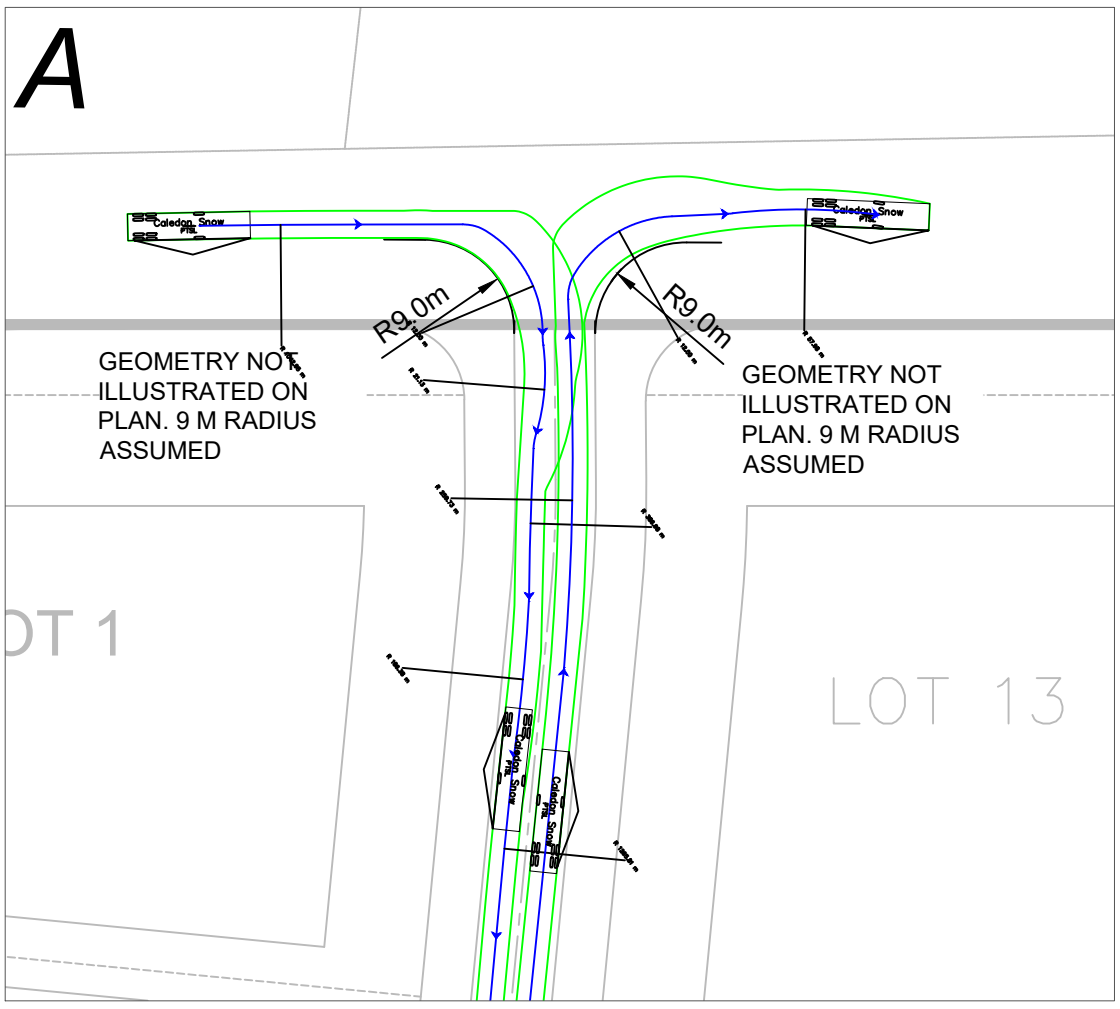


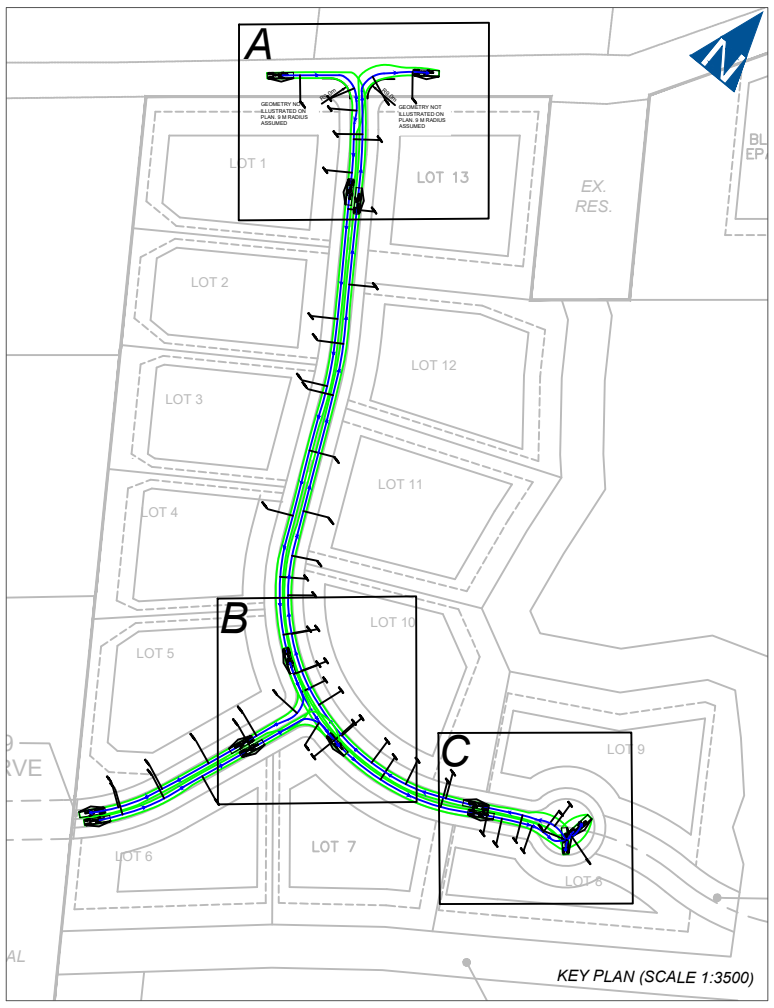
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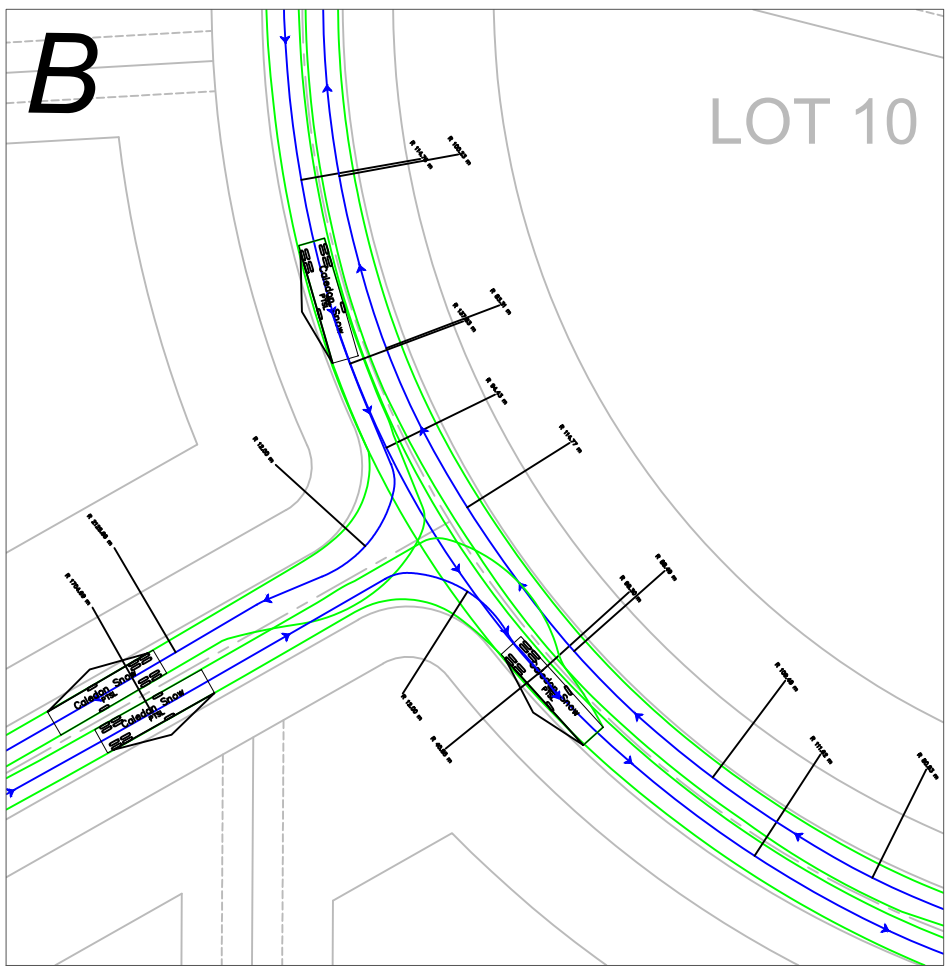
	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

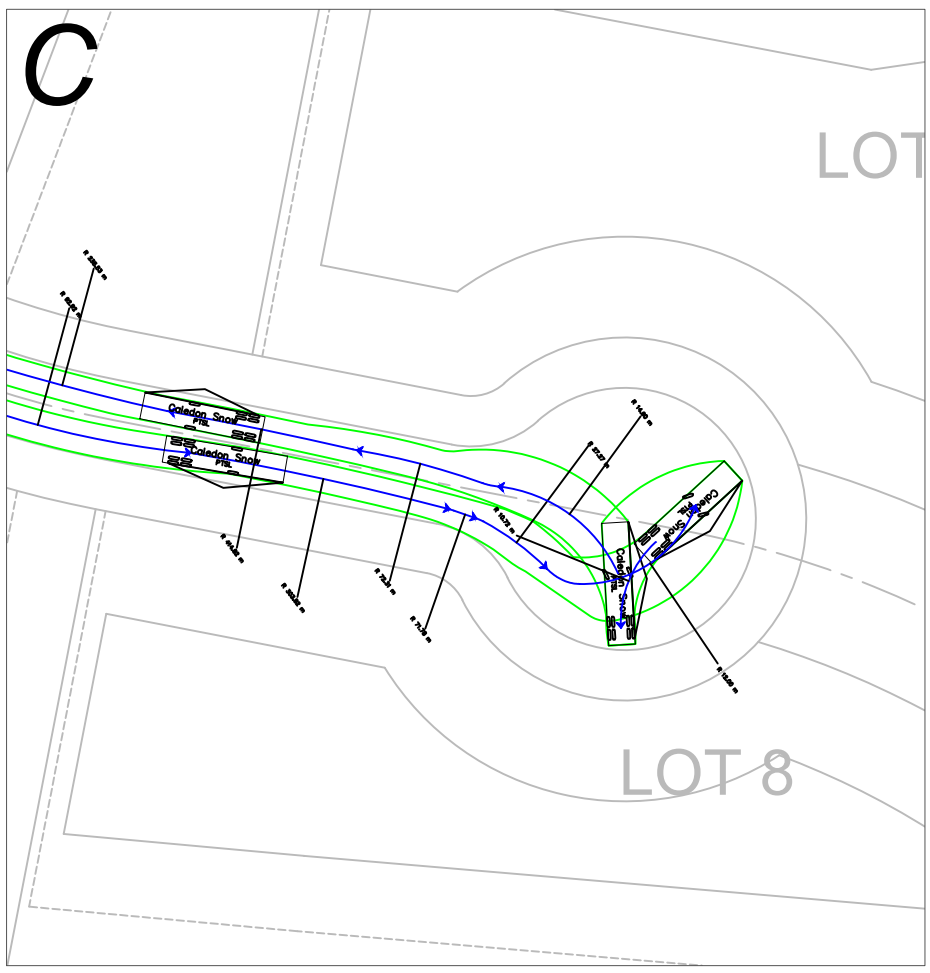
AUTOTURN ASSESSMENT
10249 HUNSDEN SIDEROAD
PEEL REGION, ON

SCALE: 1:750		DATE: OCTOBER 2023	DWG 01
DRAWN: WL	DESIGN: WL	PROJECT: 220678	







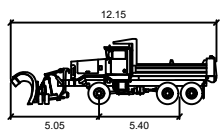


THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

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NO.	DATE	INITIAL	REVISION DETAIL

DESIGN VEHICLE:

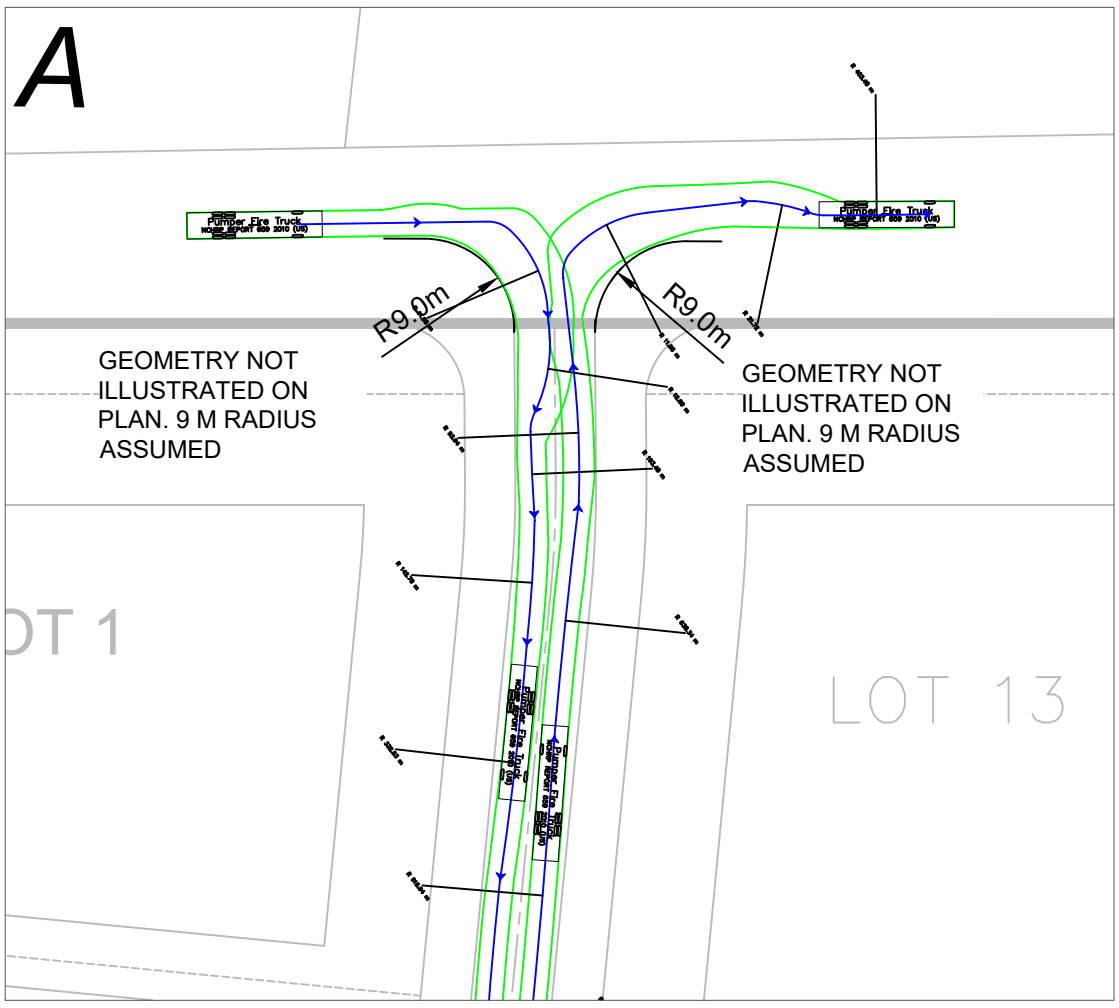


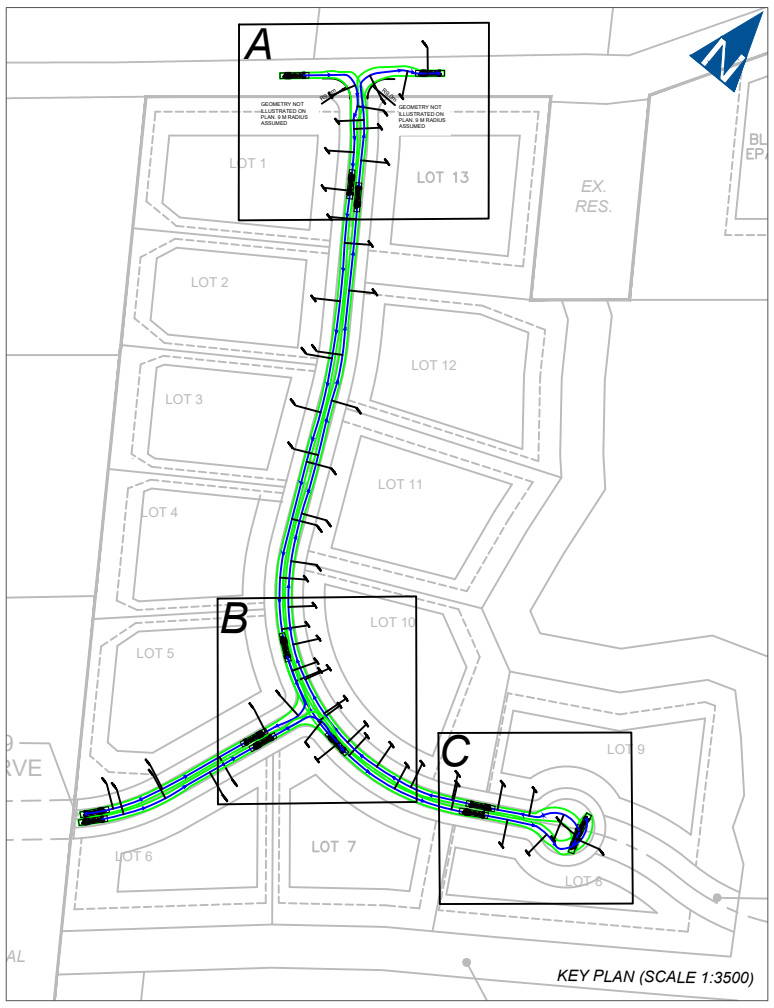
Caledon Snow

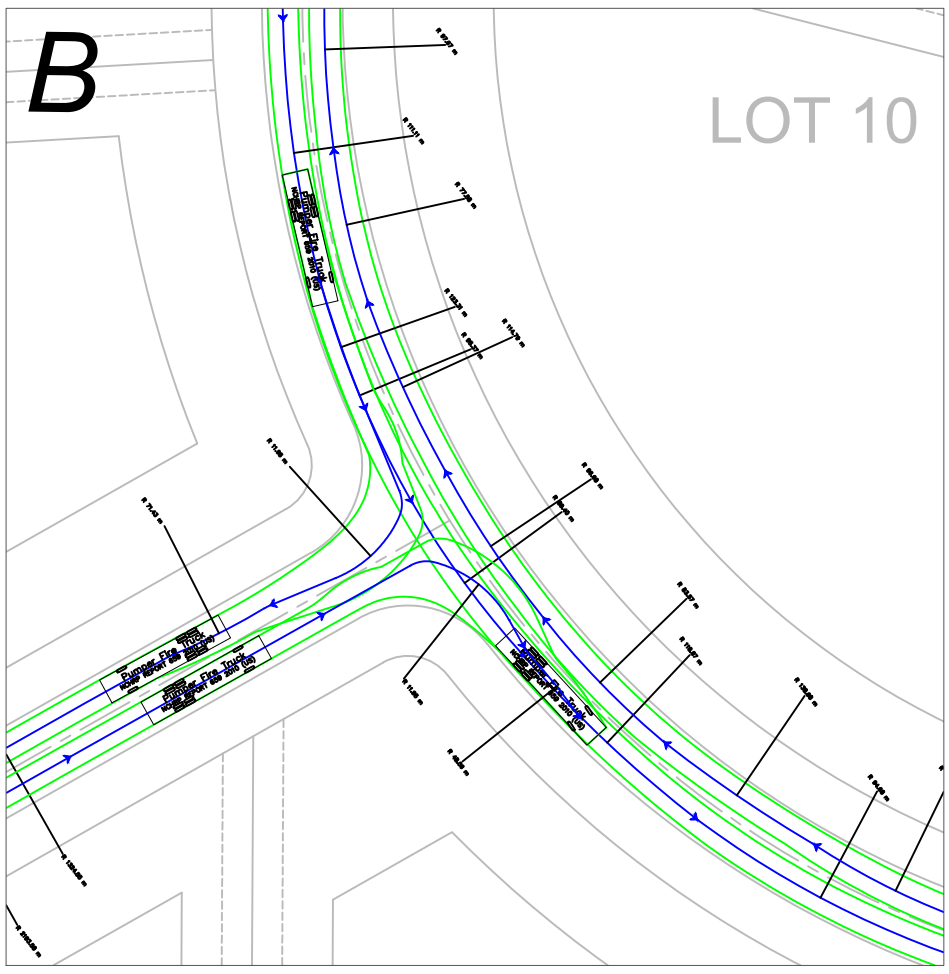
	meters
Width	: 2.65
Track	: 2.65
Lock to Lock Time	: 6.0
Steering Angle	: 26.7

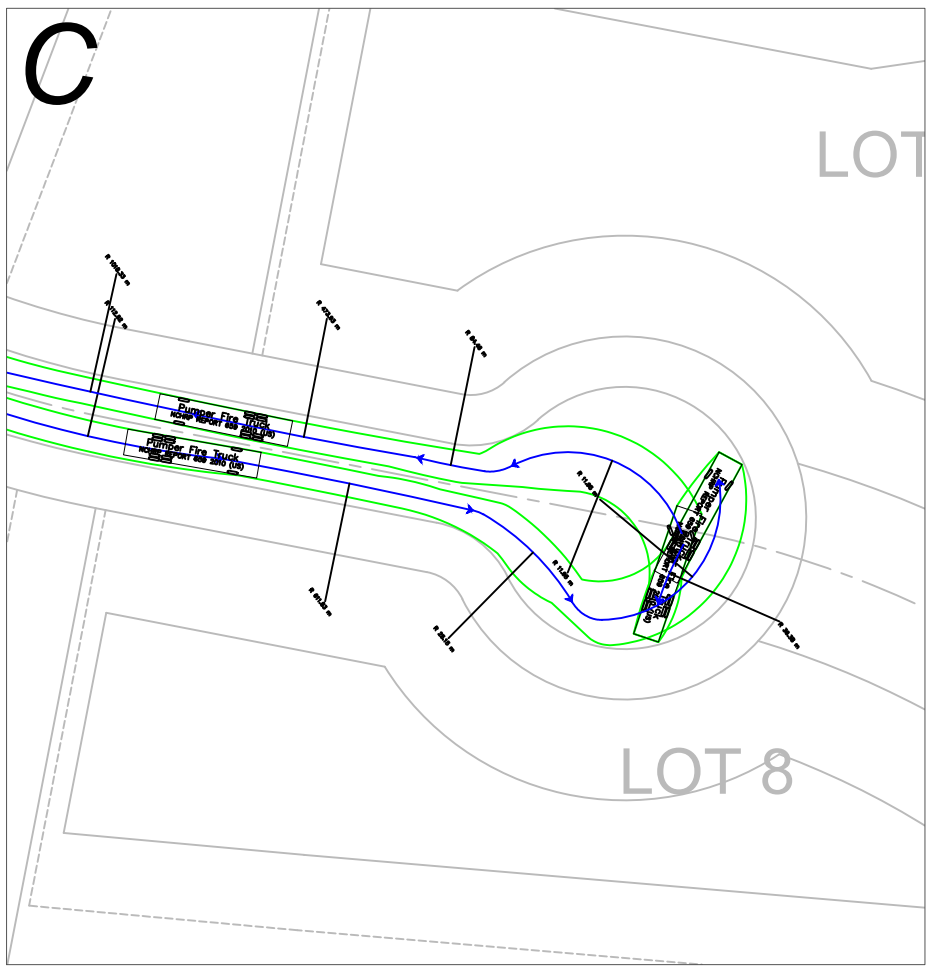
AUTOTURN ASSESSMENT
10249 HUNSDEN SIDEROAD
PEEL REGION, ON

SCALE: 1:750		DATE: OCTOBER 2023	DWG 02
DRAWN: WL	DESIGN: WL	PROJECT: 220678	





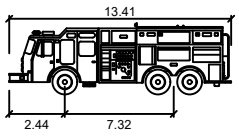




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NO.	DATE	INITIAL	REVISION DETAIL

DESIGN VEHICLE:



Pumper Fire Truck

	meters
Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 37.8

AUTOTURN ASSESSMENT
10249 HUNSDEN SIDEROAD
PEEL REGION, ON

SCALE: 1:750		DATE: OCTOBER 2023	DWG 03
DRAWN: WL	DESIGN: WL	PROJECT: 220678	

Appendix H

Sightline Assessment Diagrams

MINIMUM STOPPING SIGHT DISTANCE

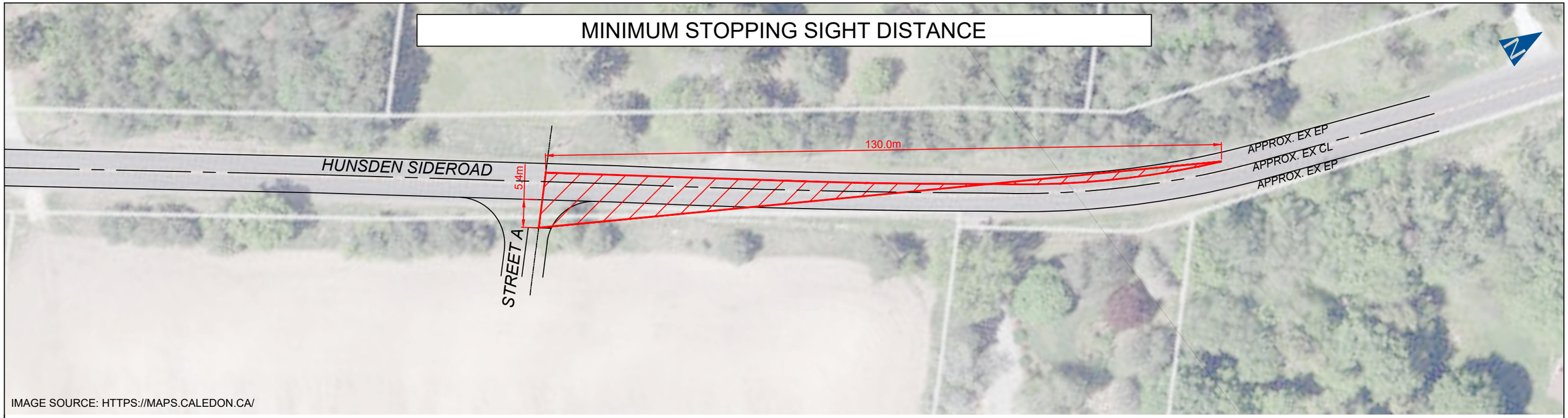


IMAGE SOURCE: HTTPS://MAPS.CALEDON.CA/

DEPARTURE SIGHT DISTANCE - LEFT-TURN FROM STOP

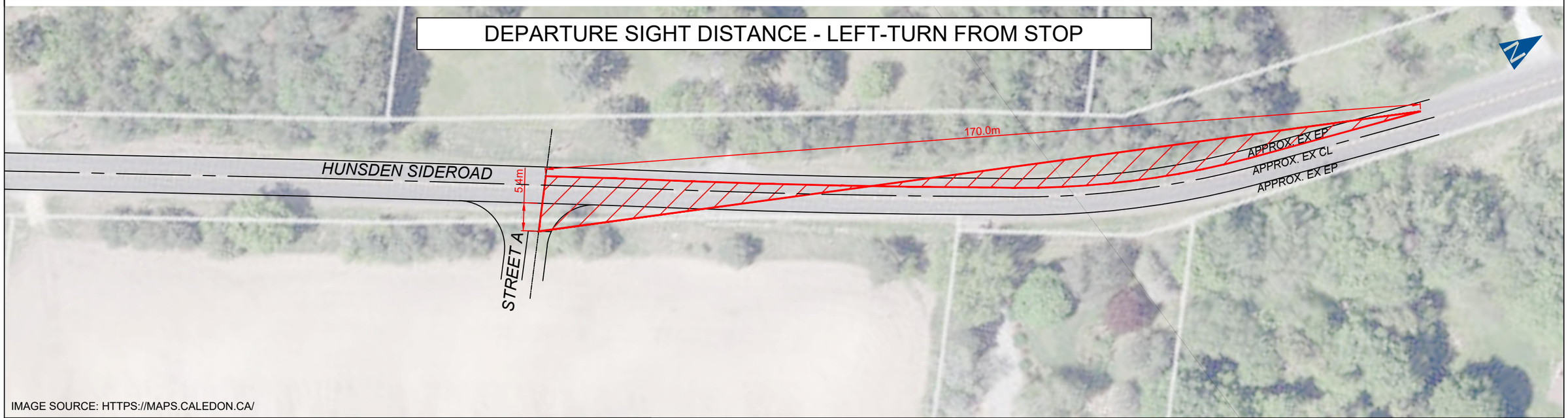


IMAGE SOURCE: HTTPS://MAPS.CALEDON.CA/

NO.	DATE	INITIAL	REVISION DETAIL

SIGHT DISTANCES REVIEW
10249 HUNSDEN SIDEROAD
TOWN OF CALEDON

paradigm TRANSPORTATION SOLUTIONS LIMITED

PROJECT NO.: 220678	DATE: APRIL 2024	SCALE: 1:750	DRAWING NO.:
DRAWN: SC	DESIGN: SC	CHECK: JD	01

MINIMUM STOPPING SIGHT DISTANCE

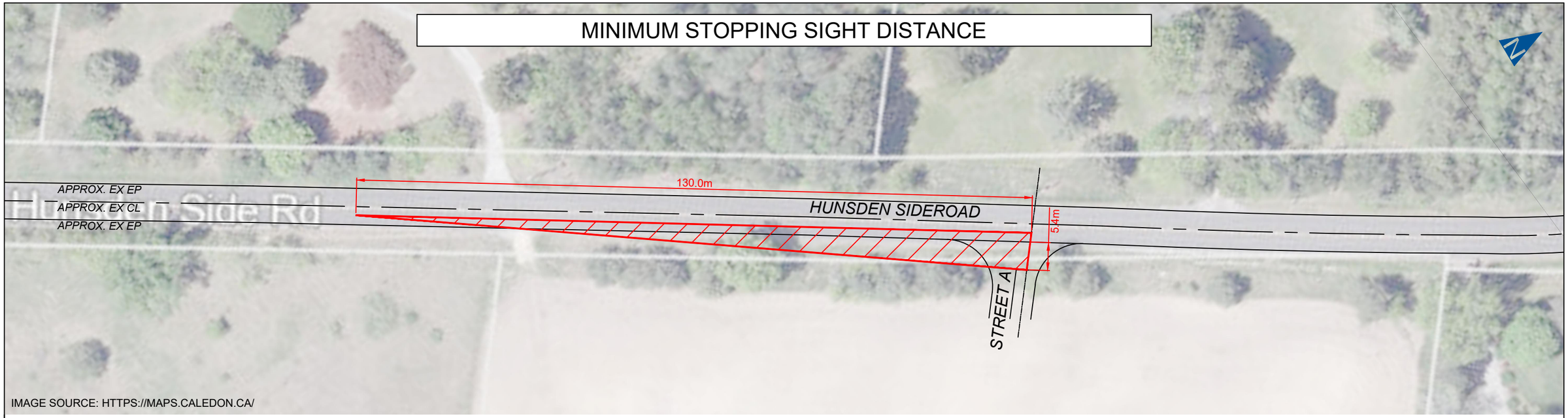


IMAGE SOURCE: HTTPS://MAPS.CALEDON.CA/

DEPARTURE SIGHT DISTANCE - LEFT-TURN FROM STOP

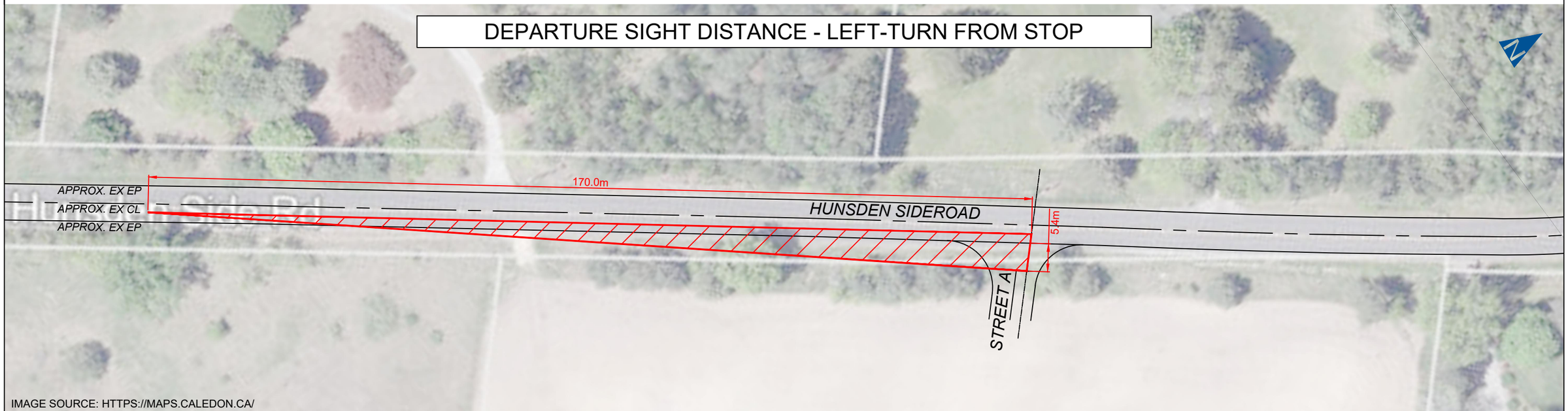


IMAGE SOURCE: HTTPS://MAPS.CALEDON.CA/

NO.	DATE	INITIAL	REVISION DETAIL

SIGHT DISTANCES REVIEW
10249 HUNSDEN SIDEROAD
TOWN OF CALEDON

paradigm TRANSPORTATION SOLUTIONS LIMITED

PROJECT NO.: 220678	DATE: APRIL 2024	SCALE: 1:750	DRAWING NO.: 02
DRAWN: SC	DESIGN: SC	CHECK: JD	