



# 1 Rosetta Street Town of Halton Hills Transportation Impact & Parking Study Update

Paradigm Transportation Solutions Limited

May 2023  
210781



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## **1 Rosetta Street Town of Halton Hills, Transportation Impact & Parking Study Update**

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# Executive Summary

## Content

Lev Developments Inc. retained Paradigm Transportation Solutions Limited to conduct this Transportation Impact Study (TIS) and Parking Study for a residential development located at 1 Rosetta Street in the Town of Halton Hills.

This study is an update to the April 2022 Transportation Impact Study and Parking Study completed for the site. This study reflects changes in the development concept and is intended to address comments received from the Town of Halton Hills on the first submission.

## Development Concept

The development proposal includes an 8-storey residential building containing 151 residential units and two interconnected 12-storey residential buildings containing 486 residential units. The proposal includes approximately 637 residential units.

Vehicle access is proposed by a driveway to Rosetta Street and a driveway to Caroline Street.

The site's parking supply is identified as 751 parking spaces (1.18 spaces per unit). The site plan identifies an allocation of 688 spaces for occupants (1.08 space per unit) and 63 spaces for visitors (0.10 spaces per unit).

## Conclusions

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

### Transportation Impact Assessment

- ▶ **Base Year Traffic Operations:** No critical movements are noted in the base year operations at the study area intersections.
- ▶ **Estimated Site Generated Traffic:** The subject site is estimated to generate approximately 187 vehicle trips during the AM peak hour and 215 vehicle trips during the PM peak hour.
- ▶ **Background Traffic Operations – Five-Year Horizon:** As the traffic volumes increase, capacity issues (v/c ratio greater than 0.85) are forecast for the westbound approach at the



Mountainview Road North and River Drive intersection during the PM peak hour.

- ▶ **Background Traffic Operations – Ten-Year Horizon:** As the traffic volumes increase, the capacity issues outlined under the five-year horizon are expected to continue to occur.
- ▶ **Total Traffic Operations – Five-Year Horizon:** The capacity deficiencies identified under background conditions will deteriorate with the addition of site generated traffic. No new capacity issues are triggered by the addition of site generated traffic.

No capacity issues are forecast to occur at any other study area intersection or the site driveways.

- ▶ **Total Traffic Operations – Ten-Year Horizon:** The capacity deficiencies identified under background conditions will deteriorate with the addition of site generated traffic. The addition of site generated traffic trigger capacity issues for the shared northbound left/through movement at the Mountainview Road North and River Drive intersection.

No capacity issues are forecast to occur at any other study area intersection or the site driveways.

- ▶ **St. Michaels Street Extension:** The extension of St. Michaels Street to John Street will have a negligible impact on traffic operations throughout the study area and is not required from a capacity perspective. The unopened right-of-way would be better used as an Active Transportation (AT) connection between John Street and Caroline Street. Desire lines through the grassed area were observed in the field suggesting the need for this AT connection.
- ▶ **130 Mountainview Road Sensitivity:** The addition of the 130 Mountainview Road development is forecast to cause traffic operations to deteriorate at the intersection of Mountainview Road and River Drive. Capacity deficiencies and mitigation measures should be explored and addressed by the applicant of 130 Mountainview Road.
- ▶ **Remedial Measures:** To manage the expected growth in traffic at the Mountainview Road North and River Drive intersection, the road authority should consider:
  - Optimize signal timings with a protected westbound left-turn phase;
  - Reduce the southbound approach to one shared through/right lane and one left-turn lane with 50 metres of storage; and



- Provide a northbound left-turn lane with 50 metres of storage.

The reconfiguration of the northbound and southbound lane groupings appears to be feasible without modifications to the existing pavement width. The revised lane configuration can likely be achieved by modifying the existing pavement markings and signage.

No new traffic control signals are recommended at the intersection of Mountainview Road North and John Street and no left-turn lanes are recommended at the proposed site driveways.

### **Parking Study**

The site's proposed parking supply is identified as 751 spaces with an allocation of 688 spaces for occupants and 63 spaces for visitors.

- ▶ The site's parking supply does not meet the Town's zoning by-law requirement. The site's parking supply is identified as 751 parking spaces (1.18 spaces per unit).
- ▶ The Town's TMP and the Region's OP both emphasise the need of influencing travel behaviour to encourage transit and active transportation in order to achieve multi-modal access through policies such as Transportation Demand Management (TDM), transit programmes, and walking and cycling.
- ▶ Vehicle ownership data from the Transportation Tomorrow Survey (TTS) for apartment units in zones surrounding GO Transit stations along the Kitchener Line between Kitchener and Mount Pleasant indicate an occupant parking demand for the subject site of 304 spaces. Visitor parking is not included in this calculation. Including the visitor parking demand, estimated by the Zoning By-law, 160 visitor parking spaces, the overall parking demand for the site is estimated to be 544 spaces.
- ▶ The ITE Parking Generation Manual indicates a parking demand ranging from 655 to 696 parking spaces (occupant and visitor).
- ▶ Proxy site data from multiple sites with similar neighbourhood characteristics indicates a parking demand of approximately 595 spaces (occupant and visitor). With a parking supply of 751 spaces, the site's parking demand is forecast to be less than the proposed supply.
- ▶ The TDM Checklist from the Region of Waterloo identifies a total of 13% reduction in parking spaces based on the



proposed TDM program. This results in a forecast parking demand of 518 spaces.

- ▶ Using several different methodologies, the proposed development is estimated to have a parking demand in the order of 518 spaces to 647 spaces. With a parking supply of 751 spaces, the site's parking demand is forecast to be accommodated by the on-site parking.
- ▶ A site-specific parking rate of 1.18 spaces per unit is suitable for this site.

### **Transportation Demand Management**

- ▶ The site concept plan includes a robust TDM program that can assist in mitigating the site's transportation and parking impacts on the adjacent road network, promote a strong and vibrant economy, and create a livable community that has a balanced transportation network. The monitoring and adjustment of the site's TDM program will be critical to the site's success.

## **Recommendations**

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

- ▶ At the Mountainview Road North and River Drive intersection the road authority consider:
  - Optimize signal timings with a protected westbound left-turn phase;
  - Reduce the southbound approach to one shared through/right lane and one left-turn lane with 50 metres of storage; and
  - Provide a northbound left-turn lane with 50 metres of storage.

The revised lane configuration can likely be achieved by modifying the existing pavement markings and signage.



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# 1 Introduction

This study is an update to the April 2022 Transportation Impact Study and Parking Study<sup>1</sup> completed for the site. This study reflects changes in the development concept and is intended to address comments received from the Town of Halton Hills on the first submission.

## 1.1 Overview

Lev Developments Inc. retained Paradigm Transportation Solutions Limited to conduct this Transportation Impact Study (TIS) and Parking Study for a residential development located at 1 Rosetta Street in the Town of Halton Hills (Georgetown). The development application requires an Official Plan Amendment and Zoning By-law Amendment

**Figure 1.1** illustrates the site location. The subject site is located at 1 Rosetta Street in the Town of Halton Hills. The Georgetown GO Station is located 200m south of the subject site and the surrounding area is designated as a Major Transit Station Area (MTSA).

The scope of the study includes:

- ▶ Assessment of the current traffic conditions within the study area;
- ▶ Estimates of background traffic growth;
- ▶ Estimates of additional traffic generated by the subject site;
- ▶ Analyses of the impact of the future traffic on the study area road network;
- ▶ Recommendations necessary to mitigate the site generated traffic in a satisfactory manner;
- ▶ Reviews the site access and circulation design to ensure compliance with review agency requirements and applicable industry guidelines;
- ▶ Prepares a signage plan complying with applicable guidelines;
- ▶ Forecast of the site's parking generation; and
- ▶ Development of a Transportation Demand Management (TDM) plan to mitigate the subject site's transportation and parking impacts.

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<sup>1</sup> Paradigm Transportation Solutions Ltd., 1 Rosetta Street, Town of Halton Hills, ON Transportation Impact and Parking Study, April 2022.



**Appendix A** contains the pre-study consultation material and responses from Town of Halton Hills. The study generally follows the Halton Region Transportation Impact Study Guidelines.<sup>2</sup>

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<sup>2</sup> Transportation Impact Study Guidelines, Halton Region, January 2015

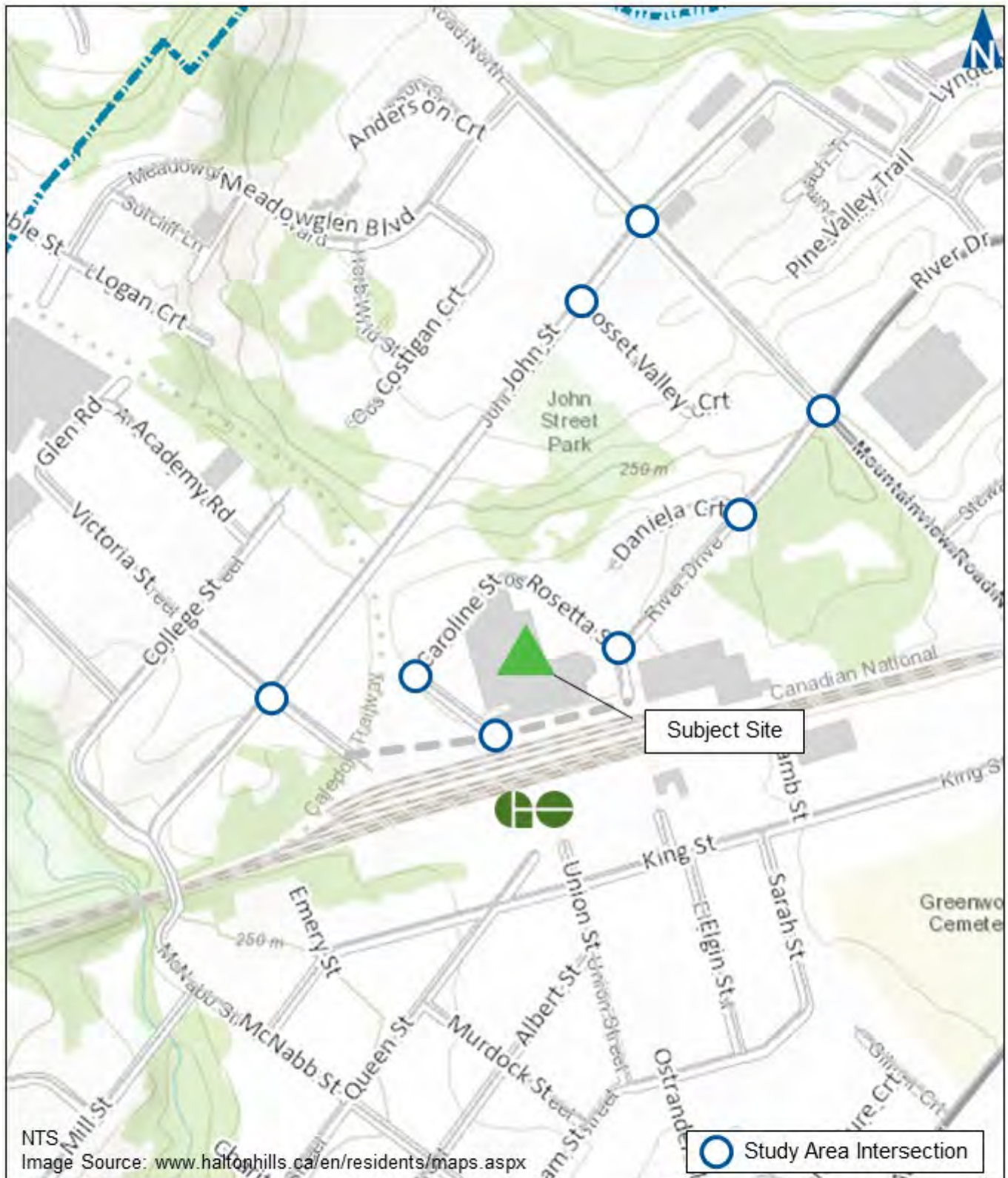


## 1.2 Study Area

The study area intersections assessed in this study include:

- ▶ Mountainview Road North and River Drive (signalized);
- ▶ Mountainview Road North and John Street (unsignalized);
- ▶ River Drive and Daniela Street (unsignalized);
- ▶ River Drive and Rosetta Street (unsignalized);
- ▶ River Drive and St. Michaels Street/GO Parking Driveway (unsignalized);
- ▶ St. Michaels Street (existing and future) and Caroline Street (uncontrolled);
- ▶ John Street and Rosset Valley Court. (unsignalized);
- ▶ John Street and Victoria Street (unsignalized); and
- ▶ The two proposed site driveways.





## Site Location

## 2 Existing Conditions

### 2.1 Road Network

The roadways of interest within the study area include:

- ▶ **Mountainview Road North** is a north-south minor arterial<sup>3</sup> roadway with an urban cross-section and a posted speed limit of 50 km/h. South of River Drive the roadway has a four-lane cross section. North of River Drive, the roadway has a two-lane cross-section and a posted speed limit of 50 km/h. Sidewalks are provided on both sides of this roadway. The intersection with River Drive is signalized.
- ▶ **River Drive** is an east-west two-lane roadway with a posted speed limit of 50 km/h. East of Mountainview Road North, the roadway is classified as a minor arterial and sidewalks are provided on both sides of this roadway. West of Mountainview Road North, the roadway is classified as a local roadway and is a part of a traffic calmed neighbourhood with sidewalk on the north side of this roadway. Two speed humps are located between Mountainview Road North and Rosetta Street.
- ▶ **Rosetta Street** is a north-south two-lane roadway with a statutory speed limit of 50 km/h. No sidewalks are provided along this roadway and no on-street parking restrictions are noted. The intersection with River Road is unsignalized with stop control on the southbound approach and yield control on the northbound approach. For analysis purposes the intersection is assumed to operate as stop control for the southbound leg only.
- ▶ **John Street** is an east-west two-lane local roadway with a posted speed limit of 50 km/h. West of Mountainview Road North the roadway is part of a traffic calmed neighbourhood. Two speed humps are located between Mountainview Road North and Victoria Street. Sidewalks are provided along the south side of this roadway with intermittent sections where sidewalks are provided on both sides. A parking lane is provided on the north side of this roadway between Victoria Street and Mountainview Road North and on-street parking is restricted on the south side of this roadway. The intersections with Mountainview Drive North and Victoria Street are unsignalized with all-way stop control.

<sup>3</sup> Town of Halton Hills Official Plan, Schedule B1: Functional Plan of Major Transportation Facilities, December 2020

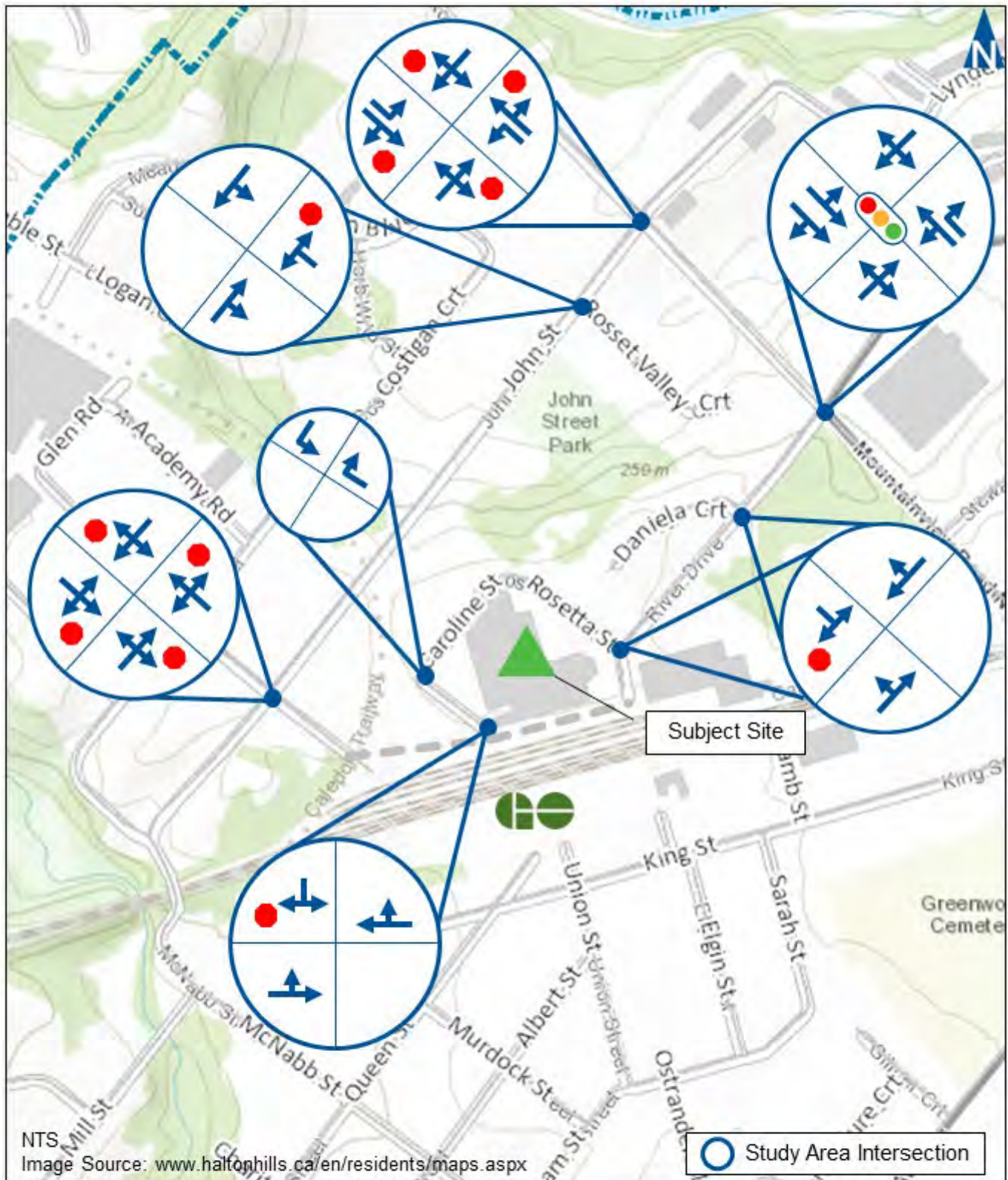


- ▶ **St. Michaels Street** is a north-south two-lane roadway with a statutory speed limit of 50 km/h. No sidewalks are provided along this roadway and no on-street parking restrictions are noted. The intersection with River Road is unsignalized, stop control is provided on the St. Michaels Street approach and the GO transit driveway approach. For analysis purposes, stop control on only the southbound approach is assumed.
- ▶ **Caroline Street** is an east-west two-lane roadway with a statutory speed limit of 50 km/h. Sidewalks are provided along the north side of this roadway and no on-street parking restrictions are noted. The intersections with St. Michaels Street and Rosetta Street are uncontrolled and function as a bend in the roadway.
- ▶ **Victoria Street** is a north-south two-lane roadway with a statutory speed limit of 50 km/h. Sidewalks are provided along the east side of this roadway and on-street parking is restricted on the west side of this roadway.

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







## Existing Traffic Control and Lane Configuration

## 2.2 Walking

Sidewalks are provided on both sides of Mountainview Road North and on one side of John Street, Victoria Street and River Street and Caroline Street. There are no sidewalks provided on Rosetta Street and St. Michaels Street.

Crosswalks are provided on the west and north legs of the signalized Mountainview Road North and River Drive intersection. No crosswalks are provided on the east and south legs as sidewalks do not exist on the south side of River Drive or the west side of Mountainview Road North. Crosswalks are provided on all approaches at the all-way stop controlled intersections of John Street at Victoria Street and Mountainview Road North.

## 2.3 Cycling

The Town of Halton Hills' active transportation network provides some cycling facilities within the immediate area. A signed bike route is provided on John Street from McNabb Street to the off-road route from John Street to Wildwood Road (Wildwood Trail) and an urban shoulder is provided on River Drive east of Mountainview Road North.

The Town of Halton Hills Active Transportation Master Plan (ATMP)<sup>4</sup> identifies the following proposed cycling facilities within the immediate area:

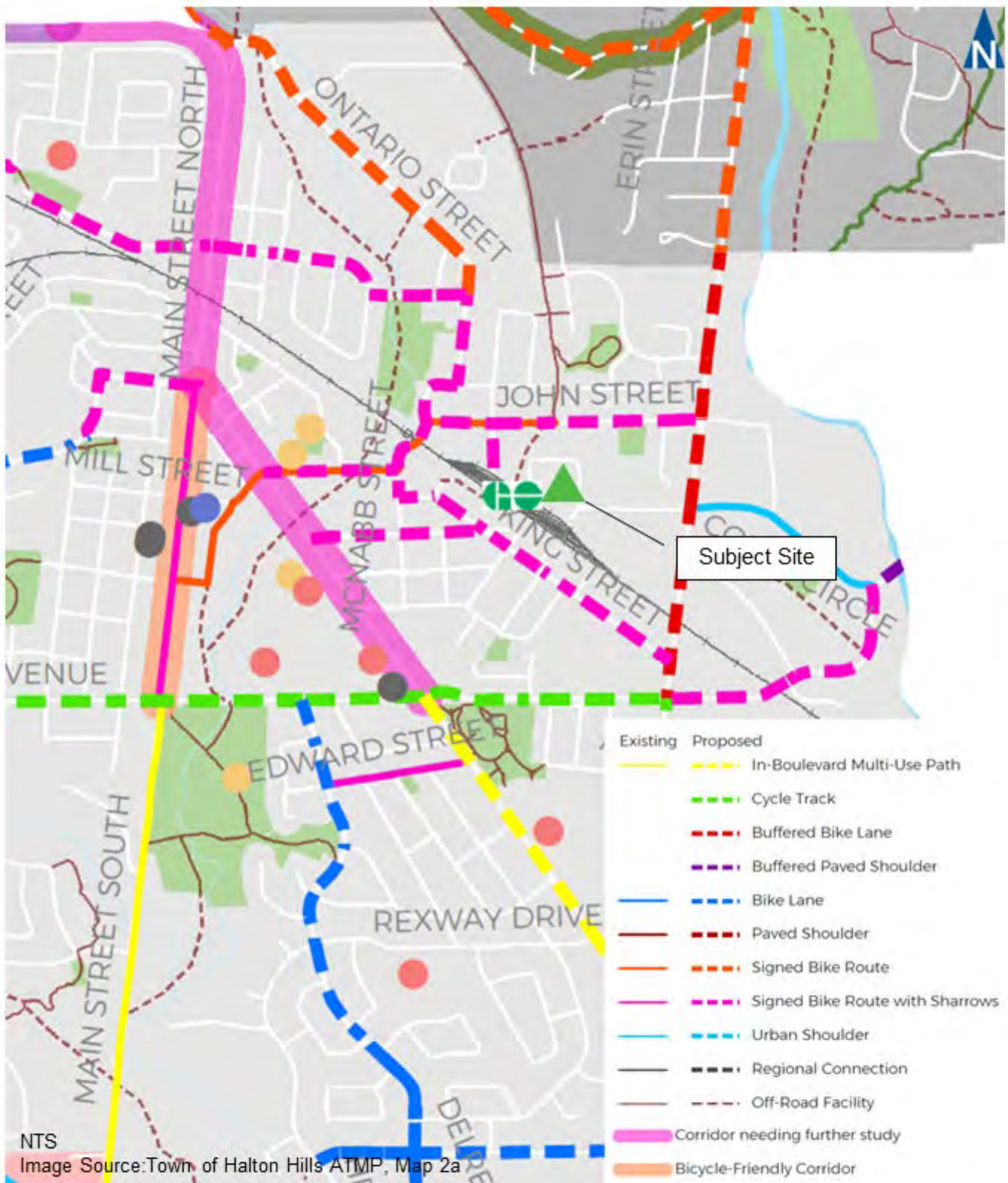
- ▶ Signed bike route with sharrows on John Street (from McNaab Street to Mountainview Road North);
- ▶ Signed bike route with sharrows on Victoria Street (from John Street to GO Transit station);
- ▶ Buffered bike lane on Mountainview Road North; and
- ▶ Off-road route connection from GO Transit station to existing off-road route on John Street.

**Figure 2.2** illustrates the existing and proposed cycling network.

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<sup>4</sup> Town of Halton Hills Active Transportation Master Plan, Map 2a – Proposed On-Road Facility Types, October 2020





## Cycling Network

Figure 2.2

## 2.4 Transit Service

Transit service in the area is provided by GO Transit and is centralized around the Georgetown GO Station located at 55 Queen Street. GO Transit offers both train and bus service from the Georgetown GO Station.

The walking time to the Georgetown GO Station from the subject site is under 2 minutes (200 m) with stops located directly opposite the site north of the rail line. Longer walk times are needed to reach the Georgetown GO Station building located on the south side of the rail line. The cycling time to the Georgetown GO Station is also under 2 minutes.

The Georgetown GO Train station platforms are accessible from areas north and south of the tracks and are connected via an underground walkway. GO Train service is provided Monday to Friday in the eastbound direction in the morning peak period and in the westbound direction during the evening peak period, with headways generally every 30 to 45 minutes. Metrolinx is planning on improving GO Train service along the Kitchener Line with two-way, all-day service.

The GO Bus station is located on the north side of the rail corridor on River Drive. GO Bus Route 31 and 33 service the Georgetown GO Station, GO Bus service is provided 7 days a week.

**Figure 2.3** illustrates the existing transit network<sup>5</sup>.

**Figure 2.4** illustrates the existing transit stops within 500 m of the subject site<sup>6</sup>. The closest bus stops to the subject site are located at the Georgetown GO Bus station on River Drive.

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<sup>5</sup> Go Transit System Map, 2023

<sup>6</sup> <https://www.triplinx.ca/>





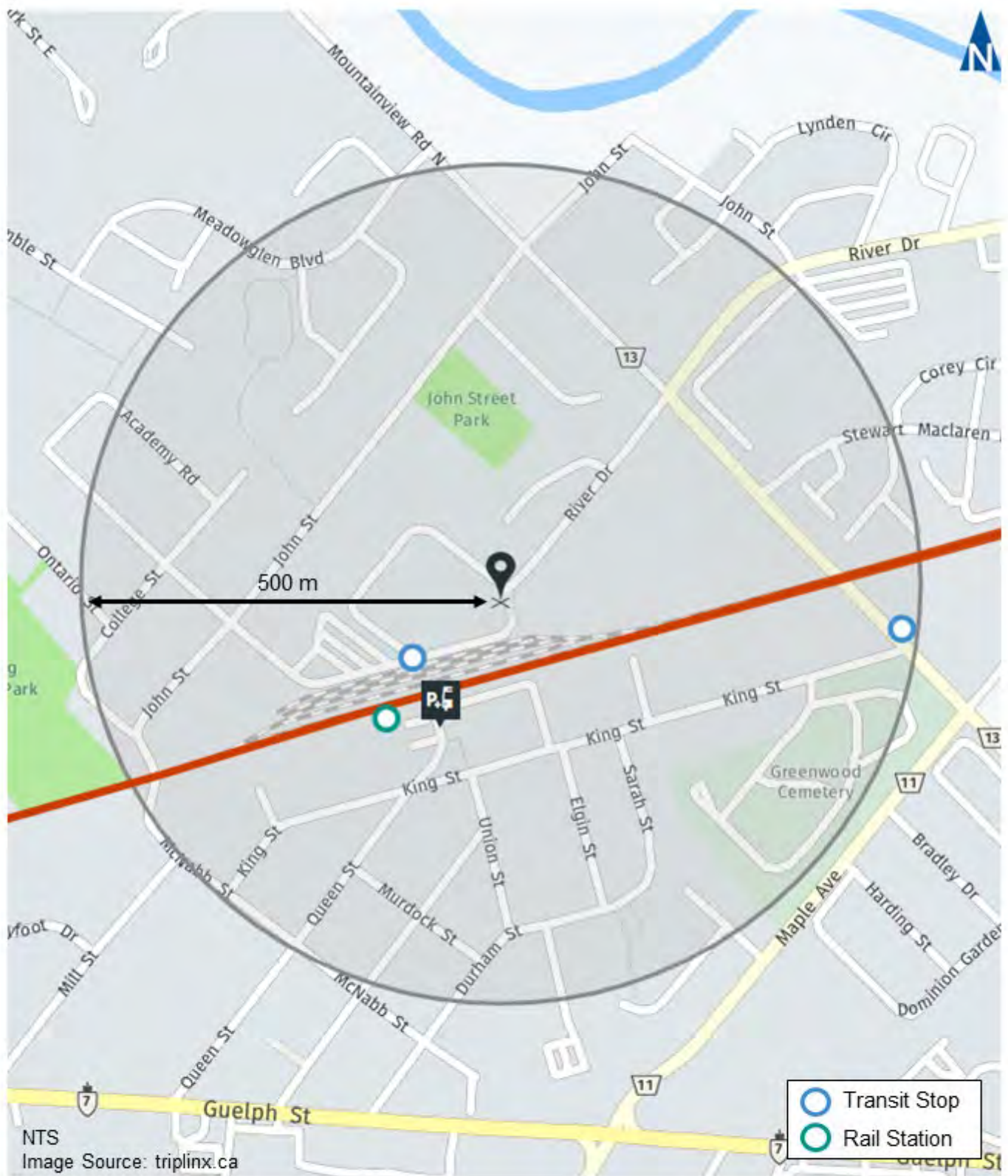
# System Map Plan du réseau



NTS  
Image Source: Go Transit System Map, 2023



## Existing Transit Network



## Existing Transit Stops

## 2.5 Traffic Volumes

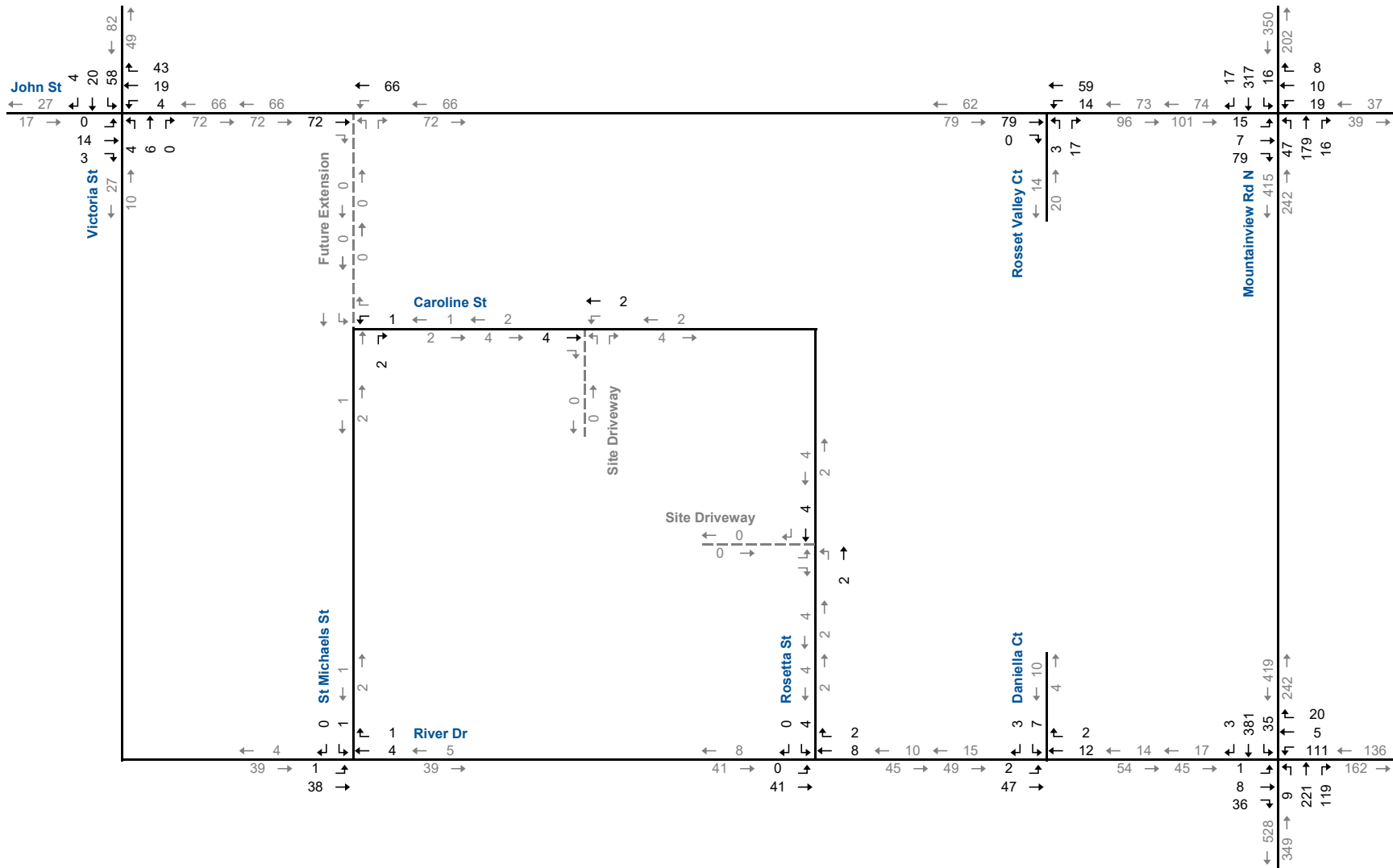
Turning movement counts were collected at the study area intersections by Paradigm in March 2022 at the direction of the Town of Halton Hills. Traffic counts were grown to a 2023 base year using a 2% per annum growth rate as outlined by the Town.

**Figures 2.5 and 2.6** illustrate the 2023 base year weekday AM and PM peak hour traffic volumes at the study area intersections.

**Appendix B** contains the existing count data.



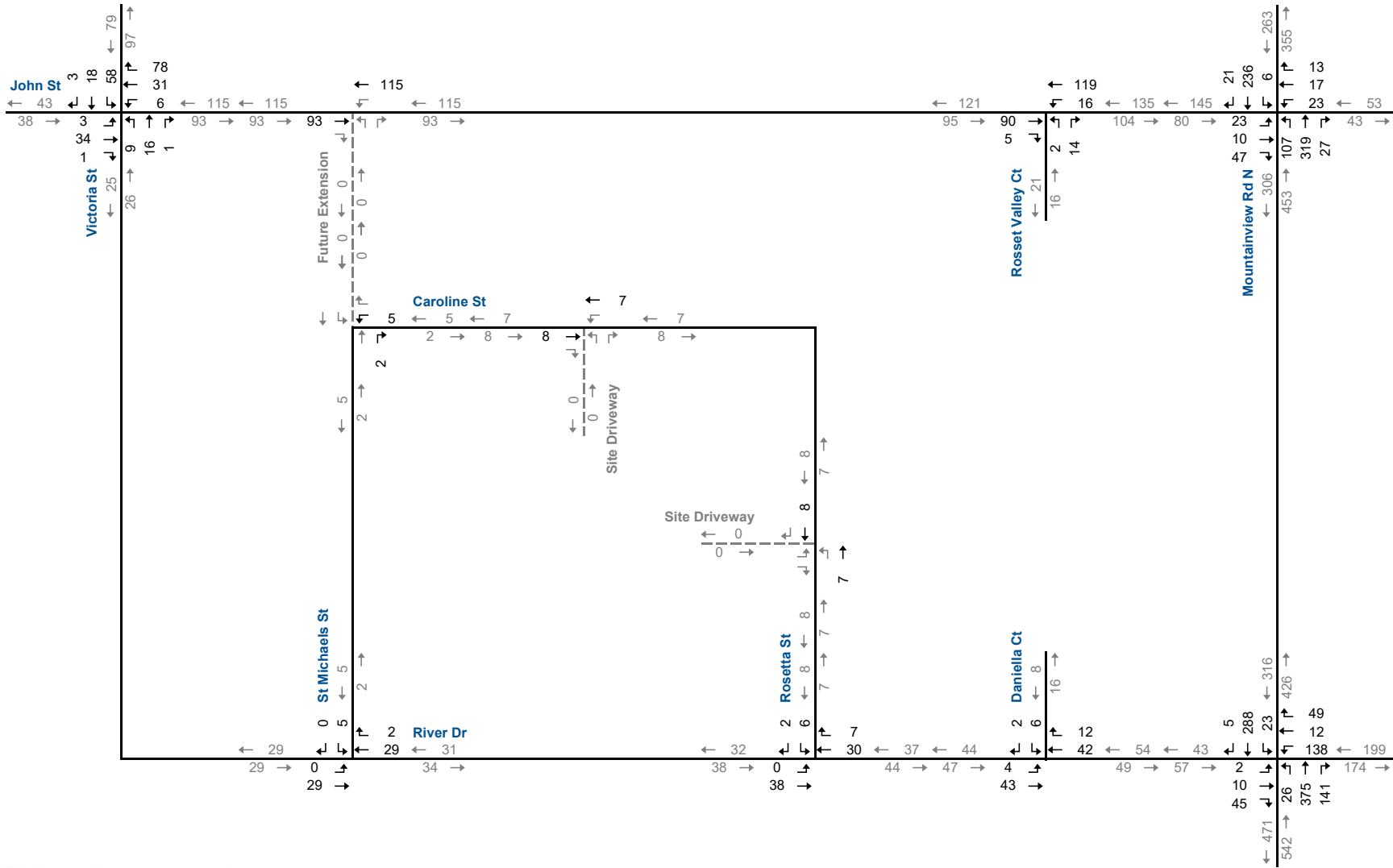
AM Peak Hour



# Base Year Traffic Volumes AM Peak Hour

Figure 2.5





## Base Year Traffic Volumes PM Peak Hour

## 2.6 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the efficiency of traffic flow 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 desiring to make a movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to the opposing traffic flows. 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 at signalized intersections (50 seconds at unsignalized), the movement is considered to have a LOS F and remedial measures are usually implemented if they are feasible.

The operations of the intersections in the study area were evaluated using the existing lane configuration, traffic control, existing base year traffic volumes and signal timings. The intersection analysis considered the following measures of performance:

- ▶ The LOS for each turning movement: LOS is based on the average control delay per vehicle;
- ▶ The volume to capacity ratio for each intersection; and
- ▶ 95th percentile queue length (m).

Synchro 11 was used to determine traffic operations at the study area intersections. In accordance with the Halton Region's TIS Guidelines<sup>7</sup>, the following criteria were used in the determination of critical movements:

- ▶ At signalized intersections,
  - Overall intersection operations, through movements, or shared through/turning movements increased to 0.85 or above.
  - V/C ratios for exclusive movements increased to 0.95 or above; or
  - Queues for an individual movement are projected to exceed turning lane storage.

<sup>7</sup> Transportation Impact Study Guidelines, Halton Region, January 2015



- ▶ At unsignalized intersections,
  - LOS, based on average delay per vehicle, on individual movements exceeds LOS “D”; or
  - The estimated 95th percentile length for an individual movement exceeds the available queue storage.

**Table 2.1A-B** summarizes the results of the analysis for the base year intersection operations. There are no critical movements noted in the base year operations.

**Appendix C** contains the supporting detailed Synchro reports.



**TABLE 2.1A: BASE YEAR OPERATIONS – AM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < C > V/C < 28 > Q < 0.06 > Ex < 8 > Avail. < - >	< C > < 28 > < 0.06 > < 8 > < - >	> > > > > > > > > >	C 28 0.06 8 -	< > < > < > < > < >	D 45 0.73 32 -	> > > > > > > > > >	D 45 0.73 32 -	< > < > < > < > < >	A 8 0.24 39 -	> > > > > > > > > >	A 7 0.09 9 -	< > < > < > < > < >	A 8 0.24 32 -	> > > > > > > > > >	A 8 0.24 32 -	B 14 0.35	
	2 - Mountainview Road N & John Street	AWSC	LOS Delay < A > V/C < 9 > Q < 0.15 > Ex < 17 > Avail. < - >	< A > < 9 > < 0.15 > < 17 > < - >	> > > > > > > > > >	A 9 0.15 17 -	< > < > < > < > < >	A 9 0.06 15 -	> > > > > > > > > >	A 9 0.06 15 -	< > < > < > < > < >	A 8 0.08 19 30 11	> > > > > > > > > >	A 9 0.30 22 -	< > < > < > < > < >	A 8 0.03 11 40 29	> > > > > > > > > >	B 12 0.51 11 40 29	B 11	
	3 - River Drive & Daniella Street	TWSC	LOS Delay < A > V/C < 0 > Q < 0.00 > Ex < 0 > Avail. < - >	< A > < 0 > < 0.00 > < 0 > < - >	> > > > > > > > > >	A 0 0.00 0 -	< > < > < > < > < >	A 0 0.01 0 -	> > > > > > > > > >	A 0 0.01 0 -	< > < > < > < > < >					< > < > < > < > < >	A 9 0.01 0 -	> > > > > > > > > >	A 9 0.01 0 -	A 1
	4 - River Drive & Rosetta Street	TWSC	LOS Delay < A > V/C < 0 > Q < 0.00 > Ex < 0 > Avail. < - >	< A > < 0 > < 0.00 > < 0 > < - >	> > > > > > > > > >	A 0 0.00 0 -	< > < > < > < > < >	A 0 0.01 0 -	> > > > > > > > > >	A 0 0.01 0 -	< > < > < > < > < >					< > < > < > < > < >	A 9 0.00 0 -	> > > > > > > > > >	A 9 0.00 0 -	A 1
	5 - River Drive & St Michaels Street	TWSC	LOS Delay < A > V/C < 0 > Q < 0.00 > Ex < 0 > Avail. < - >	< A > < 0 > < 0.00 > < 0 > < - >	> > > > > > > > > >	A 0 0.00 0 -	< > < > < > < > < >	A 0 0.00 0 -	> > > > > > > > > >	A 0 0.00 0 -	< > < > < > < > < >					< > < > < > < > < >	A 9 0.00 0 -	> > > > > > > > > >	A 9 0.00 0 -	A 0
	6 - John Street & Rosset Valley Court	TWSC	LOS Delay < A > V/C < 0 > Q < 0.05 > Ex < 0 > Avail. < - >	< A > < 0 > < 0.05 > < 0 > < - >	> > > > > > > > > >	A 0 0.05 0 -	< > < > < > < > < >	A 2 0.01 0 -	> > > > > > > > > >	A 2 0.01 0 -	< > < > < > < > < >	A 9 0.03 1 -	> > > > > > > > > >	A 9 0.03 1 -	< > < > < > < > < >					A 2
	7 - John Street & Victoria Street	AWSC	LOS Delay < A > V/C < 7 > Q < 0.02 > Ex < 10 > Avail. < - >	< A > < 7 > < 0.02 > < 10 > < - >	> > > > > > > > > >	A 7 0.02 10 -	< > < > < > < > < >	A 7 0.08 19 -	> > > > > > > > > >	A 7 0.08 19 -	< > < > < > < > < >	A 7 0.01 9 -	> > > > > > > > > >	A 7 0.01 9 -	< > < > < > < > < >	A 8 0.11 15 -	> > > > > > > > > >	A 8 0.11 15 -	A 8	

MOE - Measure of Effectiveness      Q - 95th Percentile Queue Length      TCS - Traffic Control Signal      RBT - Roundabout  
 LOS - Level of Service      Ex. - Existing Available Storage      TWSC - Two-Way Stop Control  
 Delay - Average Delay per Vehicle in Seconds      Avail. - Available Storage      AWSC - All-Way Stop Control



**TABLE 2.1B: BASE YEAR OPERATIONS – PM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall		
				Eastbound				Westbound				Northbound				Southbound						
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach			
PM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < 27 >	C 0.08	>	C 27	<	D 48	>	D 48	<	B 11	>	A 8	>	B 10	<	A 8	>	A 8	B 17	0.54
	2 - Mountainview Road N & John Street	AWSC	LOS Delay < 9 >	A 0.12	>	A 9	<	A 9	>	A 9	<	B 12	>	B 11	<	A 8	>	B 11	>	B 11	B 11	
	3 - River Drive & Daniella Street	TWSC	LOS Delay < 1 >	A 0.00	-	A 1	-	A 0	>	A 0								A 9	-	A 9	A 1	
	4 - River Drive & Rosetta Street	TWSC	LOS Delay < 0 >	A 0.00	-	A 0	-	A 0	>	A 0								A 9	-	A 9	A 1	
	5 - River Drive & St Michaels Street	TWSC	LOS Delay < 0 >	A 0.00	-	A 0	-	A 0	>	A 0								A 9	-	A 9	A 1	
	6 - John Street & Rosset Valley Court	TWSC	LOS Delay < 0 >	A 0.07	>	A 0	<	A 1	-	A 1	A 9	-	>	A 9							A 1	
	7 - John Street & Victoria Street	AWSC	LOS Delay < 8 >	A 0.05	>	A 8	<	A 8	>	A 8	<	A 8	>	A 8	<	A 8	>	A 8	>	A 8	A 8	

MOE - Measure of Effectiveness      Q - 95th Percentile Queue Length      TCS - Traffic Control Signal      RBT - Roundabout  
 LOS - Level of Service      Ex. - Existing Available Storage      TWSC - Two-Way Stop Control  
 Delay - Average Delay per Vehicle in Seconds      Avail. - Available Storage      AWSC - All-Way Stop Control



## 3 Development Concept

### 3.1 Site Description

The subject site is located at 1 Rosetta Street in the Town of Halton Hills. The development proposal includes an 8-storey residential building containing 151 residential units and two interconnected 12-storey residential buildings containing 486 residential units. The site contains a total of 637 residential units.

The site is proposed to be built in three phases. Phase 1 will see one of the 12-storey towers built, containing 249 units. Phase 2 will be the second 12-storey tower with 237 units. Phase 3 will build out the 8-storey building with 151 units. Phase 1 is assumed to be built-out by 2028; Phases 2 and 3 are assumed to be built-out by 2033.

Vehicle access is proposed by a driveway to Rosetta Street and a driveway to Caroline Street. The Rosetta Street driveway is located approximately 30 metres (CL to CL) north of River Drive. Driver sightlines at the driveway are unobstructed to the stop-controlled intersection to the south and are limited to approximately 95 metres by the physical length of Rosetta Street.

Clear throat length for Rosetta Street driveway is 9.4 m; the distance to the travelled way of Rosetta Street 20.2m. The clear throat length for the Caroline Street is 3.0m. The distance to the travelled way of Caroline Street 11.7m.

The Rosetta Street driveway has been shifted north compared to the position of the driveway in the first submission. In addition, a raised centre median is proposed on Rosetta Street between the Driveway and River Drive. The raised centre median and the repositioned driveway prevents drivers from completing turning movements on shallow angles.

The Caroline Street driveway is located approximately 40 metres (CL to CL) west of Rosetta Street. Driver sightlines at the driveway are limited by the physical length of Caroline Street to approximately 40 metres to the east and 85 metres to the west.

Two areas are provided on site to accommodate passenger pick-up and drop-off activity and are located near the lobby entrance of each building.

As part of the development, Rosetta Street, Caroline Street and St. Michaels Street will be urbanized with sidewalks provided along all roadways wrapping the subject site. Sidewalks are provided

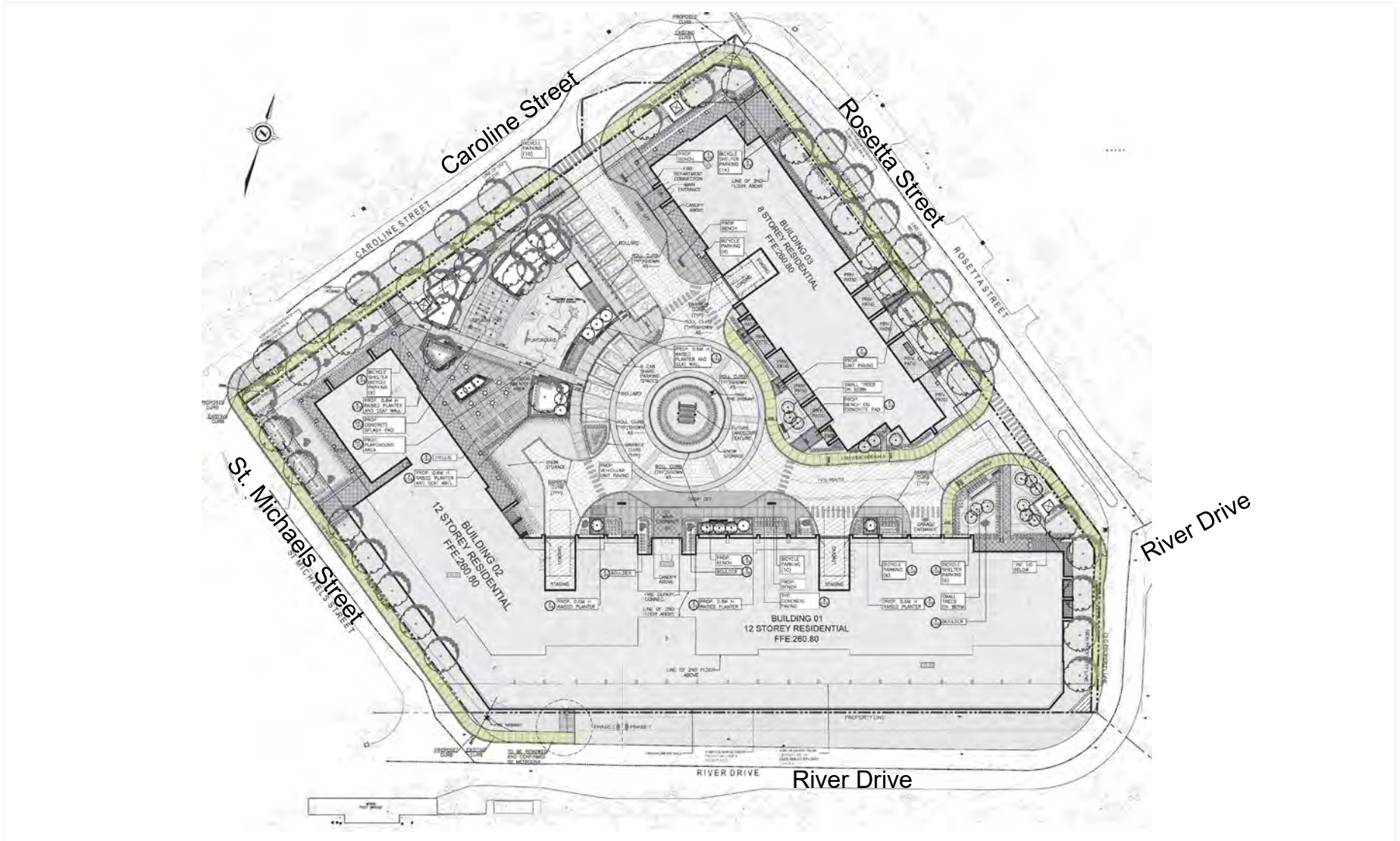


throughout the site and sidewalk connections to the road network are provided at the proposed driveways and from building exits fronting Rosetta Street and St. Michaels Street to accommodate the future pedestrian traffic. A crash wall prevents sidewalk connection to the GO Transit drive aisle across the site's southern frontage.

The site's parking supply is identified as 751 parking spaces (1.18 spaces per unit). The site plan identifies an allocation of 688 spaces for occupants (1.08 space per unit) and 63 spaces for visitors (0.10 spaces per unit).

**Figure 3.1** illustrates the concept plan.







## 3.2 Transportation Demand Management

To manage the sites' transportation and parking impacts, a robust TDM program is proposed. The following TDM measures are included in the site plan or will be provided by the site operator upon build-out:

### ► Walking

- Safe, attractive, and direct walkways for pedestrians linking building entrances with public sidewalks;
- All on-site sidewalks will conform to the Town of Halton Hills' design standards and the Accessibility for Ontarians with Disabilities Act (AODA) design standards;
- Continuous sidewalk along the frontage of River Drive and Rosetta Street (from River Drive to the site driveway); and provisions for future sidewalk on Caroline Street, St. Michaels Street, and the remaining portion of River Drive.
- The outdoor space will have amenities such as benches, seating areas, pedestrian scale lighting, and 2.1m wide sidewalks and will be detailed on the site's landscaping plans.

### ► Cycling

- A total of 702 bicycle parking spaces (1.10 spaces per unit)<sup>8</sup> are proposed.
- Long-term bicycle parking (638 spaces) is provided in secure indoor locations with four bicycle repair stations for occupants;
- Short-term bicycle parking (64 spaces) are provided near main entrances and on the ground floor for ease of access; and
- Curb cut ramps adjacent to any bicycle parking will be considered to allow for improved accessibility.

### ► Transit

- Adaptive Transit Information – Accurate and live transit information that is accessible and delivered efficiently encourage travel by transit. The provision of transit screens or message boards can inform occupants of when the next bus or train is arriving/departing. The screens can also provide other information such as weather or other important messages.

<sup>8</sup> Town of Halton Hills Zoning By-Law 2010-0050, July 2010



- Subsidized transit passes will be provided to first time buyers who do not purchase a parking space;
  - Proposed sidewalks connecting directly to the municipal sidewalks which provide convenient access to the Georgetown GO Station; and
  - Transit information will be provided to residents.
- ▶ **Parking**
- Reduced parking supply due to proximity to transit and provision of bike parking facilities;
  - Parking will be unbundled from the cost of the units, allowing occupants to purchase a unit without a parking space;
  - The parking supply will be managed by limiting the initial sale of parking spaces to one space per unit with the opportunity for units to purchase another space after the initial sale;
  - Parking costs will reflect the full cost of building and operating the parking facility; and
  - Visitor parking will be monitored and enforced to avoid disruption to the local community.
- ▶ **Car Share**
- Two car share spaces and vehicles are proposed at-grade.
- ▶ **Wayfinding, Travel Planning, Education/Promotion**
- Travel planning resources will be provided to residents (individualized marketing, active transportation maps, community resources, transit schedules);
  - Wayfinding signage to major destinations such as schools, public amenities, GO transit and commercial areas will be provided in the main lobbies of all buildings or near the main entrances; and
  - Marketing material will promote a strong TDM brand.

The above TDM measures can assist in mitigating the site's transportation and parking impacts on the adjacent road network, promote a strong and vibrant economy, and create a livable community that has a balanced transportation network. The monitoring and adjustment of the site's TDM program will be critical to the site's success.



**Section 6.9** estimates the effectiveness of the proposed TDM program on parking generation.



### 3.3 Site Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation<sup>9</sup> methods are used to estimate the site trip generation. The following land use codes were used to estimate the site's trip generation:

- ▶ 221 – Multifamily Housing, Mid-Rise (General Urban/Suburban); and
- ▶ 222 – Multifamily Housing, High-Rise (General Urban/Suburban).

**Table 3.1** summarizes the estimated trip generation for each phase and horizon year.

The subject site is forecast to generate approximately 187 vehicle trips during the AM peak hour and approximately 215 vehicle trips during the PM peak hour. To remain conservative, no reductions have been made to account for modal choice.

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<sup>9</sup> Trip Generation Manual 11<sup>th</sup> Edition, Institute of Transportation Engineers, September 2021



**TABLE 3.1: ESTIMATED SITE GENERATION**

Phase	Build-Out Year	ITE Land Use Code / Number of Units	AM Peak Hour				PM Peak Hour			
			Rate	In	Out	Sum	Rate	In	Out	Sum
1	2028	222 - Multifamily Housing (High-rise) - 249 units	0.27	17	50	67	0.32	50	30	80
2	2033	222 - Multifamily Housing (High-rise) - 237 units	0.27	17	47	64	0.32	47	29	76
3		221 - Multifamily Housing (Mid-rise) - 151 units	0.37	13	43	56	Eqn.	36	23	59
<b>Total</b>			--	<b>47</b>	<b>140</b>	<b>187</b>	--	<b>133</b>	<b>82</b>	<b>215</b>

**Equations**

LUC 221 Eqn. per Unit AM: 0.37 | PM:  $T = 0.39(X) + 0.34$

LUC 222 Rate per unit AM: 0.27 | PM: 0.32



### 3.4 Trip Distribution and Assignment

The site generated automobile trips were assigned to the road network based on the information provided in the 2016 Transportation Tomorrow Survey (TTS)<sup>10</sup> for the zone containing the subject site.

**Table 3.2** summarizes the estimated site trip distribution. **Appendix D** contains the TTS data.

The majority of trips to the site are expected to use the Rosetta Street driveway. Some site traffic is expected to use the Caroline Street driveway as the pick-up/drop-off area for the eight-story building and there is a small amount of at grade parking near the site's Caroline Street frontage.

**TABLE 3.2: ESTIMATED TRIP DISTRIBUTION**

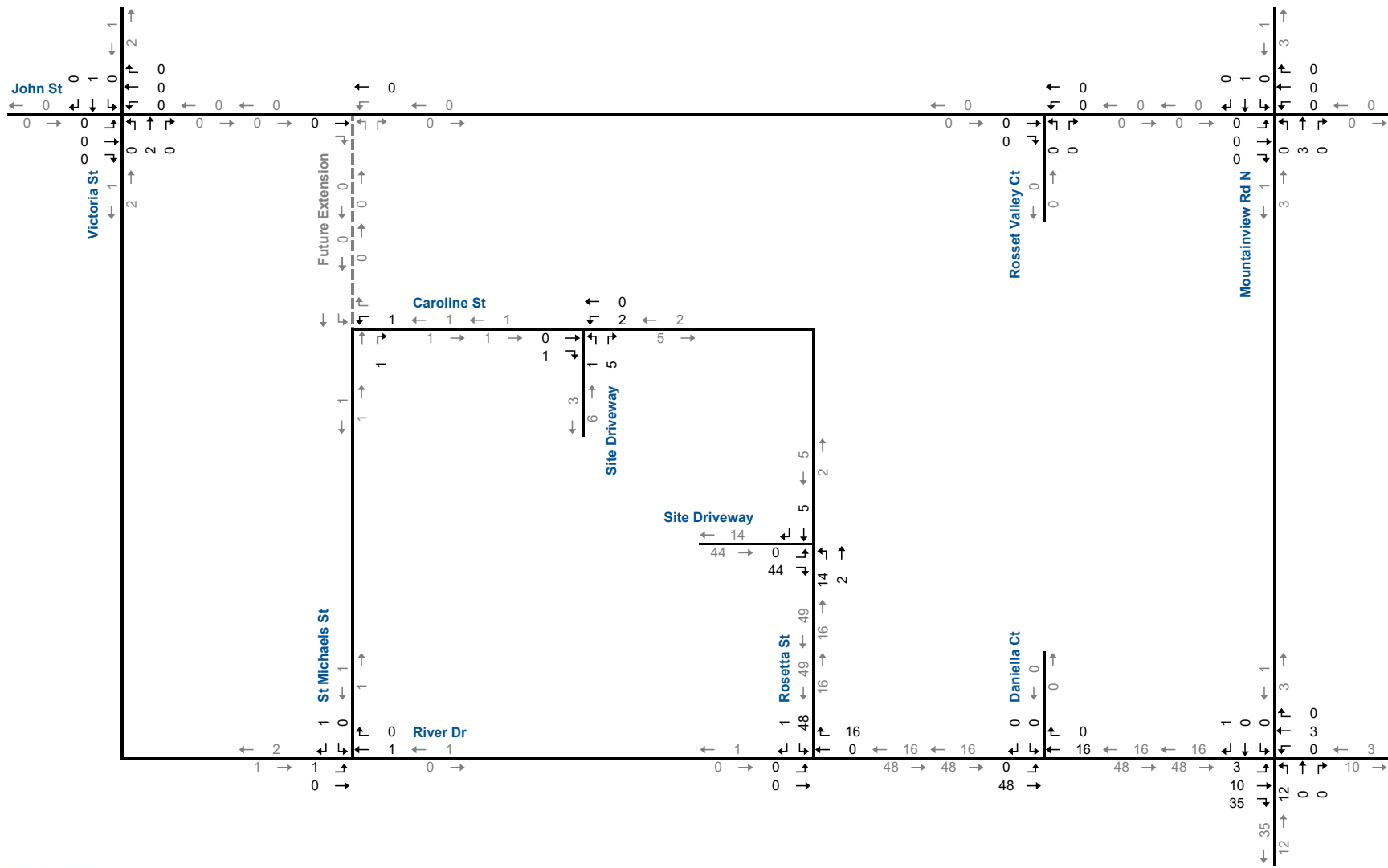
Origin/Destination	Percentage
North via Mountainview Road North	5%
North via Victoria Street	5%
East via River Drive	20%
South via Mountainview Road North	70%
<b>Total</b>	<b>100%</b>

**Figures 3.2 to 3.5** illustrate the site generated traffic volumes for the 2028 and 2033 weekday AM and PM peak hours.

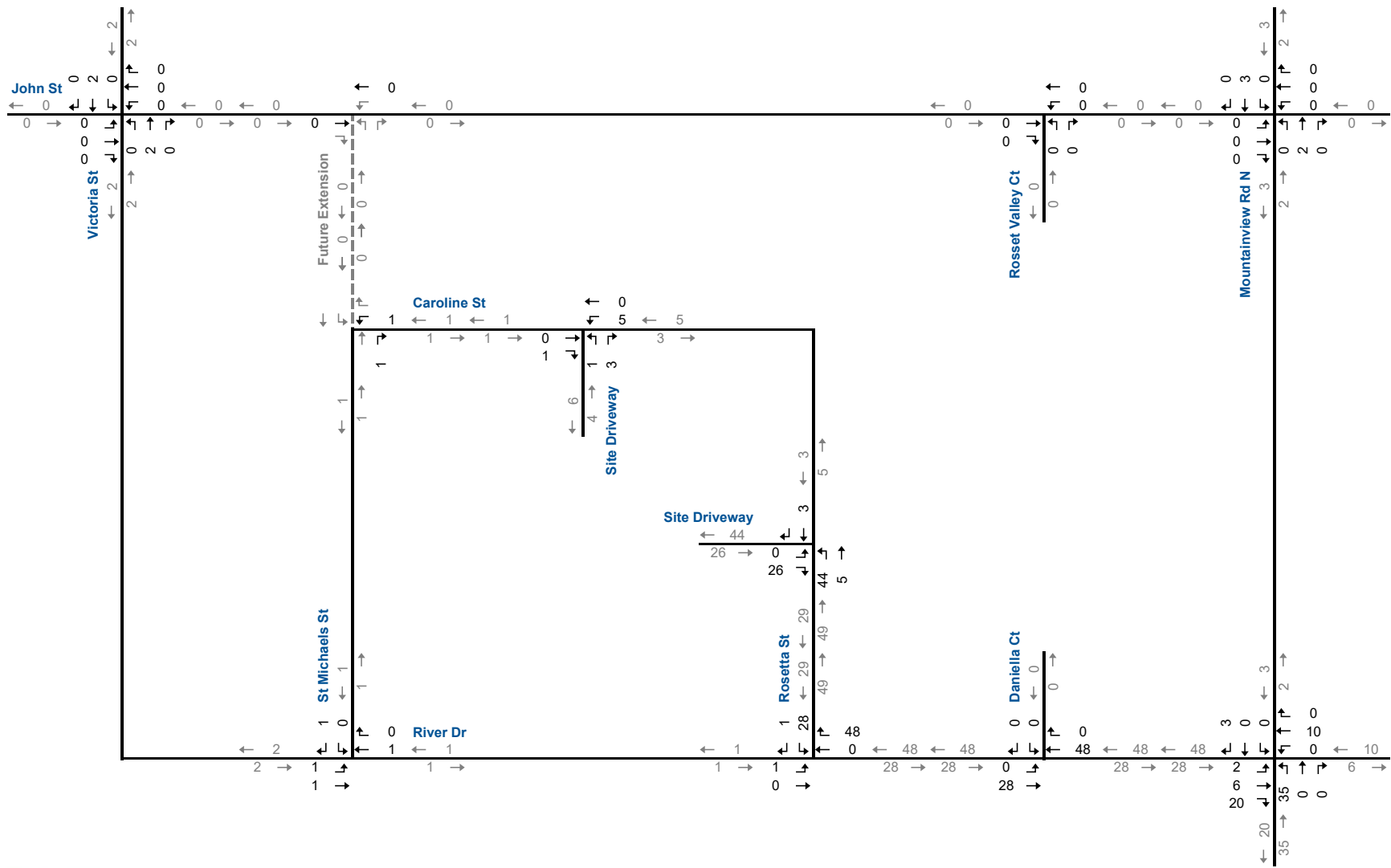
<sup>10</sup> Transportation Tomorrow Survey 2016, Traffic Zone 4164



AM Peak Hour

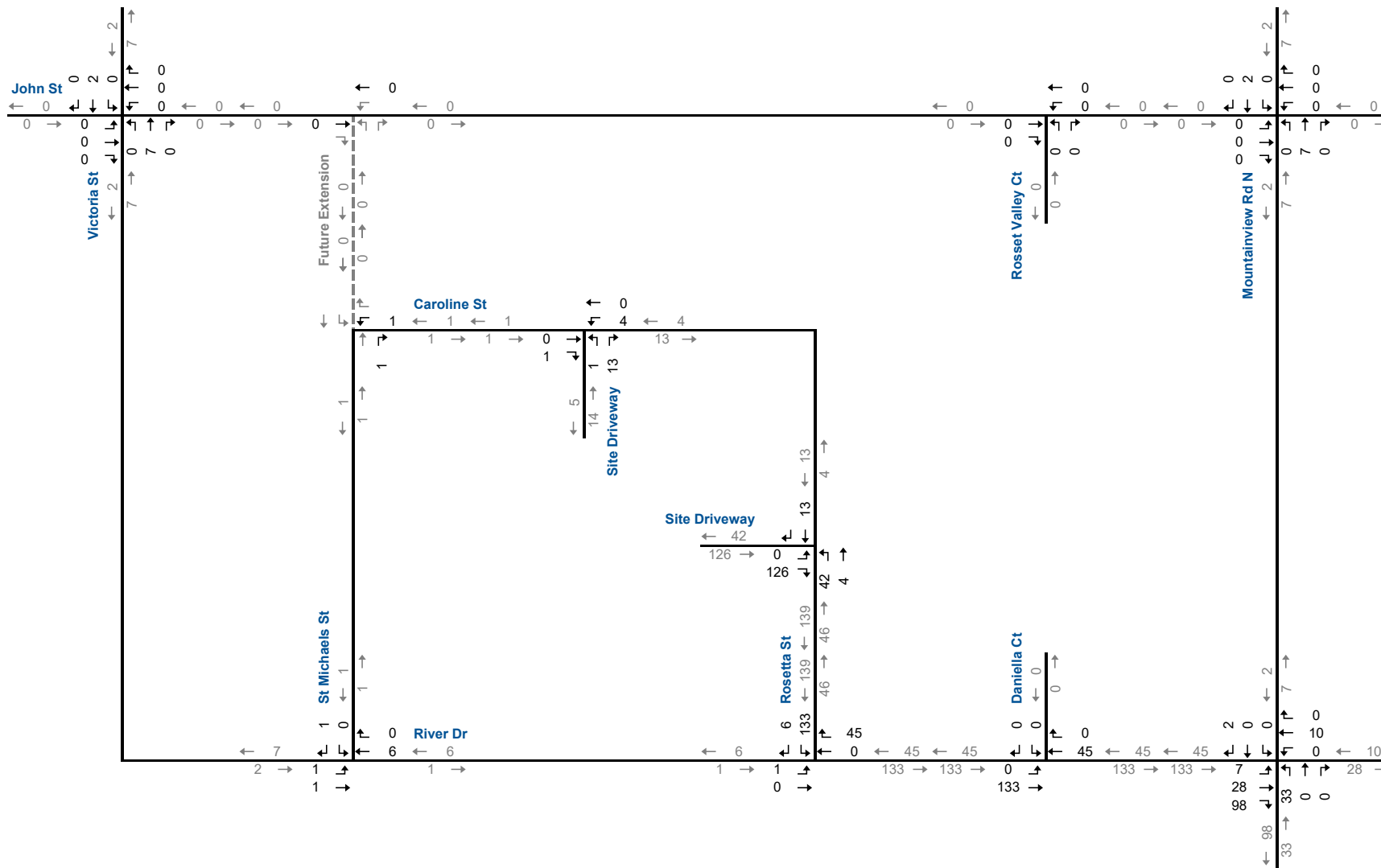


# Site Generated 2028 Traffic Volumes AM Peak Hour

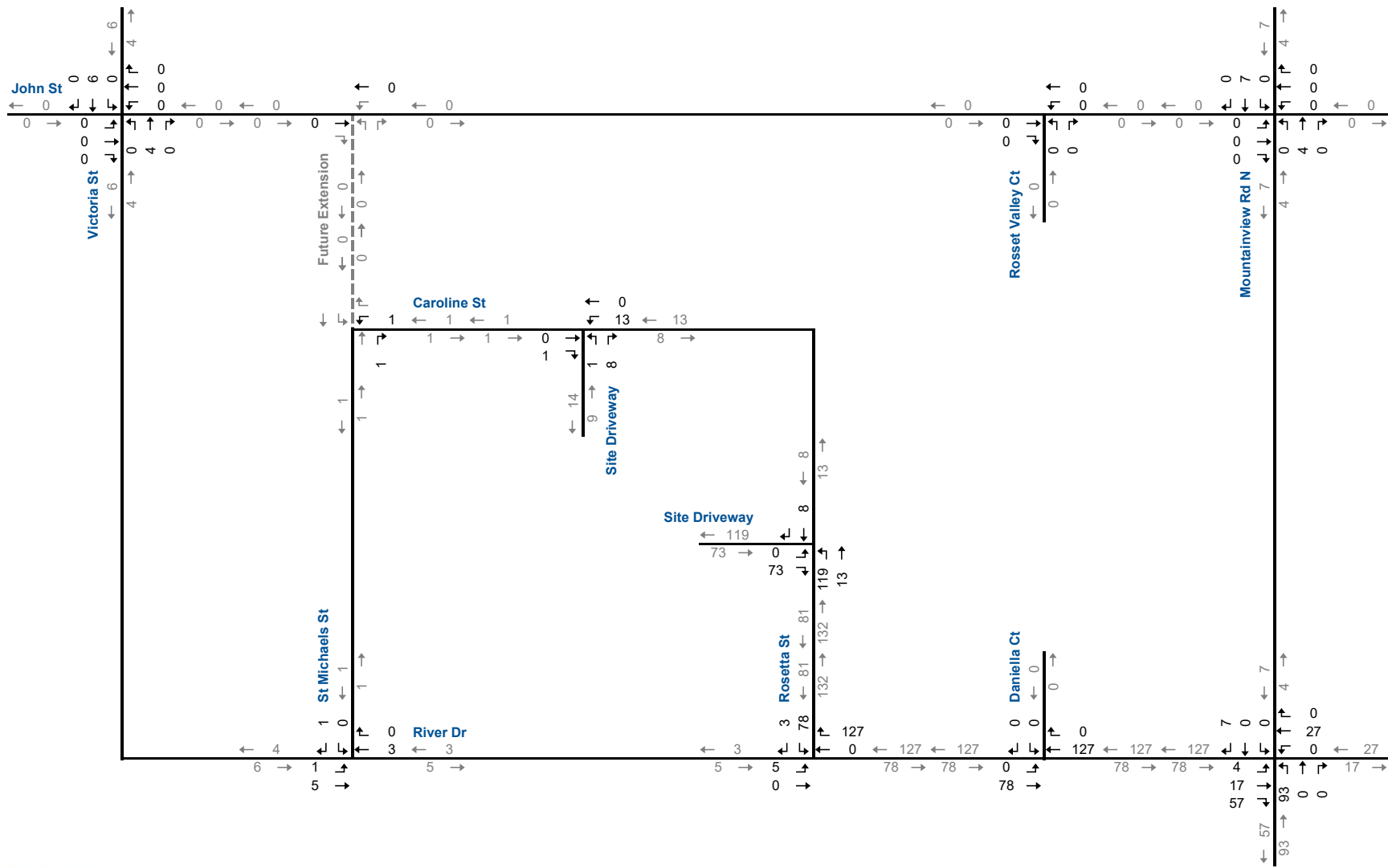


# Site Generated 2028 Traffic Volumes PM Peak Hour





# Site Generated 2033 Traffic Volumes AM Peak Hour



# Site Generated 2033 Traffic Volumes PM Peak Hour

### 3.5 Site Circulation

The site circulation has been assessed using a Fire Truck, Halton Region Front End Loading Garbage truck and a Transportation Association of Canada (TAC) Heavy Single Unit (HSU)<sup>11</sup>, TAC Medium Single Unit (MSU), and TAC Passenger Car.

**Appendix E** contains the vehicle turning movement diagrams for the site's loading zone. The diagrams are produced using the site concept plan and AutoTURN swept path analysis software.

Based on the analysis the design vehicles can circulate the site without conflicting with the proposed on-site geometry (e.g., parking spaces, etc.). Prior to site plan approval, AutoTURN analysis should be reviewed and updated as needed.

### 3.6 Signage Plan

**Appendix E** contains the preliminary signage and pavement marking plan for the subject site. Prior to site plan approval, the plan should be reviewed and updated as needed.

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<sup>11</sup> 2.4 – *Design Vehicles*, Geometric Design Guide for Canadian Roads, Transportation Association of Canada, June 2017.



## 4 Future Traffic Conditions

The assessment of the future traffic conditions contained in this section includes the forecast traffic volumes and the level of service analysis.

### 4.1 Forecast Traffic Volumes

Two horizon years, five-years from the date of the study (2028) and ten-years from the date of the study (2033) have been assessed to estimate the impact of the subject development and background roadway traffic.

The likely future traffic volumes are estimated to consist of:

- ▶ Increased non-site traffic (generalized background traffic growth) by 2% percent per annum identified in the pre-study consultation;
- ▶ Traffic generated by adjacent future developments including;  
and
  - 167-171 Mountainview Road North – proposed residential development consisting of 10-unit condominium bungaloffs.
- ▶ Traffic generated by the subject site.

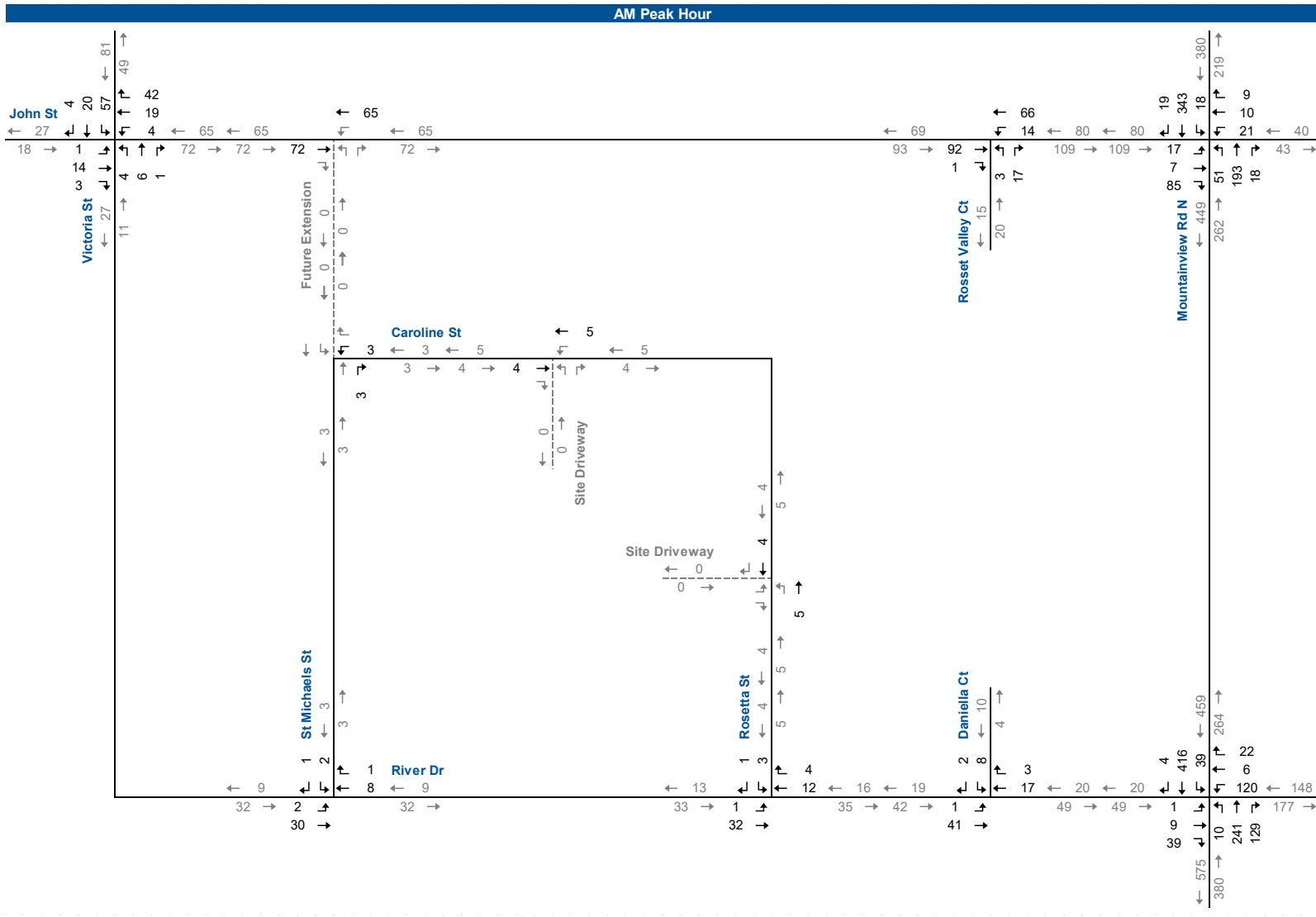
The Town has identified a potential development within the study area of 1000 residential units at 130 Mountainview Road. As the status and details of the development are uncertain, the impact of 130 Mountainview Road is assessed in a sensitivity analysis (see **Section 4.2.5**).

**Appendix F** contains the detailed traffic forecasts for the adjacent development application.

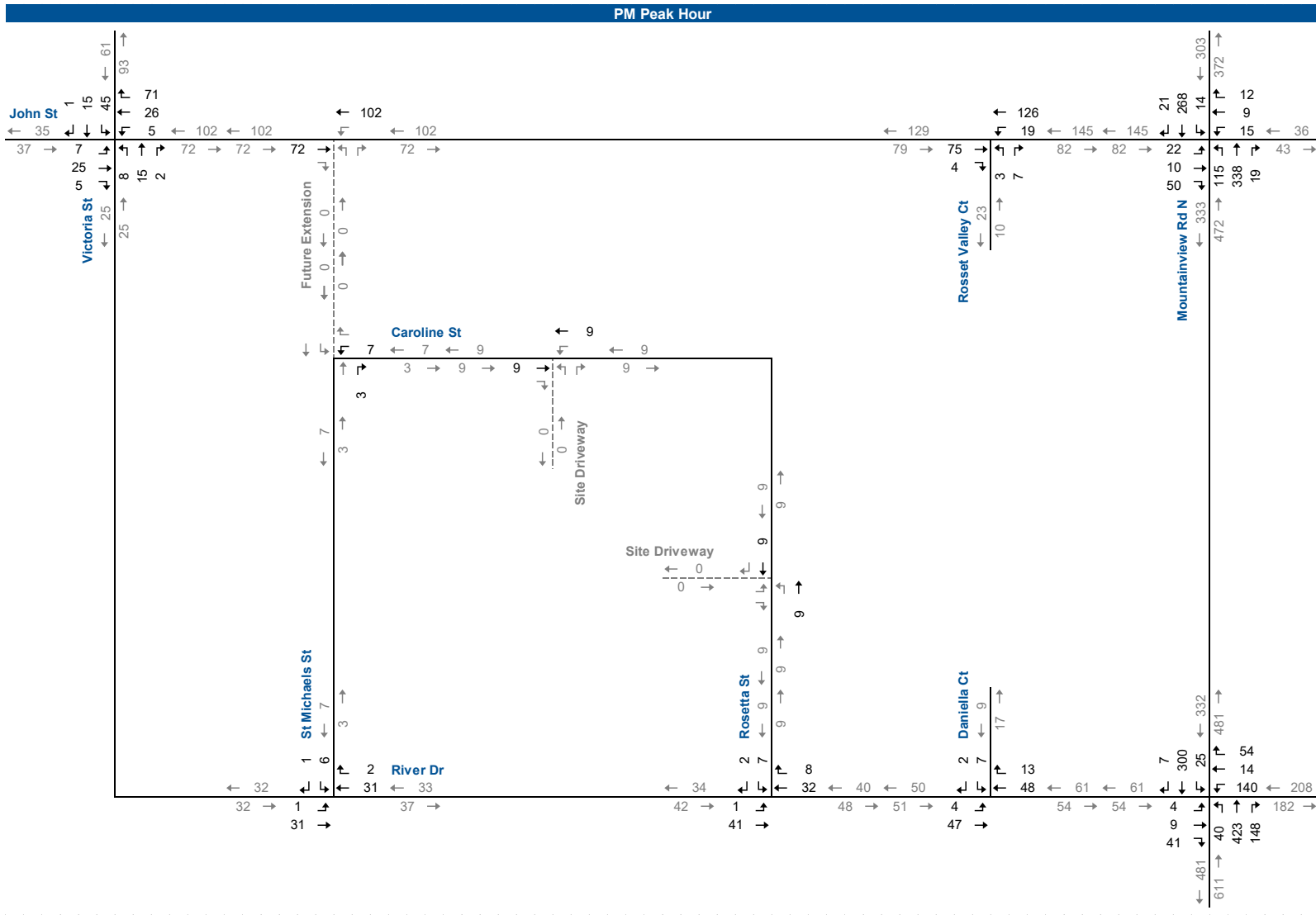
**Figures 4.1 to 4.4** illustrate the forecast background traffic volumes for the weekday AM and PM peak hours.

**Figures 4.5 to 4.8** illustrate the forecast total traffic volumes for the weekday AM and PM peak hours.

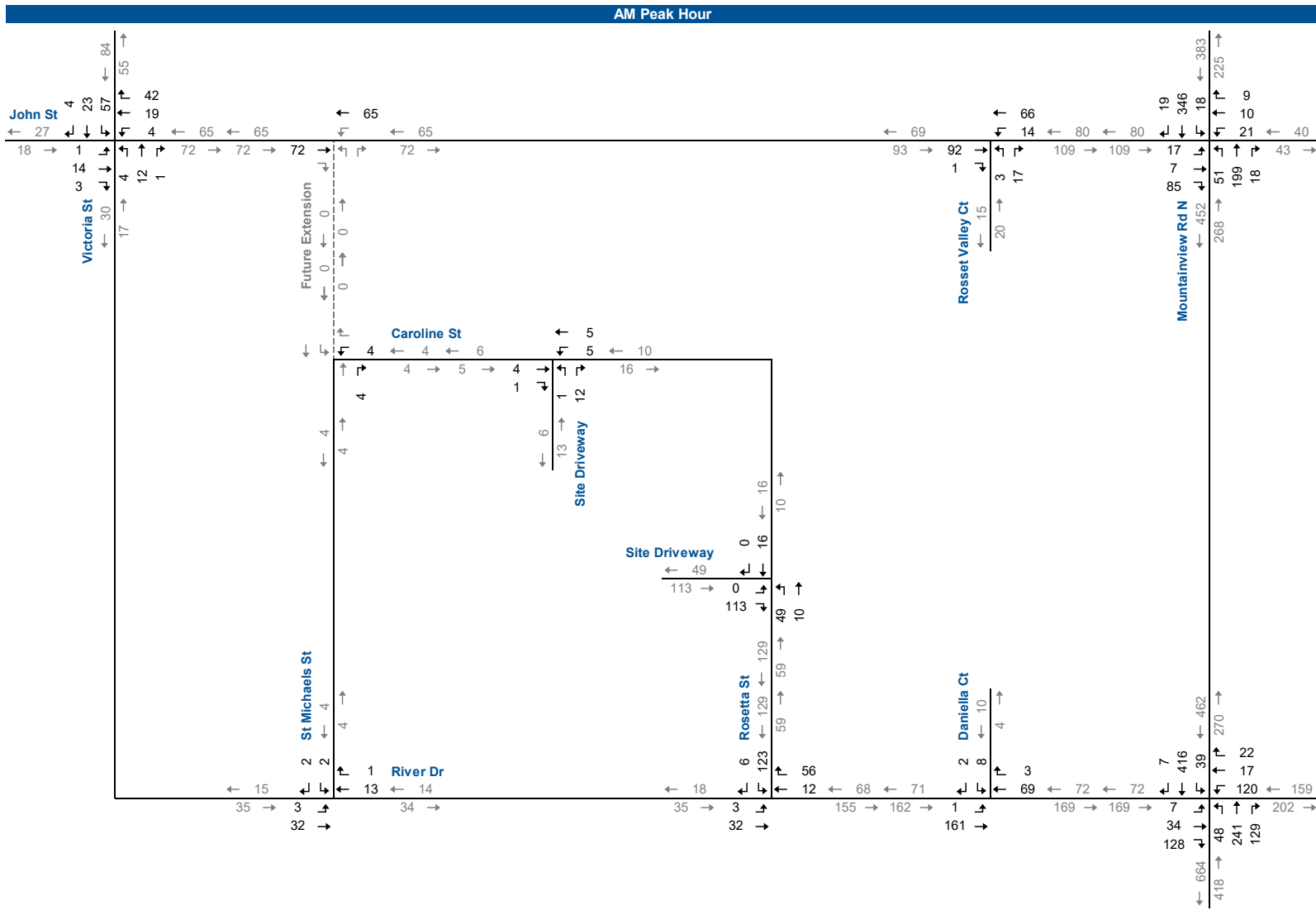




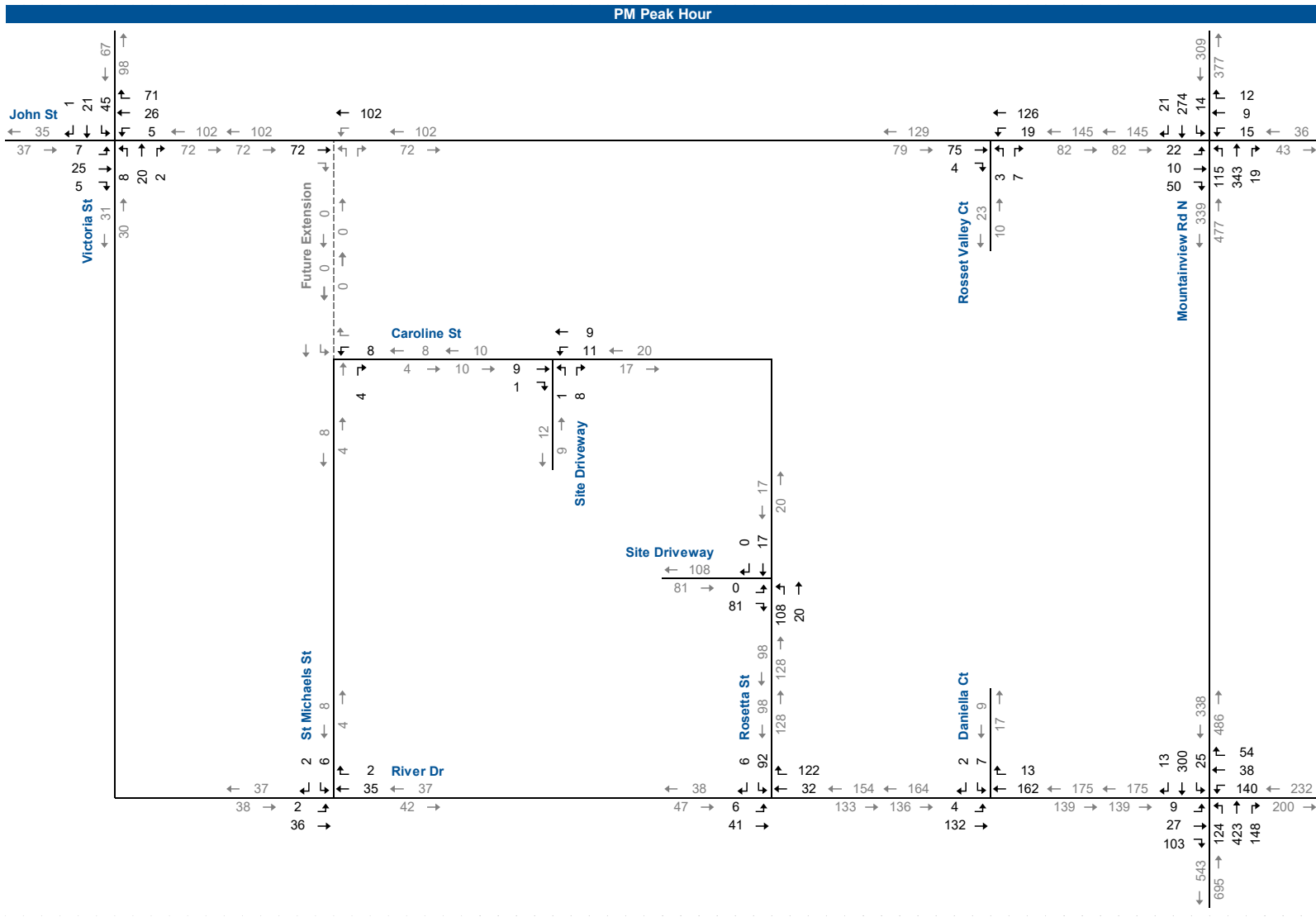
# Five-Year Background Traffic Volumes AM Peak Hour



# Five-Year Background Traffic Volumes PM Peak Hour

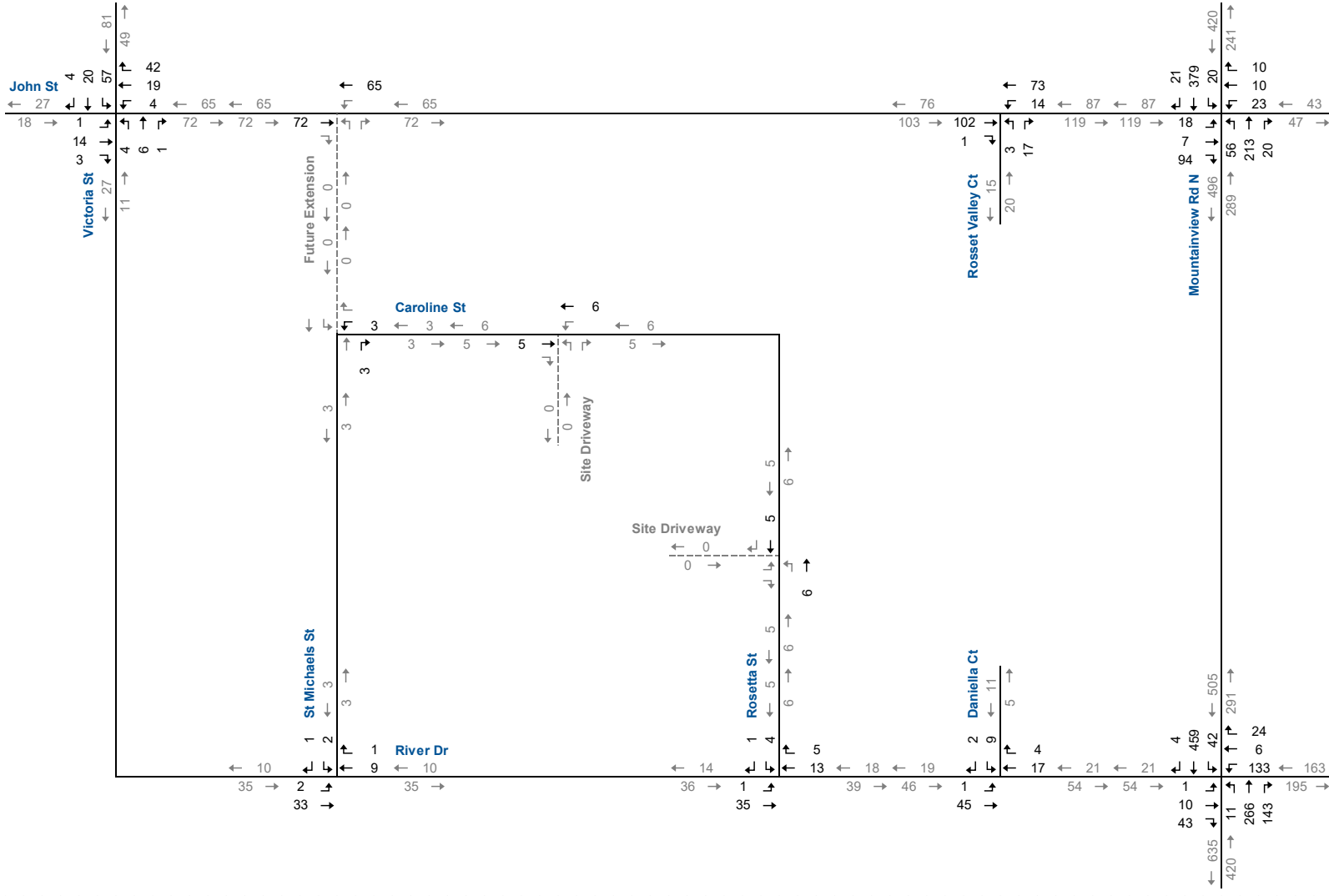


# Ten-Year Background Traffic Volumes AM Peak Hour



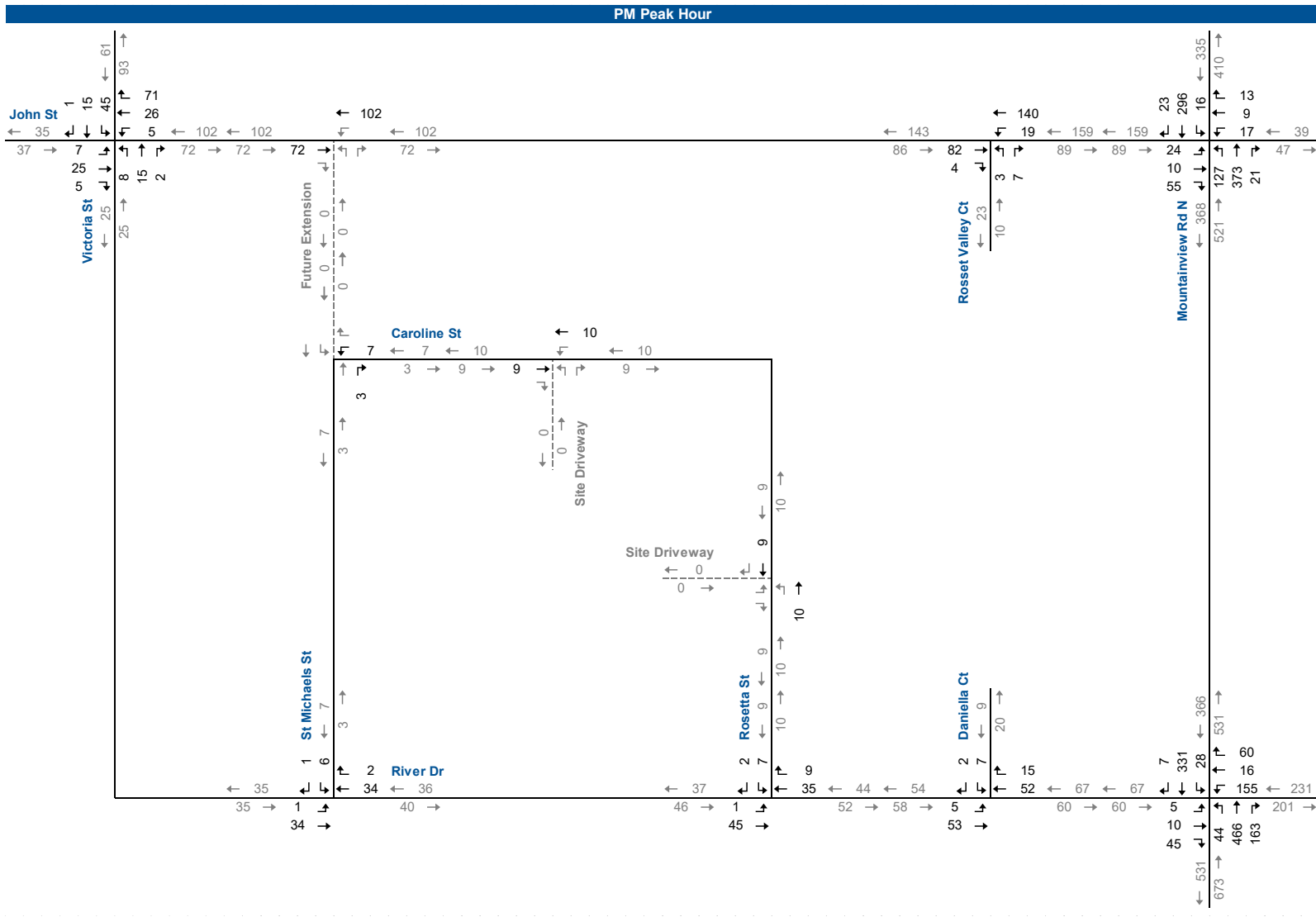
# Ten-Year Background Traffic Volumes PM Peak Hour





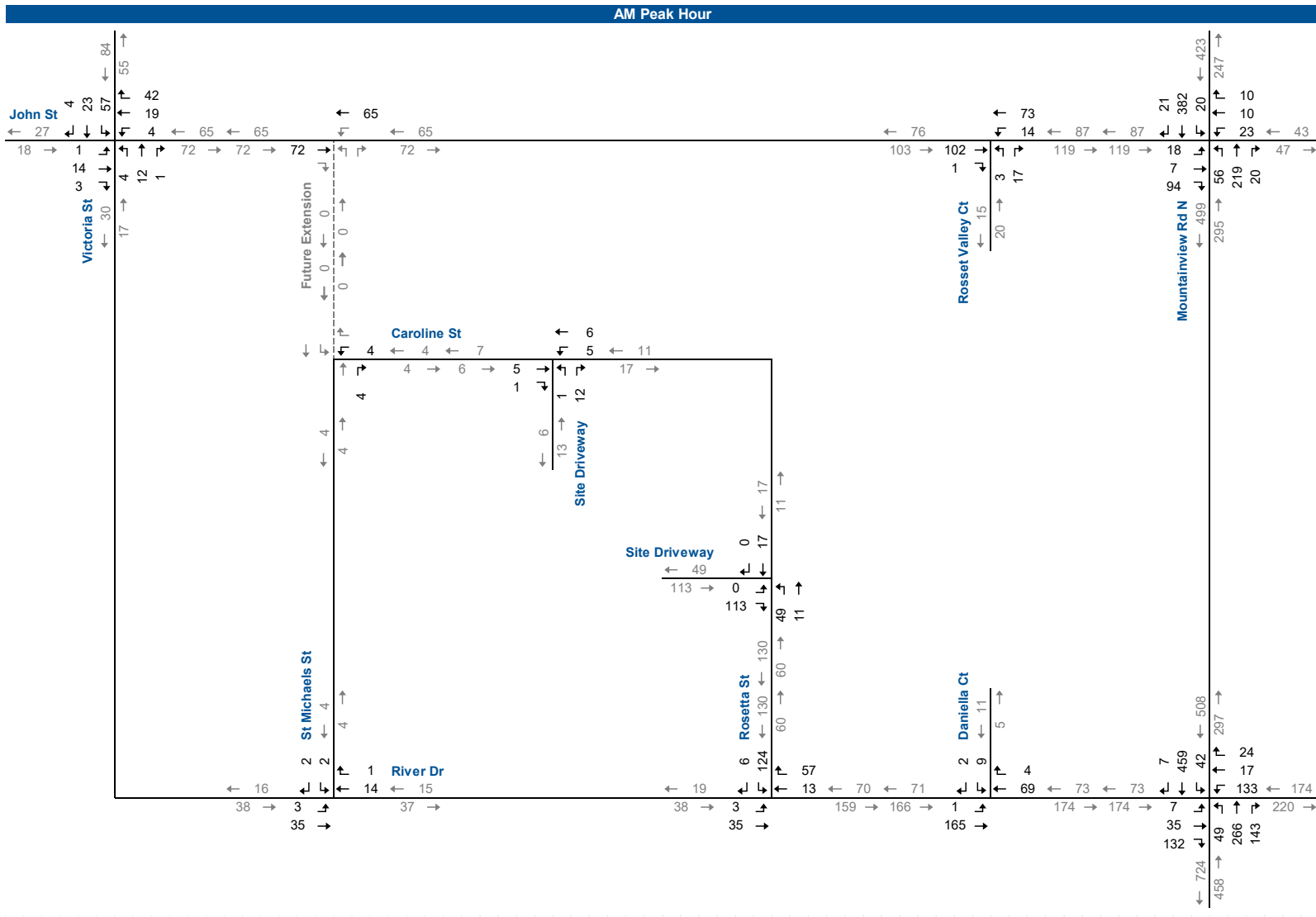
## Five-Year Total Traffic Volumes AM Peak Hour

Figure 4.5



## Five-Year Total Traffic Volumes PM Peak Hour

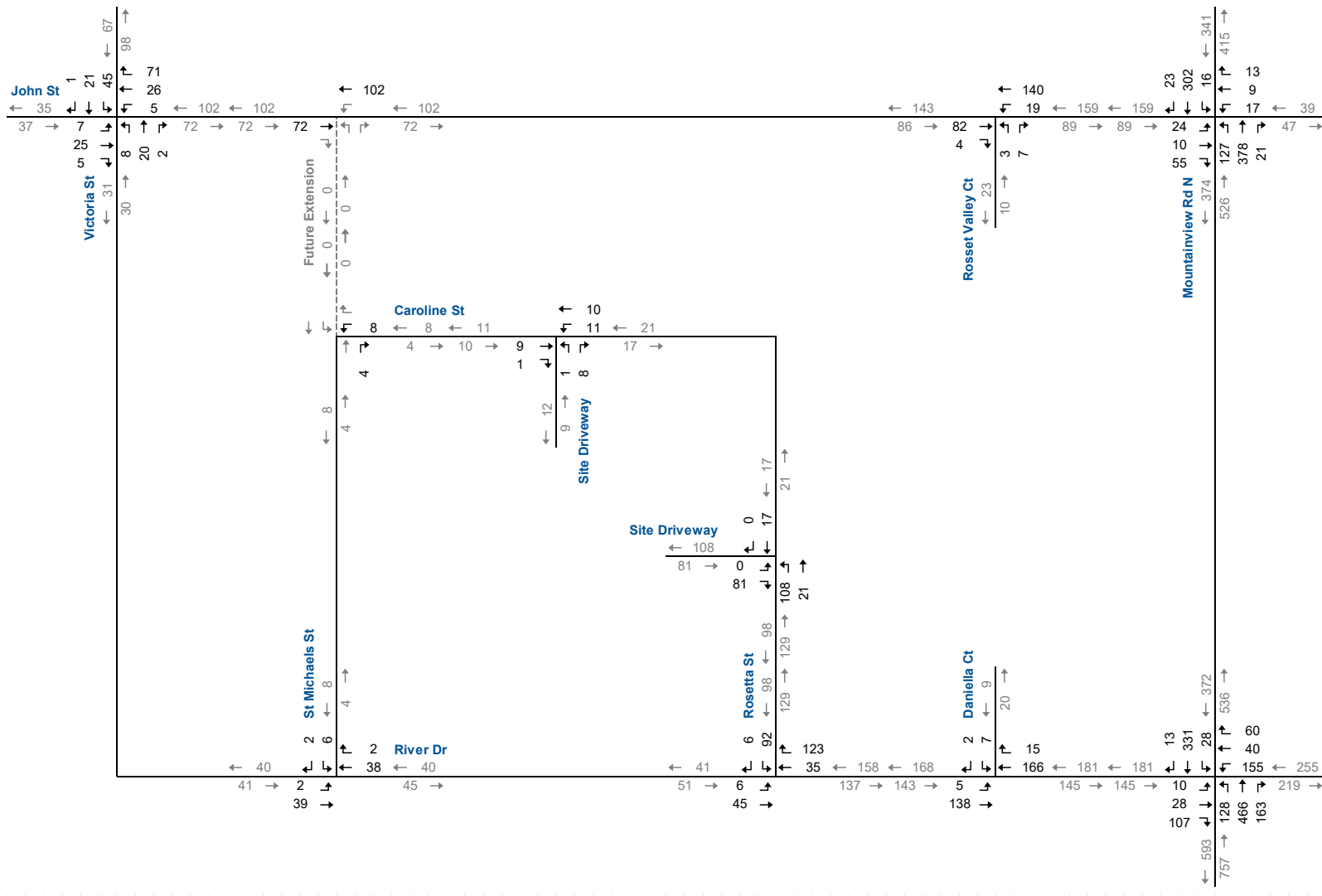
Figure 4.6



# Ten-Year Total Traffic Volumes AM Peak Hour

Figure 4.7

PM Peak Hour



## Ten-Year Total Traffic Volumes PM Peak Hour

## 4.2 Forecast Traffic Operations

The study area intersection operations analysis for the future background and future total traffic forecast followed the same methodology used for existing conditions. No changes to existing signal timings and lane configurations are assumed.

### 4.2.1 Background Operations – Five Year Horizon

**Table 4.1A-B** summarizes the level of service conditions for the AM and PM peak hours. The following critical movements are noted:

#### PM Peak Hour

- ▶ Mountainview Road North and River Drive
  - Westbound approach is forecast to operate with delays in the LOS D range with a v/c ratio of 0.85.

**Appendix G** contains the supporting detailed Synchro reports.



**TABLE 4.1A: FIVE-YEAR BACKGROUND OPERATIONS – AM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < 27 >	C 0.07	>	C 27	<	D 49	>	D 49	<	A 9	>	A 8	>	A 9	<	A 9	>	A 9	B 15
			V/C < 0.07 >	>	>	>	<	0.78	>	<	0.27	>	0.10	>	<	0.27	>	>	>	>	0.39
			Q < 9 >	>	>	>	<	35	>	<	44	>	9	>	<	36	>	>	>	>	
			Ex < - >	>	>	>	<	-	>	<	-	>	-	>	<	-	>	>	>	>	
			Avail. < - >	>	>	>	<	-	>	<	-	>	-	>	<	-	>	>	>	>	
			LOS Delay < 9 >	A 0.18	>	A 9	<	A 9	>	A 9	<	B 10	>	B 10	<	B 14	>	B 14	>	B 14	B 12
			V/C < 0.18 >	>	>	>	<	0.07	>	<	0.09	>	0.35	>	<	0.03	>	0.58	>	>	
		Q < 17 >	>	>	>	<	16	>	<	20	>	23	>	<	12	>	-	>	>		
		Ex < - >	>	>	>	<	-	>	<	30	>	-	>	<	40	>	-	>	>		
		Avail. < - >	>	>	>	<	-	>	<	10	>	-	>	<	28	>	-	>	>		
	3 - River Drive & Daniella Street	TWSC	LOS Delay < 0 >	A 0.00	-	A 0	<	A 0	>	A 0	<	-	>	-	-	-	-	-	-	A 9	A 1
			V/C < 0.00 >	>	>	>	<	0.01	>	<	0.01	>	-	>	0.01	>	-	>	>	>	
			Q < 0 >	>	>	>	<	0	>	<	0	>	-	>	0	>	-	>	>	>	
			Ex < - >	>	>	>	<	-	>	<	-	>	-	>	-	>	-	>	>	>	
			Avail. < - >	>	>	>	<	-	>	<	-	>	-	>	-	>	-	>	>	>	
	4 - River Drive & Rosetta Street	TWSC	LOS Delay < 0 >	A 0.00	-	A 0	<	A 0	>	A 0	<	-	>	-	-	-	-	-	-	A 9	A 1
			V/C < 0.00 >	>	>	>	<	0.01	>	<	0.01	>	-	>	0.00	>	-	>	>	>	
			Q < 0 >	>	>	>	<	0	>	<	0	>	-	>	0	>	-	>	>	>	
			Ex < - >	>	>	>	<	-	>	<	-	>	-	>	-	>	-	>	>	>	
			Avail. < - >	>	>	>	<	-	>	<	-	>	-	>	-	>	-	>	>	>	
	5 - River Drive & St Michaels Street	TWSC	LOS Delay < 0 >	A 0.00	-	A 0	<	A 0	>	A 0	<	-	>	-	-	-	-	-	-	A 9	A 0
			V/C < 0.00 >	>	>	>	<	0.00	>	<	0.00	>	-	>	0.00	>	-	>	>	>	
			Q < 0 >	>	>	>	<	0	>	<	0	>	-	>	0	>	-	>	>	>	
			Ex < - >	>	>	>	<	-	>	<	-	>	-	>	-	>	-	>	>	>	
			Avail. < - >	>	>	>	<	-	>	<	-	>	-	>	-	>	-	>	>	>	
	6 - John Street & Rosset Valley Court	TWSC	LOS Delay < 0 >	A 0.06	>	A 0	<	A 2	>	A 2	<	A 9	>	A 9	<	-	-	-	-	-	A 2
			V/C < 0.06 >	>	>	>	<	0.01	>	<	0.03	>	-	>	-	>	-	>	>	>	
			Q < 0 >	>	>	>	<	0	>	<	1	>	-	>	-	>	-	>	>	>	
			Ex < - >	>	>	>	<	-	>	<	-	>	-	>	-	>	-	>	>	>	
			Avail. < - >	>	>	>	<	-	>	<	-	>	-	>	-	>	-	>	>	>	
	7 - John Street & Victoria Street	AWSC	LOS Delay < 7 >	A 0.02	>	A 7	<	A 7	>	A 7	<	A 7	>	A 7	<	A 8	>	A 8	>	A 8	A 8
			V/C < 0.02 >	>	>	>	<	0.09	>	<	0.02	>	>	>	<	0.13	>	>	>	>	
			Q < 11 >	>	>	>	<	18	>	<	9	>	>	>	<	17	>	>	>	>	
			Ex < - >	>	>	>	<	-	>	<	-	>	>	>	<	-	>	>	>	>	
			Avail. < - >	>	>	>	<	-	>	<	-	>	>	>	<	-	>	>	>	>	

MOE - Measure of Effectiveness      Q - 95th Percentile Queue Length      TCS - Traffic Control Signal      RBT - Roundabout  
 LOS - Level of Service      Ex. - Existing Available Storage      TWSC - Two-Way Stop Control  
 Delay - Average Delay per Vehicle in Seconds      Avail. - Available Storage      AWSC - All-Way Stop Control



**TABLE 4.1B: FIVE-YEAR BACKGROUND OPERATIONS – PM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < C > V/C < 26 > Q < 0.08 > Ex < 10 > Avail. < - >	< C > < 26 > < 0.08 > < 10 > < - >	> C > > 26 > > 0.08 > > 10 > > - >	< C > < 26 >	< D > < 53 > < 0.85 > < 50 > < - >	> D > > 53 > > 0.85 > > 50 > > - >	< D > < 53 >	< B > < 13 > < 0.51 > < 88 > < - >	> B > > 13 > > 0.51 > > 88 > > - >	< A > < 9 > < 0.14 > < 10 > < - >	> B > > 12 >	< A > < 9 > < 0.23 > < 28 > < - >	> A > > 9 > > 0.23 > > 28 > > - >	< A > < 9 >	< B > < 19 > < 0.6 >			
	2 - Mountainview Road N & John Street	AWSC	LOS Delay < A > V/C < 10 > Q < 0.14 > Ex < 14 > Avail. < - >	< A > < 10 > < 0.14 > < 14 > < - >	> A > > 10 > > 0.14 > > 14 > > - >	< A > < 10 > < 0.10 > < 14 > < - >	> A > > 10 > > 0.10 > > 14 > > - >	< A > < 10 >	< B > < 9 > < 0.20 > < 22 > < 30 > < 8 >	> B > > 14 > > 0.58 > > 31 > > - >	< B > < 13 >	< A > < 8 > < 0.01 > < 9 > < 40 > < 31 >	> B > > 12 > > 0.45 > > - > > - >	< B > < 12 >	< B > < 12 >					
	3 - River Drive & Daniella Street	TWSC	LOS Delay < A > V/C < 1 > Q < 0.00 > Ex < 0 > Avail. < - >	< A > < 1 > < 0.00 > < 0 > < - >	> A > > 1 > > 0.00 > > 0 > > - >	< A > < 0 > < 0.04 > < 0 > < - >	> A > > 0 > > 0.04 > > 0 > > - >	< A > < 0 >	< A > < 9 > < 0.01 > < 0 > < - >	> A > > 0 > > - > > - >	< A > < 9 >	< A > < 9 >	< A > < 9 >	< A > < 9 >	< A > < 9 >	< A > < 1 >				
	4 - River Drive & Rosetta Street	TWSC	LOS Delay < A > V/C < 0 > Q < 0.00 > Ex < 0 > Avail. < - >	< A > < 0 > < 0.00 > < 0 > < - >	> A > > 0 > > 0.00 > > 0 > > - >	< A > < 0 > < 0.03 > < 0 > < - >	> A > > 0 > > 0.03 > > 0 > > - >	< A > < 0 >	< A > < 9 > < 0.01 > < 0 > < - >	> A > > 0 > > - > > - >	< A > < 9 >	< A > < 9 >	< A > < 9 >	< A > < 9 >	< A > < 1 >					
	5 - River Drive & St Michaels Street	TWSC	LOS Delay < A > V/C < 0 > Q < 0.00 > Ex < 0 > Avail. < - >	< A > < 0 > < 0.00 > < 0 > < - >	> A > > 0 > > 0.00 > > 0 > > - >	< A > < 0 > < 0.02 > < 0 > < - >	> A > > 0 > > 0.02 > > 0 > > - >	< A > < 0 >	< A > < 9 > < 0.01 > < 0 > < - >	> A > > 0 > > - > > - >	< A > < 9 >	< A > < 9 >	< A > < 9 >	< A > < 9 >	< A > < 1 >					
	6 - John Street & Rosset Valley Court	TWSC	LOS Delay < A > V/C < 0 > Q < 0.07 > Ex < 0 > Avail. < - >	< A > < 0 > < 0.07 > < 0 > < - >	> A > > 0 > > 0.07 > > 0 > > - >	< A > < 1 > < 0.01 > < 0 > < - >	> A > > 1 > > 0.01 > > 0 > > - >	< A > < 1 >	< A > < 9 > < 0.02 > < 1 > < - >	> A > > 0 > > - > > - >	< A > < 9 >	< A > < 9 >	< A > < 9 >	< A > < 9 >	< A > < 1 >					
	7 - John Street & Victoria Street	AWSC	LOS Delay < A > V/C < 8 > Q < 0.06 > Ex < 13 > Avail. < - >	< A > < 8 > < 0.06 > < 13 > < - >	> A > > 8 > > 0.06 > > 13 > > - >	< A > < 8 > < 0.16 > < 20 > < - >	> A > > 8 > > 0.16 > > 20 > > - >	< A > < 8 >	< A > < 8 > < 0.04 > < 13 > < - >	> A > > 8 > > 0.04 > > 13 > > - >	< A > < 8 >	< A > < 8 >	< A > < 8 >	< A > < 8 >	< A > < 8 >					

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds  
 Q - 95th Percentile Queue Length  
 Ex. - Existing Available Storage  
 Avail. - Available Storage  
 TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 AWSC - All-Way Stop Control  
 RBT - Roundabout

## 4.2.2 Background Operations – Ten-Year Horizon

**Table 4.2A-B** summarizes the level of service conditions for the AM and PM peak hours. The following critical movements are noted:

### PM Peak Hour

- ▶ Mountainview Road North and River Drive
  - Westbound approach is forecast to operate with delays in the LOS E range with a v/c ratio greater than 0.85.

**Appendix H** contains the supporting detailed Synchro reports.





**TABLE 4.2A: TEN-YEAR BACKGROUND OPERATIONS – AM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall			
				Eastbound				Westbound				Northbound				Southbound							
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach				
AM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay	<	C 26	>	C 26	<	D 53	>	D 53	<	A 10	>	A 8	>	A 9	<	A 9	>	A 9	B 16	
	V/C	<	0.07	>	<	0.82	>	<	0.30	>	0.11	>	<	0.31	>	<	>	<	>	>	>	0.44	
	Q	<	9	>	<	39	>	<	48	>	10	>	<	40	>	<	>	<	>	>	>		
	Ex Avail.	<	-	>	<	-	>	<	-	>	-	>	<	-	>	<	>	<	>	>	>		
	2 - Mountainview Road N & John Street	AWSC	LOS Delay	<	A 10	>	A 10	<	A 10	>	A 10	<	A 9	>	B 11	>	B 11	<	A 8	>	C 17	B 13	
	V/C	<	0.20	>	<	0.08	>	<	0.11	>	0.39	>	<	0.04	>	0.65	>	<	0.17	>	>	>	
	Q	<	18	>	<	16	>	<	19	>	26	>	<	12	>	-	>	<	40	>	>	>	
Ex Avail.	<	-	>	<	-	>	<	30	>	-	>	<	28	>	-	>	<	-	>	>	>		
3 - River Drive & Daniella Street	TWSC	LOS Delay	<	A 0	>	A 0	<	A 0	>	A 0	<		>		>		<	A 9	>	A 9	A 1		
V/C	<	0.00	>	<	0.01	>	<		>		>	<	0.02	>	-	>	<	0	>	>	>		
Q	<	0	>	<	0	>	<		>		>	<	-	>	-	>	<	-	>	>	>		
Ex Avail.	<	-	>	<	-	>	<	-	>	-	>	<	-	>	-	>	<	-	>	>	>		
4 - River Drive & Rosetta Street	TWSC	LOS Delay	<	A 0	>	A 0	<	A 0	>	A 0	<		>		>		<	A 9	>	A 9	A 1		
V/C	<	0.00	>	<	0.01	>	<		>		>	<	0.01	>	-	>	<	0	>	>	>		
Q	<	0	>	<	0	>	<		>		>	<	0	>	-	>	<	-	>	>	>		
Ex Avail.	<	-	>	<	-	>	<	-	>	-	>	<	-	>	-	>	<	-	>	>	>		
5 - River Drive & St Michaels Street	TWSC	LOS Delay	<	A 0	>	A 0	<	A 0	>	A 0	<		>		>		<	A 9	>	A 9	A 0		
V/C	<	0.00	>	<	0.00	>	<		>		>	<	0.00	>	-	>	<	0	>	>	>		
Q	<	0	>	<	0	>	<		>		>	<	0	>	-	>	<	-	>	>	>		
Ex Avail.	<	-	>	<	-	>	<	-	>	-	>	<	-	>	-	>	<	-	>	>	>		
6 - John Street & Rosset Valley Court	TWSC	LOS Delay	<	A 0	>	A 0	<	A 2	>	A 2	<	A 9	>	A 9	>	A 9	<		>		A 2		
V/C	<	0.07	>	<	0.01	>	<		>	0.03	>	<	-	>	-	>	<		>	>	>		
Q	<	0	>	<	0	>	<		>	1	>	<	-	>	-	>	<		>	>	>		
Ex Avail.	<	-	>	<	-	>	<	-	>	-	>	<	-	>	-	>	<	-	>	>	>		
7 - John Street & Victoria Street	AWSC	LOS Delay	<	A 7	>	A 7	<	A 8	>	A 8	<	A 7	>	A 7	>	A 7	<	A 8	>	A 8	A 8		
V/C	<	0.03	>	<	0.10	>	<		>	0.02	>	<	0.14	>	>	<	<	0.17	>	>	>		
Q	<	12	>	<	19	>	<		>	10	>	<	-	>	-	>	<	-	>	>	>		
Ex Avail.	<	-	>	<	-	>	<	-	>	-	>	<	-	>	-	>	<	-	>	>	>		

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

Ex. - Existing Available Storage

Avail. - Available Storage

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

RBT - Roundabout



**TABLE 4.2B: TEN-YEAR BACKGROUND OPERATIONS – PM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < < < < <	C 25 < < < <	> > > >	C 25 < < < <	E 56 < < < <	> > > >	E 56 < < < <	> > > >	< < < <	B 15 < < < <	A 10 < < < <	> > > >	B 14 < < < <	B 10 < < < <	B 10 < < < <	C 21 < < < <	0.67 < < < <	
	2 - Mountainview Road N & John Street	AWSC	LOS Delay < < < < <	A 10 < < < <	> > > >	A 10 < < < <	A 10 < < < <	> > > >	A 10 < < < <	A 10 < < < <	> > > >	A 9 < < < <	C 17 < < < <	> > > >	B 15 < < < <	A 8 < < < <	B 13 < < < <	B 13 < < < <	B 14 < < < <	
	3 - River Drive & Daniella Street	TWSC	LOS Delay < < < < <	A 1 < < < <	- > > > >	A 1 < < < <	- > > > >	A 0 < < < <	- > > > >	A 0 < < < <	- > > > >	- > > > >	- > > > >	- > > > >	- > > > >	A 9 < < < <	- > > > >	A 9 < < < <	A 1 < < < <	
	4 - River Drive & Rosetta Street	TWSC	LOS Delay < < < < <	A 0 < < < <	- > > > >	A 0 < < < <	- > > > >	A 0 < < < <	- > > > >	A 0 < < < <	- > > > >	- > > > >	- > > > >	- > > > >	- > > > >	A 9 < < < <	- > > > >	A 9 < < < <	A 1 < < < <	
	5 - River Drive & St Michaels Street	TWSC	LOS Delay < < < < <	A 0 < < < <	- > > > >	A 0 < < < <	- > > > >	A 0 < < < <	- > > > >	A 0 < < < <	- > > > >	- > > > >	- > > > >	- > > > >	- > > > >	A 9 < < < <	- > > > >	A 9 < < < <	A 1 < < < <	
	6 - John Street & Rosset Valley Court	TWSC	LOS Delay < < < < <	A 0 < < < <	> > > >	A 0 < < < <	< < < <	A 1 < < < <	- > > > >	A 1 < < < <	A 9 < < < <	- > > > >	> > > >	A 9 < < < <	- > > > >	- > > > >	- > > > >	- > > > >	A 1 < < < <	
	7 - John Street & Victoria Street	AWSC	LOS Delay < < < < <	A 8 < < < <	> > > >	A 8 < < < <	< < < <	A 8 < < < <	> > > >	A 8 < < < <	< < < <	A 8 < < < <	> > > >	A 8 < < < <	< < < <	A 9 < < < <	> > > >	A 9 < < < <	A 8 < < < <	

MOE - Measure of Effectiveness      Q - 95th Percentile Queue Length      TCS - Traffic Control Signal      RBT - Roundabout  
 LOS - Level of Service      Ex. - Existing Available Storage      TWSC - Two-Way Stop Control  
 Delay - Average Delay per Vehicle in Seconds      Avail. - Available Storage      AWSC - All-Way Stop Control

### 4.2.3 Total Operations – Five Year Horizon

**Table 4.3A-B** summarizes the level of service conditions for the AM and PM peak hours. The following critical movements are noted:

#### PM Peak Hour

- ▶ Mountainview Road North and River Drive
  - Westbound approach is forecast to operate with delays in the LOS D range with a v/c ratio greater than 0.85.

**Appendix I** contains the supporting detailed Synchro reports.

The capacity issues experienced at the Mountainview Road North and River Drive intersection under the background traffic horizon (no site generated traffic) are expected to continue to occur and deteriorate with the development of the subject site.

Site traffic impacts are minimal with minor changes in delay at all other study area intersections.

The proposed driveways with Rosetta Street and Caroline Street are forecast to operate with minimal delay and v/c ratios well within capacity during the AM and PM peak hours.

Based on the SimTraffic queue assessment, no significant queue disruptions are forecast at any of the study area intersections during the AM and PM peak hours.



**TABLE 4.3A: FIVE-YEAR TOTAL OPERATIONS – AM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < < < < <	C 27 < < < <	> > > >	C 27 < < < <	D 52 < < < <	> > > >	D 52 < < < <	< < < <	A 10 < < < <	A 8 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	B 17 < < < <	0.42 < < < <	
	2 - Mountainview Road N & John Street	AWSC	LOS Delay < < < < <	A 10 < < < <	> > > >	A 10 < < < <	A 9 < < < <	> > > >	A 9 < < < <	A 9 < < < <	B 10 < < < <	B 10 < < < <	A 10 < < < <	A 10 < < < <	A 10 < < < <	A 10 < < < <	A 10 < < < <	B 14 < < < <	B 12 < < < <	
	3 - River Drive & Daniella Street	TWSC	LOS Delay < < < < <	A 0 < < < <	- > > > >	A 0 < < < <	A 0 < < < <	> > > >	A 0 < < < <	< < < <	< < < <	< < < <	< < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 1 < < < <	
	4 - River Drive & Rosetta Street	TWSC	LOS Delay < < < < <	A 0 < < < <	- > > > >	A 0 < < < <	A 0 < < < <	> > > >	A 0 < < < <	< < < <	< < < <	< < < <	< < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 4 < < < <	
	5 - River Drive & St Michaels Street	TWSC	LOS Delay < < < < <	A 0 < < < <	- > > > >	A 0 < < < <	A 0 < < < <	> > > >	A 0 < < < <	< < < <	< < < <	< < < <	< < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 1 < < < <	
	6 - John Street & Rosset Valley Court	TWSC	LOS Delay < < < < <	A 0 < < < <	> > > >	A 0 < < < <	A 2 < < < <	- > > > >	A 2 < < < <	A 9 < < < <	- > > > >	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 9 < < < <	A 2 < < < <	A 2 < < < <	
	7 - John Street & Victoria Street	AWSC	LOS Delay < < < < <	A 7 < < < <	> > > >	A 7 < < < <	A 7 < < < <	> > > >	A 7 < < < <	A 7 < < < <	A 7 < < < <	A 7 < < < <	A 7 < < < <	A 7 < < < <	A 7 < < < <	A 7 < < < <	A 7 < < < <	A 8 < < < <	A 8 < < < <	
	8 - Rosetta Street & Site Driveway	TWSC	LOS Delay < < < < <	A 9 < < < <	> > > >	A 9 < < < <	< < < <	< < < <	< < < <	< < < <	A 6 < < < <	A 6 < < < <	A 6 < < < <	A 6 < < < <	A 6 < < < <	A 6 < < < <	A 6 < < < <	A 0 < < < <	A 7 < < < <	
	9 - Caroline Street & Site Driveway	TWSC	LOS Delay < < < < <	A 0 < < < <	> > > >	A 0 < < < <	A 4 < < < <	- > > > >	A 4 < < < <	A 8 < < < <	- > > > >	A 8 < < < <	A 8 < < < <	A 8 < < < <	A 8 < < < <	A 8 < < < <	A 8 < < < <	A 4 < < < <	A 4 < < < <	

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds  
 Q - 95th Percentile Queue Length  
 Ex. - Existing Available Storage  
 Avail. - Available Storage  
 TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 AWSC - All-Way Stop Control  
 RBT - Roundabout

**TABLE 4.3B: FIVE-YEAR TOTAL OPERATIONS – PM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
PM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay	<	C 25	>	C 25	<	D 55	>	D 55	<	B 15	A 9	B 14	<	A 10	>	A 10	C 21	
			V/C	<	0.12	>	0.12	<	0.87	>	0.87	<	0.60	0.14		<	0.23	>	0.23	0.68	
			Q	<	12	>	12	<	54	>	54	<	103	10		<	29	>	29		
			Ex Avail.	<	-	>	-	<	-	>	-	<	-	-	-	<	-	>	-	-	
			LOS Delay	<	A 10	>	A 10	<	A 10	>	A 10	<	B 9	A 14	B 13	<	A 8	B 12	>	B 12	B 12
			V/C	<	0.14	>	0.14	<	0.10	>	0.10	<	0.20	0.58		<	0.01	0.45	>	0.45	
			Q	<	15	>	15	<	14	>	14	<	21	28		<	7	-	>	-	
			Ex Avail.	<	-	>	-	<	-	>	-	<	30	-		<	40	-	>	-	
			LOS Delay	<	A 0	>	A 0	<	A 0	>	A 0	<				<	A 10	-	>	A 10	A 1
		V/C	<	0.00	-	0.00	<	0.07	>	0.07	<				<	0.01	-	>	-		
		Q	<	0	-	0	<	0	>	0	<				<	0	-	>	-		
		Ex Avail.	<	-	-	-	<	-	>	-	<				<	-	-	>	-		
		LOS Delay	<	A 0	-	A 0	<	A 0	>	A 0	<				<	A 9	-	>	A 9	A 2	
		V/C	<	0.00	-	0.00	<	0.06	>	0.06	<				<	0.05	-	>	-		
		Q	<	0	-	0	<	0	>	0	<				<	1	-	>	-		
		Ex Avail.	<	-	-	-	<	-	>	-	<				<	-	-	>	-		
		LOS Delay	<	A 0	-	A 0	<	A 0	>	A 0	<				<	A 9	-	>	A 9	A 1	
		V/C	<	0.00	-	0.00	<	0.02	>	0.02	<				<	0.01	-	>	-		
		Q	<	0	-	0	<	0	>	0	<				<	0	-	>	-		
		Ex Avail.	<	-	-	-	<	-	>	-	<				<	-	-	>	-		
		LOS Delay	-	A 0	>	A 0	<	A 1	-	A 1	<	A 9	-	>	A 9					A 1	
		V/C	-	0.07	>	0.07	<	0.01	-	0.01	<	0.02	-	>	0.02					-	
		Q	-	0	>	0	<	0	-	0	<	1	-	>	1					-	
		Ex Avail.	-	-	>	-	<	-	-	-	<	-	-	>	-					-	
		LOS Delay	<	A 8	>	A 8	<	A 8	>	A 8	<	A 8	>	A 8	<	A 8	>	A 8	>	A 8	A 8
		V/C	<	0.06	>	0.06	<	0.16	>	0.16	<	0.04	>	0.04	<	0.13	>	0.13	>	0.13	
		Q	<	14	>	14	<	19	>	19	<	14	>	14	<	19	>	19	>	19	
		Ex Avail.	<	-	>	-	<	-	>	-	<	-	>	-	<	-	>	-	>	-	
		LOS Delay	A 9	-	>	A 9					<	A 6	-	>	A 6	<	A 0	>	A 0	A 6	
		V/C	0.03	-	>	0.03					<	0.03	-	>	0.03	<	0.01	>	0.01		
		Q	1	-	>	1					<	1	-	>	1	<	0	>	0		
		Ex Avail.	-	-	>	-					<	-	-	>	-	<	-	>	-		
		LOS Delay	-	A 0	>	A 0	<	A 3	-	A 3	<	A 9	-	>	A 9					A 2	
		V/C	-	0.01	>	0.01	<	0.00	-	0.00	<	0.00	-	>	0.00					-	
		Q	-	0	>	0	<	0	-	0	<	0	-	>	0					-	
		Ex Avail.	-	-	>	-	<	-	-	-	<	-	-	>	-					-	
		LOS Delay	-	A 0	>	A 0	<	A 3	-	A 3	<	A 9	-	>	A 9					A 2	
		V/C	-	0.01	>	0.01	<	0.00	-	0.00	<	0.00	-	>	0.00					-	
		Q	-	0	>	0	<	0	-	0	<	0	-	>	0					-	
		Ex Avail.	-	-	>	-	<	-	-	-	<	-	-	>	-					-	

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

Ex. - Existing Available Storage

Avail. - Available Storage

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

RBT - Roundabout



#### 4.2.4 Total Operations – Ten Year Horizon

**Table 4.4A-B** summarizes the level of service conditions for the AM and PM peak hours. The following critical movements are noted:

##### AM Peak Hour

- ▶ Mountainview Road North and River Drive
  - Westbound approach is forecast to operate with delays in the LOS E range with a v/c ratio of 0.90.

##### PM Peak Hour

- ▶ Mountainview Road North and River Drive
  - Westbound approach is forecast to operate with delays in the LOS D range with a v/c ratio of 0.85.
  - Northbound through/left-turn lane is forecast to operate with delays in the LOS C range with a v/c ratio greater than 0.85.
  - Overall, the intersection is forecast to operate with delays in the LOS C range and a v/c ratio greater than 0.85.

**Appendix J** contains the supporting detailed Synchro reports.

The capacity issues experienced at the Mountainview Road North and River Drive intersection under the background traffic horizon (no site generated traffic) are expected to continue to occur and deteriorate with the development of the subject site.

At the Mountainview Road North and River Drive intersection, site traffic will impact westbound approach in the AM and PM peak hours and the northbound left/through movement in the PM peak hour. Site traffic impacts are minimal with minor changes in delay at all other study area intersections.

The proposed driveways with Rosetta Street and Caroline Street are forecast to operate with minimal delay and v/c ratios well within capacity during the AM and PM peak hours.

Based on the SimTraffic queue assessment, no significant queue disruptions are forecast at any of the study area intersections during the AM and PM peak hours.



**TABLE 4.4A: TEN-YEAR TOTAL OPERATIONS – AM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall		
				Eastbound				Westbound				Northbound				Southbound						
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach			
AM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < C > 27	< C > 27	< E > 68	< E > 68	< E > 68	< E > 68	< B > 11	< B > 11	< B > 11	< B > 11	< A > 10	< A > 10	< A > 10	< A > 10	< C > 20	< C > 20	< C > 20	< C > 20	0.53	
	2 - Mountainview Road N & John Street	AWSC	LOS Delay < A > 10	< A > 10	< A > 10	< A > 10	< A > 10	< B > 11	< B > 11	< B > 11	< B > 11	< B > 11	< A > 17	< A > 17	< A > 17	< A > 17	< C > 17	< C > 17	< C > 17	< C > 17	13	
	3 - River Drive & Daniella Street	TWSC	LOS Delay < A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 10	< A > 10	< A > 10	< A > 10	< A > 10	< A > 10	< A > 10	< A > 10	< A > 10	1
	4 - River Drive & Rosetta Street	TWSC	LOS Delay < A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 10	< A > 10	< A > 10	< A > 10	< A > 10	< A > 10	< A > 10	< A > 10	< A > 10	6
	5 - River Drive & St Michaels Street	TWSC	LOS Delay < A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	0
	6 - John Street & Rosset Valley Court	TWSC	LOS Delay < A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 2	< A > 2	< A > 2	< A > 2	< A > 2	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	2
	7 - John Street & Victoria Street	AWSC	LOS Delay < A > 7	< A > 7	< A > 7	< A > 7	< A > 7	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	8
	8 - Rosetta Street & Site Driveway	TWSC	LOS Delay < A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 9	< A > 6	< A > 6	< A > 6	< A > 6	< A > 6	< A > 6	< A > 6	< A > 6	< A > 6	7
	9 - Caroline Street & Site Driveway	TWSC	LOS Delay < A > 0	< A > 0	< A > 0	< A > 0	< A > 0	< A > 5	< A > 5	< A > 5	< A > 5	< A > 5	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	< A > 8	6

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

Ex. - Existing Available Storage

Avail. - Available Storage

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

RBT - Roundabout



**TABLE 4.4B: TEN-YEAR TOTAL OPERATIONS – PM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < < < < <	C 24 >	> > > >	C 24	< < < < <	D 52 >	> > > >	D 52	< < < < <	C 31 >	B 11 >	C 26	< < < < <	B 12 >	> > > >	B 12	C 27	0.88
	2 - Mountainview Road N & John Street	AWSC	LOS Delay < < < < <	A 10 >	> > > >	A 10	< < < < <	A 10 >	> > > >	A 10	< < < < <	C 10 >	C 15 >	C 15	< < < < <	B 8 >	B 14 >	B 13	B 14	
	3 - River Drive & Daniella Street	TWSC	LOS Delay < < < < <	A 0 >	- - - -	A 0	< < < < <	A 0 >	> > > >	A 0	< < < < <	- - - -	- - - -	- - - -	< < < < <	B 11 >	- - - -	B 11	A 0	
	4 - River Drive & Rosetta Street	TWSC	LOS Delay < < < < <	A 1 >	- - - -	A 1	< < < < <	A 0 >	> > > >	A 0	< < < < <	- - - -	- - - -	- - - -	< < < < <	B 10 >	- - - -	B 10	A 3	
	5 - River Drive & St Michaels Street	TWSC	LOS Delay < < < < <	A 0 >	- - - -	A 0	< < < < <	A 0 >	> > > >	A 0	< < < < <	- - - -	- - - -	- - - -	< < < < <	A 9 >	- - - -	A 9	A 1	
	6 - John Street & Rosset Valley Court	TWSC	LOS Delay - - - -	A 0 >	> > > >	A 0	< < < < <	A 1 >	- - - -	A 1	< < < < <	A 9 >	- - - -	- - - -	< < < < <	- - - -	- - - -	- - - -	A 1	
	7 - John Street & Victoria Street	AWSC	LOS Delay < < < < <	A 8 >	> > > >	A 8	< < < < <	A 8 >	> > > >	A 8	< < < < <	A 8 >	> > > >	A 8	< < < < <	A 9 >	> > > >	A 9	A 8	
	8 - Rosetta Street & Site Driveway	TWSC	LOS Delay A 9	- - - -	> > > >	A 9	< < < < <	- - - -	- - - -	- - - -	< < < < <	A 6 >	- - - -	A 6	< < < < <	A 0 >	> > > >	A 0	A 7	
	9 - Caroline Street & Site Driveway	TWSC	LOS Delay - - - -	A 0 >	> > > >	A 0	< < < < <	A 4 >	- - - -	A 4	< < < < <	A 8 >	- - - -	A 8	< < < < <	- - - -	- - - -	- - - -	A 4	

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds  
 Q - 95th Percentile Queue Length  
 Ex. - Existing Available Storage  
 Avail. - Available Storage  
 TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 AWSC - All-Way Stop Control  
 RBT - Roundabout



## 4.2.5 Total Operations – Sensitivity Analysis

### St. Michaels Street Extension

A sensitivity analysis was completed to review the impacts of the possible extension of St. Michaels Street to John Street. **Figures 4.9** and **Figure 4.10** illustrate the forecast ten-year total traffic volumes with the extension for the AM and PM peak hours.

**Table 4.5A-B** summarizes the level of service conditions for the AM and PM peak hours with extension of St. Michaels Street to John Street. The following critical movements are noted:

- ▶ Mountainview Road North and River Drive
  - Westbound approach – AM peak hour, LOS F and v/c ratio exceeds 1.00. PM peak hour, LOS E and v/c ratio exceeds 0.85.
  - Northbound shared left/through – PM peak hour, v/c ratio exceeds 0.85.
  - Overall intersection – PM peak hour, v/c ratio exceeds 0.85.

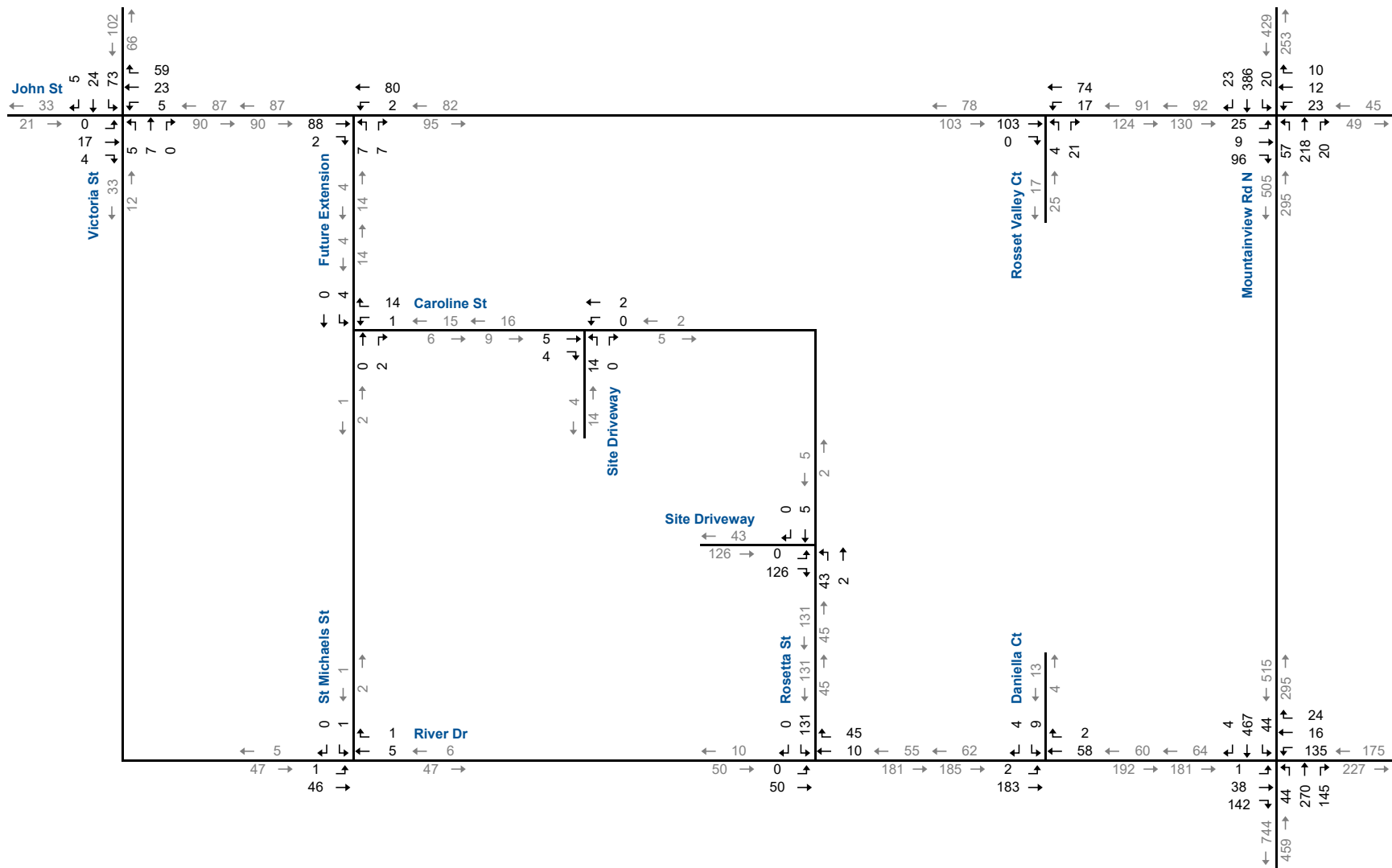
**Appendix K** contains the supporting detailed Synchro reports.

The capacity issues experienced under the total traffic horizons with the development of the subject site are expected to continue to occur with the extension of St. Michaels Street to John Street. The extension of St. Michaels Street to John Street will have a negligible impact on traffic operations throughout the study area and is not required from an intersection capacity perspective. The unopened right-of-way would be better used as an Active Transportation (AT) connection between John Street and Caroline Street. Desire lines through the grassed area were observed in the field suggesting the need for this AT connection.

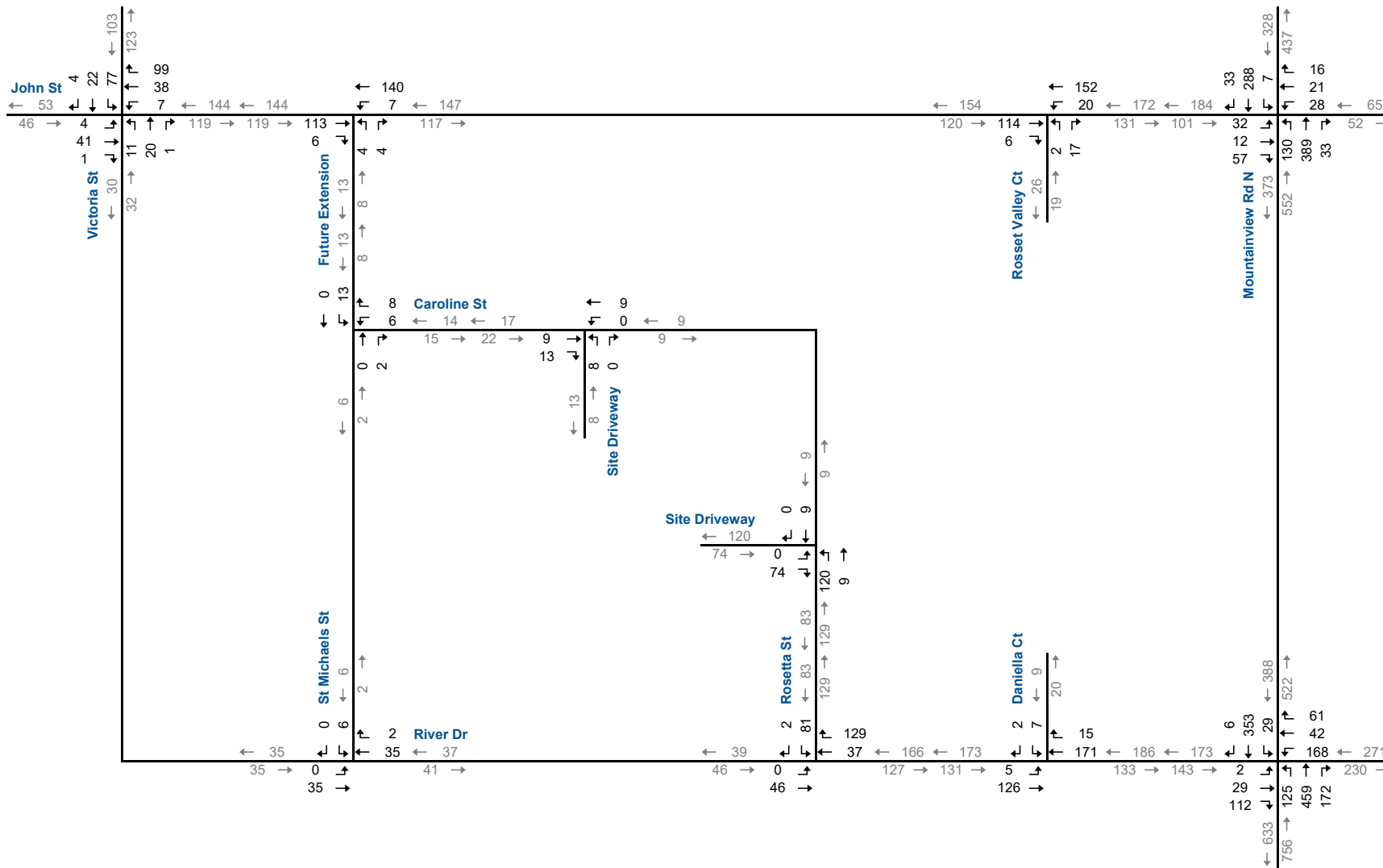
It should be noted that should note that a cul-de-sac or truck turn around may be needed at the terminus of St Michaels Street if access through the GO Station lands is restricted.



AM Peak Hour



## 2032 Total Traffic Volumes – Sensitivity Analysis With Extension - AM Peak Hour



## 2032 Total Traffic Volumes – Sensitivity Analysis With Extension - PM Peak Hour

**TABLE 4.5A: TEN-YEAR TOTAL OPERATIONS (SENSITIVITY ANALYSIS WITH EXTENSION) – AM PEAK HOUR**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < < < < < V/C < < < < < Q < < < < < Ex Avail. < < < < <	C 27 0.23 18 -	> > > > >	C 27	< < < < < E 65 0.89 43 -	> > > > >	E 65	< < < < < B 11 0.39 57 -	> > > > >	A 9 0.11 10 -	B 10	< < < < < A 10 0.31 40 -	> > > > >	A 10	B 20 0.52			
	2 - Mountainview Road N & John Street	AWSC	LOS Delay < < < < < V/C < < < < < Q < < < < < Ex Avail. < < < < <	B 10 0.21 17 -	> > > > >	B 10	< < < < < A 10 0.08 15 -	> > > > >	A 10	< < < < < A 9 0.11 18 30 12	> > > > >	B 11	< < < < < A 8 0.04 11 25 29	C 17	> > > > >	C 17	B 13			
	3 - River Drive & Daniella Street	TWSC	LOS Delay < < < < < V/C < < < < < Q < < < < < Ex Avail. < < < < <	A 0 0.00 0 -	> > > > >	A 0	< < < < < A 0 0.04 0 -	> > > > >	A 0					< < < < < A 10 0.02 0 -	> > > > >	A 10	A 1			
	4 - River Drive & Rosetta Street	TWSC	LOS Delay < < < < < V/C < < < < < Q < < < < < Ex Avail. < < < < <	A 0 0.00 0 -	> > > > >	A 0	< < < < < A 0 0.04 0 -	> > > > >	A 0					< < < < < A 10 0.16 4 -	> > > > >	A 10	A 5			
	5 - River Drive & St Michaels Street	TWSC	LOS Delay < < < < < V/C < < < < < Q < < < < < Ex Avail. < < < < <	A 0 0.00 0 -	> > > > >	A 0	< < < < < A 0 0.00 0 -	> > > > >	A 0					< < < < < A 9 0.00 0 -	> > > > >	A 9	A 0			
	6 - John Street & Rosset Valley Court	TWSC	LOS Delay - < < < < V/C - < < < < Q - < < < < Ex Avail. - < < < <	A 0 0.07 0 -	> > > > >	A 0	< < < < < A 2 0.01 0 -	> > > > >	A 2	A 9 0.03 1 -	> > > > >	A 9						A 2		
	7 - John Street & Victoria Street	AWSC	LOS Delay < < < < < V/C < < < < < Q < < < < < Ex Avail. < < < < <	A 7 0.03 12 -	> > > > >	A 7	< < < < < A 8 0.11 20 -	> > > > >	A 8	< < < < < A 8 0.02 10 -	> > > > >	A 8	< < < < < A 8 0.14 16 -	> > > > >	A 8		A 8			
	8 - Rosetta Street & Site Driveway	TWSC	LOS Delay A < < < V/C 0.13 < < < Q 3 < < < Ex Avail. - < < <	- < < < - < < < - < < < - < < <	> > > > > > > > > > > >	A 9					< < < < < A 7 0.03 1 -	> > > > >	A 7	< < < < < A 7 0.00 0 -	> > > > >	A 0		A 8		
	9 - Caroline Street & Site Driveway	TWSC	LOS Delay - < < < V/C - < < < Q - < < < Ex Avail. - < < <	A 0 0.01 0 -	> > > > >	A 0	< < < < < A 0 0.00 0 -	> > > > >	A 0	A 9 0.01 0 -	> > > > >	A 9						A 5		
	10 - St Michaels Street/Extension & Caroline Street	TWSC	LOS Delay < < < V/C < < < Q < < < Ex Avail. < < <				A 8 0.01 0 -	> > > > > > > > > > > >	A 8	A 0 0.00 0 -	> > > > > > > > > > > >	A 0	< < < A 7 0.00 0 -				A 7	A 7		
	11 - Extension & John Street	TWSC	LOS Delay < < < V/C < < < Q < < < Ex Avail. < < <	A 0 0.06 0 -	> > > > > > > > > > > >	A 0	< < < A 0 0.00 0 -	> > > > > > > > > > > >	A 0	A 9 0.02 0 -	> > > > > > > > > > > >	A 9						A 1		

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds  
 Q - 95th Percentile Queue Length  
 Ex. - Existing Available Storage  
 Avail. - Available Storage  
 TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 AWSC - All-Way Stop Control  
 RBT - Roundabout





## 130 Mountainview Road Background Development

A sensitivity analysis was completed to review the impacts of potential development at 130 Mountainview Road. The proposed development includes 1,092 units comprised of high-rise units and townhouse blocks. Detailed breakdown of the unit types was not available for this study, thus it was assumed 1,000 of the units would be high-rise units and 92 units would be townhouse units based on the size of the lot. It is assumed the development will have a single access to River Drive between Mountainview Road and Daniela Court. The distribution of site trips is assumed to follow the same distribution as the subject site outlined in Section 3.4. **Table 4.6** outlines the trip generation for 130 Mountainview Road.

**TABLE 4.6: 130 MOUNTAINVIEW ROAD TRIP GENERATION**

ITE Land Use Code / Number of Units	AM Peak Hour				PM Peak Hour			
	Rate	In	Out	Sum	Rate	In	Out	Sum
221 - Multifamily Housing (Mid-rise) - 92 Units	0.37	8	26	<b>34</b>	Eqn.	22	14	<b>36</b>
222 - Multifamily Housing (High-rise) - 1000 Units	0.27	70	200	<b>270</b>	0.32	198	122	<b>320</b>
<b>TOTAL</b>	--	78	226	<b>304</b>	--	220	136	<b>356</b>

### Equations

*LUC 221 Eqn. per Unit AM: 0.37 | PM:  $T = 0.39(X) + 0.34$*

*LUC 222 Rate per unit AM: 0.27 | PM: 0.32*

**Appendix L** contains the forecast ten-year total traffic volumes with 130 Mountainview Road. Overall, the 130 Mountainview Road development is expected to add a significant volume of vehicles to the intersection of Mountainview Road and River Drive. Other study area intersection volumes are expected to increase by less than 15 vehicles per hour during the peak hours.

**Table 4.7** summarizes the level of service conditions for the AM and PM peak hours with 130 Mountainview Road. **Appendix K** contains the supporting detailed Synchro reports.

The following critical movements are noted at the Mountainview Road at River Drive intersection:

- ▶ The westbound approach is forecast to operate with delays in the LOS E-F range with a v/c ratio greater than 0.95 during the AM and PM peak hours.
- ▶ In the PM peak hour, the northbound through/left-turn lane is forecast to operate with delays in the LOS F range and a v/c ratio greater than 1.00.



- ▶ Overall, the intersection of Mountainview Road and River Drive is forecast to operate with delays in the LOS F range and a v/c ratio greater than 1.00 during the PM peak hour.

Overall, the addition of the 130 Mountainview Road development is forecast to cause traffic operations to deteriorate at the intersection of Mountainview Road and River Drive. Capacity deficiencies and mitigation measures should be explored by the applicant of 130 Mountainview Road.



**TABLE 4.7: 130 MOUNTAINVIEW ROAD TRAFFIC OPERATIONS**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < < < <	C 27 < < < <	> > > >	C 27 < < < <	> > > >	F 97 < < < <	> > > >	F 97 < < < <	> > > >	C 23 < < < <	B 13 < < < <	B 20 < < < <	> > > >	B 15 < < < <	> > > >	B 15 < < < <	> > > >	C 29 < < < <	0.81 < < < <
PM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS Delay < < < <	C 22 < < < <	> > > >	C 22 < < < <	> > > >	E 71 < < < <	> > > >	E 71 < < < <	> > > >	F 233 < < < <	B 13 < < < <	F 192 < < < <	> > > >	B 15 < < < <	> > > >	B 15 < < < <	> > > >	F 110 < < < <	1.26 < < < <

MOE - Measure of Effectiveness  
 LOS - Level of Service  
 Delay - Average Delay per Vehicle in Seconds  
 Q - 95th Percentile Queue Length  
 Ex. - Existing Available Storage  
 Avail. - Available Storage  
 TCS - Traffic Control Signal  
 TWSC - Two-Way Stop Control  
 AWSC - All-Way Stop Control  
 RBT - Roundabout





## 5 Remedial Measures

### 5.1 Mountainview Road North and River Drive

The intersection of Mountainview Road North and River Drive is forecast to experience capacity constraints (that is, v/c ratio greater than 0.85) on the westbound approach under the 5-year background horizon. The capacity constraints are expected to continue to occur with the expected growth in non-site generated traffic.

To mitigate the increases to the delay and capacity, providing a protected left-turn phase for the westbound approach and optimizing the signal timings should be considered.

With site generated traffic, the northbound shared left/through is expected to experience capacity constraints (that is, v/c ratio greater than 0.85) while maintaining acceptable delay (that is, LOS C). To mitigate the increases to the delay, providing a left-turn storage lane for the northbound approach and optimizing the signal timings to provide additional green time for these movements should be considered. It should be noted that combining the through movement with the existing right-turn lane will also result in capacity constraints and three lanes will be required at the approach to mitigate the increases to capacity on the approach.

To accommodate the northbound left-turn lane within the existing four lane cross section on Mountainview Road North south of River Drive, the southbound approach should be reduced to one shared through/right lane and one left-turn lane. **Figure 5.1** illustrates the functional layout of the recommended lane configuration at the intersection.

To manage the expected growth in traffic at the Mountainview Road North and River Drive intersection, the road authority should consider:

- ▶ Optimize signal timings with a protected westbound left-turn phase;
- ▶ Reduce the southbound approach to one shared through/right lane and one left-turn lane with 50 metres of storage; and
- ▶ Provide a northbound left-turn lane with 50 metres of storage.

The reconfiguration of the northbound and southbound lane groupings appears to be feasible without modifications to the existing pavement width. The revised lane configuration can likely be achieved by modifying the existing pavement markings and signage.





## Recommended Lane Configuration

1 Rosetta Street, Town of Halton Hills  
210781

Figure 5.1

**Table 5.1** summarizes the level of service conditions for the AM and PM peak hour with the above noted improvements in place. The previously critical movements at the intersection will operate at LOS D or better with v/c ratios below 0.80.

No capacity issues are forecast to occur on the southbound approach with the reduction to a shared through/right lane and a left-turn lane.

**Appendix M** contains the supporting detailed Synchro reports.



**TABLE 5.1: MOUNTAINVIEW ROAD NORTH AND RIVER DRIVE OPERATIONS WITH IMPROVEMENTS**

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall		
				Eastbound				Westbound				Northbound				Southbound						
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach			
AM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS	<	C	>	C	<	D	>	D	B	B	B	B	B	B	>	B	B		
			Delay	<	24	>	24	<	36	>	36	11	12	11	B	12	15	>	15	18	B	
			V/C	<	0.23	>		<	0.72	>		0.14	0.31	0.11		0.09	0.53	>			0.68	
			Q	<	17	>		<	37	>		13	54	11		12	105	>				
			Ex Avail.	<	-	>		<	-	>		50	-	-		50	-	>				
PM Peak Hour	1 - Mountainview Road N & River Drive	TCS	LOS	<	C	>	C	<	D	>	D	B	B	B	B	B	B	>	B	B		
			Delay	<	21	>	21	<	36	>	36	16	18	12	B	12	16	>	16	20	C	
			V/C	<	0.17	>		<	0.78	>		0.36	0.59	0.15		0.09	0.47	>			0.75	
			Q	<	14	>		<	55	>		34	119	13		10	81	>				
			Ex Avail.	<	-	>		<	-	>		50	-	-		50	-	>				
			<	-	>		<	-	>	16	-	-		41	-	>						

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

Ex. - Existing Available Storage

Avail. - Available Storage

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

RBT - Roundabout



## 5.2 Auxiliary Lanes

The Ministry of Transportation's Design Supplement for the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads<sup>12</sup> provides guidance on the assessment and/or need for auxiliary left-turn lanes at intersections.

The site driveway intersections to Rosetta Street and Caroline Street have been reviewed using these procedures to determine if the future traffic volumes warrant the need for left-turn lanes to serve the site driveways.

At the site driveway to Rosetta Street and Caroline Street, the left-turn volumes are greater than 5% of the advancing volume, but the advancing and opposing volumes too low to warrant a left-turn lane. No change in the existing lane configuration is recommended. It is reiterated that from an operational perspective, the proposed site driveways will operate at good level of service and well within capacity.

**Appendix N** contains the left-turn lane warrant nomographs.

## 5.3 Traffic Control Signals

The potential for implementing traffic signal control at the Mountainview Road North and John Street intersection was assessed using the Ontario Traffic Manual (OTM Book 12 – Justification 7) signal warrant<sup>13</sup> procedures. The forecast ten-year horizon total traffic volumes were used in the warrant analysis.

Traffic control signal warrants are not satisfied. No improvements to the existing form of stop control are recommended. **Appendix O** contains the warrant analysis.

To warrant the installation of a traffic control signal at an existing intersection with forecast traffic volumes (average hourly volume), the minimum vehicular warrant or the delay to cross traffic warrant must be 120% fulfilled.

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<sup>12</sup> MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads, Appendix 9 for Chapter 9 Intersections, June 2017.

<sup>13</sup> Ontario Traffic Manual Book 12, Ministry of Transportation of Ontario, July 2001.



## 6 Parking Justification

As with any equilibrium system, there are a minimum of two components required to be in balance and reach the equilibrium point. With parking systems, this involves the balance of parking supply and demand. Achieving an appropriate supply level is equally important as demand. The ubiquitous oversupply of cheap and accessible parking has long been a significant contributing factor to single-occupant vehicle (SOV) travel growth.

There is a strong focus on the pedestrian environment and an emphasis on active transportation in the Official Plan. As the development proposal focuses on accommodating a suitable pedestrian environment, one that would encourage active transit based on the de-emphasis on parking, the use of blanketly applying the Zoning By-law across the development does not reflect these goals.

### 6.1 Proposed Parking Supply

The site's parking demand is proposed to be accommodated on site. The site's parking supply is identified as 751 parking spaces (1.18 spaces per unit). The site plan identifies an allocation of 688 spaces for occupants (1.08 space per unit) and 63 spaces for visitors (0.10 spaces per unit).

The site statistics indicate 702 proposed bicycle parking spaces with 638 long-term spaces and 64 short-term spaces located near building entrances.

### 6.2 Zoning By-Law Requirements

#### 6.2.1 Town of Halton Hills Zoning By-Law

The Town of Halton Hills Zoning By-Law<sup>14</sup> prescribes parking ratios for apartment buildings for occupants and visitors. The following minimum parking ratios are noted for apartment dwelling units:

- ▶ 1.50 occupant spaces per unit; and
- ▶ 0.25 visitor spaces per unit where more than four apartment dwelling units are located.

**Table 6.1** summarizes the site's Zoning By-Law parking requirements for the current site concept plan. The Zoning By-Law parking requirement is 1,116 spaces.

<sup>14</sup> Town of Halton Hills Zoning By-Law 2010-0050, July 2010



The site's parking supply is considered deficient by 365 spaces (268 occupant and 96 visitor parking spaces).

**TABLE 6.1: ZONING BY-LAW PARKING REQUIREMENT**

Land Use	Units	Zoning By-Law		Parking
Apartment (Occupant)	637	1.50	spaces/unit	955.5 (956)
Apartment (Visitor)	637	0.25	spaces/unit	159.3 (160)
<b>Total Parking Required</b>				<b>1,116</b>

### 6.2.2 Other Municipalities

Parking standards are increasingly seen as an instrument of planning policy, and parking ratios are now viewed as having the primary role in determining car use. Parking ratios have existed in most cities since the 1950s and have often been amended incrementally. Consequently, it is not surprising that municipalities are often unable to trace the justification or reasoning behind some of the older parking ratios found in their current Zoning By-laws.

Given that parking standards reflect an “average” condition, they will rarely prescribe the number of parking spaces to match the parking demands of any individual development project exactly. Other municipalities recognize the advantages of parking ratios supporting broader Official Plan objectives. The empirical challenge is understanding how parking demand for a given use may vary. The policy question is where the parking standard or ratio should be set in that range.

A review of municipalities who've recently updated their parking standards shows a shift in the amount of parking required and the how parking supply is viewed.

The Town of Oakville recently developed a new zoning by-law for lands located north of Dundas Street. The parking rates within this by-law for multiple dwelling units stipulate that a maximum parking rate of 1.25 per unit would be accepted with no prescribed minimum parking requirement. In contrast to generic minimum parking requirements, North Oakville provides maximum limits to restrict the total number of spaces that can be constructed rather than establish a minimum number.

The City of Welland has recently undertaken a comprehensive review of the zoning by-law to ensure that land and growth are appropriately managed and that the zoning regulations are up to date. As part of this



work, updated parking requirements were developed, which requires multiple dwellings to provide a parking rate of 1.00 parking space per unit.

City of Hamilton has a staggered approach for parking requirements for multiple dwellings. The minimum parking required depends on the size of the dwellings and the number of units, with a maximum parking rate of 1.25 spaces per unit.

Attitudes towards automobile ownership and its role in an urban lifestyle are changing in the eyes of both consumers and policymakers, and lower parking regulations reflect this. As parking regulations are an attempt for supply to meet demand, regulations that require a lower supply for future buildings are an indication that future demand is likely to be lower with the rise of sustainable travel modes (that is, transit, cycling, and walking).

The parking requirements for the development concept was calculated based on the parking rates used by other municipalities in southern Ontario. This methodology is a test of the reasonableness of the parking rates proposed for the site.

Municipalities include:

- ▶ City of Burlington;
- ▶ City of Guelph;
- ▶ City of Hamilton;
- ▶ City of Kitchener;
- ▶ City of Mississauga;
- ▶ Town of Newmarket;
- ▶ Town of Oakville;
- ▶ City of Toronto;
- ▶ City of Vaughan; and
- ▶ City of Waterloo.

Some of these municipalities have specific areas where lower parking rates are applied. Other municipalities are also reviewing and updating their respective Zoning By-Law parking requirements. It is acknowledged that some of these municipalities have public transit systems and differ contextually from the subject site. **Table 6.2** summarizes the parking rates for the various municipalities.





**TABLE 6.2: OTHER JURISDICTIONS PARKING BY-LAWS**

Municipality	Land Use	Parking Rate (spaces/unit)
City of Waterloo (Residential Mixed-Use Zones)	Multiple Residential	0.60
	Visitor	0.10
City of Toronto (Downtown PA1)	Multiple Residential	0.30-1.00
	Visitor	0.10
City of Kitchener (Downtown Zone) - 85-1	Multiple Residential	0.165-1.00
City of Vaughan Metropolitan Centre	Multiple Residential	0.70-1.00
	Visitor	0.15
City of Hamilton	Multiple Residential	0.30-1.00
Town of New Market	Multiple Residential	0.70-1.20
	Visitor	0.15
Town of Oakville - Mixed Use Zones	Multiple Residential	1.00-1.25
	Visitor	0.25
City of Kitchener - 2019-051	Multiple Residential	1.00
	Visitor	0.10
City of Waterloo (Zone R9)	Multiple Residential	1.00
	Visitor	0.10
City of Guelph - Parking Review - Mixed Use Area	Multiple Residential	1.00
	Visitor	0.10
City of Guelph - Parking Review - Other Areas	Multiple Residential	1.00
	Visitor	0.15
City of Mississauga: Apartment, within CC1 to CC4 Zones)	Multiple Residential	1.00
	Visitor	0.15
City of Burlington: City Wide Intensification	Multiple Residential	1.00
	Visitor	0.25
City of Burlington	Multiple Residential	1.25-1.75
	Visitor	0.35
Town of Halton Hills	Multiple Residential	1.50
	Visitor	0.25

Occupant parking requirements for apartment buildings in the selected municipalities range from 0.30 to 1.75 spaces per unit. Visitor parking requirements for apartment buildings in the municipalities range from zero to 0.35 spaces per unit. Some special planning areas do not require visitor parking.

The Town of Newmarket Zoning By-Law<sup>15</sup> allows for a 30% reduction in the required parking for residential and non-residential uses located

<sup>15</sup> The Corporation of the Town of Newmarket Zoning By-Law 2010-40. Section 5.3.3.3 Reduced Parking Standards for Proximity to Transit in The Urban Centres



within a 500-metre walking distance of either a GO train station or a GO bus terminal.

**Table 6.3** summarizes the calculated parking requirement for the site concept based on other Municipal Zoning By-laws.

The data indicates a wide range of parking requirements across southern Ontario. The 751 parking spaces proposed for the site would be considered appropriate in the majority of selected municipalities which demonstrates that the proposed supply is reasonable.

**TABLE 6.3: PARKING REQUIREMENTS OTHER MUNICIPALITIES**

Source	Parking Requirement		
	O	V	Total
City of Waterloo (Residential Mixed-Use Zones)	383	64	<b>447</b>
City of Toronto (Downtown PA1)	370	64	<b>434</b>
City of Kitchener (Downtown Zone) - 85-1	324	0	<b>324</b>
City of Vaughan Metropolitan Centre	479	96	<b>575</b>
City of Hamilton (Maximum)	374	0	<b>374</b>
Town of Newmarket	546	96	<b>642</b>
Town of Oakville - Mixed Use Zones	648	160	<b>808</b>
City of Kitchener - 2019-051	637	64	<b>701</b>
City of Waterloo (Zone R9)	637	64	<b>701</b>
City of Guelph - Parking Review - Mixed Use Area	637	64	<b>701</b>
City of Guelph - Parking Review - Other Areas	637	96	<b>733</b>
City of Mississauga: Apartment in CC1 to CC4 Zones	637	96	<b>733</b>
City of Burlington: City Wide Intensification	637	160	<b>797</b>
City of Burlington	842	223	<b>1065</b>
<b>Average: Municipalities other than Halton Hills</b>	<b>557</b>	<b>90</b>	<b>647</b>
Town of Halton Hills	960	160	<b>1120</b>
<b>Proposed Supply</b>	<b>688</b>	<b>63</b>	<b>751</b>



## 6.3 Policy Framework

The Growth Plan for the Greater Golden Horseshoe (Ministry of Infrastructure, 2020)<sup>16</sup>, Provincial Policy Statement (MMAH, 2020)<sup>17</sup>, Halton Regional Official Plan<sup>18</sup>, and Town of Halton Hills Transportation Master Plan<sup>19</sup> all directly call for a shift away from automobile travel and towards more sustainable forms of transportation, including transit, and active transportation:

- ▶ The Growth Plan states: “Population and employment growth will be accommodated by ... reducing dependence on the automobile through the development of mixed-use, transit-supportive, pedestrian-friendly urban environments” (Section 4.2.10);
- ▶ The Provincial Policy Statement (PPS) states that land-use patterns should “minimize the length and number of vehicle trips, and support current and future use of transit and active transportation” (Section 1.6.7.4);
- ▶ The Regional Official Plan encourages “alternative development standards, including reduced parking standards in Major Transit Station Areas (MTSAs)” (Section 81.1); and
- ▶ The Town of Halton Hills Transportation Master Plan includes a policy to develop and implement “Transportation Demand Management initiatives to reduce single-occupant vehicle travel, lessen congestion on the Town’s road system, especially during peak periods, and facilitate more sustainable travel behaviour” (Section 7.1).

The Town’s TMP and Region’s OP outline the need to influence travel behaviour to support transit and active transportation to achieve multi-modal access through various policies such as Transportation Demand Management (TDM), transit programs, and walking and cycling initiatives.

### 6.3.1 Parking and GHG Emissions

While single-occupant vehicle trips are commonly targeted in transport policies, they are only a consequence of the spatial layout and densities of the accompanying land uses. There is merit in targeting

<sup>16</sup> A Place to Grow, Growth Plan for the Greater Golden Horseshoe, 2020.

<sup>17</sup> Provincial Policy Statement, 2020

<sup>18</sup> Regional Municipality of Halton, Halton Region Official Plan, November 2022

<sup>19</sup> Town of Halton Hills, Transportation Master Plan Report, November 2011



the underlying cause of these carbon emissions rather than solely focusing on policies to reduce private vehicle use.

Parking management has an important role to play as an instrument to reduce carbon emissions<sup>20</sup>. In this respect, car parking is the “glue” between these facets of the land use and transport environment. In addition, car parking is a critical factor that can be targeted relatively quickly by planners and their municipality plans.

The transportation sector is currently responsible for 23% of Canada’s GHG emissions<sup>21</sup> and offers tremendous opportunities for significant emissions reduction. Municipalities in Canada are lagging behind other countries in supporting zero-emission vehicles and other sustainable transportation policies. Cities and towns need to transition towards zero and low-emissions transportation modes, increase cleaner fuels, support public transit ridership, and encourage denser, mixed-use communities to reduce emissions. A significant encouragement is needed to shift travel modes from single-occupant vehicles towards public transit, auto-share and active transportation to reduce greenhouse gas emissions related to the transportation sector.

Halton Hills Town Council declared a climate change emergency in May 2019<sup>22</sup>. The acceptance of the declaration commits the Town to taking real efforts to attain a net-zero objective by 2030.

### 6.3.2 Affordability

According to the Government of Ontario, housing prices in Ontario almost tripled, far outpacing the income growth. The Government of Ontario has developed a “Housing Affordability Task Force” comprised of industry leaders and experts to produce a report identifying and recommending measures to address the housing supply crisis<sup>23</sup>.

One of the main recommendations by the Housing Task Force to increase housing supply and affordability is to reduce and streamline urban design rules to lower the costs of development. The Housing Task Force recommends removing or reducing the parking requirements in cities with over 50,000 people.

<sup>20</sup> Parking as a tool to reduce carbon emissions, McCormick Rankin Cagney Pty Ltd, 2009

<sup>21</sup> Reducing GHG Emissions in Canada’s Transportation Sector, Clean Energy Canada, June 2016.

<sup>22</sup> Town of Halton Hills, Climate Change Resolution, <<https://www.haltonhills.ca/en/your-government/climate-change.aspx#Council-reports-and-updates>> May 2019

<sup>23</sup> Housing Affordability Task Force Report, Government of Ontario, February 2022



With over 60,000 persons<sup>24</sup>, the Town of Halton Hill is one of these municipalities.

Generous parking requirements reduce housing affordability and impose various economic and environmental costs. The Housing Task Force reports that minimum parking requirements add as much as \$165,000 to the price of a new housing unit, and parking space demand is falling, with one in three parking stalls going unsold. Based on typical affordable housing development costs, one parking space per unit increases costs by approximately 12.5%, and two parking spaces can raise prices by 25%.

Residential minimum parking requirements should ensure that a basic, responsible parking level is provided without unduly increasing the development costs.

### 6.3.3 Parking Reform

Minimum parking requirements have long been a staple of urban planning regulations based on some formulation. These regulations are driven by auto-centric engineering models. Recent changes in transportation technology and services, characterized by ride-hailing and automobile sharing, and the emerging technologies dominated by Autonomous Vehicles (AVs) suggest that automobile ownership will likely experience declines.

The Town's growth objective is to create and develop a sustainable and livable town through urban design criteria and guidelines. The Region's OP embraces sustainability and creates a vision for complete compact communities served by streets made for walking, cycling, and an attractive transit system. This vision is supported by policies to reduce auto dependence and provide connectivity for pedestrian and cycling networks. The transportation policies are deliberately interspersed with the land-use policies to emphasize the importance of considering both areas to achieve the overall vision of complete compact communities.

The intent is to reprioritize mobility to balance the transportation system. A more sustainable community requires an integrated transportation system that supports a compact urban form. Bringing jobs, housing services, and amenities closer encourages non-automobile modes of travel, providing more choice to Halton Hills residents.

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<sup>24</sup> Statistics Canada, 2021 Census Profile, <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/>, Accessed May 2023



To encourage active transportation and transit-friendly neighbourhood centred around the Georgetown GO Station as outlined in the Region's OP, the Town needs to recognize that minimum parking requirements present a significant barrier to these goals. It must be remembered that parking carries high costs, heavily subsidizes the choice to drive, and hampers the ability to promote sustainable developments. Parking should not be viewed as only an amenity required to support our towns and our ability to drive; instead, it must be considered a significant economic investment that carries outcomes that shape our towns, cities, and regions.

## 6.4 Future Transit Plans

The study area currently has transit service in the form of GO train and GO bus service. Future transit plans for the Georgetown GO Station area outline plans to intensify development around the GO Station and improve cycling and pedestrian network connectivity. The Georgetown GO Station Area Secondary Plan<sup>25</sup> outlines that at the GO station, various modes of transportation are planned to be supported through consideration for "pedestrians, bicycle routes, bicycle parking, commuter pick-up/drop off areas, carpool parking, car share vehicles, and parking/recharging stations for electric vehicles". GO Train service is expected to increase with improvements to service such as two-way, all-day service.

With future plans for the Georgetown GO Station and the surrounding area as a MTSA, the existing zoning parking rates will not support the orderly development of the Georgetown GO Station area.

## 6.5 Travel Trends

The Transportation Tomorrow Survey<sup>26</sup> (TTS) is a comprehensive travel survey conducted in the southern Ontario once every five years. **Table 6.4** summarizes the TTS mode share estimates for the Town of Halton Hills as a whole. The data is aggregated by survey year (Year 2006, 2011 and 2016). **Appendix P** contains the TTS data.

Travel by automobile in the Town accounts for approximately 90% of daily trips. Active transportation (AT) and transit-oriented trips account for approximately 6% of daily trips.

<sup>25</sup> Town of Halton Hills, Georgetown GO Station Area/Mill Street Corridor – Secondary Plan Review – Background and Policy Options Report, 2022

<sup>26</sup> <http://dmg.utoronto.ca/transportation-tomorrow-survey/tts-introduction>



**TABLE 6.4: TTS MODE SHARE – HALTON HILLS**

<b>Travel Mode</b>	<b>Year 2006</b>	<b>Year 2011</b>	<b>Year 2016</b>
<b>Active Transportation</b>	<b>4%</b>	<b>4%</b>	<b>5%</b>
Cycle	0%	0%	1%
Walk	4%	4%	4%
<b>Auto Oriented</b>	<b>90%</b>	<b>91%</b>	<b>90%</b>
Auto driver	75%	77%	76%
Auto passenger	14%	13%	14%
Motorcycle	0%	0%	0%
Paid rideshare	0%	0%	0%
Taxi passenger	0%	0%	0%
<b>Transit</b>	<b>1%</b>	<b>2%</b>	<b>1%</b>
GO rail only	1%	1%	1%
Joint GO rail and local transit	0%	0%	0%
Transit excluding GO rail	0%	0%	0%
<b>Other (School bus, etc.)</b>	<b>5%</b>	<b>3%</b>	<b>4%</b>
<b>Grand Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



**Table 6.5** summarizes the TTS mode share estimates for TTS Zones surrounding GO Transit stations along the Kitchener Line between Kitchener and Mount Pleasant. The data is aggregated by survey year (Year 2006, 2011 and 2016).

Though other transit stations along the Kitchener Line include some cities which contain local transit service, the mode share in these areas provides a look at what the future environment of Georgetown could be with the planned GO Station redevelopment.

Travel by automobile within TTS Zones surrounding GO Transit stations accounts for approximately 88% of daily trips. Active Transportation (AT) and transit-oriented trips account for approximately 8% of daily trips.

**TABLE 6.5: TTS MODE SHARE – KITCHENER LINE**

Travel Mode	Year 2006	Year 2011	Year 2016
<b>Active Transportation</b>	<b>3%</b>	<b>3%</b>	<b>3%</b>
Cycle	0%	0%	0%
Walk	3%	3%	3%
<b>Auto Oriented</b>	<b>90%</b>	<b>93%</b>	<b>88%</b>
Auto driver	76%	80%	70%
Auto passenger	14%	13%	17%
Motorcycle	0%	0%	0%
Paid rideshare	0%	0%	0%
Taxi passenger	0%	0%	0%
<b>Transit</b>	<b>5%</b>	<b>2%</b>	<b>5%</b>
GO rail only	1%	0%	0%
Joint GO rail and local transit	0%	1%	0%
Transit excluding GO rail	4%	2%	5%
<b>Other (School bus, etc.)</b>	<b>2%</b>	<b>1%</b>	<b>4%</b>
<b>Grand Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

With an existing active transportation and transit mode share in the order of 8%, travel and dependence upon automobile in areas surrounding the Kitchener Line is lower than other areas in Halton Hills.

This data in comparison to the Town of Halton Hills as a whole, alludes that for developments located near a transit rail line results in a higher uptake and use of the adjacent transit services.





The Halton Transportation Master Plan outlines the transit mode share target for a gradual transition to a transit supportive environment over the next 20 years. **Table 6.6** summarizes the Region's Mode Share Targets<sup>27</sup>.

**TABLE 6.6: HALTON REGION TRANSIT MODE SHARE TARGETS**

Horizon Year	Internal Trips	External Trips	Total
2016	2%	7%	5%
2021	6%	20%	10%
2026	8%	30%	15%
2031	11%	30%	20%

## 6.6 Vehicle Ownership

Vehicle ownership data from the Transportation Tomorrow Survey (TTS) for apartment units in zones surrounding GO Transit stations along the Kitchener Line between Kitchener and Mount Pleasant was reviewed. Findings indicate approximately 40% of residents living in apartment units do not own a vehicle.

**Table 6.7** summarizes the vehicle ownership characteristics for apartment units for zones surrounding the GO Transit stations along the Kitchener Line. The survey data suggests that vehicle ownership for apartment units is approximately 0.60 vehicles per unit.

**Appendix P** contains the TTS data.

**TABLE 6.7: VEHICLES PER HOUSEHOLD (2016 TTS)**

Dwelling Unit Type	Number of Vehicles in Household					Total
	0	1	2	3	4	
Apartment	170	257	0	0	0	<b>427</b>
Vehicles	0	257	0	0	0	<b>257</b>
Percentage	0%	100%	0%	0%	0%	<b>100%</b>
<b>Vehicles per Unit</b>	<b>0.00</b>	<b>0.60</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.60</b>

<sup>27</sup> Halton Region Transportation Master Plan (2031). Table 7.1 Transit Mode Share Targets by Horizon.



The vehicle ownership data along the Kitchener Line provides an outlook at the possible mode shifts the Town of Halton Hills could see with the planned developments and investments.

Applying the Kitchener Line vehicle ownership rate of 0.60 vehicles per unit, the parking demand for occupants is estimated to be 384 spaces. With 688 occupant spaces proposed, the site's occupant parking supply is estimated to exceed the forecast demand by 304 spaces. Visitor parking is not included in this calculation.

Including the visitor parking demand, estimated by the Zoning By-law, 160 visitor parking spaces, the overall parking demand for the site is estimated to be 544 spaces. With 751 spaces proposed, the site's parking demand is estimated to be less than the proposed supply.

## 6.7 Industry Parking Guidelines

There are numerous industry associations that are dedicated to the survey and review of parking requirements related to various land uses. These associations, such as the Institute of Transportation Engineers (ITE), collect, review, and publish information related to parking demand, supply, and appropriate design standards.

An accepted industry standard for the determination of potential parking demand is ITE's Parking Generation Manual<sup>28</sup>. ITE provides data on surveys across the USA and Canada of peak parking demand for different land uses.

ITE Parking Generation is regarded as a reliable source for measured parking demands when local data cannot be readily collected at similar land uses.

Land Use Code 221 – Multi-family Housing (Mid-Rise) and Land Use Code 222 – Multi-family Housing (High-Rise) in the Parking Generation Manual are applicable to the site. For Land Use Code 221, the setting General Urban/Suburban (< ½ mile to rail transit) was used since the site is located within half a mile (± 800 m) of the Georgetown Go Station. For Land Use Code 222, there is no setting for a General Urban/Suburban site near rail transit, the setting General Urban/Suburban (no nearby rail transit) was used.

**Table 6.8** summarizes the estimated peak parking generation for the subject site.

ITE data does not aggregate the parking generation data by occupant or visitor. The data is an overall rate for both occupant and visitor

<sup>28</sup> Institute of Transportation Engineers Parking Generation Manual, 5th Edition



parking demands. It is also acknowledged that that the ITE rates may include some locations where local transit is present which will impact the parking rate.

The site's parking demand using the ITE methodology is estimated to range from 645 to 655 parking spaces. The site's parking demand is forecast to be less than the proposed supply of 751 parking spaces.



**TABLE 6.8: ITE PARKING GENERATION**

Land Use	221 - Multifamily Housing (Mid-Rise)	222 - Multifamily Housing (High-Rise)
Variable	Dwelling Units	Dwelling Units
Period	Weekday (Monday - Friday)	Weekday (Monday - Friday)
Setting	General Urban/Suburban (< 1/2 mile to rail transit)	General Urban/Suburban (no nearby rail transit)
Number of Studies:	27	5
Avg. Num. of Dwelling Units:	318	399
Average Rate:	1.12	0.98
Range of Rates:	0.55 - 1.45	0.57 – 1.19
33rd / 85th Percentile:	0.91 / 1.25	0.78 / 1.19
95% Confidence Interval:	1.06 - 1.18	***
Standard Deviation:	0.17	0.27
Coefficient of Variation:	15%	28%
Fitted Curve Equation:	$P = 1.22(X) - 31.38$	$P = 1.25(X) - 105.47$
R2:	0.99	0.97
<b>Calculated Parking Demand:</b>	<b>151 units</b>	<b>486 units</b>
<b>Average Rate</b>	<b>169</b>	<b>476</b>
	<b>645</b>	
<b>Fitted Curve</b>	<b>153</b>	<b>502</b>
	<b>655</b>	



## 6.8 Parking Survey Data

Another proven method of estimating parking demands is to survey existing sites with similar situational characteristics. Local surveys are perceived to be the best predictor of demands.

A range of parking surveys have been reviewed to assess the parking demand for the subject site. The survey sites have been reviewed based on a neighbourhood multi-modal assessment to ensure they provide comparable environments to the subject site. The tools used to assess the neighbourhood characteristics are the Walk Score, Transit Score, and Bike Score:

- ▶ **Walk Score** is a well-known (but proprietary) measure of walkability – it aggregates several data sources to provide a proxy measure of the quality of the pedestrian environment. It is used to gauge the walkability and destination density of each neighbourhood.
- ▶ **Transit Score** is a measure of transit accessibility. It aggregates information regarding transit frequency, the density of stops and routes, and mode of service. It is used to gauge the transit accessibility of each neighbourhood.
- ▶ **Bike Score** is a measure of the area's ability to accommodate cyclists. A Bike Score is calculated for a given location by measuring bike infrastructure (lanes, trails, etc.), hills, destinations and road connectivity, and the number of bike commuters.

**Table 6.9** summarizes the proxy survey sites, their neighbourhood characteristics, and the observed parking rates. Parking proxy survey data can be found in **Appendix Q**. The parking studies are generally located at car-dependent sites with little to no transit access. Bike infrastructure around the sites ranges from some infrastructure (i.e. Bikeable) to no infrastructure. Overall, the parking rates at the survey sites range from 0.75 to 1.17 parking spaces per unit; the average parking rate is 1.00 parking spaces per unit.

Similar to ITE's methodology, a parking demand equation was derived from the survey data based on number of units and the observed maximum parking demand. **Figure 6.1** illustrates the proxy sites parking demand and the derived equation.

Based on the derived equation, the subject site with 637 residential units would have a parking demand of 595 parking spaces. The proposed parking of 751 parking spaces would provide 156 more spaces than the anticipated demand.



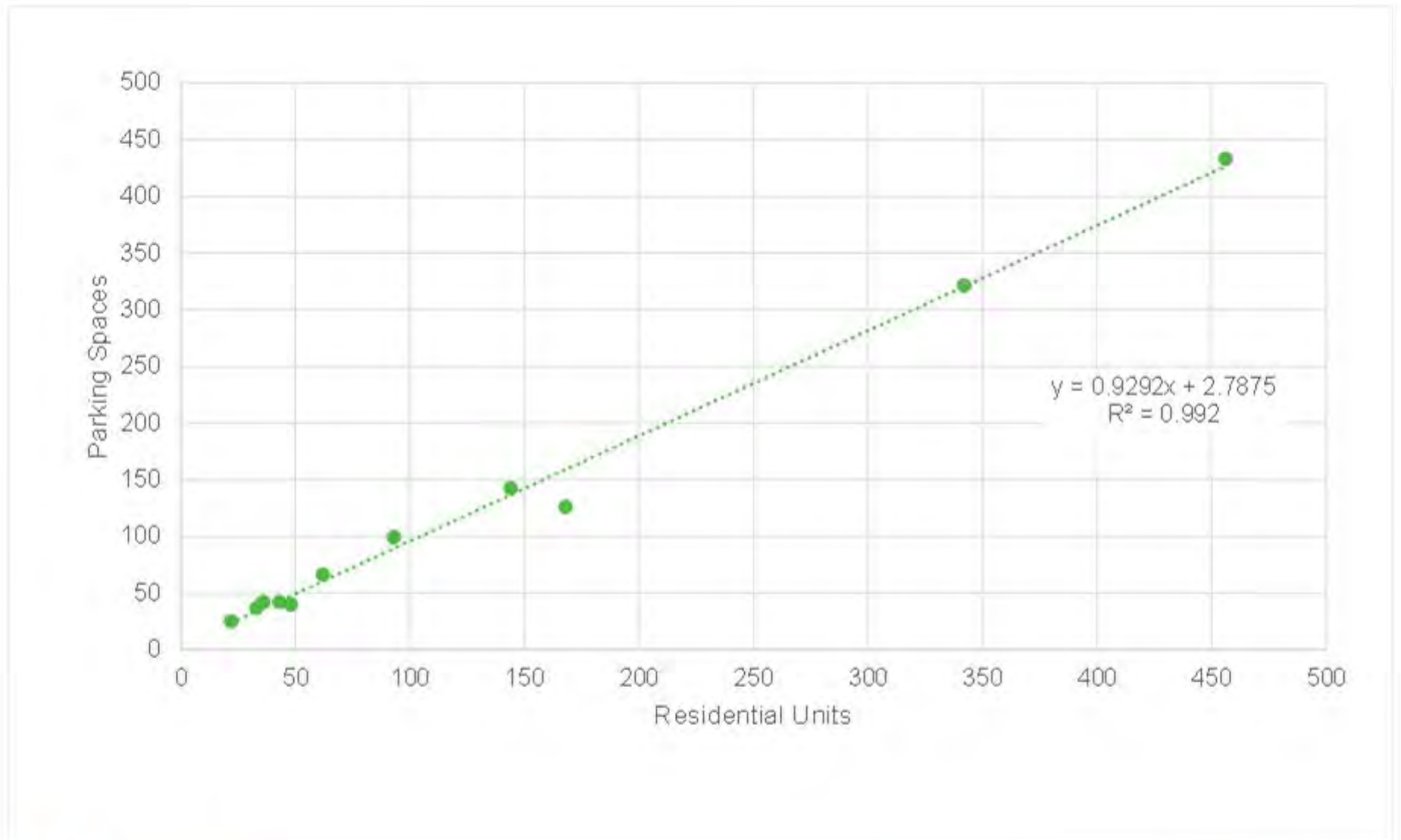
**TABLE 6.9: PROXY SURVEY CHARACTERISTICS**

Site	Survey Year	Walk Score	Transit Score	Bike Score	Units	Parking Rate
21 Raylawn Crescent, Halton Hills	2020 <sup>1</sup>	Car-Dependent	--	Bikeable	43	0.98
9 Bonheur Court, Brantford		Car-Dependent	--	--	144	0.99
63 Sympatica Crescent, Brantford		Car-Dependent	--	Bikeable	168	0.75
192 Churchill Road South, Halton Hills		Car-Dependent	--	Somewhat Bikeable	22	1.14
196 Churchill Road South, Halton Hills		Car-Dependent	--	Somewhat Bikeable	33	1.12
200 Churchill Road South, Halton Hills		Car-Dependent	--	Somewhat Bikeable	36	1.17
16 4th Street, Orangeville	2017 <sup>1</sup>	Very Walkable	Some Transit	Bikeable	48	0.83
45 Bredin Parkway, Orangeville		Very Walkable	Some Transit	Bikeable	93	1.07
16 Concord Place, Grimsby	2022 <sup>2</sup>	Car-Dependent	--	Somewhat Bikeable	342	0.94
100 Shoreview Place, Hamilton		Car-Dependent	Minimal Transit	Somewhat Bikeable	456	0.95
115 John Street, Halton Hills	2015 <sup>2</sup>	Car-Dependent	--	Somewhat Bikeable	62	1.07
<b>Average Parking Rate</b>						<b>1.00</b>

<sup>1</sup> Amico Properties Inc. Parking Study Update, Proposed Mixed-Use Development 71 Main Street, Town of Halton Hills, Lea Consulting, March 2021

<sup>2</sup> Parking Survey data collected by Paradigm Transportation Solutions Ltd





## Proxy Sites Parking Demand

## 6.9 Parking Reduction

A Transportation Demand Management (TDM) plan aims to reduce the development's overall traffic and parking impacts by implementing strategies to affect the demand side of the transportation equation. TDM strategies include all the incentives and disincentives that increase people's likelihood of changing their travel behaviour. Strategies include financial incentives, time incentives, new or enhanced commuter services, dissemination of information, and marketing alternative services.

As outlined in the Town's TMP, TDM measures are important initiatives to reduce single-occupant vehicle travel, lessen congestion on the Town's road system and support sustainable travel behaviour.

Generally, applying TDM measures can result in a reduction of parking demand. The Town of Halton Hills currently does not have a method for calculating a parking reduction based on a proposed TDM program.

Parking demand for the subject site is estimated to vary between 544 and 655 parking spaces based on the methodologies explored in this study. For the TDM parking reduction, the proxy survey parking demand estimate of 595 parking spaces is used as the "base parking demand" to which the parking reductions will be applied.

The Region of Waterloo TDM Checklist<sup>29</sup> was reviewed to determine potential parking reductions based on the TDM plan outlined in **Section 3.2** of this report.

With the TDM measures proposed, the site's potential parking reduction is calculated to be 13% of the parking requirement. The reduction in parking is related to:

- ▶ **Pedestrian & Cyclist Orientation – 1% reduction**
  - Development incorporates functional building entrances that are oriented to public space or to locations where pedestrians and transit users arrive from such as a street, square, park, or plaza. – 1% reduction
- ▶ **Parking – 3% reduction**
  - 75% of parking or more is located underground or in a structure – 3% reduction
- ▶ **Trip Reduction Incentives – 9% reduction**

<sup>29</sup> Region of Waterloo Report P-13-088, Proposed Revisions to the Regional Transportation Impact Study Guidelines, September 10, 2013





- The building owner/occupant will provide subsidized transit passes for all occupants – 4% reduction; and
- The building owner/occupant agrees to charge for parking as a separate cost to occupants – 5% reduction.

A 13% reduction to the local parking survey data results in a parking demand of 518 spaces. With a total parking supply of 751 spaces, the site's parking demand is forecast to be less than the proposed supply.

**Appendix R** contains the Region of Waterloo TDM Checklist.

## 6.10 Summary

Using several different methodologies, the proposed 637-unit apartment development is estimated to have a parking demand in the order of 518 to 647 spaces, depending upon the methodology used to forecast the demand. The proposed parking supply of 751 spaces is sufficient to accommodate the estimated demands.

**Table 6.10** summarizes the parking demand estimates.

**TABLE 6.10: SUMMARY OF PARKING DEMAND ESTIMATES**

Methodology	Estimated Parking Demand		
	O	V	Total
Town of Halton Hills Zoning By-Law	956	160	1116
Zoning By-Law Other Municipalities Average	557	90	647
TTS Vehicle Ownership + Visitor By-Law	384	160	544
Institute of Transportation Engineers – per Unit	--	--	655
Proxy Site Parking Demand	--	--	595
Waterloo TDM Reduction with Proxy Site Data	--	--	518

The transition from an automobile-dependent environment to one that supports active transportation and transit will require strategies to assist in shifting mode choice and enabling the emergence of a pedestrian-friendly and transit-supportive environment through TDM measures.

To support the proposed parking supply, a shift in travel modes and vehicle ownership for residents plus the integration of TDM measures will be critical to the development's success.



Overall, the parking demand is forecast to be significantly lower than the zoning by-law requirements and the proposed parking supply of 751 parking spaces is expected contain the parking demand on site.



## 7 Conclusions and Recommendations

### 7.1 Conclusions

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

#### Transportation Impact Assessment

- ▶ **Base Year Traffic Operations:** No critical movements are noted in the base year operations at the study area intersections.
- ▶ **Estimated Site Generated Traffic:** The subject site is estimated to generate approximately 187 vehicle trips during the AM peak hour and 215 vehicle trips during the PM peak hour.
- ▶ **Background Traffic Operations – Five-Year Horizon:** As the traffic volumes increase, capacity issues (v/c ratio greater than 0.85) are forecast for the westbound approach at the Mountainview Road North and River Drive intersection during the PM peak hour.
- ▶ **Background Traffic Operations – Ten-Year Horizon:** As the traffic volumes increase, the capacity issues outlined under the five-year horizon are expected to continue to occur.
- ▶ **Total Traffic Operations – Five-Year Horizon:** The capacity deficiencies identified under background conditions will deteriorate with the addition of site generated traffic. No new capacity issues are triggered by the addition of site generated traffic.

No capacity issues are forecast to occur at any other study area intersection or the site driveways.

- ▶ **Total Traffic Operations – Ten-Year Horizon:** The capacity deficiencies identified under background conditions will deteriorate with the addition of site generated traffic. The addition of site generated traffic trigger capacity issues for the shared northbound left/through movement at the Mountainview Road North and River Drive intersection.

No capacity issues are forecast to occur at any other study area intersection or the site driveways.

- ▶ **St. Michaels Street Extension:** The extension of St. Michaels Street to John Street will have a negligible impact on traffic operations throughout the study area and is not required from a capacity perspective. The unopened right-of-way would be better used as an Active Transportation (AT) connection



between John Street and Caroline Street. Desire lines through the grassed area were observed in the field suggesting the need for this AT connection.

- ▶ **130 Mountainview Road Sensitivity:** The addition of the 130 Mountainview Road development is forecast to cause traffic operations to deteriorate at the intersection of Mountainview Road and River Drive. Capacity deficiencies and mitigation measures should be explored and addressed by the applicant of 130 Mountainview Road.
- ▶ **Remedial Measures:** To manage the expected growth in traffic at the Mountainview Road North and River Drive intersection, the road authority should consider:
  - Optimize signal timings with a protected westbound left-turn phase;
  - Reduce the southbound approach to one shared through/right lane and one left-turn lane with 50 metres of storage; and
  - Provide a northbound left-turn lane with 50 metres of storage.

The reconfiguration of the northbound and southbound lane groupings appears to be feasible without modifications to the existing pavement width. The revised lane configuration can likely be achieved by modifying the existing pavement markings and signage.

No new traffic control signals are recommended at the intersection of Mountainview Road North and John Street and no left-turn lanes are recommended at the proposed site driveways.

### Parking Study

The site's proposed parking supply is identified as 751 spaces with an allocation of 688 spaces for occupants and 63 spaces for visitors.

- ▶ The site's parking supply does not meet the Town's zoning by-law requirement. The site's parking supply is identified as 751 parking spaces (1.18 spaces per unit).
- ▶ The Town's TMP and the Region's OP both emphasise the need of influencing travel behaviour to encourage transit and active transportation in order to achieve multi-modal access through policies such as Transportation Demand Management (TDM), transit programmes, and walking and cycling.



- ▶ Vehicle ownership data from the Transportation Tomorrow Survey (TTS) for apartment units in zones surrounding GO Transit stations along the Kitchener Line between Kitchener and Mount Pleasant indicate an occupant parking demand for the subject site of 304 spaces. Visitor parking is not included in this calculation. Including the visitor parking demand, estimated by the Zoning By-law, 160 visitor parking spaces, the overall parking demand for the site is estimated to be 544 spaces.
- ▶ The ITE Parking Generation Manual indicates a parking demand ranging from 655 to 696 parking spaces (occupant and visitor).
- ▶ Proxy site data from multiple sites with similar neighbourhood characteristics indicates a parking demand of approximately 595 spaces (occupant and visitor). With a parking supply of 751 spaces, the site's parking demand is forecast to be less than the proposed supply.
- ▶ The TDM Checklist from the Region of Waterloo identifies a total of 13% reduction in parking spaces based on the proposed TDM program. This results in a forecast parking demand of 518 spaces.
- ▶ Using several different methodologies, the proposed development is estimated to have a parking demand in the order of 518 spaces to 647 spaces. With a parking supply of 751 spaces, the site's parking demand is forecast to be accommodated by the on-site parking.
- ▶ A site-specific parking rate of 1.18 spaces per unit is suitable for this site.

### Transportation Demand Management

- ▶ The site concept plan includes a robust TDM program that can assist in mitigating the site's transportation and parking impacts on the adjacent road network, promote a strong and vibrant economy, and create a livable community that has a balanced transportation network. The monitoring and adjustment of the site's TDM program will be critical to the site's success.

## 7.2 Recommendations

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

- ▶ At the Mountainview Road North and River Drive intersection the road authority consider:
  - Optimize signal timings with a protected westbound left-turn phase;



- Reduce the southbound approach to one shared through/right lane and one left-turn lane with 50 metres of storage; and
- Provide a northbound left-turn lane with 50 metres of storage.

The revised lane configuration can likely be achieved by modifying the existing pavement markings and signage.



# Appendix A

## Pre-Study Consultation



## Stefan Hajgato

---

**From:** Ivan Drewnitski <idrewnitski@haltonhills.ca>  
**Sent:** Wednesday, February 9, 2022 4:50 PM  
**To:** Stefan Hajgato  
**Cc:** Scott Catton; Maureen Van Ravens  
**Subject:** RE: (210781: 1 Rosetta St) Transportation Study - Terms of Reference

Hi Stefan,

Please see my comments below in **green**.

If you have any questions, please do not hesitate to contact me.

Thanks,

**Ivan Drewnitski**  
Transportation Planning Technologist  
Transportation & Public Works  
Town of Halton Hills  
T: 905-873-2601 ext. 2328  
[idrewnitski@haltonhills.ca](mailto:idrewnitski@haltonhills.ca)

---

**From:** Stefan Hajgato <>  
**Sent:** Thursday, January 27, 2022 9:04 AM  
**To:** Ivan Drewnitski <[idrewnitski@haltonhills.ca](mailto:idrewnitski@haltonhills.ca)>  
**Cc:** Scott Catton <>  
**Subject:** RE: (210781: 1 Rosetta St) Transportation Study - Terms of Reference

**[EXTERNAL EMAIL]**

Hi Ivan,

Please see attached.

**Stefan Hajgato, P.Eng.**  
*Transportation Engineer*  
(He/Him)



**Paradigm Transportation Solutions Limited**  
p: 519.896.3163 x209

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**From:** Ivan Drewnitski <[idrewnitski@haltonhills.ca](mailto:idrewnitski@haltonhills.ca)>  
**Sent:** Wednesday, January 26, 2022 5:48 PM



**To:** Stefan Hajgato <[shajgato@ptsl.com](mailto:shajgato@ptsl.com)>; Scott Catton <[scatton@ptsl.com](mailto:scatton@ptsl.com)>  
**Subject:** RE: (210781: 1 Rosetta St) Transportation Study - Terms of Reference

Hello,

Please send a conceptual site plan to my attention in order for us to be able to comment on the TIS terms of reference.

Thanks,

**Ivan Drewnitski**

Transportation Planning Technologist  
Transportation & Public Works  
Town of Halton Hills  
T: 905-873-2601 ext. 2328  
[ldrewnitski@haltonhills.ca](mailto:ldrewnitski@haltonhills.ca)

---

**From:** Stefan Hajgato <[shajgato@ptsl.com](mailto:shajgato@ptsl.com)>  
**Sent:** Thursday, January 20, 2022 11:35 AM  
**To:** Ivan Drewnitski <[ldrewnitski@haltonhills.ca](mailto:ldrewnitski@haltonhills.ca)>  
**Cc:** Scott Catton <[scatton@ptsl.com](mailto:scatton@ptsl.com)>  
**Subject:** RE: (210781: 1 Rosetta St) Transportation Study - Terms of Reference

**[EXTERNAL EMAIL]**

Hi Ivan,

We've been retained to complete a Traffic Impact Study, Parking Study, and Access Review for the proposed development at 1 Rosetta Street in Georgetown. The site concept plan includes 3 residential buildings ranging in height from 8-storey to 12-storey containing approximately 638 units. The parking supply is approximately 706 parking spaces (1.11 spaces / unit). The build-out year is currently unknown. The study will generally follow the Halton Region TIS guidelines. A copy of the current site plan is attached.

**General**

- SimTraffic queuing analysis is required for all intersections.
- We agree with the methodology for trip generation, distribution and the proposed study hours. However, query results obtained from the TTS data shall be appended to the report for our reference and review.
- The study must document active transportation (pedestrian and cyclist) and transit opportunities, travel demand management and provide recommendations for infrastructure improvements and other measures to promote active transportation.
- Internal (on-site) pavement marking and signage plan, please reference the Ontario Traffic Manual regarding the type and location of signs and pavement markings. Traffic calming measures, such as Raised Pedestrian Crossings and Speed Humps are strongly encouraged at applicable locations. Signs and pavement markings are to conform to the Ontario Traffic Manual. The plan shall additionally present right-of-way widths, fire routes with appropriate signage, accessible parking with signage, parking spaces and pedestrian connections.

Can you please review our proposed scope of work and provide comment by 01 February 2022?

Key items I would like to have input on include:

1. Method to develop baseline volumes for analysis. See our suggested approach below; [Approach is acceptable](#).

2. Adjacent developments to include in the traffic forecast; and [Included below.](#)
3. Any planned geometric or traffic control improvements at the intersections in the study area?  
[Information provided below.](#)

## **Transportation Impact Study**

### Study Area Intersections:

- Mountainview Road North at River Drive (signalized);
- Mountainview Road North at John Street (unsignalized);
- River Drive at Rosetta Street (unsignalized);
- River Drive at Daniela Street (unsignalized);
- River Drive at St. Michaels Street/GO Parking Driveway (unsignalized);
- St. Michaels Street (existing and future)/Caroline Street (uncontrolled);
- John Street at Rosset Valley Court. (unsignalized);
- John Street at Victoria Street (unsignalized); and
- The two proposed site driveways.

### Existing Data

- Weekday Turning Movement Count (TMC) data has been obtained from the Town for the following intersections:
  - Mountainview Road North at River Drive (2019);
  - Mountainview Road North at John Street (2019);
  - River Drive at Rosetta Street (2004); and
  - John Street at Victoria Street (2019).
- New TMC data will be collected at the following intersections as no data is available:
  - River Drive at St. Michaels Street/GO Parking Driveway;
  - St. Michaels Street (existing and future)/Caroline Street;
  - John Street at Rosset Valley Court; and
  - River Drive at Daniela Street.
  - [New counts should be conducted for the 2019 & 2004 intersections.](#)
- Base Year Forecast - The existing TMC data will be increased to a year 2022 condition using a growth rate of 2% per annum.
- Existing signal timing plans to be obtained. [Attached above.](#)

### Analysis Periods

- Weekday AM and PM peak hours.

### Horizon Years

- Existing (Base Year)
- 5-years from the date of the study (Year 2027); and
- 10-years from the date of the study (Year 2032).

### Analysis

- Synchro 10, HCM 2000 analysis
- TAC left-turn lane warrants, OTM signal warrants ([please ensure to conduct one especially for Mountainview Road at John Street](#)), etc.

### Background Traffic

- Growth rate of 2% per annum for all movements along Mountainview Road North. This is the only study area road that may be significantly impacted by future background growth. All other roads are assumed to have zero growth. [Please also include a growth rate of 2% per annum for all movements along River Drive west of Mountainview Road North, as there are developable lands within this area that are expected to be built out within the 2032 study horizon.](#)

### Active Development Applications:

- Sites to be identified by Town Staff.
- [167 - 171 Mountainview Rd N \(10 Unit Condominium Bungaloffs\)](#)

### Capital Works Improvements

- Improvements (if any) to be identified by Town Staff.

### Sensitivity Analysis

- Possible extension of St. Michaels Street to John Street.

#### Trip Generation

- ITE Trip Generation Data 11th Edition
  - LUC 221 – Multifamily Housing (Mid-Rise) – General Urban / Suburban Locations.
  - LUC 222 – Multifamily Housing (High-Rise) – General Urban / Suburban Locations.
  - The AM trip generation is estimated to be 182 trips. The PM trip generation is estimated to be 209 trips.

#### Modal Split Reductions:

- None for analysis purposes.

#### Site Traffic Distribution

- Existing travel patterns/TTS data

#### Transportation Demand Management

- A comprehensive Transportation Demand Management Plan is to be part of the report. Provide a TDM plan to demonstrate measures to be implemented to reduce single occupancy vehicle (SOV) trips to the site.

#### **Parking Study**

We will calculate the parking supply required for the proposed development by the municipal zoning by-law. If the planned parking supply does not meet the by-law requirement, we will forecast peak parking demand based on the rates obtained from the Institute of Transportation Engineers (ITE) Parking Generation (5th Edition), TTS Data, proxy data, and other available information. This forecast will be further refined through consideration of typical auto ownership characteristics for land uses of this nature.

COVID-19 containment measures are expected to impact our ability to collect accurate proxy site data. Published data is considered more reliable.

If the planned parking supply for the proposed development will adequately serve the forecast peak demand, we will provide a justification for the proposed number of spaces, recognizing site constraints, local conditions, and potential spillover impacts. We will identify parking management measures that could be considered to alleviate the projected supply deficit (e.g., transit, active transportation, TDM strategies, shared parking). This may include use of legal on-street and off-site parking nearby.

#### **Access and Circulation Review**

The analysis will be completed using AutoTURN and include assessments of vehicle access and egress, clearance and swept path maneuvers within the site based on a suitable design vehicle (e.g., fire, garbage, moving trucks) to identify potential conflicts with the site driveways, circulation aisles, loading areas and/or parking layout.

We will determine sight distance requirements following applicable review agency and industry guidelines and assess compliance based on field measurements. If the sight distance available does not meet the minimum requirement, mitigating measures will be identified.

Review the underground parking plan illustrating the passenger vehicle movements exiting and entering the underground parking area to ensure that the turning movements will be adequately accommodated at the underground parking level.

#### **Report**

We will document the study methodologies, findings, and conclusions in a report. The report will include appendices containing the detailed analysis results and any data collected.

Regards,

**Stefan Hajgato, P.Eng.**

*Transportation Engineer  
(He/Him)*



**Paradigm Transportation Solutions Limited**

150 Pinebush Road, Unit 5A, Cambridge ON N1R 8J8

p: 519.896.3163 x209

e: [shajgato@ptsl.com](mailto:shajgato@ptsl.com)

w: [www.ptsl.com](http://www.ptsl.com)

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# Appendix B

## Traffic Data





Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cdowness@pts.com

Count Name: Mountainview Road & River Drive  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 1

### Turning Movement Data

Start Time	River Drive Eastbound						River Drive Westbound						Mountainview Road Northbound						Mountainview 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	0	2	5	0	0	7	29	1	2	0	0	32	3	28	16	0	0	47	6	42	0	0	1	48	134
7:15 AM	1	2	6	0	0	9	20	0	2	0	0	22	2	24	37	0	0	63	26	53	0	0	0	79	173
7:30 AM	0	5	9	0	0	14	21	0	3	0	2	24	3	23	32	0	0	58	13	48	0	0	0	61	157
7:45 AM	2	6	4	0	0	12	27	2	6	0	1	35	4	37	36	0	0	77	16	73	0	0	0	89	213
Hourly Total	3	15	24	0	0	42	97	3	13	0	3	113	12	112	121	0	0	245	61	216	0	0	1	277	677
8:00 AM	1	2	14	0	0	17	21	2	7	0	2	30	0	58	37	0	0	95	7	99	1	0	2	107	249
8:15 AM	0	4	8	0	0	12	20	1	2	0	1	23	3	48	33	0	0	84	12	103	0	0	2	115	234
8:30 AM	0	2	3	0	0	5	32	1	5	0	1	38	1	57	26	0	0	84	8	78	0	0	1	86	213
8:45 AM	0	0	10	0	0	10	36	1	6	0	0	43	5	54	21	0	0	80	7	94	2	0	0	103	236
Hourly Total	1	8	35	0	0	44	109	5	20	0	4	134	9	217	117	0	0	343	34	374	3	0	5	411	932
9:00 AM	1	0	4	0	0	5	19	0	4	0	0	23	2	61	20	0	0	83	3	63	0	0	0	66	177
9:15 AM	0	0	3	0	0	3	17	0	2	0	3	19	8	46	33	0	0	87	5	60	0	0	2	65	174
9:30 AM	1	1	7	0	1	9	21	1	5	0	1	27	3	32	20	0	0	55	4	52	0	0	2	56	147
9:45 AM	1	0	4	0	0	5	18	0	0	0	3	18	7	42	15	0	0	64	2	58	0	0	1	60	147
Hourly Total	3	1	18	0	1	22	75	1	11	0	7	87	20	181	88	0	0	289	14	233	0	0	5	247	645
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	1	1	6	0	0	8	11	2	2	0	0	15	3	58	21	0	0	82	0	46	0	0	3	46	151
11:15 AM	1	0	8	0	0	9	25	0	3	0	1	28	4	52	15	0	0	71	3	44	3	0	1	50	158
11:30 AM	0	2	5	0	0	7	32	2	4	0	3	38	7	56	12	0	0	75	5	61	0	0	2	66	186
11:45 AM	1	0	6	0	0	7	20	1	3	0	1	24	6	61	25	0	0	92	0	45	1	0	3	46	169
Hourly Total	3	3	25	0	0	31	88	5	12	0	5	105	20	227	73	0	0	320	8	196	4	0	9	208	664
12:00 PM	0	2	12	0	0	14	37	0	3	0	2	40	7	58	24	0	0	89	1	63	1	0	1	65	208
12:15 PM	2	1	7	0	0	10	25	2	2	0	0	29	1	72	28	0	0	101	1	48	0	0	0	49	189
12:30 PM	0	2	2	0	0	4	27	3	3	0	0	33	5	57	37	0	0	99	6	71	0	0	1	77	213
12:45 PM	0	3	7	0	0	10	23	1	6	0	4	30	3	63	28	0	0	94	4	63	0	0	4	67	201
Hourly Total	2	8	28	0	0	38	112	6	14	0	6	132	16	250	117	0	0	383	12	245	1	0	6	258	811
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	0	1	7	0	0	8	28	0	9	0	1	37	9	89	20	0	0	118	14	67	1	0	0	82	245
3:15 PM	2	0	9	0	0	11	37	4	13	0	1	54	4	79	29	0	0	112	8	71	1	0	1	80	257
3:30 PM	0	2	18	0	1	20	32	4	12	0	4	48	5	97	39	0	1	141	7	86	2	0	5	95	304
3:45 PM	0	2	7	0	1	9	35	1	10	0	3	46	5	85	32	0	0	122	5	57	1	0	5	63	240
Hourly Total	2	5	41	0	2	48	132	9	44	0	9	185	23	350	120	0	1	493	34	281	5	0	11	320	1046
4:00 PM	2	2	8	0	0	12	41	2	16	0	1	59	7	99	36	0	0	142	5	66	1	0	1	72	285
4:15 PM	0	4	11	0	0	15	27	5	10	0	1	42	8	87	31	0	0	126	6	73	1	0	2	80	263
4:30 PM	1	1	7	0	0	9	34	4	9	0	1	47	9	96	34	0	0	139	5	58	4	0	0	67	262

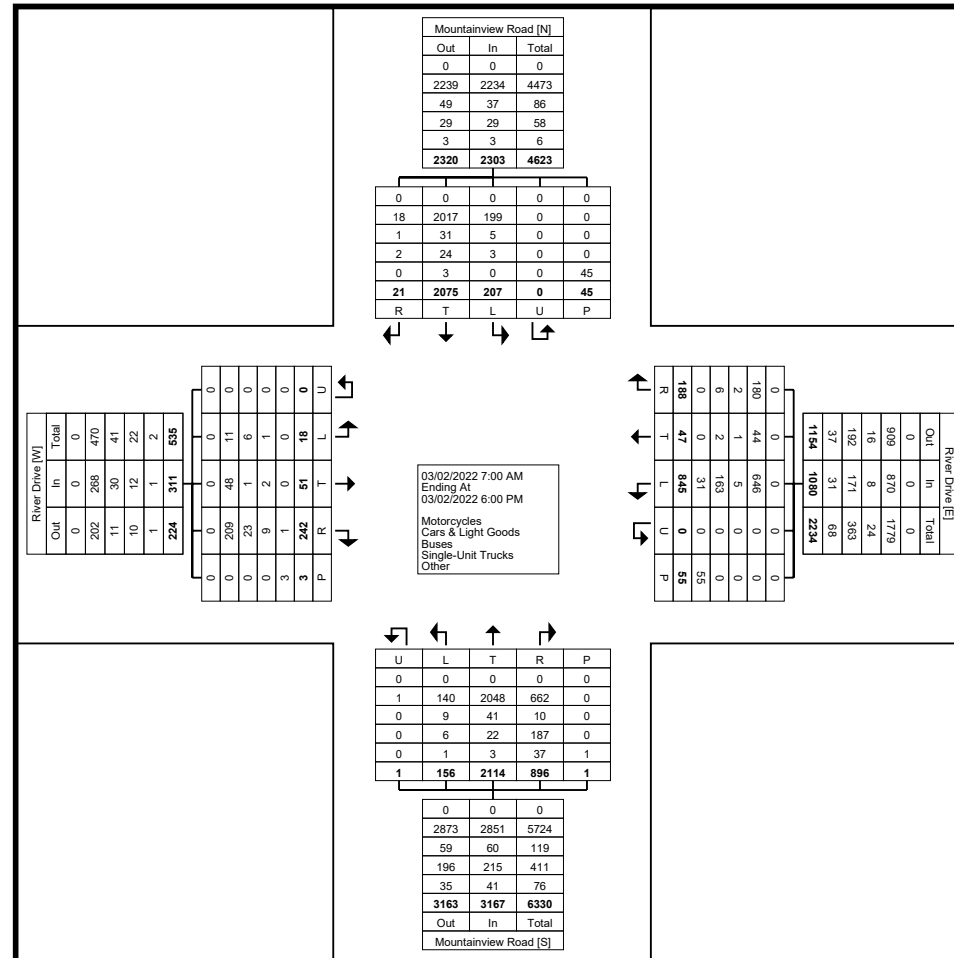
4:45 PM	1	1	11	0	0	13	25	2	13	0	7	40	12	99	33	0	0	144	6	73	0	0	2	79	276
Hourly Total	4	8	37	0	0	49	127	13	48	0	10	188	36	381	134	0	0	551	22	270	6	0	5	298	1086
5:00 PM	0	1	7	0	0	8	31	1	11	0	1	43	5	100	41	0	0	146	3	65	0	0	0	68	265
5:15 PM	0	1	10	0	0	11	26	2	8	0	6	36	2	106	31	0	0	139	8	70	1	0	3	79	265
5:30 PM	0	1	12	0	0	13	23	1	2	0	3	26	7	102	29	0	0	138	6	65	0	0	0	71	248
5:45 PM	0	0	5	0	0	5	25	1	5	0	1	31	6	88	25	1	0	120	5	60	1	0	0	66	222
Hourly Total	0	3	34	0	0	37	105	5	26	0	11	136	20	396	126	1	0	543	22	260	2	0	3	284	1000
Grand Total	18	51	242	0	3	311	845	47	188	0	55	1080	156	2114	896	1	1	3167	207	2075	21	0	45	2303	6861
Approach %	5.8	16.4	77.8	0.0	-	-	78.2	4.4	17.4	0.0	-	-	4.9	66.8	28.3	0.0	-	-	9.0	90.1	0.9	0.0	-	-	-
Total %	0.3	0.7	3.5	0.0	-	4.5	12.3	0.7	2.7	0.0	-	15.7	2.3	30.8	13.1	0.0	-	46.2	3.0	30.2	0.3	0.0	-	33.6	-
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	0.0	-	-	0.0	0.0
Cars & Light Goods	11	48	209	0	-	268	646	44	180	0	-	870	140	2048	662	1	-	2851	199	2017	18	0	-	2234	6223
% Cars & Light Goods	61.1	94.1	86.4	-	-	86.2	76.4	93.6	95.7	-	-	80.6	89.7	96.9	73.9	100.0	-	90.0	96.1	97.2	85.7	-	-	97.0	90.7
Buses	6	1	23	0	-	30	5	1	2	0	-	8	9	41	10	0	-	60	5	31	1	0	-	37	135
% Buses	33.3	2.0	9.5	-	-	9.6	0.6	2.1	1.1	-	-	0.7	5.8	1.9	1.1	0.0	-	1.9	2.4	1.5	4.8	-	-	1.6	2.0
Single-Unit Trucks	1	2	9	0	-	12	163	2	6	0	-	171	6	22	187	0	-	215	3	24	2	0	-	29	427
% Single-Unit Trucks	5.6	3.9	3.7	-	-	3.9	19.3	4.3	3.2	-	-	15.8	3.8	1.0	20.9	0.0	-	6.8	1.4	1.2	9.5	-	-	1.3	6.2
Articulated Trucks	0	0	1	0	-	1	31	0	0	0	-	31	1	3	34	0	-	38	0	3	0	0	-	3	73
% Articulated Trucks	0.0	0.0	0.4	-	-	0.3	3.7	0.0	0.0	-	-	2.9	0.6	0.1	3.8	0.0	-	1.2	0.0	0.1	0.0	-	-	0.1	1.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	3	0	-	3	0	0	0	0	-	0	3
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.3	0.0	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	5.5	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	52	-	-	-	-	-	1	-	-	-	-	-	-	45	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	94.5	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
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Count Name: Mountainview Road & River Drive  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 3



Turning Movement Data Plot





Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: Mountainview Road & River Drive  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 4

### Turning Movement Peak Hour Data (8:00 AM)

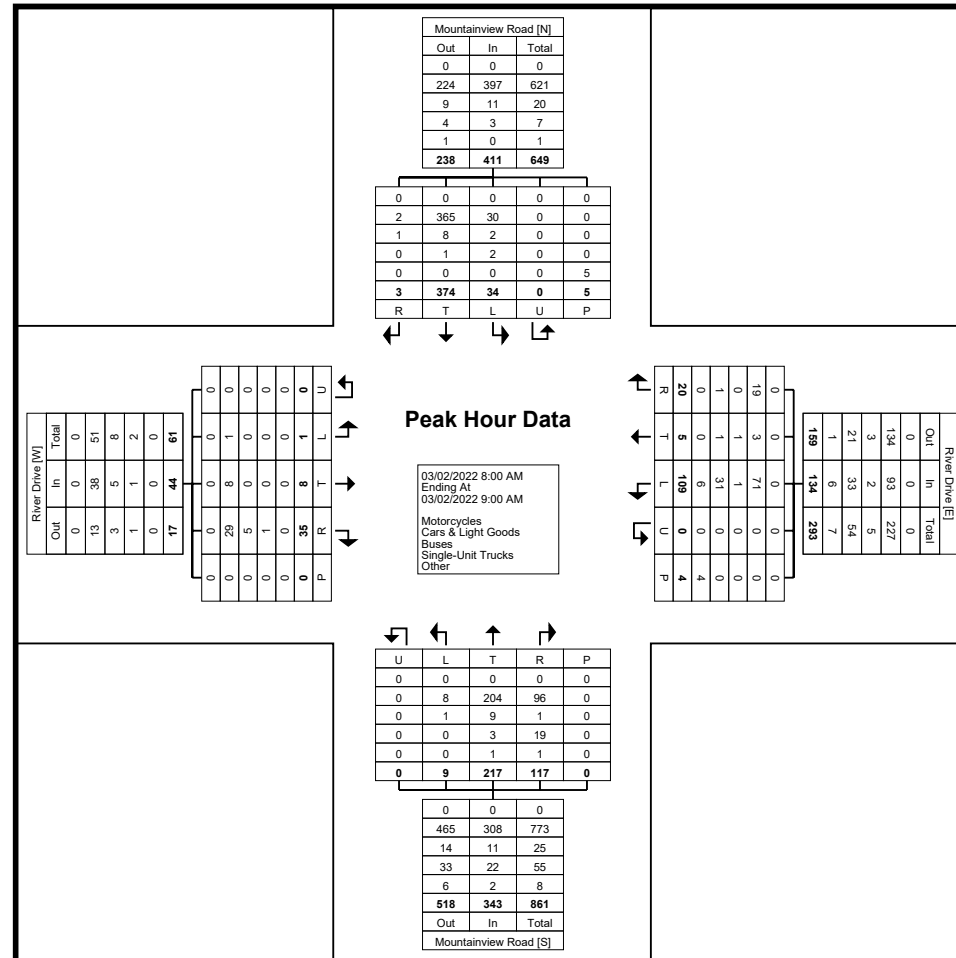
Start Time	River Drive Eastbound						River Drive Westbound						Mountainview Road Northbound						Mountainview Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:00 AM	1	2	14	0	0	17	21	2	7	0	2	30	0	58	37	0	0	95	7	99	1	0	2	107	249
8:15 AM	0	4	8	0	0	12	20	1	2	0	1	23	3	48	33	0	0	84	12	103	0	0	2	115	234
8:30 AM	0	2	3	0	0	5	32	1	5	0	1	38	1	57	26	0	0	84	8	78	0	0	1	86	213
8:45 AM	0	0	10	0	0	10	36	1	6	0	0	43	5	54	21	0	0	80	7	94	2	0	0	103	236
<b>Total</b>	<b>1</b>	<b>8</b>	<b>35</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>109</b>	<b>5</b>	<b>20</b>	<b>0</b>	<b>4</b>	<b>134</b>	<b>9</b>	<b>217</b>	<b>117</b>	<b>0</b>	<b>0</b>	<b>343</b>	<b>34</b>	<b>374</b>	<b>3</b>	<b>0</b>	<b>5</b>	<b>411</b>	<b>932</b>
Approach %	2.3	18.2	79.5	0.0	-	-	81.3	3.7	14.9	0.0	-	-	2.6	63.3	34.1	0.0	-	-	8.3	91.0	0.7	0.0	-	-	-
Total %	0.1	0.9	3.8	0.0	-	4.7	11.7	0.5	2.1	0.0	-	14.4	1.0	23.3	12.6	0.0	-	36.8	3.6	40.1	0.3	0.0	-	44.1	-
PHF	0.250	0.500	0.625	0.000	-	0.647	0.757	0.625	0.714	0.000	-	0.779	0.450	0.935	0.791	0.000	-	0.903	0.708	0.908	0.375	0.000	-	0.893	0.936
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	-	-	0.0	0.0
Cars & Light Goods	1	8	29	0	-	38	71	3	19	0	-	93	8	204	96	0	-	308	30	365	2	0	-	397	836
% Cars & Light Goods	100.0	100.0	82.9	-	-	86.4	65.1	60.0	95.0	-	-	69.4	88.9	94.0	82.1	-	-	89.8	88.2	97.6	66.7	-	-	96.6	89.7
Buses	0	0	5	0	-	5	1	1	0	0	-	2	1	9	1	0	-	11	2	8	1	0	-	11	29
% Buses	0.0	0.0	14.3	-	-	11.4	0.9	20.0	0.0	-	-	1.5	11.1	4.1	0.9	-	-	3.2	5.9	2.1	33.3	-	-	2.7	3.1
Single-Unit Trucks	0	0	1	0	-	1	31	1	1	0	-	33	0	3	19	0	-	22	2	1	0	0	-	3	59
% Single-Unit Trucks	0.0	0.0	2.9	-	-	2.3	28.4	20.0	5.0	-	-	24.6	0.0	1.4	16.2	-	-	6.4	5.9	0.3	0.0	-	-	0.7	6.3
Articulated Trucks	0	0	0	0	-	0	6	0	0	0	-	6	0	1	0	0	-	1	0	0	0	0	-	0	7
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	5.5	0.0	0.0	-	-	4.5	0.0	0.5	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.8
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	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	-	-	0.0	0.0	0.0	0.9	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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Count Name: Mountainview Road & River Drive  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 5



Turning Movement Peak Hour Data Plot (8:00 AM)



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
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Count Name: Mountainview Road & River Drive  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 6

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

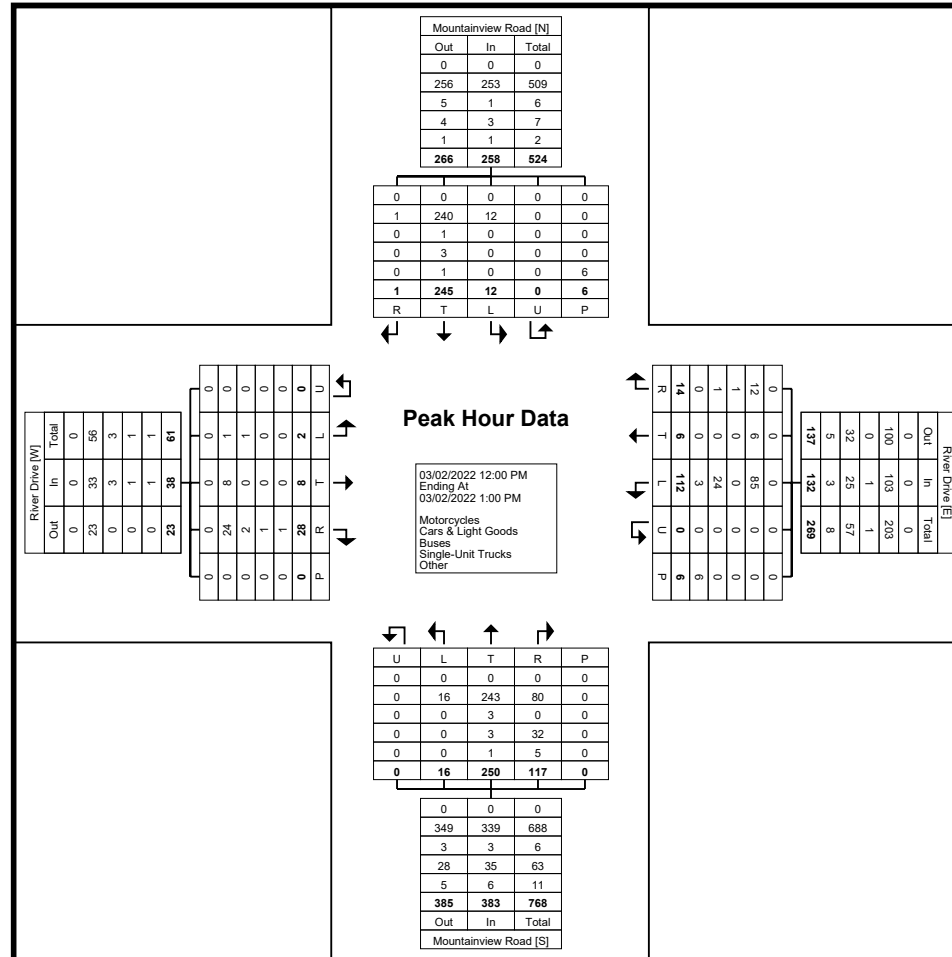
Start Time	River Drive Eastbound						River Drive Westbound						Mountainview Road Northbound						Mountainview Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	0	2	12	0	0	14	37	0	3	0	2	40	7	58	24	0	0	89	1	63	1	0	1	65	208
12:15 PM	2	1	7	0	0	10	25	2	2	0	0	29	1	72	28	0	0	101	1	48	0	0	0	49	189
12:30 PM	0	2	2	0	0	4	27	3	3	0	0	33	5	57	37	0	0	99	6	71	0	0	1	77	213
12:45 PM	0	3	7	0	0	10	23	1	6	0	4	30	3	63	28	0	0	94	4	63	0	0	4	67	201
<b>Total</b>	<b>2</b>	<b>8</b>	<b>28</b>	<b>0</b>	<b>0</b>	<b>38</b>	<b>112</b>	<b>6</b>	<b>14</b>	<b>0</b>	<b>6</b>	<b>132</b>	<b>16</b>	<b>250</b>	<b>117</b>	<b>0</b>	<b>0</b>	<b>383</b>	<b>12</b>	<b>245</b>	<b>1</b>	<b>0</b>	<b>6</b>	<b>258</b>	<b>811</b>
Approach %	5.3	21.1	73.7	0.0	-	-	84.8	4.5	10.6	0.0	-	-	4.2	65.3	30.5	0.0	-	-	4.7	95.0	0.4	0.0	-	-	-
Total %	0.2	1.0	3.5	0.0	-	4.7	13.8	0.7	1.7	0.0	-	16.3	2.0	30.8	14.4	0.0	-	47.2	1.5	30.2	0.1	0.0	-	31.8	-
PHF	0.250	0.667	0.583	0.000	-	0.679	0.757	0.500	0.583	0.000	-	0.825	0.571	0.868	0.791	0.000	-	0.948	0.500	0.863	0.250	0.000	-	0.838	0.952
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	-	-	0.0	0.0
Cars & Light Goods	1	8	24	0	-	33	85	6	12	0	-	103	16	243	80	0	-	339	12	240	1	0	-	253	728
% Cars & Light Goods	50.0	100.0	85.7	-	-	86.8	75.9	100.0	85.7	-	-	78.0	100.0	97.2	68.4	-	-	88.5	100.0	98.0	100.0	-	-	98.1	89.8
Buses	1	0	2	0	-	3	0	0	1	0	-	1	0	3	0	0	-	3	0	1	0	0	-	1	8
% Buses	50.0	0.0	7.1	-	-	7.9	0.0	0.0	7.1	-	-	0.8	0.0	1.2	0.0	-	-	0.8	0.0	0.4	0.0	-	-	0.4	1.0
Single-Unit Trucks	0	0	1	0	-	1	24	0	1	0	-	25	0	3	32	0	-	35	0	3	0	0	-	3	64
% Single-Unit Trucks	0.0	0.0	3.6	-	-	2.6	21.4	0.0	7.1	-	-	18.9	0.0	1.2	27.4	-	-	9.1	0.0	1.2	0.0	-	-	1.2	7.9
Articulated Trucks	0	0	1	0	-	1	3	0	0	0	-	3	0	1	5	0	-	6	0	1	0	0	-	1	11
% Articulated Trucks	0.0	0.0	3.6	-	-	2.6	2.7	0.0	0.0	-	-	2.3	0.0	0.4	4.3	-	-	1.6	0.0	0.4	0.0	-	-	0.4	1.4
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	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	6	-	-	-	-	-	0	-	-	-	-	-	6	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
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Count Name: Mountainview Road & River Drive  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 7



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



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Mountainview Road & River Drive  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 8

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

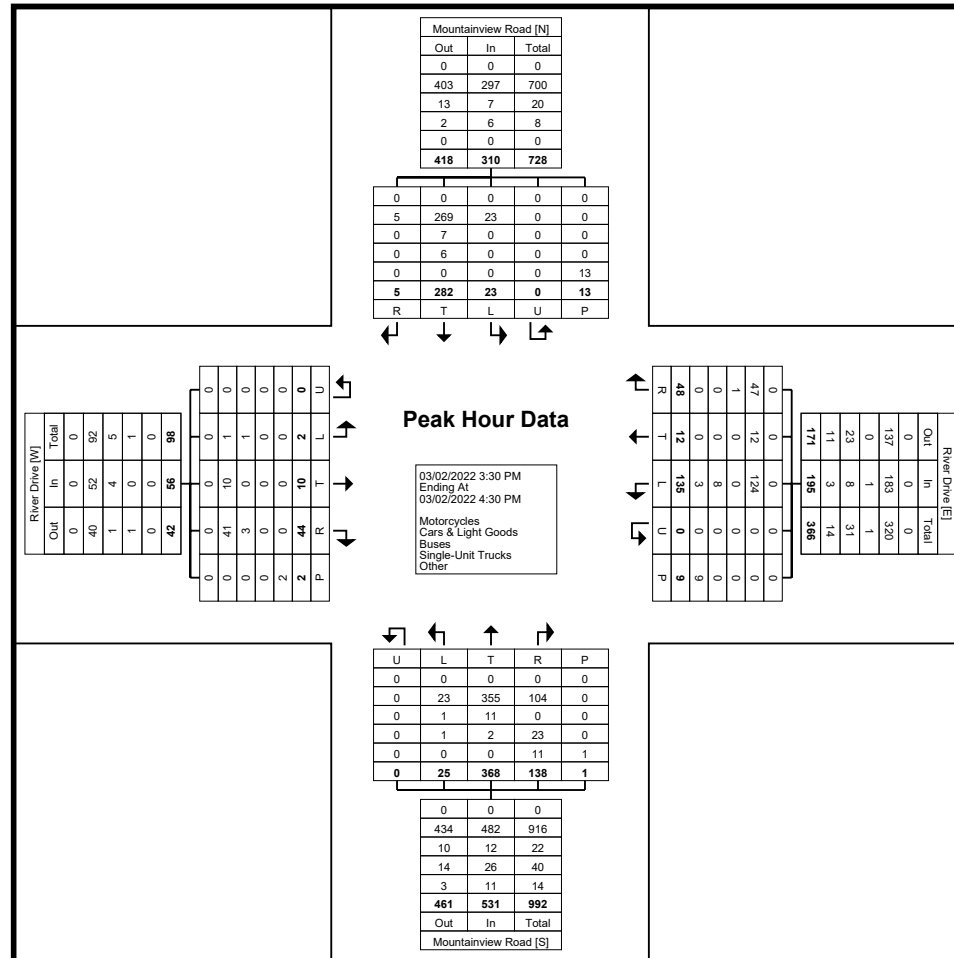
Start Time	River Drive Eastbound						River Drive Westbound						Mountainview Road Northbound						Mountainview Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
3:30 PM	0	2	18	0	1	20	32	4	12	0	4	48	5	97	39	0	1	141	7	86	2	0	5	95	304
3:45 PM	0	2	7	0	1	9	35	1	10	0	3	46	5	85	32	0	0	122	5	57	1	0	5	63	240
4:00 PM	2	2	8	0	0	12	41	2	16	0	1	59	7	99	36	0	0	142	5	66	1	0	1	72	285
4:15 PM	0	4	11	0	0	15	27	5	10	0	1	42	8	87	31	0	0	126	6	73	1	0	2	80	263
<b>Total</b>	<b>2</b>	<b>10</b>	<b>44</b>	<b>0</b>	<b>2</b>	<b>56</b>	<b>135</b>	<b>12</b>	<b>48</b>	<b>0</b>	<b>9</b>	<b>195</b>	<b>25</b>	<b>368</b>	<b>138</b>	<b>0</b>	<b>1</b>	<b>531</b>	<b>23</b>	<b>282</b>	<b>5</b>	<b>0</b>	<b>13</b>	<b>310</b>	<b>1092</b>
Approach %	3.6	17.9	78.6	0.0	-	-	69.2	6.2	24.6	0.0	-	-	4.7	69.3	26.0	0.0	-	-	7.4	91.0	1.6	0.0	-	-	-
Total %	0.2	0.9	4.0	0.0	-	5.1	12.4	1.1	4.4	0.0	-	17.9	2.3	33.7	12.6	0.0	-	48.6	2.1	25.8	0.5	0.0	-	28.4	-
PHF	0.250	0.625	0.611	0.000	-	0.700	0.823	0.600	0.750	0.000	-	0.826	0.781	0.929	0.885	0.000	-	0.935	0.821	0.820	0.625	0.000	-	0.816	0.898
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	-	-	0.0	0.0
Cars & Light Goods	1	10	41	0	-	52	124	12	47	0	-	183	23	355	104	0	-	482	23	269	5	0	-	297	1014
% Cars & Light Goods	50.0	100.0	93.2	-	-	92.9	91.9	100.0	97.9	-	-	93.8	92.0	96.5	75.4	-	-	90.8	100.0	95.4	100.0	-	-	95.8	92.9
Buses	1	0	3	0	-	4	0	0	1	0	-	1	1	11	0	0	-	12	0	7	0	0	-	7	24
% Buses	50.0	0.0	6.8	-	-	7.1	0.0	0.0	2.1	-	-	0.5	4.0	3.0	0.0	-	-	2.3	0.0	2.5	0.0	-	-	2.3	2.2
Single-Unit Trucks	0	0	0	0	-	0	8	0	0	0	-	8	1	2	23	0	-	26	0	6	0	0	-	6	40
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	5.9	0.0	0.0	-	-	4.1	4.0	0.5	16.7	-	-	4.9	0.0	2.1	0.0	-	-	1.9	3.7
Articulated Trucks	0	0	0	0	-	0	3	0	0	0	-	3	0	0	10	0	-	10	0	0	0	0	-	0	13
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	2.2	0.0	0.0	-	-	1.5	0.0	0.0	7.2	-	-	1.9	0.0	0.0	0.0	-	-	0.0	1.2
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	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	-	-	0.0	0.0	0.0	0.7	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	11.1	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	2	-	-	-	-	-	8	-	-	-	-	-	1	-	-	-	-	-	13	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	88.9	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
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Count Name: Mountainview Road & River Drive  
Site Code: 210781  
Start Date: 03/02/2022  
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Turning Movement Peak Hour Data Plot (3:30 PM)



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Mountainview Road & John Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 1

### Turning Movement Data

Start Time	John Street Eastbound						John Street Westbound						Mountainview Road Northbound						Mountainview 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	5	1	13	0	0	19	4	0	0	0	0	4	3	24	4	0	0	0	31	1	33	1	0	0	35	89
7:15 AM	2	3	26	0	0	31	0	0	2	0	2	2	5	19	2	0	0	0	26	2	51	4	0	0	57	116
7:30 AM	3	1	16	0	1	20	2	1	2	0	1	5	3	23	1	0	0	0	27	2	43	4	0	0	49	101
7:45 AM	6	4	18	0	1	28	7	6	0	0	1	13	11	33	2	0	0	0	46	2	61	4	0	1	67	154
Hourly Total	16	9	73	0	2	98	13	7	4	0	4	24	22	99	9	0	0	0	130	7	188	13	0	1	208	460
8:00 AM	4	1	18	0	4	23	4	3	3	0	0	10	14	45	3	0	3	62	6	87	3	0	0	96	191	
8:15 AM	3	2	19	0	4	24	4	2	1	0	0	7	12	37	2	0	2	51	5	86	5	0	2	96	178	
8:30 AM	2	0	19	0	1	21	5	1	0	0	0	6	10	48	1	0	0	59	4	67	4	0	0	75	161	
8:45 AM	6	4	21	0	0	31	6	4	4	0	0	14	10	45	10	0	0	65	1	71	5	0	0	77	187	
Hourly Total	15	7	77	0	9	99	19	10	8	0	0	37	46	175	16	0	5	237	16	311	17	0	2	344	717	
9:00 AM	5	2	10	0	0	17	1	5	0	0	0	6	3	56	3	0	0	62	3	55	2	0	1	60	145	
9:15 AM	1	3	18	0	2	22	5	1	1	0	0	7	7	41	4	0	1	52	0	42	2	0	0	44	125	
9:30 AM	2	4	10	0	1	16	2	4	0	0	0	6	6	25	4	0	0	35	0	43	3	0	0	46	103	
9:45 AM	2	1	9	0	2	12	4	1	0	0	0	5	5	32	6	1	2	44	1	49	5	0	0	55	116	
Hourly Total	10	10	47	0	5	67	12	11	1	0	0	24	21	154	17	1	3	193	4	189	12	0	1	205	489	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	0	9	0	6	9	3	2	1	0	1	6	11	46	2	0	1	59	0	36	4	0	1	40	114	
11:15 AM	2	3	10	0	1	15	4	1	1	0	0	6	10	42	4	0	1	56	2	37	2	0	0	41	118	
11:30 AM	9	3	11	0	1	23	5	1	2	0	1	8	14	40	3	0	1	57	0	49	5	0	0	54	142	
11:45 AM	3	0	9	0	0	12	4	1	0	0	0	5	9	51	2	0	0	62	2	36	5	0	0	43	122	
Hourly Total	14	6	39	0	8	59	16	5	4	0	2	25	44	179	11	0	3	234	4	158	16	0	1	178	496	
12:00 PM	1	2	13	0	1	16	8	3	2	0	0	13	19	43	5	0	0	67	1	44	5	0	1	50	146	
12:15 PM	2	2	10	0	1	14	3	1	4	0	0	8	17	54	5	0	1	76	1	30	5	0	0	36	134	
12:30 PM	1	3	15	0	3	19	8	1	0	0	0	9	19	34	5	0	1	58	0	57	4	0	0	61	147	
12:45 PM	5	1	7	0	1	13	5	1	4	0	0	10	20	46	5	0	3	71	1	52	6	0	0	59	153	
Hourly Total	9	8	45	0	6	62	24	6	10	0	0	40	75	177	20	0	5	272	3	183	20	0	1	206	580	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	6	3	12	0	2	21	4	5	4	0	0	13	18	70	4	0	1	92	3	67	10	0	0	80	206	
3:15 PM	5	4	13	0	3	22	9	4	3	0	0	16	22	69	3	1	0	95	2	60	8	0	0	70	203	
3:30 PM	13	3	20	0	4	36	8	4	6	0	1	18	26	84	4	0	0	114	1	64	3	0	1	68	236	
3:45 PM	7	0	14	0	0	21	3	2	2	0	2	7	27	65	3	0	0	95	2	43	5	0	1	50	173	
Hourly Total	31	10	59	0	9	100	24	15	15	0	3	54	93	288	14	1	1	396	8	234	26	0	2	268	818	
4:00 PM	6	3	10	0	2	19	6	3	7	0	0	16	25	83	3	0	0	111	3	56	4	0	1	63	209	
4:15 PM	4	3	13	0	2	20	3	1	1	0	0	5	22	70	5	0	0	97	3	65	7	1	0	76	198	
4:30 PM	3	2	14	0	3	19	2	1	1	0	0	4	29	73	4	2	1	108	4	50	6	0	1	60	191	

4:45 PM	7	2	8	0	1	17	3	4	2	0	0	9	28	80	5	0	0	113	3	72	2	0	1	77	216
Hourly Total	20	10	45	0	8	75	14	9	11	0	0	34	104	306	17	2	1	429	13	243	19	1	3	276	814
5:00 PM	6	6	10	0	1	22	8	6	5	0	1	19	28	75	8	0	1	111	2	48	7	0	0	57	209
5:15 PM	7	1	14	0	0	22	5	4	4	0	0	13	28	80	6	0	0	114	1	59	5	0	1	65	214
5:30 PM	3	1	14	0	0	18	7	3	2	0	0	12	21	78	7	0	0	106	0	52	7	0	0	59	195
5:45 PM	3	0	13	0	2	16	2	4	1	0	2	7	15	74	4	0	0	93	2	50	7	0	2	59	175
Hourly Total	19	8	51	0	3	78	22	17	12	0	3	51	92	307	25	0	1	424	5	209	26	0	3	240	793
Grand Total	134	68	436	0	50	638	144	80	65	0	12	289	497	1685	129	4	19	2315	60	1715	149	1	14	1925	5167
Approach %	21.0	10.7	68.3	0.0	-	-	49.8	27.7	22.5	0.0	-	-	21.5	72.8	5.6	0.2	-	-	3.1	89.1	7.7	0.1	-	-	-
Total %	2.6	1.3	8.4	0.0	-	12.3	2.8	1.5	1.3	0.0	-	5.6	9.6	32.6	2.5	0.1	-	44.8	1.2	33.2	2.9	0.0	-	37.3	-
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	0.0	0.0	-	0.0	0.0
Cars & Light Goods	130	65	423	0	-	618	139	76	60	0	-	275	466	1642	122	3	-	2233	58	1661	143	0	-	1862	4988
% Cars & Light Goods	97.0	95.6	97.0	-	-	96.9	96.5	95.0	92.3	-	-	95.2	93.8	97.4	94.6	75.0	-	96.5	96.7	96.9	96.0	0.0	-	96.7	96.5
Buses	2	0	6	0	-	8	1	3	3	0	-	7	23	22	3	0	-	48	1	33	2	0	-	36	99
% Buses	1.5	0.0	1.4	-	-	1.3	0.7	3.8	4.6	-	-	2.4	4.6	1.3	2.3	0.0	-	2.1	1.7	1.9	1.3	0.0	-	1.9	1.9
Single-Unit Trucks	2	3	7	0	-	12	4	1	2	0	-	7	8	17	4	0	-	29	1	19	4	1	-	25	73
% Single-Unit Trucks	1.5	4.4	1.6	-	-	1.9	2.8	1.3	3.1	-	-	2.4	1.6	1.0	3.1	0.0	-	1.3	1.7	1.1	2.7	100.0	-	1.3	1.4
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	4	0	0	-	4	0	2	0	0	-	2	6
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.2	0.0	0.0	-	0.2	0.0	0.1	0.0	0.0	-	0.1	0.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	1	-	1	0	0	0	0	-	0	1
% 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	25.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	2.0	-	-	-	-	-	8.3	-	-	-	-	-	5.3	-	-	-	-	-	7.1	-	-
Pedestrians	-	-	-	-	49	-	-	-	-	-	11	-	-	-	-	-	18	-	-	-	-	-	13	-	-
% Pedestrians	-	-	-	-	98.0	-	-	-	-	-	91.7	-	-	-	-	-	94.7	-	-	-	-	-	92.9	-	-

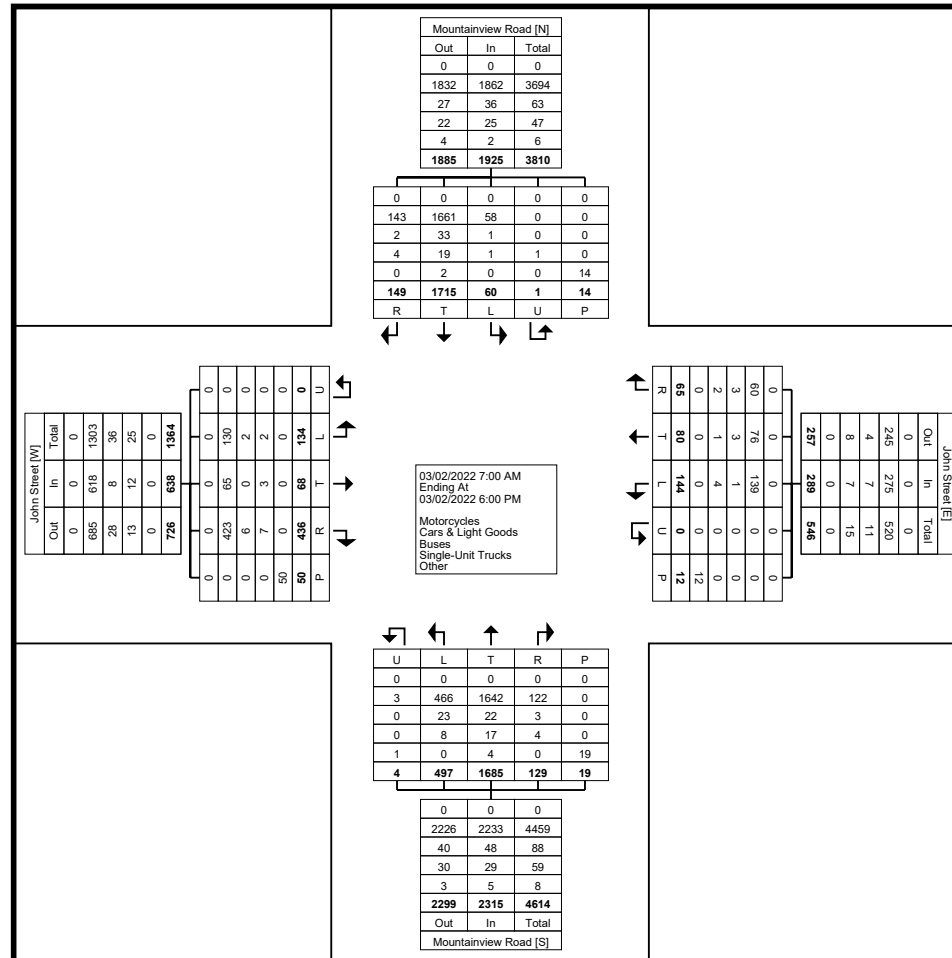




Paradigm Transportation Solutions Limited  
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Count Name: Mountainview Road & John Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
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Count Name: Mountainview Road & John Street  
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Start Date: 03/02/2022  
Page No: 4

### Turning Movement Peak Hour Data (8:00 AM)

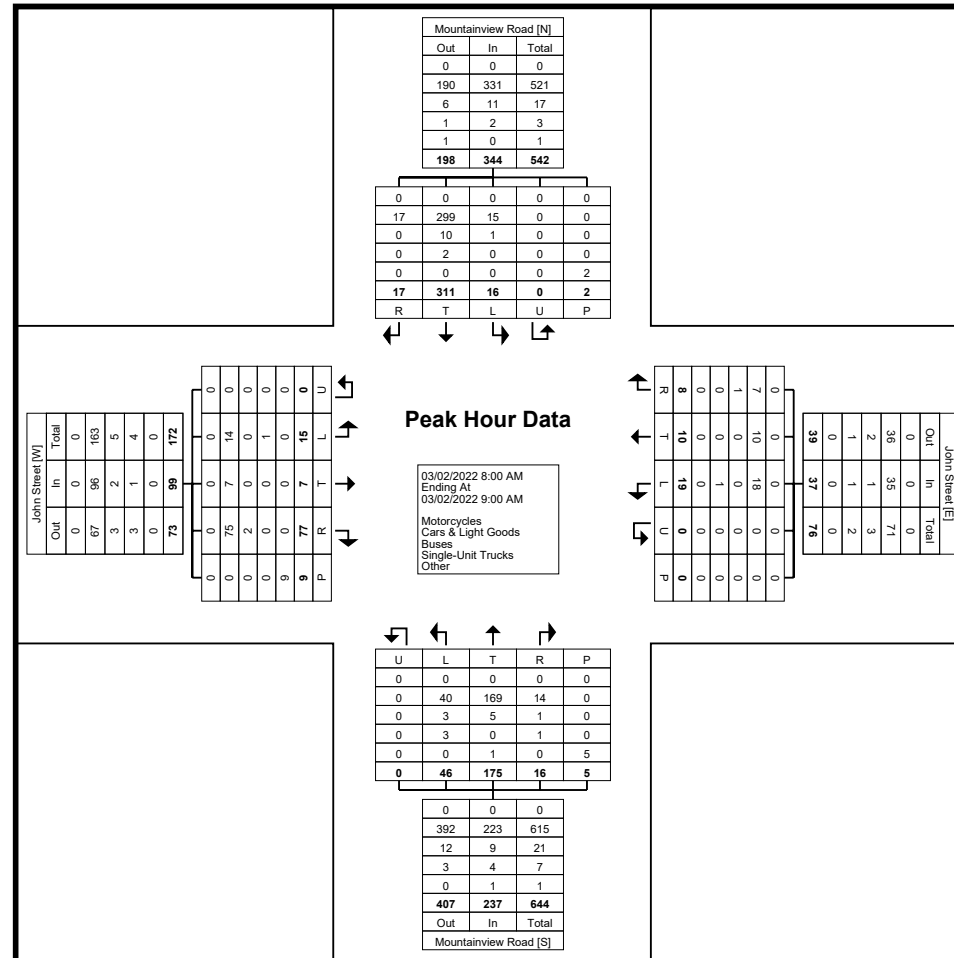
Start Time	John Street Eastbound						John Street Westbound						Mountainview Road Northbound						Mountainview Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:00 AM	4	1	18	0	4	23	4	3	3	0	0	10	14	45	3	0	3	62	6	87	3	0	0	96	191
8:15 AM	3	2	19	0	4	24	4	2	1	0	0	7	12	37	2	0	2	51	5	86	5	0	2	96	178
8:30 AM	2	0	19	0	1	21	5	1	0	0	0	6	10	48	1	0	0	59	4	67	4	0	0	75	161
8:45 AM	6	4	21	0	0	31	6	4	4	0	0	14	10	45	10	0	0	65	1	71	5	0	0	77	187
<b>Total</b>	15	7	77	0	9	99	19	10	8	0	0	37	46	175	16	0	5	237	16	311	17	0	2	344	717
Approach %	15.2	7.1	77.8	0.0	-	-	51.4	27.0	21.6	0.0	-	-	19.4	73.8	6.8	0.0	-	-	4.7	90.4	4.9	0.0	-	-	-
Total %	2.1	1.0	10.7	0.0	-	13.8	2.6	1.4	1.1	0.0	-	5.2	6.4	24.4	2.2	0.0	-	33.1	2.2	43.4	2.4	0.0	-	48.0	-
PHF	0.625	0.438	0.917	0.000	-	0.798	0.792	0.625	0.500	0.000	-	0.661	0.821	0.911	0.400	0.000	-	0.912	0.667	0.894	0.850	0.000	-	0.896	0.938
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	-	-	0.0	0.0
Cars & Light Goods	14	7	75	0	-	96	18	10	7	0	-	35	40	169	14	0	-	223	15	299	17	0	-	331	685
% Cars & Light Goods	93.3	100.0	97.4	-	-	97.0	94.7	100.0	87.5	-	-	94.6	87.0	96.6	87.5	-	-	94.1	93.8	96.1	100.0	-	-	96.2	95.5
Buses	0	0	2	0	-	2	0	0	1	0	-	1	3	5	1	0	-	9	1	10	0	0	-	11	23
% Buses	0.0	0.0	2.6	-	-	2.0	0.0	0.0	12.5	-	-	2.7	6.5	2.9	6.3	-	-	3.8	6.3	3.2	0.0	-	-	3.2	3.2
Single-Unit Trucks	1	0	0	0	-	1	1	0	0	0	-	1	3	0	1	0	-	4	0	2	0	0	-	2	8
% Single-Unit Trucks	6.7	0.0	0.0	-	-	1.0	5.3	0.0	0.0	-	-	2.7	6.5	0.0	6.3	-	-	1.7	0.0	0.6	0.0	-	-	0.6	1.1
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.1
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	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	9	-	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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Start Date: 03/02/2022  
Page No: 5



Turning Movement Peak Hour Data Plot (8:00 AM)



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Mountainview Road & John Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 6

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

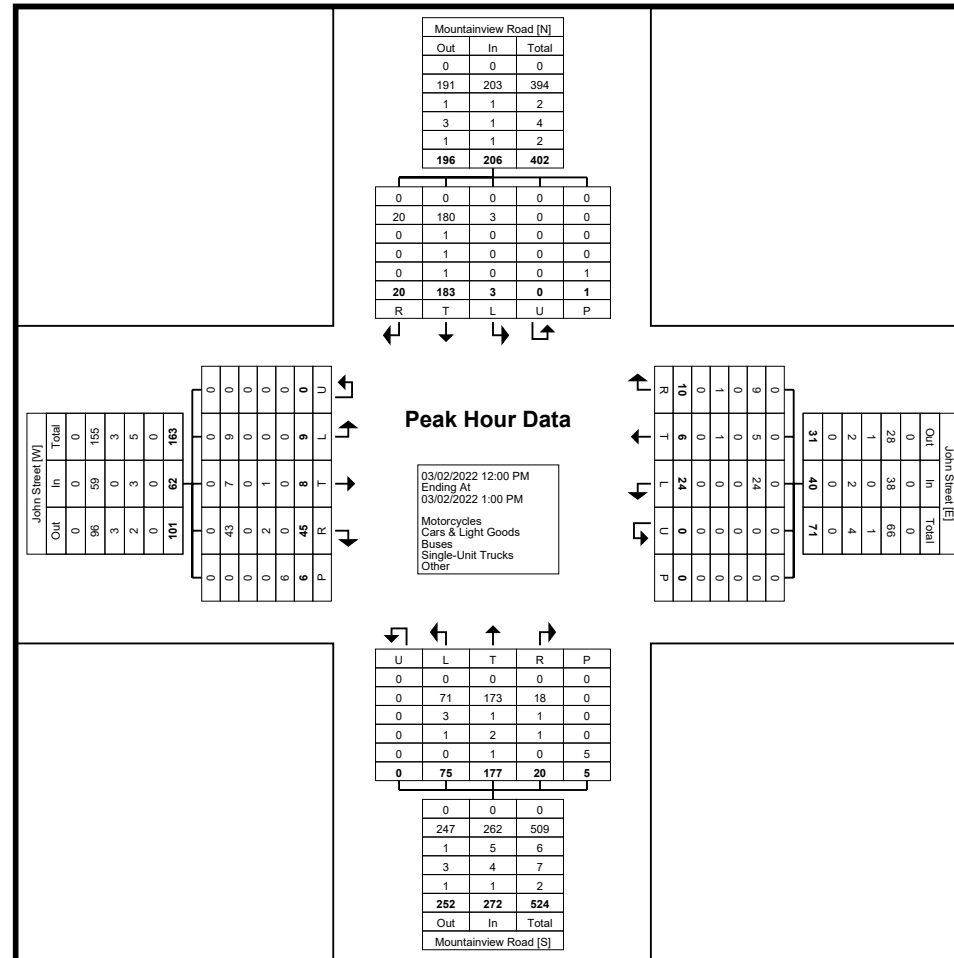
Start Time	John Street Eastbound						John Street Westbound						Mountainview Road Northbound						Mountainview Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	1	2	13	0	1	16	8	3	2	0	0	13	19	43	5	0	0	67	1	44	5	0	1	50	146
12:15 PM	2	2	10	0	1	14	3	1	4	0	0	8	17	54	5	0	1	76	1	30	5	0	0	36	134
12:30 PM	1	3	15	0	3	19	8	1	0	0	0	9	19	34	5	0	1	58	0	57	4	0	0	61	147
12:45 PM	5	1	7	0	1	13	5	1	4	0	0	10	20	46	5	0	3	71	1	52	6	0	0	59	153
<b>Total</b>	<b>9</b>	<b>8</b>	<b>45</b>	<b>0</b>	<b>6</b>	<b>62</b>	<b>24</b>	<b>6</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>75</b>	<b>177</b>	<b>20</b>	<b>0</b>	<b>5</b>	<b>272</b>	<b>3</b>	<b>183</b>	<b>20</b>	<b>0</b>	<b>1</b>	<b>206</b>	<b>580</b>
Approach %	14.5	12.9	72.6	0.0	-	-	60.0	15.0	25.0	0.0	-	-	27.6	65.1	7.4	0.0	-	-	1.5	88.8	9.7	0.0	-	-	-
Total %	1.6	1.4	7.8	0.0	-	10.7	4.1	1.0	1.7	0.0	-	6.9	12.9	30.5	3.4	0.0	-	46.9	0.5	31.6	3.4	0.0	-	35.5	-
PHF	0.450	0.667	0.750	0.000	-	0.816	0.750	0.500	0.625	0.000	-	0.769	0.938	0.819	1.000	0.000	-	0.895	0.750	0.803	0.833	0.000	-	0.844	0.948
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	-	-	0.0	0.0
Cars & Light Goods	9	7	43	0	-	59	24	5	9	0	-	38	71	173	18	0	-	262	3	180	20	0	-	203	562
% Cars & Light Goods	100.0	87.5	95.6	-	-	95.2	100.0	83.3	90.0	-	-	95.0	94.7	97.7	90.0	-	-	96.3	100.0	98.4	100.0	-	-	98.5	96.9
Buses	0	0	0	0	-	0	0	0	0	0	-	0	3	1	1	0	-	5	0	1	0	0	-	1	6
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	4.0	0.6	5.0	0	-	1.8	0.0	0.5	0.0	-	-	0.5	1.0
Single-Unit Trucks	0	1	2	0	-	3	0	1	1	0	-	2	1	2	1	0	-	4	0	1	0	0	-	1	10
% Single-Unit Trucks	0.0	12.5	4.4	-	-	4.8	0.0	16.7	10.0	-	-	5.0	1.3	1.1	5.0	-	-	1.5	0.0	0.5	0.0	-	-	0.5	1.7
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	2
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.4	0.0	0.5	0.0	-	-	0.5	0.3
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	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	6	-	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: Mountainview Road & John Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 7



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



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: Mountainview Road & John Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 8

### Turning Movement Peak Hour Data (4:45 PM)

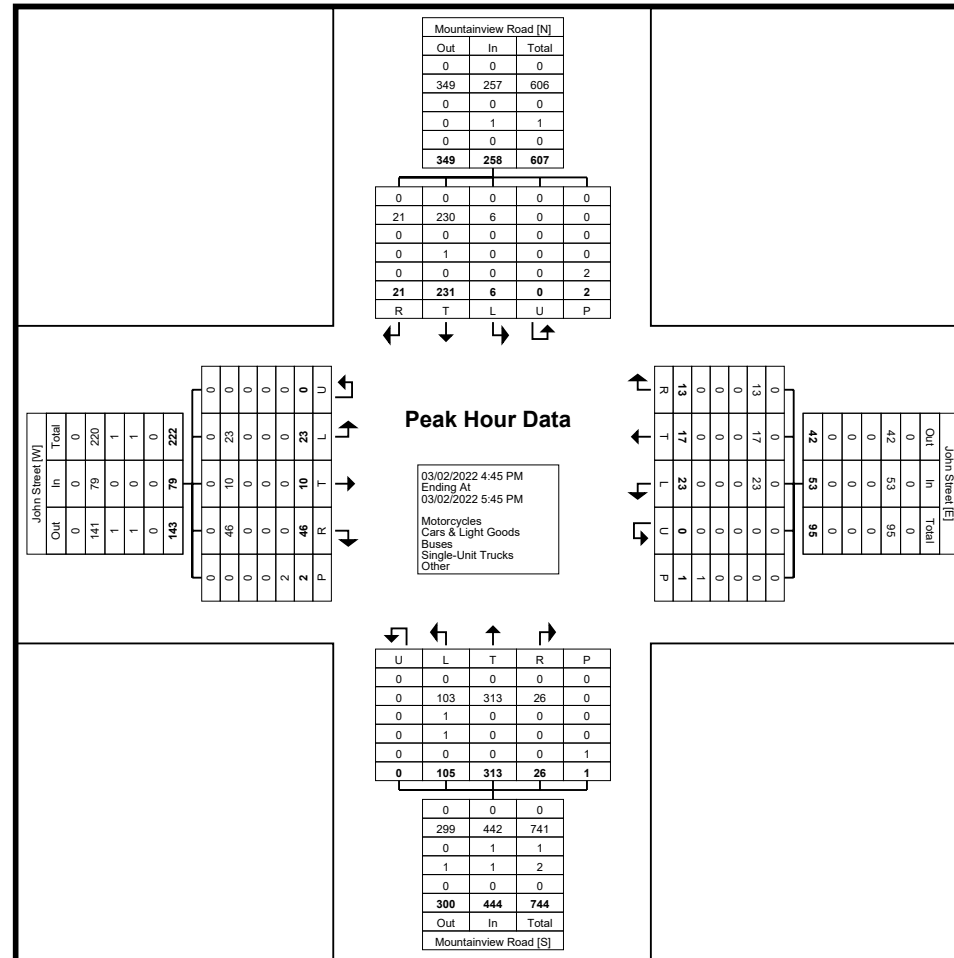
Start Time	John Street Eastbound						John Street Westbound						Mountainview Road Northbound						Mountainview Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	7	2	8	0	1	17	3	4	2	0	0	9	28	80	5	0	0	113	3	72	2	0	1	77	216
5:00 PM	6	6	10	0	1	22	8	6	5	0	1	19	28	75	8	0	1	111	2	48	7	0	0	57	209
5:15 PM	7	1	14	0	0	22	5	4	4	0	0	13	28	80	6	0	0	114	1	59	5	0	1	65	214
5:30 PM	3	1	14	0	0	18	7	3	2	0	0	12	21	78	7	0	0	106	0	52	7	0	0	59	195
<b>Total</b>	<b>23</b>	<b>10</b>	<b>46</b>	<b>0</b>	<b>2</b>	<b>79</b>	<b>23</b>	<b>17</b>	<b>13</b>	<b>0</b>	<b>1</b>	<b>53</b>	<b>105</b>	<b>313</b>	<b>26</b>	<b>0</b>	<b>1</b>	<b>444</b>	<b>6</b>	<b>231</b>	<b>21</b>	<b>0</b>	<b>2</b>	<b>258</b>	<b>834</b>
Approach %	29.1	12.7	58.2	0.0	-	-	43.4	32.1	24.5	0.0	-	-	23.6	70.5	5.9	0.0	-	-	2.3	89.5	8.1	0.0	-	-	-
Total %	2.8	1.2	5.5	0.0	-	9.5	2.8	2.0	1.6	0.0	-	6.4	12.6	37.5	3.1	0.0	-	53.2	0.7	27.7	2.5	0.0	-	30.9	-
PHF	0.821	0.417	0.821	0.000	-	0.898	0.719	0.708	0.650	0.000	-	0.697	0.938	0.978	0.813	0.000	-	0.974	0.500	0.802	0.750	0.000	-	0.838	0.965
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	-	-	0.0	0.0
Cars & Light Goods	23	10	46	0	-	79	23	17	13	0	-	53	103	313	26	0	-	442	6	230	21	0	-	257	831
% Cars & Light Goods	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	98.1	100.0	100.0	-	-	99.5	100.0	99.6	100.0	-	-	99.6	99.6
Buses	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	1
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.0	0.0	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.1
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	1	0	1	0	0	-	1	2
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.0	0.0	0.0	-	-	0.2	0.0	0.4	0.0	-	-	0.4	0.2
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	-	-	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	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: Mountainview Road & John Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 9



Turning Movement Peak Hour Data Plot (4:45 PM)



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & Daniela Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 1

### Turning Movement Data

Start Time	River Drive Eastbound					River Drive Westbound					Daniela Court Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	0	6	0	0	6	3	1	0	0	4	1	0	0	0	1	11
7:15 AM	1	8	0	0	9	2	0	0	0	2	1	3	0	0	4	15
7:30 AM	0	12	0	0	12	3	0	0	0	3	2	0	0	0	2	17
7:45 AM	1	12	0	0	13	4	2	0	0	6	2	0	0	3	2	21
Hourly Total	2	38	0	0	40	12	3	0	0	15	6	3	0	3	9	64
8:00 AM	0	14	0	0	14	3	0	0	0	3	2	0	0	0	2	19
8:15 AM	0	9	0	0	9	3	1	0	0	4	2	0	0	2	2	15
8:30 AM	0	3	0	0	3	2	0	0	0	2	2	1	0	2	3	8
8:45 AM	0	9	0	0	9	6	2	0	0	8	1	1	0	0	2	19
Hourly Total	0	35	0	0	35	14	3	0	0	17	7	2	0	4	9	61
9:00 AM	1	5	0	0	6	1	1	0	0	2	0	0	0	1	0	8
9:15 AM	0	3	0	0	3	8	0	0	0	8	0	0	0	1	0	11
9:30 AM	1	7	0	0	8	3	1	0	0	4	2	0	0	3	2	14
9:45 AM	0	3	0	0	3	6	1	0	0	7	2	1	0	1	3	13
Hourly Total	2	18	0	0	20	18	3	0	0	21	4	1	0	6	5	46
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	8	0	0	8	5	0	0	0	5	0	0	0	2	0	13
11:15 AM	0	7	0	0	7	4	3	0	0	7	2	0	1	0	3	17
11:30 AM	0	6	0	0	6	7	1	0	0	8	1	1	0	1	2	16
11:45 AM	0	5	0	0	5	7	1	0	0	8	1	0	0	3	1	14
Hourly Total	0	26	0	0	26	23	5	0	0	28	4	1	1	6	6	60
12:00 PM	0	13	0	0	13	6	1	0	0	7	2	0	0	1	2	22
12:15 PM	0	9	0	0	9	3	0	0	0	3	0	0	0	0	0	12
12:30 PM	0	5	0	0	5	7	1	0	0	8	0	0	0	1	0	13
12:45 PM	0	10	0	0	10	2	2	0	0	4	1	1	0	1	2	16
Hourly Total	0	37	0	0	37	18	4	0	0	22	3	1	0	3	4	63
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	0	8	0	0	8	7	1	0	0	8	1	1	0	1	2	18
3:15 PM	0	10	0	0	10	8	3	0	0	11	0	0	0	3	0	21
3:30 PM	0	19	0	0	19	10	1	0	0	11	1	0	0	11	1	31
3:45 PM	0	6	0	0	6	6	1	0	0	7	3	0	0	2	3	16
Hourly Total	0	43	0	0	43	31	6	0	0	37	5	1	0	17	6	86
4:00 PM	1	11	0	0	12	9	1	0	0	10	1	0	0	1	1	23
4:15 PM	1	14	0	0	15	11	3	0	0	14	2	0	0	2	2	31
4:30 PM	2	6	0	0	8	12	3	1	0	16	1	1	0	0	2	26
4:45 PM	0	11	0	0	11	9	5	0	0	14	2	1	0	1	3	28



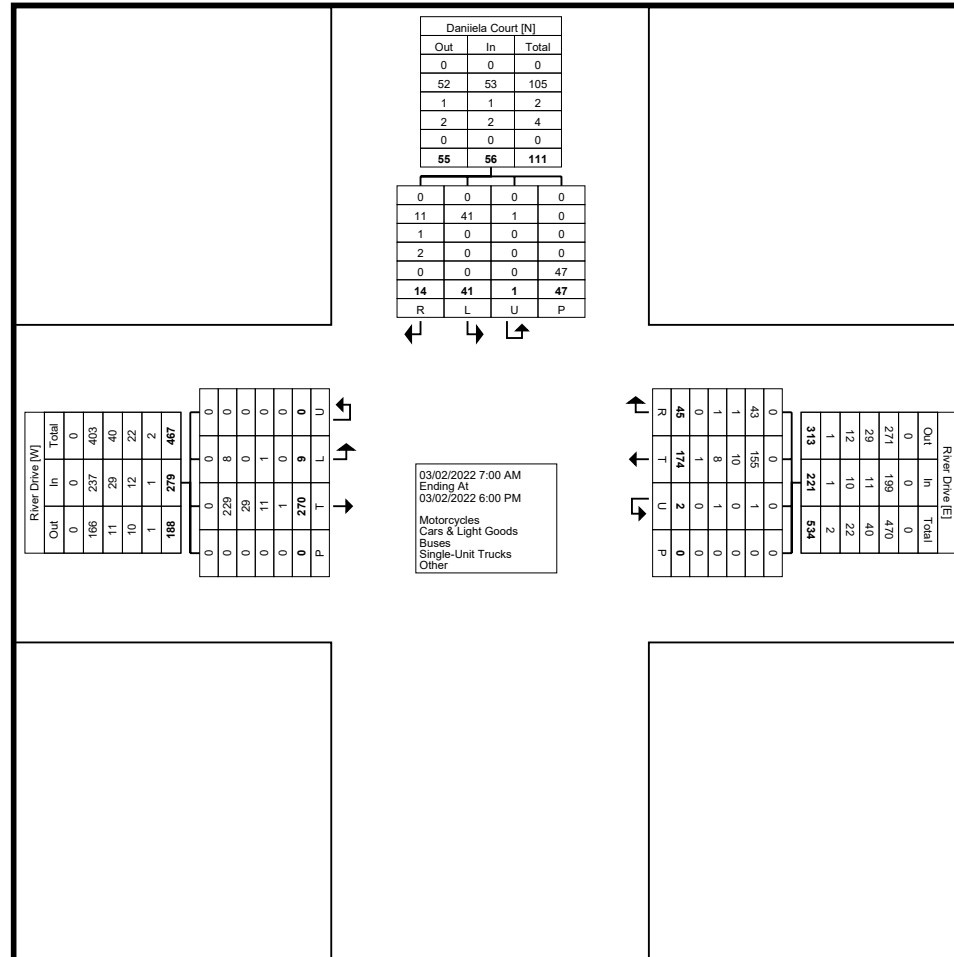
Hourly Total	4	42	0	0	46	41	12	1	0	54	6	2	0	4	8	108
5:00 PM	0	8	0	0	8	3	3	0	0	6	0	3	0	1	3	17
5:15 PM	1	9	0	0	10	5	0	0	0	5	2	0	0	2	2	17
5:30 PM	0	12	0	0	12	4	3	1	0	8	0	0	0	1	0	20
5:45 PM	0	2	0	0	2	5	3	0	0	8	4	0	0	0	4	14
Hourly Total	1	31	0	0	32	17	9	1	0	27	6	3	0	4	9	68
Grand Total	9	270	0	0	279	174	45	2	0	221	41	14	1	47	56	556
Approach %	3.2	96.8	0.0	-	-	78.7	20.4	0.9	-	-	73.2	25.0	1.8	-	-	-
Total %	1.6	48.6	0.0	-	50.2	31.3	8.1	0.4	-	39.7	7.4	2.5	0.2	-	10.1	-
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	0.0	-	0.0	0.0
Cars & Light Goods	8	229	0	-	237	155	43	1	-	199	41	11	1	-	53	489
% Cars & Light Goods	88.9	84.8	-	-	84.9	89.1	95.6	50.0	-	90.0	100.0	78.6	100.0	-	94.6	87.9
Buses	0	29	0	-	29	10	1	0	-	11	0	1	0	-	1	41
% Buses	0.0	10.7	-	-	10.4	5.7	2.2	0.0	-	5.0	0.0	7.1	0.0	-	1.8	7.4
Single-Unit Trucks	1	11	0	-	12	8	1	1	-	10	0	2	0	-	2	24
% Single-Unit Trucks	11.1	4.1	-	-	4.3	4.6	2.2	50.0	-	4.5	0.0	14.3	0.0	-	3.6	4.3
Articulated Trucks	0	1	0	-	1	1	0	0	-	1	0	0	0	-	0	2
% Articulated Trucks	0.0	0.4	-	-	0.4	0.6	0.0	0.0	-	0.5	0.0	0.0	0.0	-	0.0	0.4
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	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	47	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: River Drive & Daniela Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & Daniela Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 4

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

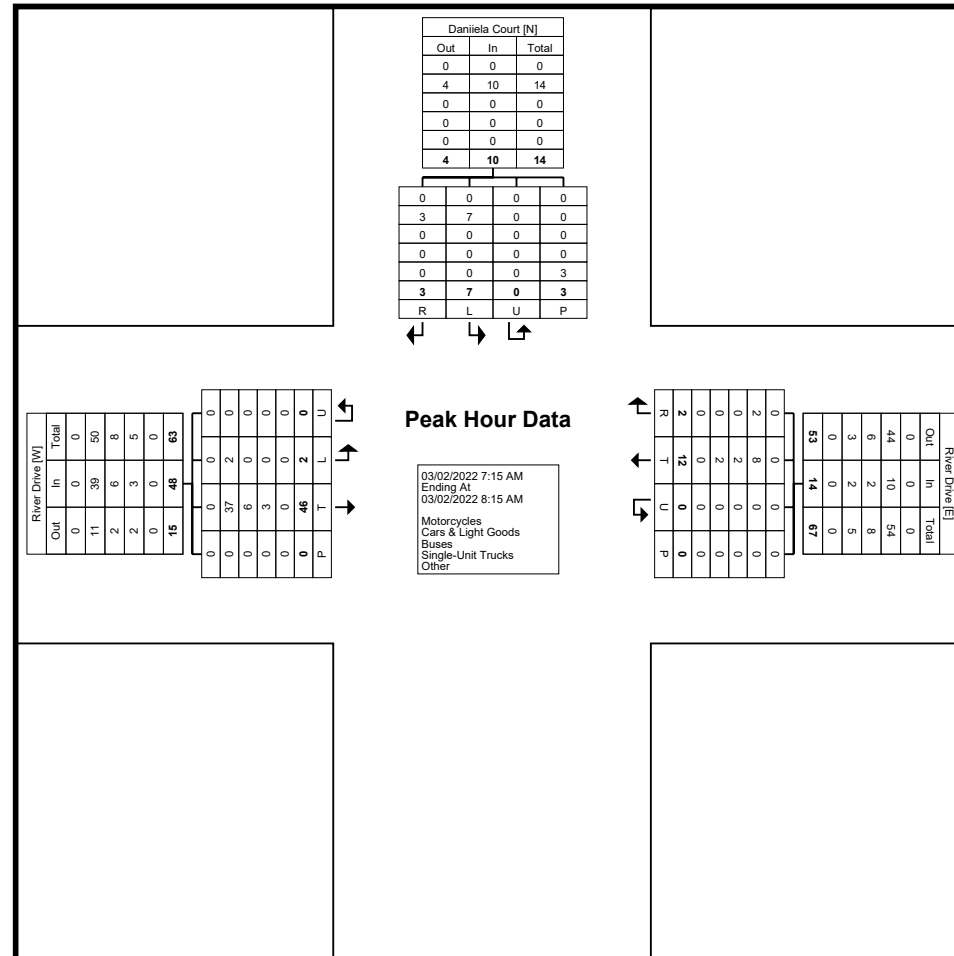
Start Time	River Drive Eastbound					River Drive Westbound					Daniela Court Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:15 AM	1	8	0	0	9	2	0	0	0	2	1	3	0	0	4	15
7:30 AM	0	12	0	0	12	3	0	0	0	3	2	0	0	0	2	17
7:45 AM	1	12	0	0	13	4	2	0	0	6	2	0	0	3	2	21
8:00 AM	0	14	0	0	14	3	0	0	0	3	2	0	0	0	2	19
<b>Total</b>	<b>2</b>	<b>46</b>	<b>0</b>	<b>0</b>	<b>48</b>	<b>12</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>10</b>	<b>72</b>
Approach %	4.2	95.8	0.0	-	-	85.7	14.3	0.0	-	-	70.0	30.0	0.0	-	-	-
Total %	2.8	63.9	0.0	-	66.7	16.7	2.8	0.0	-	19.4	9.7	4.2	0.0	-	13.9	-
PHF	0.500	0.821	0.000	-	0.857	0.750	0.250	0.000	-	0.583	0.875	0.250	0.000	-	0.625	0.857
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	0.0
Cars & Light Goods	2	37	0	-	39	8	2	0	-	10	7	3	0	-	10	59
% Cars & Light Goods	100.0	80.4	-	-	81.3	66.7	100.0	-	-	71.4	100.0	100.0	-	-	100.0	81.9
Buses	0	6	0	-	6	2	0	0	-	2	0	0	0	-	0	8
% Buses	0.0	13.0	-	-	12.5	16.7	0.0	-	-	14.3	0.0	0.0	-	-	0.0	11.1
Single-Unit Trucks	0	3	0	-	3	2	0	0	-	2	0	0	0	-	0	5
% Single-Unit Trucks	0.0	6.5	-	-	6.3	16.7	0.0	-	-	14.3	0.0	0.0	-	-	0.0	6.9
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	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
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Count Name: River Drive & Daniela Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 5



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@pts1.com

Count Name: River Drive & Daniela Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 6

### Turning Movement Peak Hour Data (11:15 AM)

Start Time	River Drive Eastbound					River Drive Westbound					Daniela Court Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
11:15 AM	0	7	0	0	7	4	3	0	0	7	2	0	1	0	3	17
11:30 AM	0	6	0	0	6	7	1	0	0	8	1	1	0	1	2	16
11:45 AM	0	5	0	0	5	7	1	0	0	8	1	0	0	3	1	14
12:00 PM	0	13	0	0	13	6	1	0	0	7	2	0	0	1	2	22
<b>Total</b>	0	31	0	0	31	24	6	0	0	30	6	1	1	5	8	69
Approach %	0.0	100.0	0.0	-	-	80.0	20.0	0.0	-	-	75.0	12.5	12.5	-	-	-
Total %	0.0	44.9	0.0	-	44.9	34.8	8.7	0.0	-	43.5	8.7	1.4	1.4	-	11.6	-
PHF	0.000	0.596	0.000	-	0.596	0.857	0.500	0.000	-	0.938	0.750	0.250	0.250	-	0.667	0.784
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	0.0
Cars & Light Goods	0	25	0	-	25	22	5	0	-	27	6	0	1	-	7	59
% Cars & Light Goods	-	80.6	-	-	80.6	91.7	83.3	-	-	90.0	100.0	0.0	100.0	-	87.5	85.5
Buses	0	2	0	-	2	0	0	0	-	0	0	0	0	-	0	2
% Buses	-	6.5	-	-	6.5	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	2.9
Single-Unit Trucks	0	4	0	-	4	1	1	0	-	2	0	1	0	-	1	7
% Single-Unit Trucks	-	12.9	-	-	12.9	4.2	16.7	-	-	6.7	0.0	100.0	0.0	-	12.5	10.1
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Articulated Trucks	-	0.0	-	-	0.0	4.2	0.0	-	-	3.3	0.0	0.0	0.0	-	0.0	1.4
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	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-





Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: River Drive & Daniela Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 8

### Turning Movement Peak Hour Data (4:00 PM)

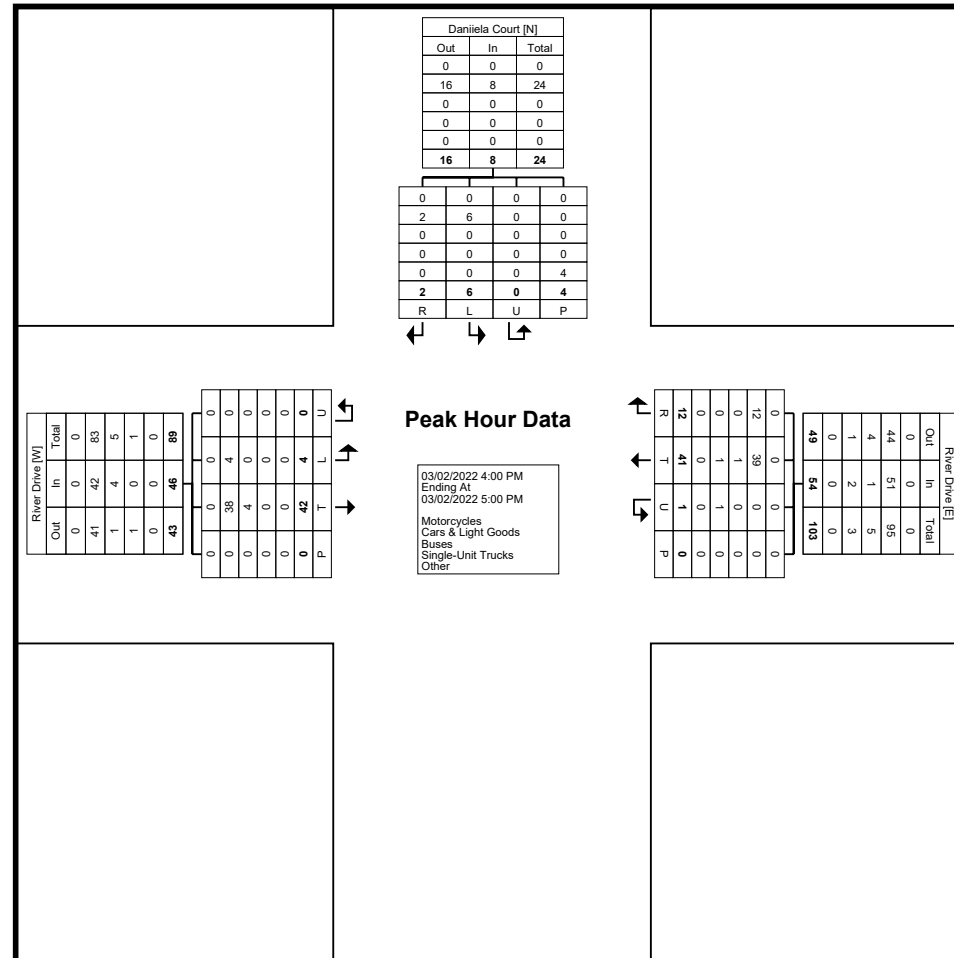
Start Time	River Drive Eastbound					River Drive Westbound					Daniela Court Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
4:00 PM	1	11	0	0	12	9	1	0	0	10	1	0	0	1	1	23
4:15 PM	1	14	0	0	15	11	3	0	0	14	2	0	0	2	2	31
4:30 PM	2	6	0	0	8	12	3	1	0	16	1	1	0	0	2	26
4:45 PM	0	11	0	0	11	9	5	0	0	14	2	1	0	1	3	28
Total	4	42	0	0	46	41	12	1	0	54	6	2	0	4	8	108
Approach %	8.7	91.3	0.0	-	-	75.9	22.2	1.9	-	-	75.0	25.0	0.0	-	-	-
Total %	3.7	38.9	0.0	-	42.6	38.0	11.1	0.9	-	50.0	5.6	1.9	0.0	-	7.4	-
PHF	0.500	0.750	0.000	-	0.767	0.854	0.600	0.250	-	0.844	0.750	0.500	0.000	-	0.667	0.871
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	-	-	0.0	0.0
Cars & Light Goods	4	38	0	-	42	39	12	0	-	51	6	2	0	-	8	101
% Cars & Light Goods	100.0	90.5	-	-	91.3	95.1	100.0	0.0	-	94.4	100.0	100.0	-	-	100.0	93.5
Buses	0	4	0	-	4	1	0	0	-	1	0	0	0	-	0	5
% Buses	0.0	9.5	-	-	8.7	2.4	0.0	0.0	-	1.9	0.0	0.0	-	-	0.0	4.6
Single-Unit Trucks	0	0	0	-	0	1	0	1	-	2	0	0	0	-	0	2
% Single-Unit Trucks	0.0	0.0	-	-	0.0	2.4	0.0	100.0	-	3.7	0.0	0.0	-	-	0.0	1.9
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	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	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: River Drive & Daniela Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)





Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & Rosetta Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 1

### Turning Movement Data

Start Time	Victoria Street Eastbound					River Drive Westbound					Rosetta Street Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	0	6	0	0	6	0	3	0	0	3	0	0	0	0	0	9
7:15 AM	0	5	0	0	5	3	0	0	0	3	0	0	0	0	0	8
7:30 AM	0	11	0	0	11	2	0	0	0	2	0	0	0	0	0	13
7:45 AM	0	9	0	0	9	2	0	0	0	2	3	0	0	0	3	14
Hourly Total	0	31	0	0	31	7	3	0	0	10	3	0	0	0	3	44
8:00 AM	0	11	0	0	11	1	2	0	1	3	1	0	0	0	1	15
8:15 AM	0	9	0	0	9	3	0	0	1	3	0	0	0	0	0	12
8:30 AM	0	2	0	1	2	1	1	0	0	2	1	0	0	2	1	5
8:45 AM	0	7	0	0	7	6	1	0	0	7	1	0	0	0	1	15
Hourly Total	0	29	0	1	29	11	4	0	2	15	3	0	0	2	3	47
9:00 AM	0	6	0	0	6	1	0	0	0	1	0	0	0	0	0	7
9:15 AM	0	3	0	0	3	6	1	0	0	7	0	0	0	0	0	10
9:30 AM	0	4	0	0	4	1	2	0	0	3	3	0	0	0	3	10
9:45 AM	0	3	0	0	3	3	3	0	0	6	1	0	0	0	1	10
Hourly Total	0	16	0	0	16	11	6	0	0	17	4	0	0	0	4	37
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	1	6	0	0	7	4	1	0	2	5	0	0	0	0	0	12
11:15 AM	0	7	0	0	7	2	2	0	0	4	0	0	0	0	0	11
11:30 AM	1	4	0	0	5	5	2	0	0	7	2	0	0	0	2	14
11:45 AM	0	3	0	0	3	1	3	0	3	4	2	0	0	0	2	9
Hourly Total	2	20	0	0	22	12	8	0	5	20	4	0	0	0	4	46
12:00 PM	1	8	0	0	9	5	1	0	0	6	0	0	0	1	0	15
12:15 PM	0	5	0	1	5	3	0	0	0	3	2	0	0	0	2	10
12:30 PM	0	5	0	0	5	6	0	0	0	6	0	1	0	1	1	12
12:45 PM	0	8	0	0	8	1	2	0	0	3	1	0	0	0	1	12
Hourly Total	1	26	0	1	27	15	3	0	0	18	3	1	0	2	4	49
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	7	0	0	8	6	1	0	0	7	1	1	0	0	2	17
3:15 PM	0	5	0	0	5	5	2	0	0	7	3	0	0	1	3	15
3:30 PM	1	8	0	0	9	9	1	0	0	10	2	0	0	5	2	21
3:45 PM	0	5	0	0	5	4	2	0	0	6	1	0	0	2	1	12
Hourly Total	2	25	0	0	27	24	6	0	0	30	7	1	0	8	8	65
4:00 PM	0	13	0	0	13	5	4	0	0	9	1	1	0	0	2	24
4:15 PM	0	10	0	0	10	5	2	0	0	7	2	0	0	2	2	19
4:30 PM	0	4	0	0	4	10	0	0	0	10	2	0	0	1	2	16
4:45 PM	0	10	0	0	10	9	1	0	0	10	1	1	0	0	2	22

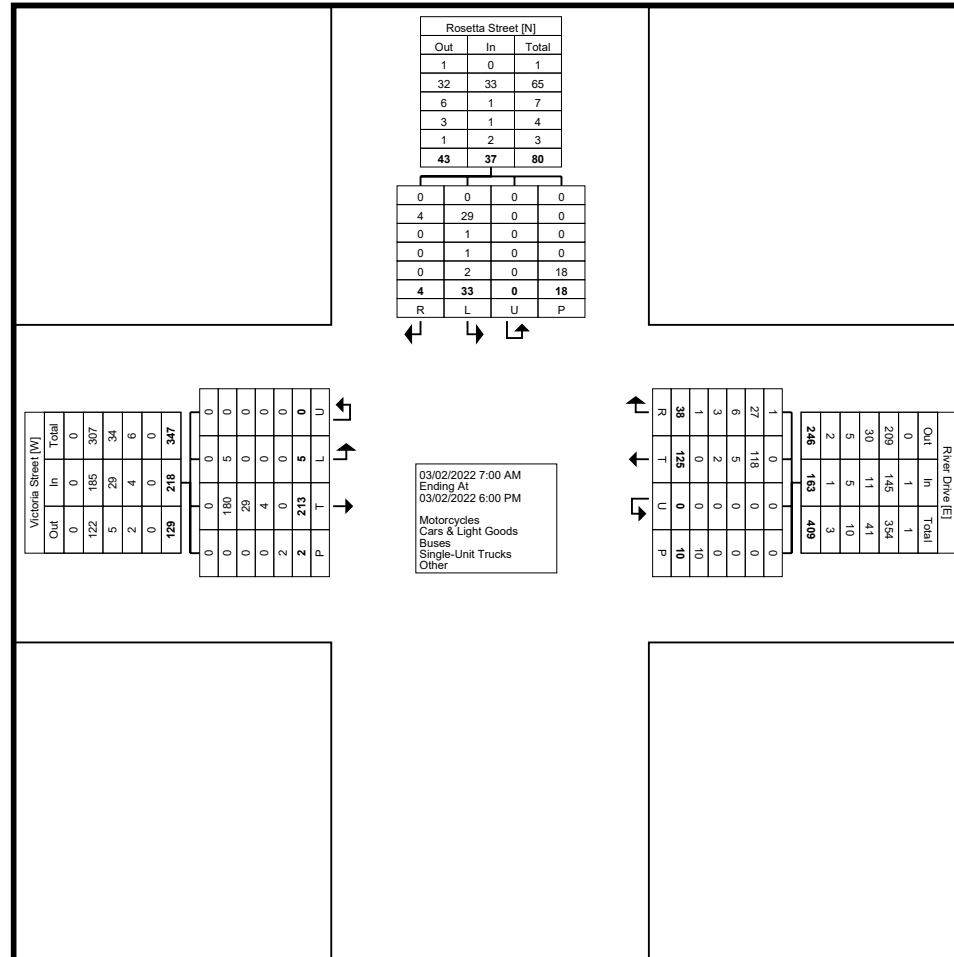
Hourly Total	0	37	0	0	37	29	7	0	0	36	6	2	0	3	8	81
5:00 PM	0	7	0	0	7	5	0	0	1	5	1	0	0	1	1	13
5:15 PM	0	8	0	0	8	6	0	0	1	6	2	0	0	1	2	16
5:30 PM	0	12	0	0	12	0	1	0	1	1	0	0	0	0	0	13
5:45 PM	0	2	0	0	2	5	0	0	0	5	0	0	0	1	0	7
Hourly Total	0	29	0	0	29	16	1	0	3	17	3	0	0	3	3	49
Grand Total	5	213	0	2	218	125	38	0	10	163	33	4	0	18	37	418
Approach %	2.3	97.7	0.0	-	-	76.7	23.3	0.0	-	-	89.2	10.8	0.0	-	-	-
Total %	1.2	51.0	0.0	-	52.2	29.9	9.1	0.0	-	39.0	7.9	1.0	0.0	-	8.9	-
Motorcycles	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Motorcycles	0.0	0.0	-	-	0.0	0.0	2.6	-	-	0.6	0.0	0.0	-	-	0.0	0.2
Cars & Light Goods	5	180	0	-	185	118	27	0	-	145	29	4	0	-	33	363
% Cars & Light Goods	100.0	84.5	-	-	84.9	94.4	71.1	-	-	89.0	87.9	100.0	-	-	89.2	86.8
Buses	0	29	0	-	29	5	6	0	-	11	1	0	0	-	1	41
% Buses	0.0	13.6	-	-	13.3	4.0	15.8	-	-	6.7	3.0	0.0	-	-	2.7	9.8
Single-Unit Trucks	0	4	0	-	4	2	3	0	-	5	1	0	0	-	1	10
% Single-Unit Trucks	0.0	1.9	-	-	1.8	1.6	7.9	-	-	3.1	3.0	0.0	-	-	2.7	2.4
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	2	0	0	-	2	3
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	2.6	-	-	0.6	6.1	0.0	-	-	5.4	0.7
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	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	-	-	10	-	-	-	-	18	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: River Drive & Rosetta Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & Rosetta Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 4

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

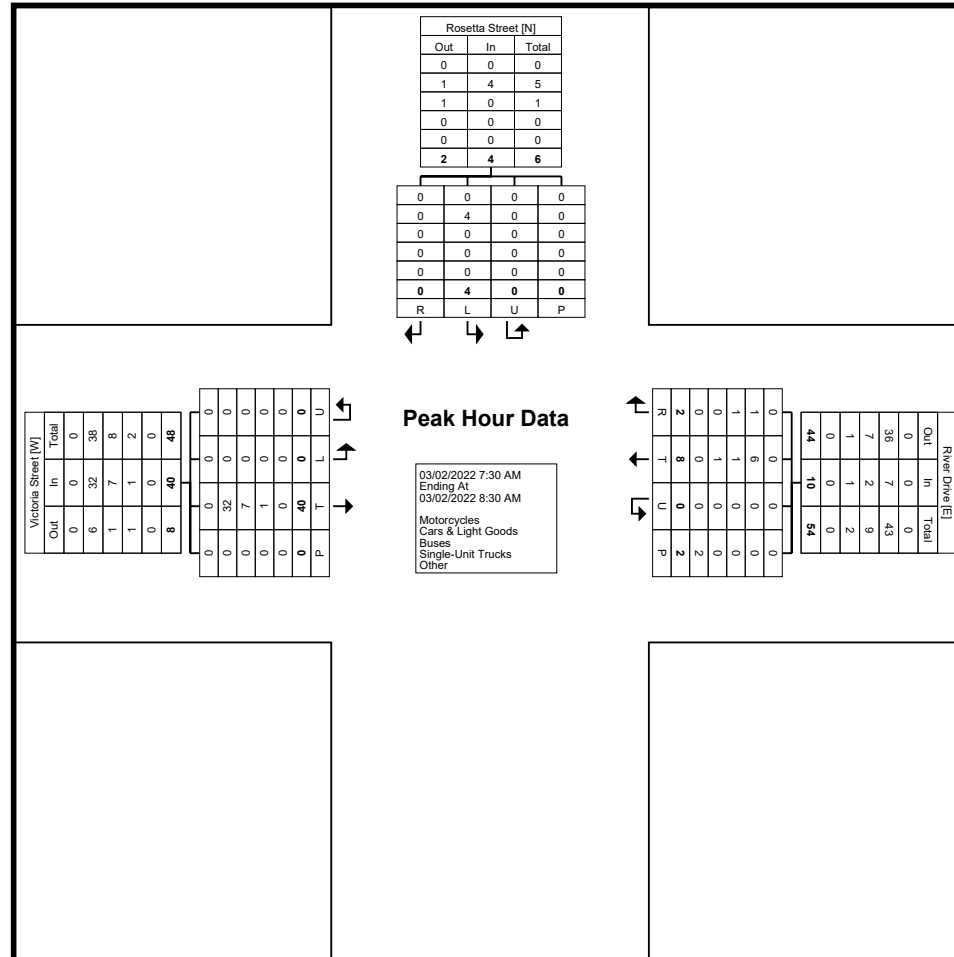
Start Time	Victoria Street Eastbound					River Drive Westbound					Rosetta Street Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:30 AM	0	11	0	0	11	2	0	0	0	2	0	0	0	0	0	13
7:45 AM	0	9	0	0	9	2	0	0	0	2	3	0	0	0	3	14
8:00 AM	0	11	0	0	11	1	2	0	1	3	1	0	0	0	1	15
8:15 AM	0	9	0	0	9	3	0	0	1	3	0	0	0	0	0	12
Total	0	40	0	0	40	8	2	0	2	10	4	0	0	0	4	54
Approach %	0.0	100.0	0.0	-	-	80.0	20.0	0.0	-	-	100.0	0.0	0.0	-	-	-
Total %	0.0	74.1	0.0	-	74.1	14.8	3.7	0.0	-	18.5	7.4	0.0	0.0	-	7.4	-
PHF	0.000	0.909	0.000	-	0.909	0.667	0.250	0.000	-	0.833	0.333	0.000	0.000	-	0.333	0.900
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
Cars & Light Goods	0	32	0	-	32	6	1	0	-	7	4	0	0	-	4	43
% Cars & Light Goods	-	80.0	-	-	80.0	75.0	50.0	-	-	70.0	100.0	-	-	-	100.0	79.6
Buses	0	7	0	-	7	1	1	0	-	2	0	0	0	-	0	9
% Buses	-	17.5	-	-	17.5	12.5	50.0	-	-	20.0	0.0	-	-	-	0.0	16.7
Single-Unit Trucks	0	1	0	-	1	1	0	0	-	1	0	0	0	-	0	2
% Single-Unit Trucks	-	2.5	-	-	2.5	12.5	0.0	-	-	10.0	0.0	-	-	-	0.0	3.7
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
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
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & Rosetta Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 5



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



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: River Drive & Rosetta Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 6

### Turning Movement Peak Hour Data (11:15 AM)

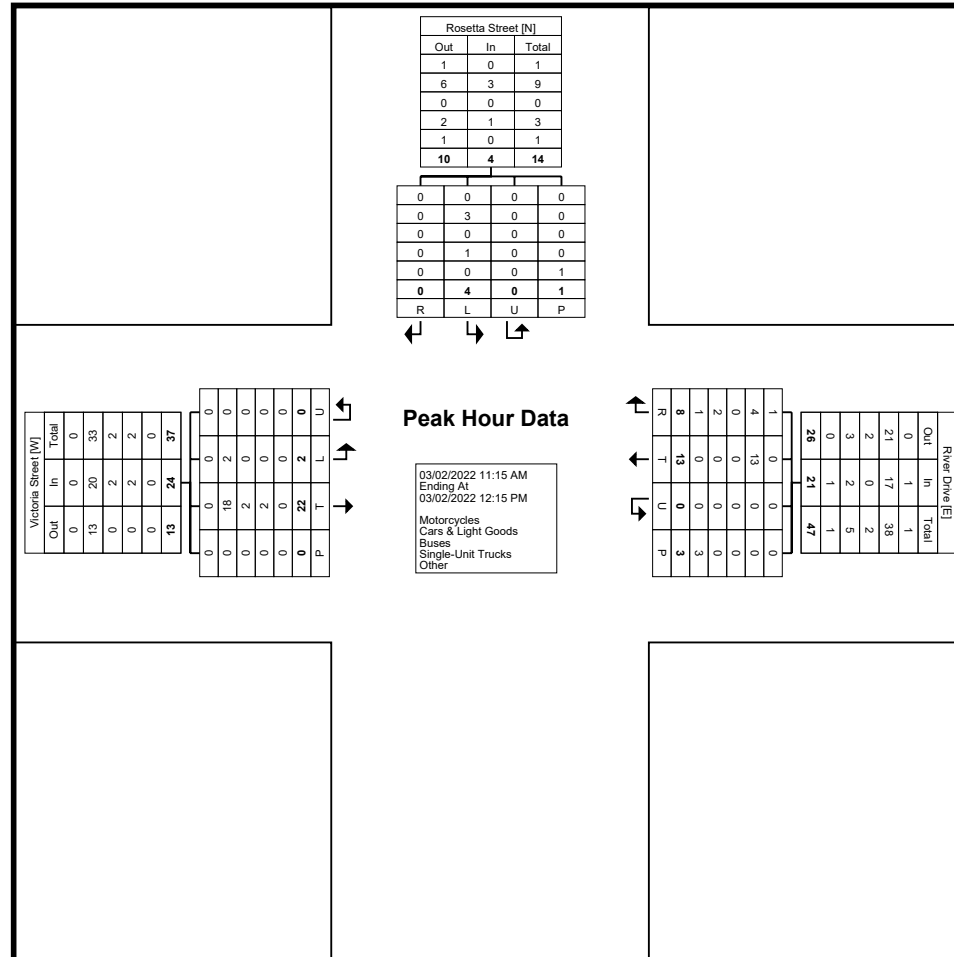
Start Time	Victoria Street Eastbound					River Drive Westbound					Rosetta Street Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
11:15 AM	0	7	0	0	7	2	2	0	0	4	0	0	0	0	0	11
11:30 AM	1	4	0	0	5	5	2	0	0	7	2	0	0	0	2	14
11:45 AM	0	3	0	0	3	1	3	0	3	4	2	0	0	0	2	9
12:00 PM	1	8	0	0	9	5	1	0	0	6	0	0	0	1	0	15
<b>Total</b>	<b>2</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>13</b>	<b>8</b>	<b>0</b>	<b>3</b>	<b>21</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>49</b>
Approach %	8.3	91.7	0.0	-	-	61.9	38.1	0.0	-	-	100.0	0.0	0.0	-	-	-
Total %	4.1	44.9	0.0	-	49.0	26.5	16.3	0.0	-	42.9	8.2	0.0	0.0	-	8.2	-
PHF	0.500	0.688	0.000	-	0.667	0.650	0.667	0.000	-	0.750	0.500	0.000	0.000	-	0.500	0.817
Motorcycles	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Motorcycles	0.0	0.0	-	-	0.0	0.0	12.5	-	-	4.8	0.0	-	-	-	0.0	2.0
Cars & Light Goods	2	18	0	-	20	13	4	0	-	17	3	0	0	-	3	40
% Cars & Light Goods	100.0	81.8	-	-	83.3	100.0	50.0	-	-	81.0	75.0	-	-	-	75.0	81.6
Buses	0	2	0	-	2	0	0	0	-	0	0	0	0	-	0	2
% Buses	0.0	9.1	-	-	8.3	0.0	0.0	-	-	0.0	0.0	-	-	-	0.0	4.1
Single-Unit Trucks	0	2	0	-	2	0	2	0	-	2	1	0	0	-	1	5
% Single-Unit Trucks	0.0	9.1	-	-	8.3	0.0	25.0	-	-	9.5	25.0	-	-	-	25.0	10.2
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	12.5	-	-	4.8	0.0	-	-	-	0.0	2.0
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	-	-	-	-	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	3	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: River Drive & Rosetta Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 7



Turning Movement Peak Hour Data Plot (11:15 AM)



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & Rosetta Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 8

### Turning Movement Peak Hour Data (4:00 PM)

Start Time	Victoria Street Eastbound					River Drive Westbound					Rosetta Street Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
4:00 PM	0	13	0	0	13	5	4	0	0	9	1	1	0	0	2	24
4:15 PM	0	10	0	0	10	5	2	0	0	7	2	0	0	2	2	19
4:30 PM	0	4	0	0	4	10	0	0	0	10	2	0	0	1	2	16
4:45 PM	0	10	0	0	10	9	1	0	0	10	1	1	0	0	2	22
Total	0	37	0	0	37	29	7	0	0	36	6	2	0	3	8	81
Approach %	0.0	100.0	0.0	-	-	80.6	19.4	0.0	-	-	75.0	25.0	0.0	-	-	-
Total %	0.0	45.7	0.0	-	45.7	35.8	8.6	0.0	-	44.4	7.4	2.5	0.0	-	9.9	-
PHF	0.000	0.712	0.000	-	0.712	0.725	0.438	0.000	-	0.900	0.750	0.500	0.000	-	1.000	0.844
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	0	33	0	-	33	29	6	0	-	35	6	2	0	-	8	76
% Cars & Light Goods	-	89.2	-	-	89.2	100.0	85.7	-	-	97.2	100.0	100.0	-	-	100.0	93.8
Buses	0	4	0	-	4	0	1	0	-	1	0	0	0	-	0	5
% Buses	-	10.8	-	-	10.8	0.0	14.3	-	-	2.8	0.0	0.0	-	-	0.0	6.2
Single-Unit Trucks	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
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	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

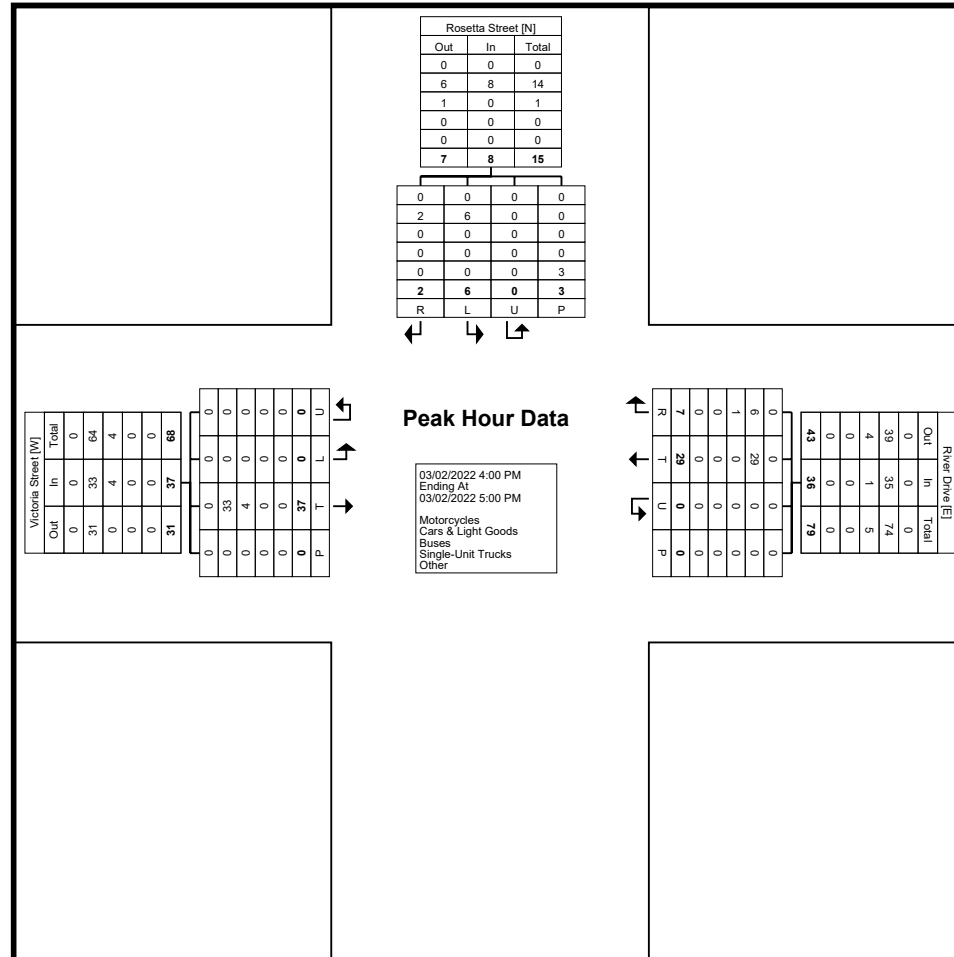




Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cowness@pts1.com

Count Name: River Drive & Rosetta Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & St. Michaels Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 1

### Turning Movement Data

Start Time	Go Parking Lot Eastbound					Victoria Street Westbound					St. Michaels Street Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	5
7:15 AM	0	6	1	0	7	3	0	0	0	3	0	0	0	0	0	10
7:30 AM	0	10	0	1	10	1	0	0	0	1	0	0	0	1	0	11
7:45 AM	0	7	0	0	7	0	1	0	0	1	0	0	0	0	0	8
Hourly Total	0	28	1	1	29	4	1	0	0	5	0	0	0	1	0	34
8:00 AM	0	12	0	0	12	0	0	0	1	0	1	0	0	2	1	13
8:15 AM	1	8	0	0	9	3	0	0	0	3	0	0	0	0	0	12
8:30 AM	1	2	0	0	3	1	0	0	0	1	0	1	0	0	1	5
8:45 AM	0	5	0	0	5	3	0	1	1	4	1	0	0	0	1	10
Hourly Total	2	27	0	0	29	7	0	1	2	8	2	1	0	2	3	40
9:00 AM	0	5	0	0	5	2	0	0	0	2	1	0	0	0	1	8
9:15 AM	0	3	0	0	3	6	0	0	0	6	0	0	0	0	0	9
9:30 AM	1	4	0	0	5	0	0	0	0	0	0	0	0	0	0	5
9:45 AM	4	2	0	0	6	3	0	0	0	3	1	3	0	0	4	13
Hourly Total	5	14	0	0	19	11	0	0	0	11	2	3	0	0	5	35
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	5	0	0	5	3	0	0	0	3	1	3	0	0	4	12
11:15 AM	0	5	0	0	5	1	2	0	0	3	2	0	0	0	2	10
11:30 AM	0	5	0	0	5	3	0	0	0	3	1	2	0	0	3	11
11:45 AM	0	3	0	0	3	1	0	0	2	1	0	0	0	0	0	4
Hourly Total	0	18	0	0	18	8	2	0	2	10	4	5	0	0	9	37
12:00 PM	1	8	0	0	9	3	1	0	0	4	1	0	0	0	1	14
12:15 PM	0	4	0	1	4	3	0	0	0	3	0	0	0	0	0	7
12:30 PM	0	5	0	0	5	5	0	0	0	5	0	1	0	0	1	11
12:45 PM	0	7	0	0	7	1	0	0	0	1	0	0	0	0	0	8
Hourly Total	1	24	0	1	25	12	1	0	0	13	1	1	0	0	2	40
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	2	6	0	0	8	6	1	0	0	7	1	2	0	0	3	18
3:15 PM	0	6	0	0	6	4	2	0	0	6	0	0	0	0	0	12
3:30 PM	0	5	0	0	5	10	0	0	0	10	0	1	0	1	1	16
3:45 PM	0	6	0	0	6	4	0	0	1	4	0	0	0	0	0	10
Hourly Total	2	23	0	0	25	24	3	0	1	27	1	3	0	1	4	56
4:00 PM	0	7	0	0	7	5	0	1	0	6	4	0	0	1	4	17
4:15 PM	0	8	0	0	8	4	2	0	0	6	1	0	0	1	1	15
4:30 PM	0	4	0	0	4	9	0	0	0	9	0	0	0	0	0	13
4:45 PM	0	9	0	0	9	10	0	0	0	10	0	0	0	0	0	19

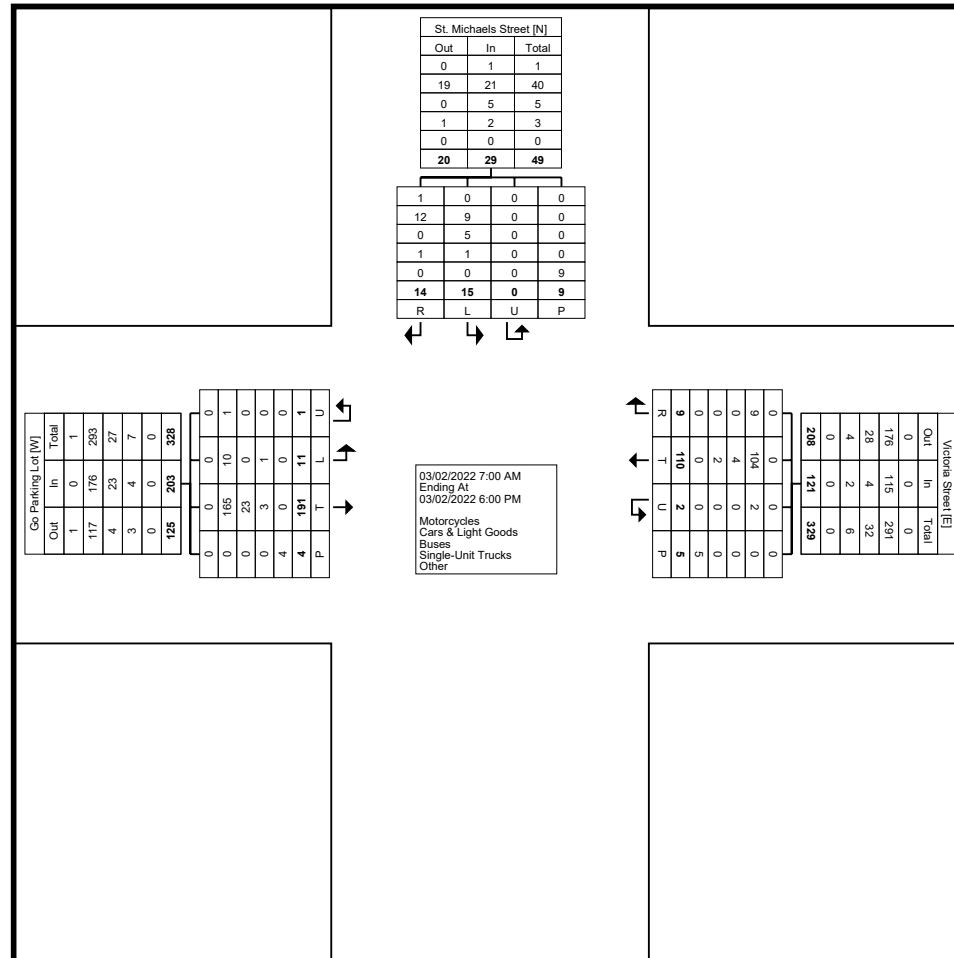
Hourly Total	0	28	0	0	28	28	2	1	0	31	5	0	0	2	5	64
5:00 PM	1	7	0	0	8	5	0	0	0	5	0	0	0	1	0	13
5:15 PM	0	8	0	0	8	6	0	0	0	6	0	1	0	0	1	15
5:30 PM	0	11	0	2	11	0	0	0	0	0	0	0	0	0	0	11
5:45 PM	0	3	0	0	3	5	0	0	0	5	0	0	0	2	0	8
Hourly Total	1	29	0	2	30	16	0	0	0	16	0	1	0	3	1	47
Grand Total	11	191	1	4	203	110	9	2	5	121	15	14	0	9	29	353
Approach %	5.4	94.1	0.5	-	-	90.9	7.4	1.7	-	-	51.7	48.3	0.0	-	-	-
Total %	3.1	54.1	0.3	-	57.5	31.2	2.5	0.6	-	34.3	4.2	4.0	0.0	-	8.2	-
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	7.1	-	-	3.4	0.3
Cars & Light Goods	10	165	1	-	176	104	9	2	-	115	9	12	0	-	21	312
% Cars & Light Goods	90.9	86.4	100.0	-	86.7	94.5	100.0	100.0	-	95.0	60.0	85.7	-	-	72.4	88.4
Buses	0	23	0	-	23	4	0	0	-	4	5	0	0	-	5	32
% Buses	0.0	12.0	0.0	-	11.3	3.6	0.0	0.0	-	3.3	33.3	0.0	-	-	17.2	9.1
Single-Unit Trucks	1	3	0	-	4	2	0	0	-	2	1	1	0	-	2	8
% Single-Unit Trucks	9.1	1.6	0.0	-	2.0	1.8	0.0	0.0	-	1.7	6.7	7.1	-	-	6.9	2.3
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	-	-	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	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	4	-	-	-	-	5	-	-	-	-	9	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
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Count Name: River Drive & St. Michaels Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: River Drive & St. Michaels Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 4

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

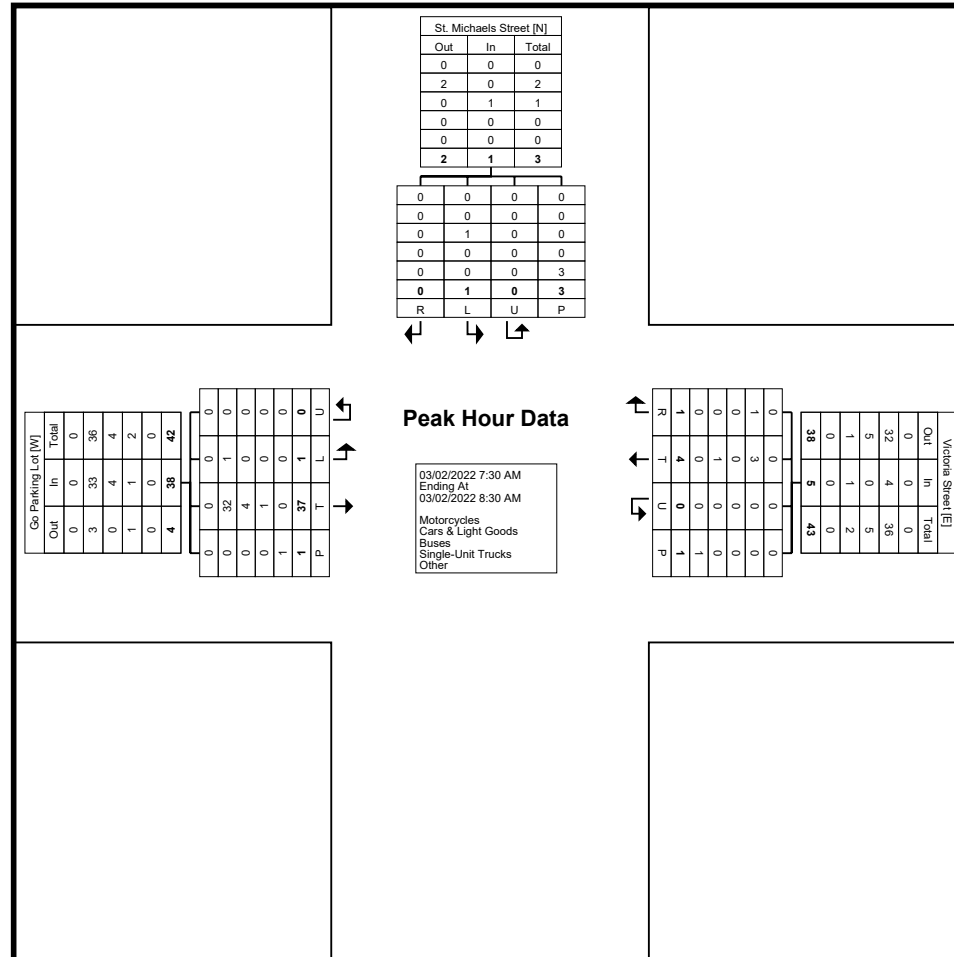
Start Time	Go Parking Lot Eastbound					Victoria Street Westbound					St. Michaels Street Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:30 AM	0	10	0	1	10	1	0	0	0	1	0	0	0	1	0	11
7:45 AM	0	7	0	0	7	0	1	0	0	1	0	0	0	0	0	8
8:00 AM	0	12	0	0	12	0	0	0	1	0	1	0	0	2	1	13
8:15 AM	1	8	0	0	9	3	0	0	0	3	0	0	0	0	0	12
<b>Total</b>	<b>1</b>	<b>37</b>	<b>0</b>	<b>1</b>	<b>38</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>44</b>
Approach %	2.6	97.4	0.0	-	-	80.0	20.0	0.0	-	-	100.0	0.0	0.0	-	-	-
Total %	2.3	84.1	0.0	-	86.4	9.1	2.3	0.0	-	11.4	2.3	0.0	0.0	-	2.3	-
PHF	0.250	0.771	0.000	-	0.792	0.333	0.250	0.000	-	0.417	0.250	0.000	0.000	-	0.250	0.846
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	1	32	0	-	33	3	1	0	-	4	0	0	0	-	0	37
% Cars & Light Goods	100.0	86.5	-	-	86.8	75.0	100.0	-	-	80.0	0.0	-	-	-	0.0	84.1
Buses	0	4	0	-	4	0	0	0	-	0	1	0	0	-	1	5
% Buses	0.0	10.8	-	-	10.5	0.0	0.0	-	-	0.0	100.0	-	-	-	100.0	11.4
Single-Unit Trucks	0	1	0	-	1	1	0	0	-	1	0	0	0	-	0	2
% Single-Unit Trucks	0.0	2.7	-	-	2.6	25.0	0.0	-	-	20.0	0.0	-	-	-	0.0	4.5
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	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	1	-	-	-	-	1	-	-	-	-	3	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & St. Michaels Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 5



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

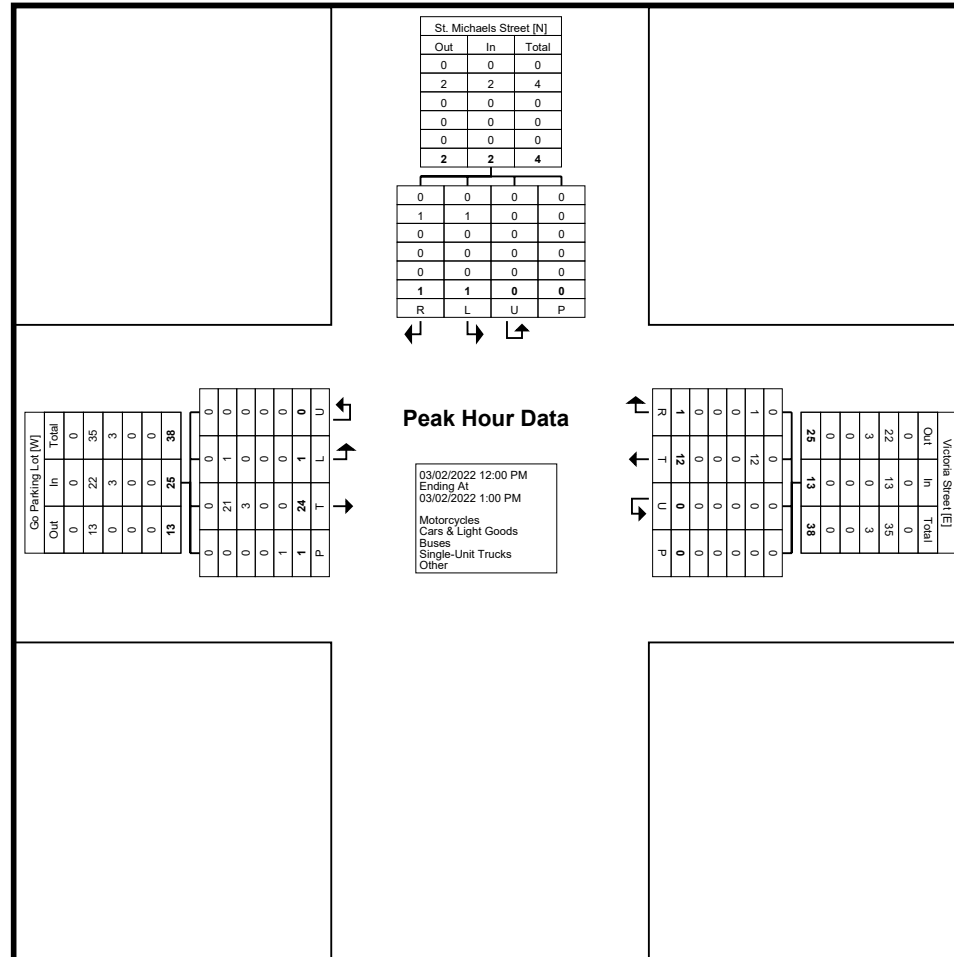




Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & St. Michaels Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 7



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





Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & St. Michaels Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 8

### Turning Movement Peak Hour Data (4:00 PM)

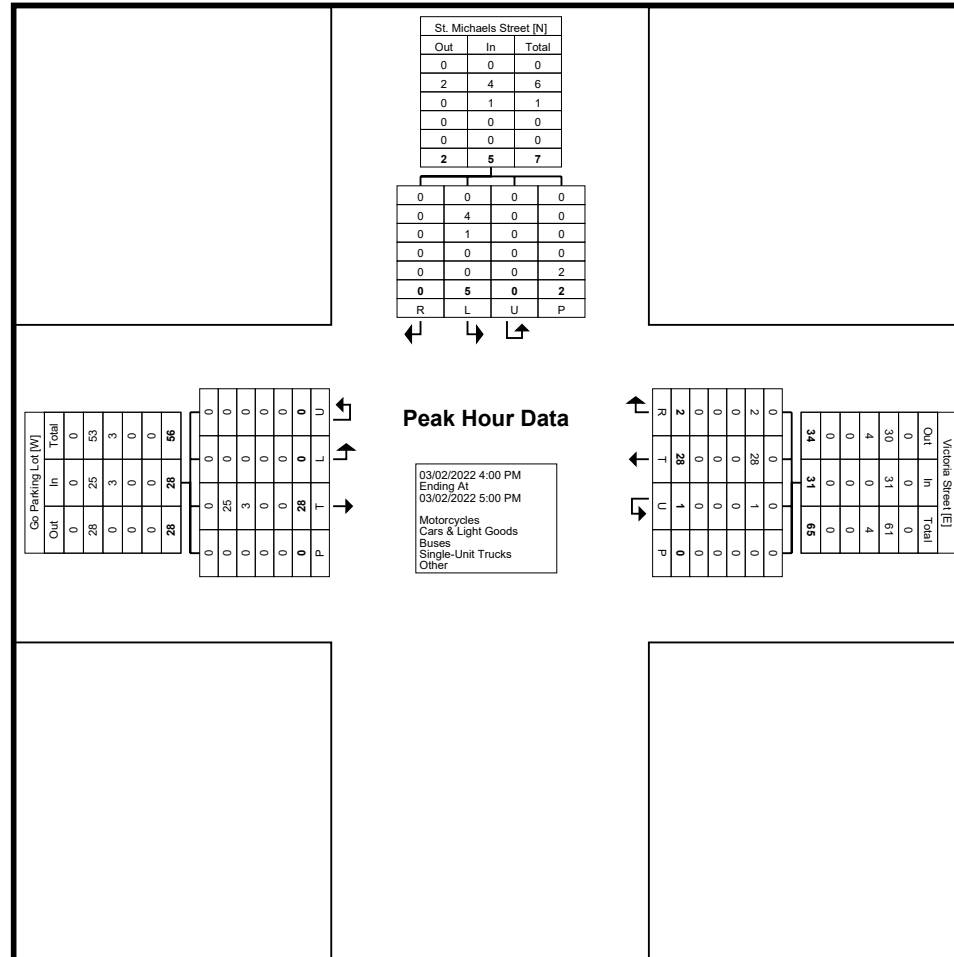
Start Time	Go Parking Lot Eastbound					Victoria Street Westbound					St. Michaels Street Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
4:00 PM	0	7	0	0	7	5	0	1	0	6	4	0	0	1	4	17
4:15 PM	0	8	0	0	8	4	2	0	0	6	1	0	0	1	1	15
4:30 PM	0	4	0	0	4	9	0	0	0	9	0	0	0	0	0	13
4:45 PM	0	9	0	0	9	10	0	0	0	10	0	0	0	0	0	19
Total	0	28	0	0	28	28	2	1	0	31	5	0	0	2	5	64
Approach %	0.0	100.0	0.0	-	-	90.3	6.5	3.2	-	-	100.0	0.0	0.0	-	-	-
Total %	0.0	43.8	0.0	-	43.8	43.8	3.1	1.6	-	48.4	7.8	0.0	0.0	-	7.8	-
PHF	0.000	0.778	0.000	-	0.778	0.700	0.250	0.250	-	0.775	0.313	0.000	0.000	-	0.313	0.842
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	0	25	0	-	25	28	2	1	-	31	4	0	0	-	4	60
% Cars & Light Goods	-	89.3	-	-	89.3	100.0	100.0	100.0	-	100.0	80.0	-	-	-	80.0	93.8
Buses	0	3	0	-	3	0	0	0	-	0	1	0	0	-	1	4
% Buses	-	10.7	-	-	10.7	0.0	0.0	0.0	-	0.0	20.0	-	-	-	20.0	6.3
Single-Unit Trucks	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
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	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: River Drive & St. Michaels Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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

Count Name: John Street & Rosetta Valley Court  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 1

### Turning Movement Data

Start Time	John Street Eastbound					John Street Westbound					Rosset Valley Court Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	14	0	0	0	14	1	2	0	0	3	1	3	0	0	4	21
7:15 AM	27	0	0	0	27	0	8	0	0	8	1	3	0	0	4	39
7:30 AM	18	1	0	5	19	0	6	0	0	6	0	3	0	0	3	28
7:45 AM	23	0	0	0	23	0	21	0	0	21	2	2	0	1	4	48
Hourly Total	82	1	0	5	83	1	37	0	0	38	4	11	0	1	15	136
8:00 AM	14	0	0	0	14	8	12	0	0	20	0	7	0	3	7	41
8:15 AM	19	0	0	0	19	1	17	0	0	18	1	5	0	3	6	43
8:30 AM	18	0	0	0	18	1	13	0	0	14	1	3	0	2	4	36
8:45 AM	26	0	0	0	26	4	16	1	0	21	1	2	0	0	3	50
Hourly Total	77	0	0	0	77	14	58	1	0	73	3	17	0	8	20	170
9:00 AM	15	1	0	0	16	0	12	0	0	12	0	2	0	0	2	30
9:15 AM	20	1	0	0	21	1	11	0	0	12	1	2	0	0	3	36
9:30 AM	16	1	0	0	17	0	15	0	0	15	1	1	0	0	2	34
9:45 AM	11	0	1	0	12	1	9	0	0	10	0	1	0	1	1	23
Hourly Total	62	3	1	0	66	2	47	0	0	49	2	6	0	1	8	123
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	7	0	0	0	7	1	15	0	0	16	0	0	0	4	0	23
11:15 AM	14	1	0	0	15	1	12	0	0	13	1	1	0	0	2	30
11:30 AM	20	1	0	0	21	2	13	1	0	16	0	2	0	2	2	39
11:45 AM	10	0	0	0	10	1	14	0	0	15	1	2	0	0	3	28
Hourly Total	51	2	0	0	53	5	54	1	0	60	2	5	0	6	7	120
12:00 PM	14	0	0	0	14	4	23	0	0	27	0	3	0	1	3	44
12:15 PM	13	1	0	0	14	2	22	0	0	24	0	2	0	3	2	40
12:30 PM	16	0	0	3	16	3	21	0	0	24	0	3	0	5	3	43
12:45 PM	11	1	1	0	13	3	24	0	0	27	0	2	0	0	2	42
Hourly Total	54	2	1	3	57	12	90	0	0	102	0	10	0	9	10	169
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	20	2	0	0	22	1	31	0	1	32	0	1	0	0	1	55
3:15 PM	18	0	0	0	18	5	28	0	2	33	0	4	0	2	4	55
3:30 PM	30	2	0	1	32	7	26	0	0	33	0	7	0	4	7	72
3:45 PM	20	1	0	0	21	3	32	0	0	35	2	2	0	0	4	60
Hourly Total	88	5	0	1	93	16	117	0	3	133	2	14	0	6	16	242
4:00 PM	18	2	0	0	20	4	26	0	0	30	2	1	0	1	3	53
4:15 PM	20	1	0	1	21	5	25	0	0	30	0	1	0	1	1	52
4:30 PM	14	1	0	0	15	6	28	0	0	34	0	2	0	2	2	51
4:45 PM	15	0	0	0	15	4	31	0	0	35	1	3	0	2	4	54

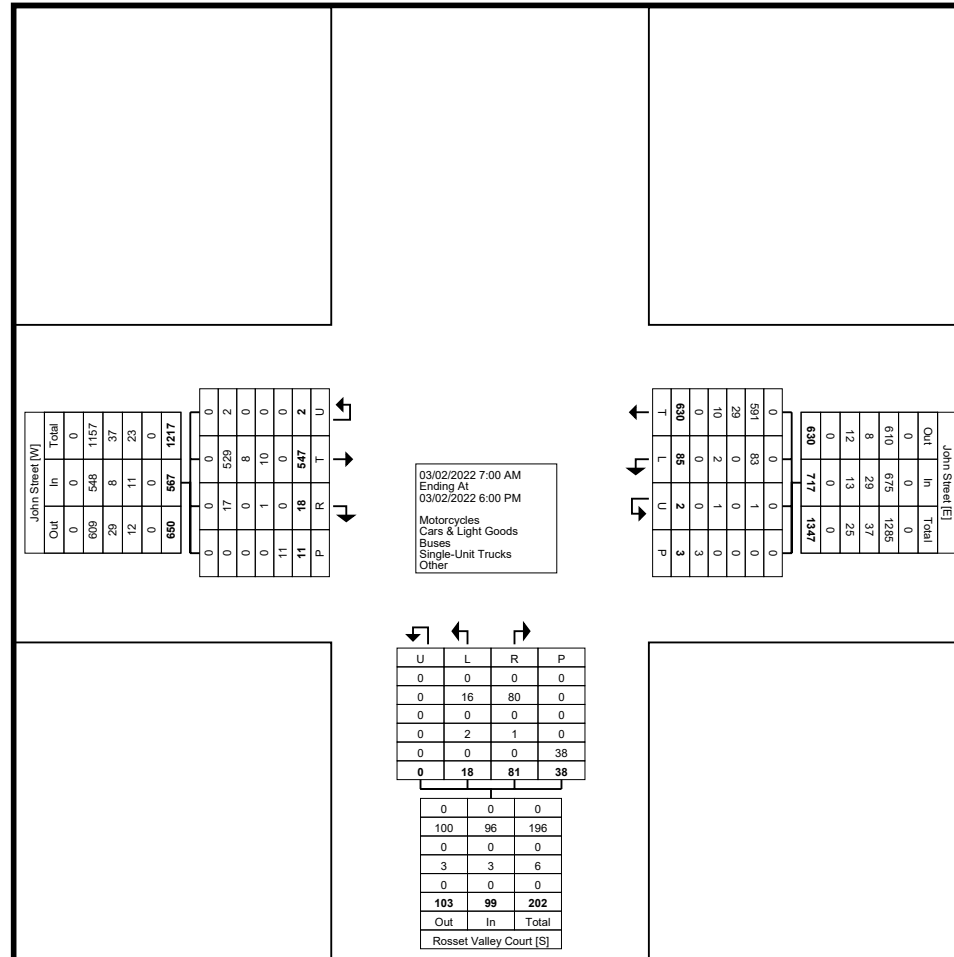
Hourly Total	67	4	0	1	71	19	110	0	0	129	3	7	0	6	10	210
5:00 PM	19	1	0	0	20	1	39	0	0	40	2	2	0	0	4	64
5:15 PM	18	0	0	1	18	6	31	0	0	37	0	4	0	0	4	59
5:30 PM	14	0	0	0	14	5	25	0	0	30	0	4	0	0	4	48
5:45 PM	15	0	0	0	15	4	22	0	0	26	0	1	0	1	1	42
Hourly Total	66	1	0	1	67	16	117	0	0	133	2	11	0	1	13	213
Grand Total	547	18	2	11	567	85	630	2	3	717	18	81	0	38	99	1383
Approach %	96.5	3.2	0.4	-	-	11.9	87.9	0.3	-	-	18.2	81.8	0.0	-	-	-
Total %	39.6	1.3	0.1	-	41.0	6.1	45.6	0.1	-	51.8	1.3	5.9	0.0	-	7.2	-
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	0.0	-	-	0.0	0.0
Cars & Light Goods	529	17	2	-	548	83	591	1	-	675	16	80	0	-	96	1319
% Cars & Light Goods	96.7	94.4	100.0	-	96.6	97.6	93.8	50.0	-	94.1	88.9	98.8	-	-	97.0	95.4
Buses	8	0	0	-	8	0	29	0	-	29	0	0	0	-	0	37
% Buses	1.5	0.0	0.0	-	1.4	0.0	4.6	0.0	-	4.0	0.0	0.0	-	-	0.0	2.7
Single-Unit Trucks	10	1	0	-	11	2	10	1	-	13	2	1	0	-	3	27
% Single-Unit Trucks	1.8	5.6	0.0	-	1.9	2.4	1.6	50.0	-	1.8	11.1	1.2	-	-	3.0	2.0
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	-	-	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	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	11	-	-	-	-	3	-	-	-	-	38	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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Count Name: John Street & Rosetta Valley Court  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
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Count Name: John Street & Rosetta Valley Court  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 4

### Turning Movement Peak Hour Data (8:00 AM)

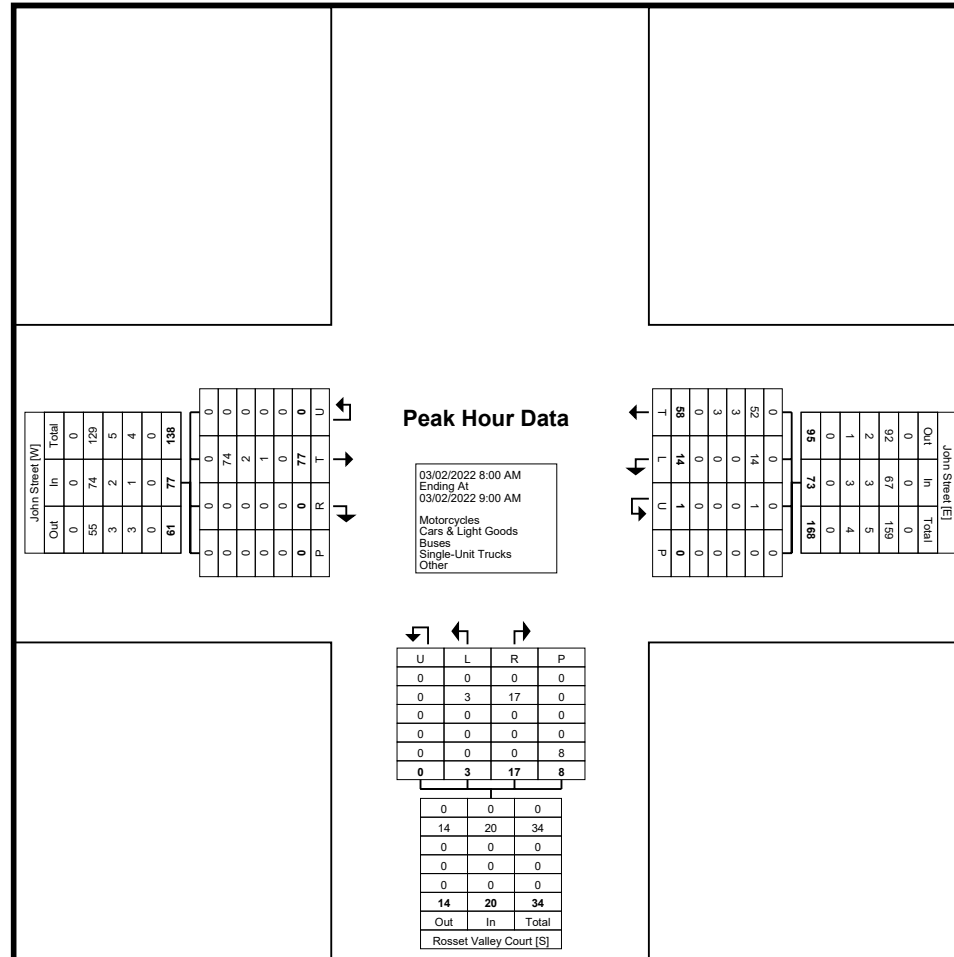
Start Time	John Street Eastbound					John Street Westbound					Rosset Valley Court Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
8:00 AM	14	0	0	0	14	8	12	0	0	20	0	7	0	3	7	41
8:15 AM	19	0	0	0	19	1	17	0	0	18	1	5	0	3	6	43
8:30 AM	18	0	0	0	18	1	13	0	0	14	1	3	0	2	4	36
8:45 AM	26	0	0	0	26	4	16	1	0	21	1	2	0	0	3	50
Total	77	0	0	0	77	14	58	1	0	73	3	17	0	8	20	170
Approach %	100.0	0.0	0.0	-	-	19.2	79.5	1.4	-	-	15.0	85.0	0.0	-	-	-
Total %	45.3	0.0	0.0	-	45.3	8.2	34.1	0.6	-	42.9	1.8	10.0	0.0	-	11.8	-
PHF	0.740	0.000	0.000	-	0.740	0.438	0.853	0.250	-	0.869	0.750	0.607	0.000	-	0.714	0.850
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	0.0
Cars & Light Goods	74	0	0	-	74	14	52	1	-	67	3	17	0	-	20	161
% Cars & Light Goods	96.1	-	-	-	96.1	100.0	89.7	100.0	-	91.8	100.0	100.0	-	-	100.0	94.7
Buses	2	0	0	-	2	0	3	0	-	3	0	0	0	-	0	5
% Buses	2.6	-	-	-	2.6	0.0	5.2	0.0	-	4.1	0.0	0.0	-	-	0.0	2.9
Single-Unit Trucks	1	0	0	-	1	0	3	0	-	3	0	0	0	-	0	4
% Single-Unit Trucks	1.3	-	-	-	1.3	0.0	5.2	0.0	-	4.1	0.0	0.0	-	-	0.0	2.4
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	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	8	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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Count Name: John Street & Rosetta Valley Court  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 5



Turning Movement Peak Hour Data Plot (8:00 AM)



Paradigm Transportation Solutions Limited  
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Cambridge, Ontario, Canada N1R 8J8  
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Count Name: John Street & Rosetta Valley Court  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 6

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

Start Time	John Street Eastbound					John Street Westbound					Rosset Valley Court Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
12:00 PM	14	0	0	0	14	4	23	0	0	27	0	3	0	1	3	44
12:15 PM	13	1	0	0	14	2	22	0	0	24	0	2	0	3	2	40
12:30 PM	16	0	0	3	16	3	21	0	0	24	0	3	0	5	3	43
12:45 PM	11	1	1	0	13	3	24	0	0	27	0	2	0	0	2	42
Total	54	2	1	3	57	12	90	0	0	102	0	10	0	9	10	169
Approach %	94.7	3.5	1.8	-	-	11.8	88.2	0.0	-	-	0.0	100.0	0.0	-	-	-
Total %	32.0	1.2	0.6	-	33.7	7.1	53.3	0.0	-	60.4	0.0	5.9	0.0	-	5.9	-
PHF	0.844	0.500	0.250	-	0.891	0.750	0.938	0.000	-	0.944	0.000	0.833	0.000	-	0.833	0.960
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	0.0
Cars & Light Goods	52	2	1	-	55	11	86	0	-	97	0	9	0	-	9	161
% Cars & Light Goods	96.3	100.0	100.0	-	96.5	91.7	95.6	-	-	95.1	-	90.0	-	-	90.0	95.3
Buses	0	0	0	-	0	0	3	0	-	3	0	0	0	-	0	3
% Buses	0.0	0.0	0.0	-	0.0	0.0	3.3	-	-	2.9	-	0.0	-	-	0.0	1.8
Single-Unit Trucks	2	0	0	-	2	1	1	0	-	2	0	1	0	-	1	5
% Single-Unit Trucks	3.7	0.0	0.0	-	3.5	8.3	1.1	-	-	2.0	-	10.0	-	-	10.0	3.0
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	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	3	-	-	-	-	0	-	-	-	-	9	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

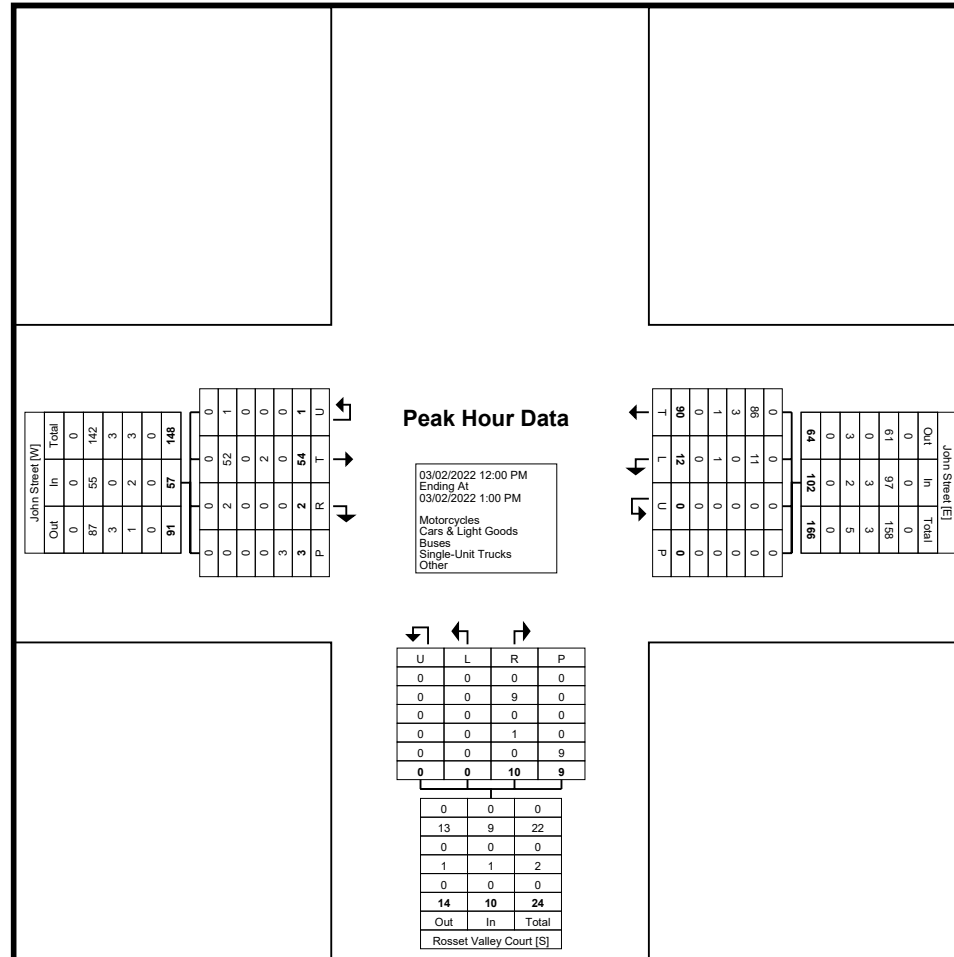




Paradigm Transportation Solutions Limited  
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Count Name: John Street & Rosetta Valley Court  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 7



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



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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Count Name: John Street & Rosetta Valley Court  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 8

### Turning Movement Peak Hour Data (3:00 PM)

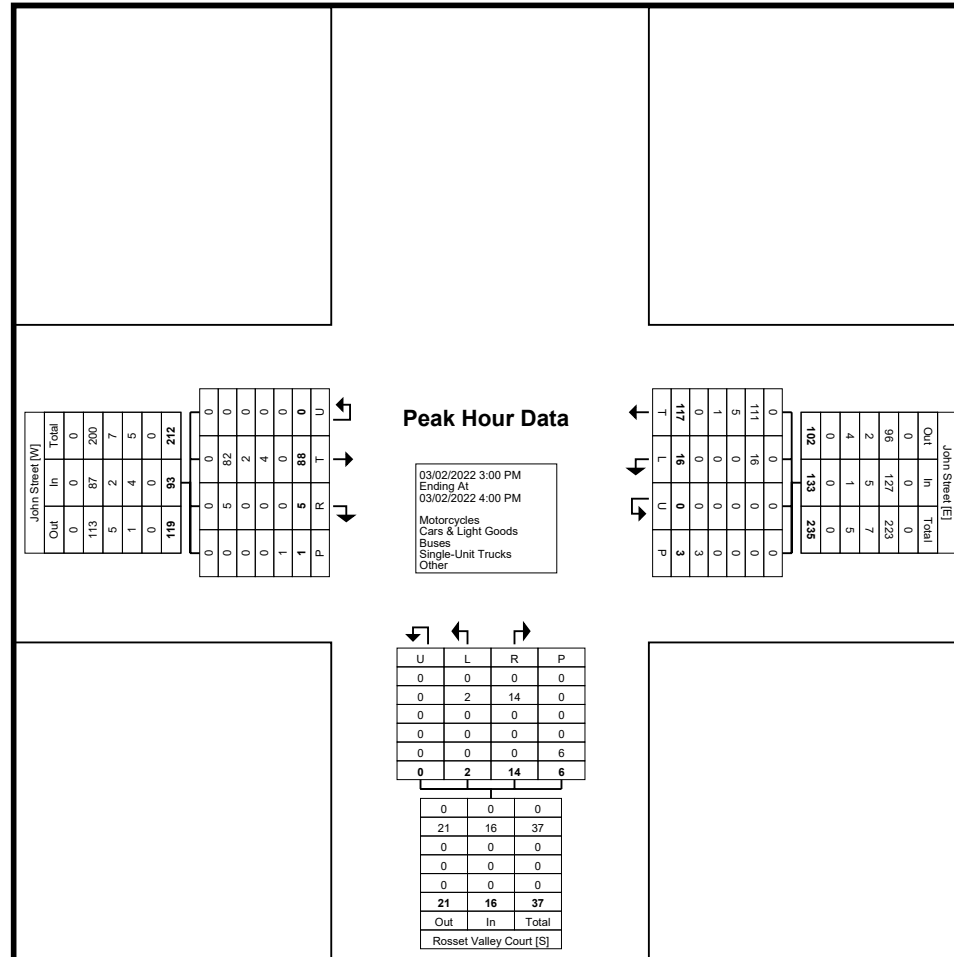
Start Time	John Street Eastbound					John Street Westbound					Rosset Valley Court Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
3:00 PM	20	2	0	0	22	1	31	0	1	32	0	1	0	0	1	55
3:15 PM	18	0	0	0	18	5	28	0	2	33	0	4	0	2	4	55
3:30 PM	30	2	0	1	32	7	26	0	0	33	0	7	0	4	7	72
3:45 PM	20	1	0	0	21	3	32	0	0	35	2	2	0	0	4	60
Total	88	5	0	1	93	16	117	0	3	133	2	14	0	6	16	242
Approach %	94.6	5.4	0.0	-	-	12.0	88.0	0.0	-	-	12.5	87.5	0.0	-	-	-
Total %	36.4	2.1	0.0	-	38.4	6.6	48.3	0.0	-	55.0	0.8	5.8	0.0	-	6.6	-
PHF	0.733	0.625	0.000	-	0.727	0.571	0.914	0.000	-	0.950	0.250	0.500	0.000	-	0.571	0.840
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	0.0
Cars & Light Goods	82	5	0	-	87	16	111	0	-	127	2	14	0	-	16	230
% Cars & Light Goods	93.2	100.0	-	-	93.5	100.0	94.9	-	-	95.5	100.0	100.0	-	-	100.0	95.0
Buses	2	0	0	-	2	0	5	0	-	5	0	0	0	-	0	7
% Buses	2.3	0.0	-	-	2.2	0.0	4.3	-	-	3.8	0.0	0.0	-	-	0.0	2.9
Single-Unit Trucks	4	0	0	-	4	0	1	0	-	1	0	0	0	-	0	5
% Single-Unit Trucks	4.5	0.0	-	-	4.3	0.0	0.9	-	-	0.8	0.0	0.0	-	-	0.0	2.1
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	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	1	-	-	-	-	3	-	-	-	-	6	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
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Count Name: John Street & Rosetta Valley Court  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 9



Turning Movement Peak Hour Data Plot (3:00 PM)



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
519-896-3163 cbowness@pts1.com

Count Name: John Street & Victoria Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 1

### Turning Movement Data

Start Time	John Street Eastbound						John Street Westbound						Victoria Street Northbound						Victoria Street 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	3	0	0	0	4	1	1	2	0	0	4	0	0	0	0	0	0	8	3	0	0	0	11	19
7:15 AM	0	6	1	0	0	7	2	2	5	0	4	9	1	1	1	0	2	3	19	4	1	0	0	24	43
7:30 AM	1	3	1	0	1	5	0	1	5	0	1	6	1	0	0	0	1	1	17	8	1	0	0	26	38
7:45 AM	0	4	2	0	0	6	2	7	10	0	3	19	0	0	0	0	0	0	19	4	0	0	0	23	48
Hourly Total	2	16	4	0	1	22	5	11	22	0	8	38	2	1	1	0	3	4	63	19	2	0	0	84	148
8:00 AM	0	2	1	0	0	3	1	0	13	0	3	14	0	0	0	0	0	0	11	8	0	0	0	19	36
8:15 AM	0	3	1	0	1	4	2	6	10	0	2	18	1	2	0	0	2	3	11	6	1	0	0	18	43
8:30 AM	0	4	1	0	0	5	1	7	9	0	1	17	1	3	0	0	3	4	16	2	0	0	1	18	44
8:45 AM	0	5	0	0	1	5	0	6	10	0	1	16	2	1	0	0	0	3	19	4	3	0	1	26	50
Hourly Total	0	14	3	0	2	17	4	19	42	0	7	65	4	6	0	0	5	10	57	20	4	0	2	81	173
9:00 AM	0	5	0	0	0	5	1	5	7	0	0	13	1	0	0	0	0	1	10	4	0	0	0	14	33
9:15 AM	3	3	0	0	0	6	0	2	10	0	0	12	0	2	0	0	0	2	17	1	1	0	0	19	39
9:30 AM	1	3	0	0	0	4	0	6	8	0	2	14	0	1	0	0	0	1	13	5	1	0	1	19	38
9:45 AM	1	2	0	0	0	3	0	5	6	1	0	12	1	0	0	0	0	1	9	4	1	0	2	14	30
Hourly Total	5	13	0	0	0	18	1	18	31	1	2	51	2	3	0	0	0	5	49	14	3	0	3	66	140
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	1	0	1	0	0	2	3	3	9	0	0	15	1	1	0	0	0	2	6	2	0	0	0	8	27
11:15 AM	0	2	0	0	0	2	1	4	9	0	4	14	0	0	3	0	0	3	12	3	1	0	0	16	35
11:30 AM	1	10	1	0	3	12	0	5	9	0	3	14	1	3	0	0	2	4	10	4	0	0	2	14	44
11:45 AM	2	3	0	0	0	5	2	4	5	1	0	12	0	1	0	0	1	1	5	3	0	0	1	8	26
Hourly Total	4	15	2	0	3	21	6	16	32	1	7	55	2	5	3	0	3	10	33	12	1	0	3	46	132
12:00 PM	0	2	2	0	0	4	0	9	11	0	1	20	0	3	0	0	0	3	10	4	0	0	0	14	41
12:15 PM	1	3	1	0	0	5	0	4	19	0	0	23	1	2	0	0	1	3	11	3	0	0	0	14	45
12:30 PM	0	0	0	0	2	0	0	4	17	0	0	21	1	5	0	0	1	6	17	4	1	0	0	22	49
12:45 PM	0	6	1	0	1	7	2	8	12	0	0	22	0	0	1	0	1	1	4	6	0	0	0	10	40
Hourly Total	1	11	4	0	3	16	2	25	59	0	1	86	2	10	1	0	3	13	42	17	1	0	0	60	175
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	4	0	0	0	5	4	13	14	0	0	31	3	4	1	0	0	8	17	4	1	0	0	22	66
3:15 PM	0	8	0	0	2	8	0	7	21	0	1	28	2	1	0	0	1	3	13	6	1	0	1	20	59
3:30 PM	2	14	0	0	0	16	0	4	20	0	3	24	2	8	0	0	7	10	17	4	0	0	1	21	71
3:45 PM	0	7	1	0	0	8	2	6	21	0	1	29	2	3	0	0	2	5	10	4	1	0	0	15	57
Hourly Total	3	33	1	0	2	37	6	30	76	0	5	112	9	16	1	0	10	26	57	18	3	0	2	78	253
4:00 PM	1	7	1	0	2	9	1	7	17	0	1	25	2	2	0	0	0	4	11	4	0	0	0	15	53
4:15 PM	0	12	1	0	2	13	1	4	21	0	1	26	1	1	0	0	3	2	12	5	1	0	1	18	59
4:30 PM	5	2	1	0	0	8	2	6	14	0	3	22	3	6	0	0	0	9	10	3	0	0	0	13	52

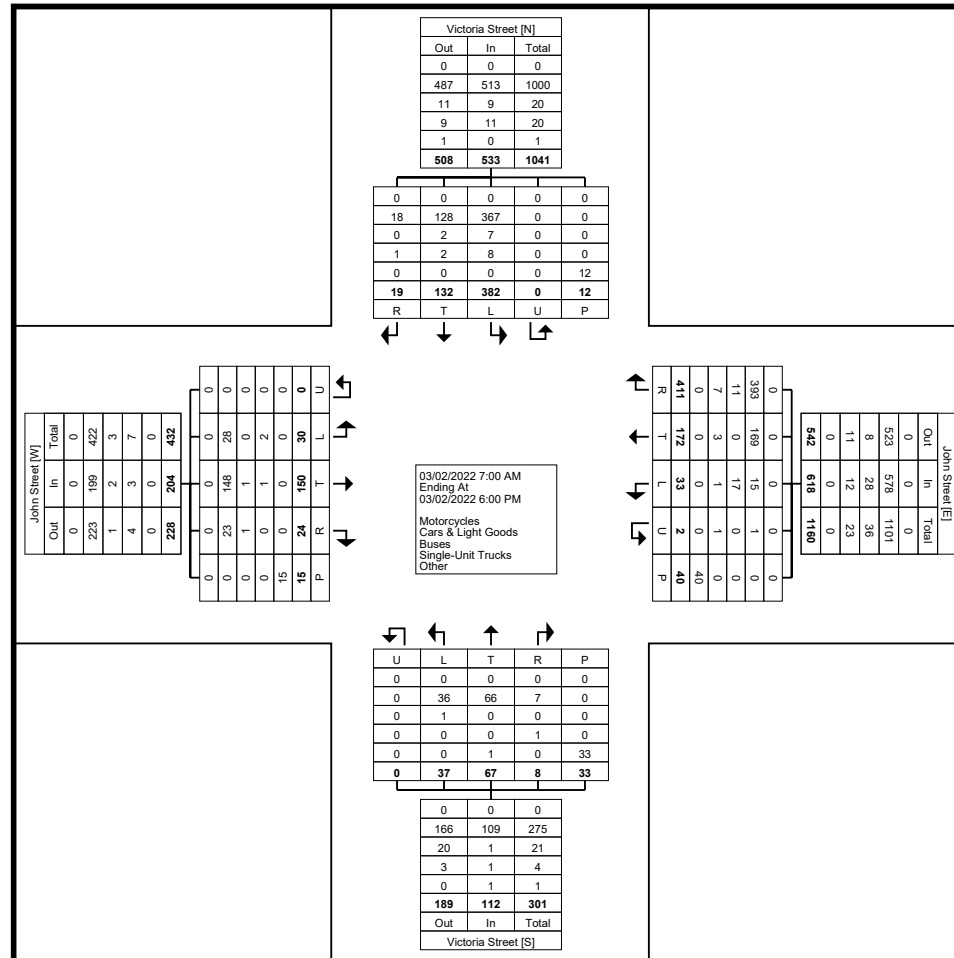
4:45 PM	1	4	2	0	0	7	1	9	19	0	1	29	2	6	2	0	1	10	12	3	0	0	0	15	61
Hourly Total	7	25	5	0	4	37	5	26	71	0	6	102	8	15	2	0	4	25	45	15	1	0	1	61	225
5:00 PM	4	9	2	0	0	15	0	10	24	0	1	34	4	4	0	0	1	8	9	5	2	0	0	16	73
5:15 PM	1	7	1	0	0	9	2	6	24	0	1	32	1	3	0	0	1	4	9	6	1	0	1	16	61
5:30 PM	1	4	1	0	0	6	1	5	16	0	1	22	2	0	0	0	0	2	7	5	0	0	0	12	42
5:45 PM	2	3	1	0	0	6	1	6	14	0	1	21	1	4	0	0	3	5	11	1	1	0	0	13	45
Hourly Total	8	23	5	0	0	36	4	27	78	0	4	109	8	11	0	0	5	19	36	17	4	0	1	57	221
Grand Total	30	150	24	0	15	204	33	172	411	2	40	618	37	67	8	0	33	112	382	132	19	0	12	533	1467
Approach %	14.7	73.5	11.8	0.0	-	-	5.3	27.8	66.5	0.3	-	-	33.0	59.8	7.1	0.0	-	-	71.7	24.8	3.6	0.0	-	-	-
Total %	2.0	10.2	1.6	0.0	-	13.9	2.2	11.7	28.0	0.1	-	42.1	2.5	4.6	0.5	0.0	-	7.6	26.0	9.0	1.3	0.0	-	36.3	-
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	0.0	-	-	0.0	0.0
Cars & Light Goods	28	148	23	0	-	199	15	169	393	1	-	578	36	66	7	0	-	109	367	128	18	0	-	513	1399
% Cars & Light Goods	93.3	98.7	95.8	-	-	97.5	45.5	98.3	95.6	50.0	-	93.5	97.3	98.5	87.5	-	-	97.3	96.1	97.0	94.7	-	-	96.2	95.4
Buses	0	1	1	0	-	2	17	0	11	0	-	28	1	0	0	0	-	1	7	2	0	0	-	9	40
% Buses	0.0	0.7	4.2	-	-	1.0	51.5	0.0	2.7	0.0	-	4.5	2.7	0.0	0.0	-	-	0.9	1.8	1.5	0.0	-	-	1.7	2.7
Single-Unit Trucks	2	1	0	0	-	3	1	3	7	1	-	12	0	0	1	0	-	1	8	2	1	0	-	11	27
% Single-Unit Trucks	6.7	0.7	0.0	-	-	1.5	3.0	1.7	1.7	50.0	-	1.9	0.0	0.0	12.5	-	-	0.9	2.1	1.5	5.3	-	-	2.1	1.8
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	0.0	-	-	0.0	0.0
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	0.0	-	0.0	0.0	1.5	0.0	-	-	0.9	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	15	-	-	-	-	40	-	-	-	-	-	-	33	-	-	-	-	-	12	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

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Count Name: John Street & Victoria Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited  
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Cambridge, Ontario, Canada N1R 8J8  
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Count Name: John Street & Victoria Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 4

### Turning Movement Peak Hour Data (8:00 AM)

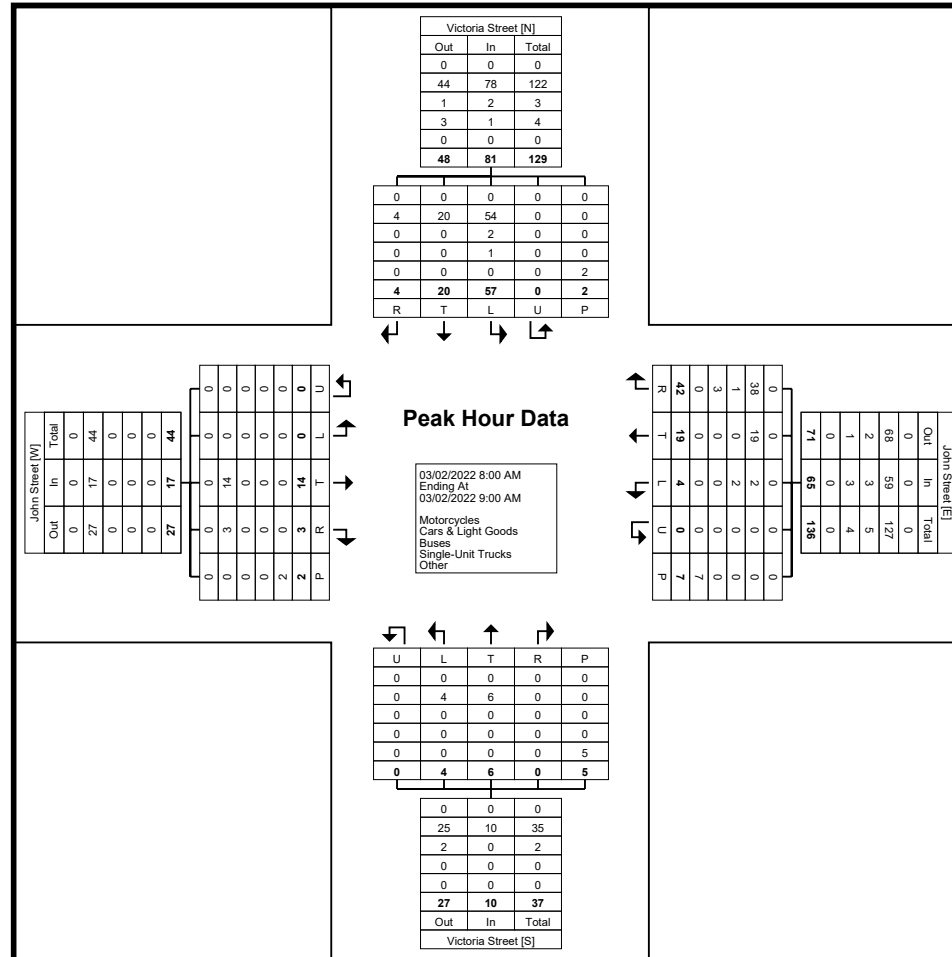
Start Time	John Street Eastbound						John Street Westbound						Victoria Street Northbound						Victoria Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:00 AM	0	2	1	0	0	3	1	0	13	0	3	14	0	0	0	0	0	0	11	8	0	0	0	19	36
8:15 AM	0	3	1	0	1	4	2	6	10	0	2	18	1	2	0	0	2	3	11	6	1	0	0	18	43
8:30 AM	0	4	1	0	0	5	1	7	9	0	1	17	1	3	0	0	3	4	16	2	0	0	1	18	44
8:45 AM	0	5	0	0	1	5	0	6	10	0	1	16	2	1	0	0	0	3	19	4	3	0	1	26	50
<b>Total</b>	<b>0</b>	<b>14</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>17</b>	<b>4</b>	<b>19</b>	<b>42</b>	<b>0</b>	<b>7</b>	<b>65</b>	<b>4</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>10</b>	<b>57</b>	<b>20</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>81</b>	<b>173</b>
Approach %	0.0	82.4	17.6	0.0	-	-	6.2	29.2	64.6	0.0	-	-	40.0	60.0	0.0	0.0	-	-	70.4	24.7	4.9	0.0	-	-	-
Total %	0.0	8.1	1.7	0.0	-	9.8	2.3	11.0	24.3	0.0	-	37.6	2.3	3.5	0.0	0.0	-	5.8	32.9	11.6	2.3	0.0	-	46.8	-
PHF	0.000	0.700	0.750	0.000	-	0.850	0.500	0.679	0.808	0.000	-	0.903	0.500	0.500	0.000	0.000	-	0.625	0.750	0.625	0.333	0.000	-	0.779	0.865
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	0	14	3	0	-	17	2	19	38	0	-	59	4	6	0	0	-	10	54	20	4	0	-	78	164
% Cars & Light Goods	-	100.0	100.0	-	-	100.0	50.0	100.0	90.5	-	-	90.8	100.0	100.0	-	-	-	100.0	94.7	100.0	100.0	-	-	96.3	94.8
Buses	0	0	0	0	-	0	2	0	1	0	-	3	0	0	0	0	-	0	2	0	0	0	-	2	5
% Buses	-	0.0	0.0	-	-	0.0	50.0	0.0	2.4	-	-	4.6	0.0	0.0	-	-	-	0.0	3.5	0.0	0.0	-	-	2.5	2.9
Single-Unit Trucks	0	0	0	0	-	0	0	0	3	0	-	3	0	0	0	0	-	0	1	0	0	0	-	1	4
% Single-Unit Trucks	-	0.0	0.0	-	-	0.0	0.0	0.0	7.1	-	-	4.6	0.0	0.0	-	-	-	0.0	1.8	0.0	0.0	-	-	1.2	2.3
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	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	2	-	-	-	-	-	7	-	-	-	-	-	5	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
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Count Name: John Street & Victoria Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 5



Turning Movement Peak Hour Data Plot (8:00 AM)





Paradigm Transportation Solutions Limited  
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8  
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Count Name: John Street & Victoria Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 6

### Turning Movement Peak Hour Data (11:00 AM)

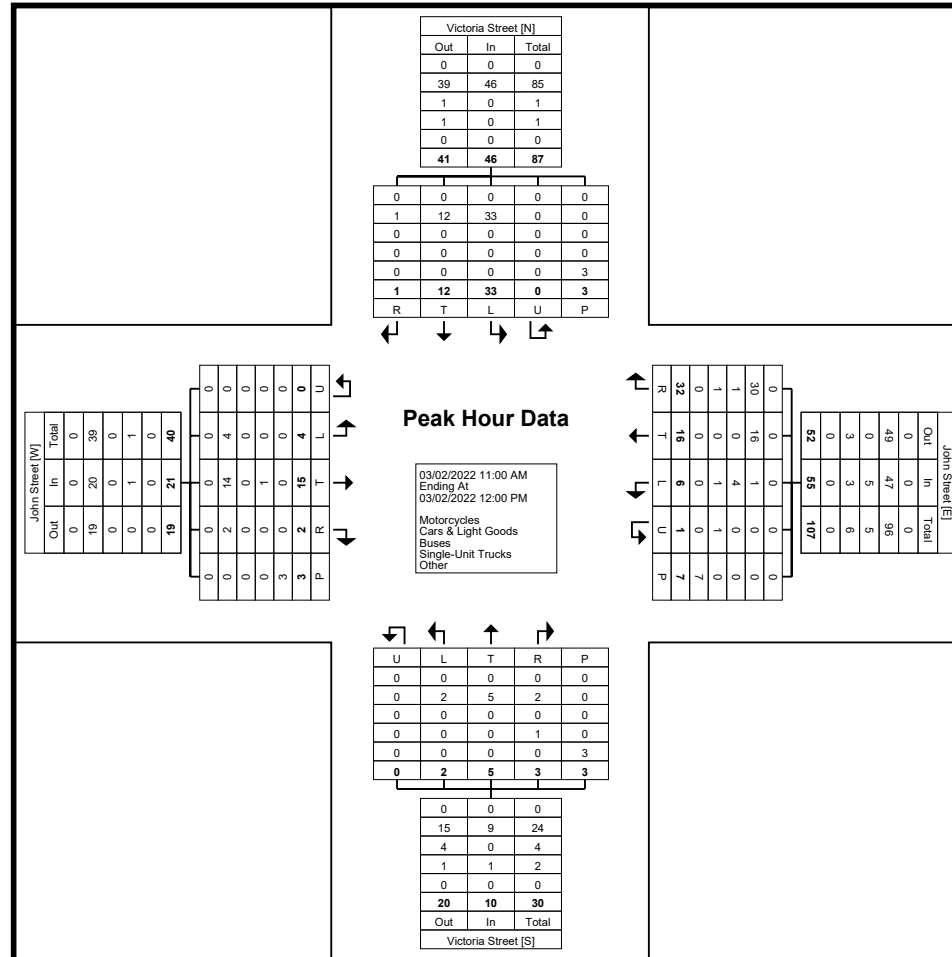
Start Time	John Street Eastbound						John Street Westbound						Victoria Street Northbound						Victoria Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:00 AM	1	0	1	0	0	2	3	3	9	0	0	15	1	1	0	0	0	2	6	2	0	0	0	8	27
11:15 AM	0	2	0	0	0	2	1	4	9	0	4	14	0	0	3	0	0	3	12	3	1	0	0	16	35
11:30 AM	1	10	1	0	3	12	0	5	9	0	3	14	1	3	0	0	2	4	10	4	0	0	2	14	44
11:45 AM	2	3	0	0	0	5	2	4	5	1	0	12	0	1	0	0	1	1	5	3	0	0	1	8	26
<b>Total</b>	<b>4</b>	<b>15</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>21</b>	<b>6</b>	<b>16</b>	<b>32</b>	<b>1</b>	<b>7</b>	<b>55</b>	<b>2</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>10</b>	<b>33</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>46</b>	<b>132</b>
Approach %	19.0	71.4	9.5	0.0	-	-	10.9	29.1	58.2	1.8	-	-	20.0	50.0	30.0	0.0	-	-	71.7	26.1	2.2	0.0	-	-	-
Total %	3.0	11.4	1.5	0.0	-	15.9	4.5	12.1	24.2	0.8	-	41.7	1.5	3.8	2.3	0.0	-	7.6	25.0	9.1	0.8	0.0	-	34.8	-
PHF	0.500	0.375	0.500	0.000	-	0.438	0.500	0.800	0.889	0.250	-	0.917	0.500	0.417	0.250	0.000	-	0.625	0.688	0.750	0.250	0.000	-	0.719	0.750
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	0.0	-	-	0.0	0.0
Cars & Light Goods	4	14	2	0	-	20	1	16	30	0	-	47	2	5	2	0	-	9	33	12	1	0	-	46	122
% Cars & Light Goods	100.0	93.3	100.0	-	-	95.2	16.7	100.0	93.8	0.0	-	85.5	100.0	100.0	66.7	-	-	90.0	100.0	100.0	100.0	-	-	100.0	92.4
Buses	0	0	0	0	-	0	4	0	1	0	-	5	0	0	0	0	-	0	0	0	0	0	-	0	5
% Buses	0.0	0.0	0.0	-	-	0.0	66.7	0.0	3.1	0.0	-	9.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	3.8
Single-Unit Trucks	0	1	0	0	-	1	1	0	1	1	-	3	0	0	1	0	-	1	0	0	0	0	-	0	5
% Single-Unit Trucks	0.0	6.7	0.0	-	-	4.8	16.7	0.0	3.1	100.0	-	5.5	0.0	0.0	33.3	-	-	10.0	0.0	0.0	0.0	-	-	0.0	3.8
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	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	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	7	-	-	-	-	-	3	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited  
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Count Name: John Street & Victoria Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 7



Turning Movement Peak Hour Data Plot (11:00 AM)



Paradigm Transportation Solutions Limited  
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Cambridge, Ontario, Canada N1R 8J8  
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Count Name: John Street & Victoria Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 8

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

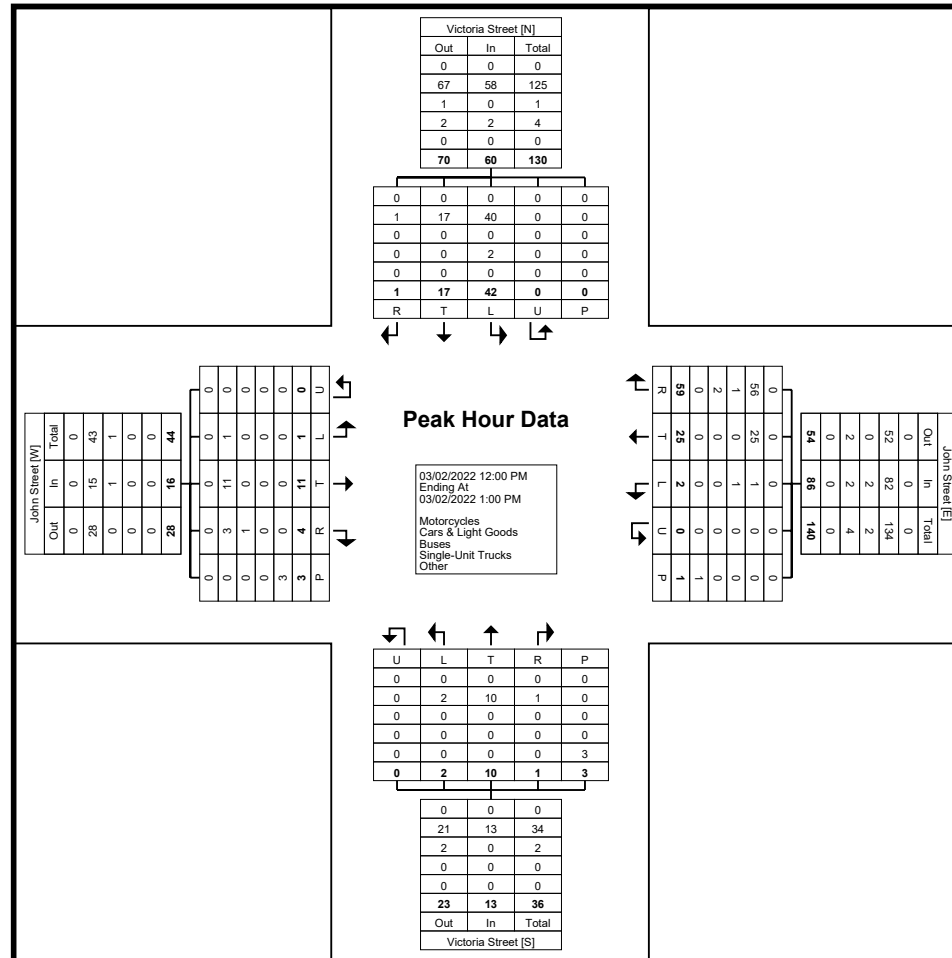
Start Time	John Street Eastbound						John Street Westbound						Victoria Street Northbound						Victoria Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	0	2	2	0	0	4	0	9	11	0	1	20	0	3	0	0	0	3	10	4	0	0	0	14	41
12:15 PM	1	3	1	0	0	5	0	4	19	0	0	23	1	2	0	0	1	3	11	3	0	0	0	14	45
12:30 PM	0	0	0	0	2	0	0	4	17	0	0	21	1	5	0	0	1	6	17	4	1	0	0	22	49
12:45 PM	0	6	1	0	1	7	2	8	12	0	0	22	0	0	1	0	1	1	4	6	0	0	0	10	40
<b>Total</b>	<b>1</b>	<b>11</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>16</b>	<b>2</b>	<b>25</b>	<b>59</b>	<b>0</b>	<b>1</b>	<b>86</b>	<b>2</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>13</b>	<b>42</b>	<b>17</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>60</b>	<b>175</b>
Approach %	6.3	68.8	25.0	0.0	-	-	2.3	29.1	68.6	0.0	-	-	15.4	76.9	7.7	0.0	-	-	70.0	28.3	1.7	0.0	-	-	-
Total %	0.6	6.3	2.3	0.0	-	9.1	1.1	14.3	33.7	0.0	-	49.1	1.1	5.7	0.6	0.0	-	7.4	24.0	9.7	0.6	0.0	-	34.3	-
PHF	0.250	0.458	0.500	0.000	-	0.571	0.250	0.694	0.776	0.000	-	0.935	0.500	0.500	0.250	0.000	-	0.542	0.618	0.708	0.250	0.000	-	0.682	0.893
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	-	-	0.0	0.0
Cars & Light Goods	1	11	3	0	-	15	1	25	56	0	-	82	2	10	1	0	-	13	40	17	1	0	-	58	168
% Cars & Light Goods	100.0	100.0	75.0	-	-	93.8	50.0	100.0	94.9	-	-	95.3	100.0	100.0	100.0	-	-	100.0	95.2	100.0	100.0	-	-	96.7	96.0
Buses	0	0	1	0	-	1	1	0	1	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	3
% Buses	0.0	0.0	25.0	-	-	6.3	50.0	0.0	1.7	-	-	2.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.7
Single-Unit Trucks	0	0	0	0	-	0	0	0	2	0	-	2	0	0	0	0	-	0	2	0	0	0	-	2	4
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	3.4	-	-	2.3	0.0	0.0	0.0	-	-	0.0	4.8	0.0	0.0	-	-	3.3	2.3
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	-	-	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	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-



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Count Name: John Street & Victoria Street  
Site Code: 210781  
Start Date: 03/02/2022  
Page No: 9



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



Paradigm Transportation Solutions Limited  
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Count Name: John Street & Victoria Street  
Site Code: 210781  
Start Date: 03/02/2022  
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### Turning Movement Peak Hour Data (3:00 PM)

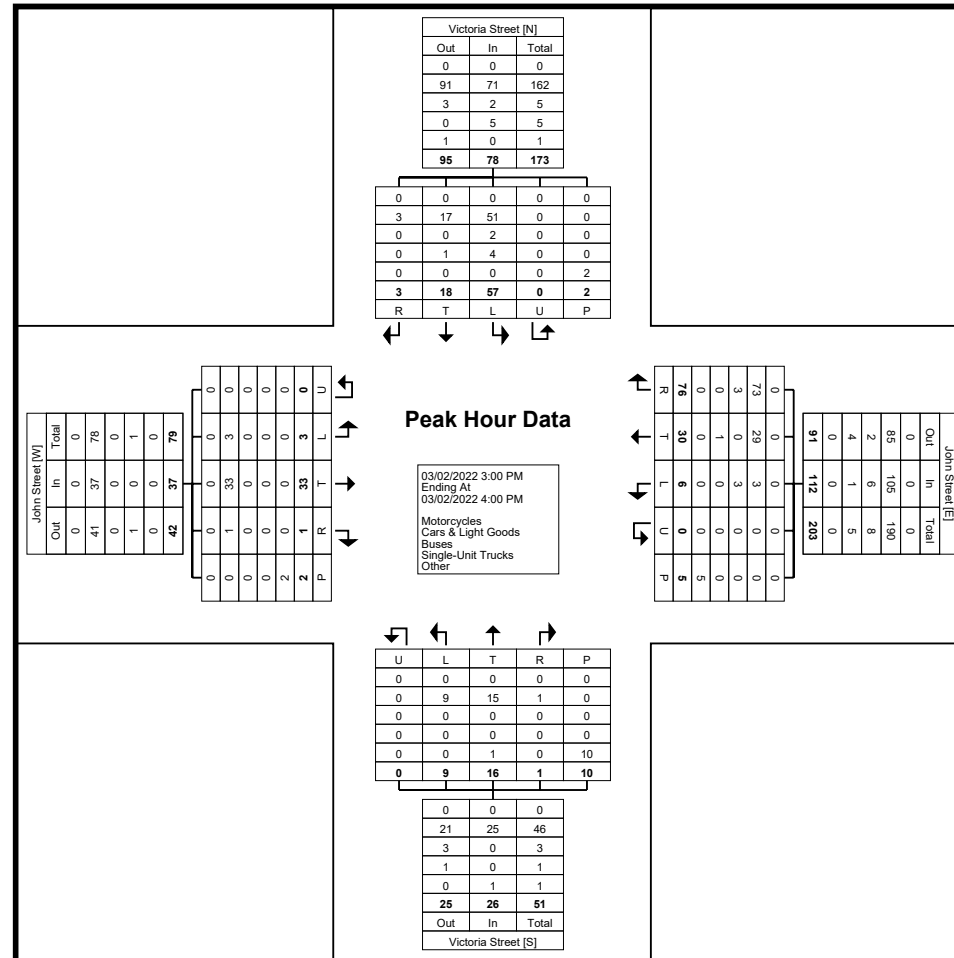
Start Time	John Street Eastbound						John Street Westbound						Victoria Street Northbound						Victoria Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
3:00 PM	1	4	0	0	0	5	4	13	14	0	0	31	3	4	1	0	0	8	17	4	1	0	0	22	66
3:15 PM	0	8	0	0	2	8	0	7	21	0	1	28	2	1	0	0	1	3	13	6	1	0	1	20	59
3:30 PM	2	14	0	0	0	16	0	4	20	0	3	24	2	8	0	0	7	10	17	4	0	0	1	21	71
3:45 PM	0	7	1	0	0	8	2	6	21	0	1	29	2	3	0	0	2	5	10	4	1	0	0	15	57
<b>Total</b>	<b>3</b>	<b>33</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>37</b>	<b>6</b>	<b>30</b>	<b>76</b>	<b>0</b>	<b>5</b>	<b>112</b>	<b>9</b>	<b>16</b>	<b>1</b>	<b>0</b>	<b>10</b>	<b>26</b>	<b>57</b>	<b>18</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>78</b>	<b>253</b>
Approach %	8.1	89.2	2.7	0.0	-	-	5.4	26.8	67.9	0.0	-	-	34.6	61.5	3.8	0.0	-	-	73.1	23.1	3.8	0.0	-	-	-
Total %	1.2	13.0	0.4	0.0	-	14.6	2.4	11.9	30.0	0.0	-	44.3	3.6	6.3	0.4	0.0	-	10.3	22.5	7.1	1.2	0.0	-	30.8	-
PHF	0.375	0.589	0.250	0.000	-	0.578	0.375	0.577	0.905	0.000	-	0.903	0.750	0.500	0.250	0.000	-	0.650	0.838	0.750	0.750	0.000	-	0.886	0.891
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	-	-	0.0	0.0
Cars & Light Goods	3	33	1	0	-	37	3	29	73	0	-	105	9	15	1	0	-	25	51	17	3	0	-	71	238
% Cars & Light Goods	100.0	100.0	100.0	-	-	100.0	50.0	96.7	96.1	-	-	93.8	100.0	93.8	100.0	-	-	96.2	89.5	94.4	100.0	-	-	91.0	94.1
Buses	0	0	0	0	-	0	3	0	3	0	-	6	0	0	0	0	-	0	2	0	0	0	-	2	8
% Buses	0.0	0.0	0.0	-	-	0.0	50.0	0.0	3.9	-	-	5.4	0.0	0.0	0.0	-	-	0.0	3.5	0.0	0.0	-	-	2.6	3.2
Single-Unit Trucks	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	4	1	0	0	-	5	6
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	3.3	0.0	-	-	0.9	0.0	0.0	0.0	-	-	0.0	7.0	5.6	0.0	-	-	6.4	2.4
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	-	-	0.0	0.0
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	-	-	0.0	0.0	6.3	0.0	-	-	3.8	0.0	0.0	0.0	-	-	0.0	0.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	2	-	-	-	-	-	5	-	-	-	-	-	10	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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Turning Movement Peak Hour Data Plot (3:00 PM)

# Appendix C

## Base Year Synchro Operations Reports



Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Base Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	1	8	36	111	5	20	9	221	119	35	381	3
Future Volume (vph)	1	8	36	111	5	20	9	221	119	35	381	3
Satd. Flow (prot)	0	1494	0	0	1363	0	0	1785	1380	0	3503	0
Fit Permitted		0.994			0.732			0.979			0.909	
Satd. Flow (perm)	0	1486	0	0	1038	0	0	1751	1346	0	3196	0
Satd. Flow (RTOR)		38			11			127			1	
Lane Group Flow (vph)	0	48	0	0	144	0	0	245	127	0	445	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0		45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		14.2			14.2			47.2	47.2		47.2	
Actuated g/C Ratio		0.18			0.18			0.59	0.59		0.59	
v/c Ratio		0.16			0.75			0.24	0.15		0.24	
Control Delay		11.2			50.0			10.3	2.9		9.6	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		11.2			50.0			10.3	2.9		9.6	
LOS		B			D			B	A		A	
Approach Delay		11.2			50.0			7.8			9.6	
Approach LOS		B			D			A			A	
Queue Length 50th (m)		1.3			19.8			15.2	0.0		14.5	
Queue Length 95th (m)		7.9			31.5			39.0	8.7		32.1	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		506			343			1033	846		1885	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.09			0.42			0.24	0.15		0.24	

**Intersection Summary**

Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 14.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 81.8%  
 ICU Level of Service D  
 Analysis Period (min) 15



Queues  
1: Mountainview Road N & River Drive

Base Year  
AM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	48	144	245	127	445
v/c Ratio	0.16	0.75	0.24	0.15	0.24
Control Delay	11.2	50.0	10.3	2.9	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	50.0	10.3	2.9	9.6
Queue Length 50th (m)	1.3	19.8	15.2	0.0	14.5
Queue Length 95th (m)	7.9	31.5	39.0	8.7	32.1
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	506	343	1033	846	1885
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.09	0.42	0.24	0.15	0.24

**Intersection Summary**



HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Base Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	1	8	36	111	5	20	9	221	119	35	381	3
Future Volume (vph)	1	8	36	111	5	20	9	221	119	35	381	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)		9.1			9.1			9.5	9.5		9.5	
Lane Util. Factor		1.00			1.00			1.00	1.00		0.95	
Frbp, ped/bikes		1.00			1.00			1.00	0.97		1.00	
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	
Frt		0.89			0.98			1.00	0.85		1.00	
Flt Protected		1.00			0.96			1.00	1.00		1.00	
Satd. Flow (prot)		1494			1363			1785	1346		3501	
Flt Permitted		0.99			0.73			0.98	1.00		0.91	
Satd. Flow (perm)		1486			1038			1751	1346		3198	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1	9	38	118	5	21	10	235	127	37	405	3
RTOR Reduction (vph)	0	31	0	0	9	0	0	0	52	0	0	0
Lane Group Flow (vph)	0	17	0	0	135	0	0	245	75	0	445	0
Confl. Peds. (#/hr)	5					5			4	4		
Heavy Vehicles (%)	0%	0%	17%	35%	40%	5%	11%	6%	17%	6%	2%	33%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Actuated Green, G (s)		17.2			17.2			50.2	50.2		50.2	
Effective Green, g (s)		14.2			14.2			47.2	47.2		47.2	
Actuated g/C Ratio		0.18			0.18			0.59	0.59		0.59	
Clearance Time (s)		6.1			6.1			6.5	6.5		6.5	
Vehicle Extension (s)		3.0			3.0			4.5	4.5		4.5	
Lane Grp Cap (vph)		263			184			1033	794		1886	
v/s Ratio Prot												
v/s Ratio Perm		0.01			c0.13			c0.14	0.06		0.14	
v/c Ratio		0.06			0.73			0.24	0.09		0.24	
Uniform Delay, d1		27.4			31.1			7.8	7.1		7.8	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.1			14.0			0.5	0.2		0.3	
Delay (s)		27.5			45.1			8.4	7.4		8.1	
Level of Service		C			D			A	A		A	
Approach Delay (s)		27.5			45.1			8.0			8.1	
Approach LOS		C			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			14.3									B
HCM 2000 Volume to Capacity ratio												0.35
Actuated Cycle Length (s)			80.0									Sum of lost time (s) 18.6
Intersection Capacity Utilization			81.8%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Base Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	15	7	79	19	10	8	47	179	16	16	317	17
Future Volume (vph)	15	7	79	19	10	8	47	179	16	16	317	17
Satd. Flow (prot)	0	1631	0	0	1706	0	1544	1802	0	1646	1816	0
Flt Permitted		0.993			0.976		0.950			0.950		
Satd. Flow (perm)	0	1631	0	0	1706	0	1544	1802	0	1646	1816	0
Lane Group Flow (vph)	0	107	0	0	40	0	50	207	0	17	355	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 46.2% ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
2: Mountainview Road N & John Street

Base Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↖	↗		↖	↗	
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	15	7	79	19	10	8	47	179	16	16	317	17
Future Volume (vph)	15	7	79	19	10	8	47	179	16	16	317	17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	16	7	84	20	11	9	50	190	17	17	337	18
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	107	40	50	207	17	355						
Volume Left (vph)	16	20	50	0	17	0						
Volume Right (vph)	84	9	0	17	0	18						
Hadj (s)	-0.38	0.06	0.72	0.01	0.60	0.03						
Departure Headway (s)	5.1	5.7	6.0	5.3	5.8	5.2						
Degree Utilization, x	0.15	0.06	0.08	0.30	0.03	0.51						
Capacity (veh/h)	631	557	577	657	599	675						
Control Delay (s)	9.0	9.0	8.3	9.4	7.7	12.3						
Approach Delay (s)	9.0	9.0	9.2	12.1								
Approach LOS	A	A	A	B								
<b>Intersection Summary</b>												
Delay			10.6									
Level of Service			B									
Intersection Capacity Utilization			46.2%	ICU Level of Service		A						
Analysis Period (min)			15									

Lanes, Volumes, Timings  
3: River Drive & Daniella Street

Base Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	2	47	12	2	7	3
Future Volume (vph)	2	47	12	2	7	3
Satd. Flow (prot)	0	1589	1794	0	1766	0
Fit Permitted		0.998		0.965		
Satd. Flow (perm)	0	1589	1794	0	1766	0
Lane Group Flow (vph)	0	57	16	0	11	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.3%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Base Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	47	12	2	7	3
Future Volume (Veh/h)	2	47	12	2	7	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	2	55	14	2	8	3
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	19				77	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	19				77	18
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1606				927	1063
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	57	16	11			
Volume Left	2	0	8			
Volume Right	0	2	3			
cSH	1606	1700	961			
Volume to Capacity	0.00	0.01	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.3	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	8.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.3			
Intersection Capacity Utilization		19.3%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Base Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	41	8	2	4	0
Future Volume (vph)	0	41	8	2	4	0
Satd. Flow (prot)	0	1583	1430	0	1805	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	1583	1430	0	1805	0
Lane Group Flow (vph)	0	46	11	0	4	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 18.3%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Base Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	41	8	2	4	0
Future Volume (Veh/h)	0	41	8	2	4	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	46	9	2	4	0
Pedestrians			2			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	11				58	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	11				58	10
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1621				952	1077
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	46	11	4			
Volume Left	0	0	4			
Volume Right	0	2	0			
cSH	1621	1700	952			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (m)	0.0	0.0	0.1			
Control Delay (s)	0.0	0.0	8.8			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization		18.3%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Base Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	38	4	1	1	0
Future Volume (vph)	1	38	4	1	1	0
Satd. Flow (prot)	0	1669	1536	0	1805	0
Fit Permitted		0.999			0.950	
Satd. Flow (perm)	0	1669	1536	0	1805	0
Lane Group Flow (vph)	0	46	6	0	1	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.6%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
5: Victoria Street/River Drive & St Michaels Street

Base Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	38	4	1	1	0
Future Volume (Veh/h)	1	38	4	1	1	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	45	5	1	1	0
Pedestrians		1	1		3	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	9				56	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	9				56	10
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1620				952	1074
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	46	6	1			
Volume Left	1	0	1			
Volume Right	0	1	0			
cSH	1620	1700	952			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.2	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	8.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization		19.6%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
6: Rosset Valley Court & John Street

Base Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	79	0	14	59	3	17
Future Volume (vph)	79	0	14	59	3	17
Satd. Flow (prot)	1827	0	0	1567	1672	0
Fit Permitted				0.991	0.992	
Satd. Flow (perm)	1827	0	0	1567	1672	0
Lane Group Flow (vph)	93	0	0	85	24	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 25.5%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Base Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	79	0	14	59	3	17
Future Volume (Veh/h)	79	0	14	59	3	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	93	0	16	69	4	20
Pedestrians					8	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			101		202	101
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			101		202	101
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1493		777	953
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	93	85	24			
Volume Left	0	16	4			
Volume Right	0	0	20			
cSH	1700	1493	918			
Volume to Capacity	0.05	0.01	0.03			
Queue Length 95th (m)	0.0	0.2	0.6			
Control Delay (s)	0.0	1.5	9.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.5	9.0			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization		25.5%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Base Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	0	14	3	4	19	43	4	6	0	58	20	4
Future Volume (vph)	0	14	3	4	19	43	4	6	0	58	20	4
Satd. Flow (prot)	0	1860	0	0	1417	0	0	1862	0	0	1760	0
Fit Permitted					0.997			0.980			0.966	
Satd. Flow (perm)	0	1860	0	0	1417	0	0	1862	0	0	1760	0
Lane Group Flow (vph)	0	19	0	0	77	0	0	12	0	0	95	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 27.5%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Base Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	0	14	3	4	19	43	4	6	0	58	20	4
Future Volume (vph)	0	14	3	4	19	43	4	6	0	58	20	4
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	16	3	5	22	50	5	7	0	67	23	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	19	77	12	95								
Volume Left (vph)	0	5	5	67								
Volume Right (vph)	3	50	0	5								
Hadj (s)	-0.09	-0.21	0.08	0.17								
Departure Headway (s)	4.1	4.0	4.3	4.3								
Degree Utilization, x	0.02	0.08	0.01	0.11								
Capacity (veh/h)	842	884	808	819								
Control Delay (s)	7.2	7.3	7.3	7.8								
Approach Delay (s)	7.2	7.3	7.3	7.8								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.5								
Level of Service				A								
Intersection Capacity Utilization			27.5%	ICU Level of Service			A					
Analysis Period (min)				15								

Queuing and Blocking Report

Base Year  
AM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	25.1	77.5	35.6	21.0	37.0	33.0
Average Queue (m)	8.2	32.4	11.4	4.7	14.3	9.4
95th Queue (m)	19.7	59.4	27.5	13.4	28.5	23.8
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	21.9	16.3	25.1	25.1	12.6	35.3
Average Queue (m)	9.6	7.1	8.0	13.8	3.8	17.3
95th Queue (m)	16.8	14.7	18.9	21.5	11.3	27.5
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			30.0			40.0
Storage Blk Time (%)			0	0	0	
Queuing Penalty (veh)			0	0	0	

Intersection: 3: River Drive & Daniella Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.7
95th Queue (m)	9.4
Link Distance (m)	120.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Base Year  
AM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	1.0
95th Queue (m)	5.6
Link Distance (m)	106.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	4.3
Average Queue (m)	0.3
95th Queue (m)	2.5
Link Distance (m)	72.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	9.2	8.2
Average Queue (m)	0.3	3.2
95th Queue (m)	3.0	9.4
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Base Year  
AM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.0	22.2	9.2	18.8
Average Queue (m)	3.3	9.3	2.3	9.0
95th Queue (m)	10.2	18.8	8.6	15.2
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0



Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Base Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	2	10	45	138	12	49	26	375	141	23	288	5
Future Volume (vph)	2	10	45	138	12	49	26	375	141	23	288	5
Satd. Flow (prot)	0	1564	0	0	1658	0	0	1817	1302	0	3428	0
Fit Permitted		0.988			0.753			0.959			0.903	
Satd. Flow (perm)	0	1548	0	0	1292	0	0	1747	1261	0	3106	0
Satd. Flow (RTOR)		50			22			157			3	
Lane Group Flow (vph)	0	63	0	0	220	0	0	446	157	0	352	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0	45.0		
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		15.5			15.5			45.9	45.9		45.9	
Actuated g/C Ratio		0.19			0.19			0.57	0.57		0.57	
v/c Ratio		0.19			0.82			0.45	0.20		0.20	
Control Delay		10.3			50.4			13.3	2.9		9.9	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		10.3			50.4			13.3	2.9		9.9	
LOS		B			D			B	A		A	
Approach Delay		10.3			50.4			10.6			9.9	
Approach LOS		B			D			B			A	
Queue Length 50th (m)		1.6			29.5			34.7	0.0		11.9	
Queue Length 95th (m)		9.3			44.6			76.4	9.7		25.5	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		534			433			1002	790		1784	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.12			0.51			0.45	0.20		0.20	

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBSB, Start of Green
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.82
Intersection Signal Delay:	17.4
Intersection LOS:	B
Intersection Capacity Utilization:	82.3%
ICU Level of Service:	E
Analysis Period (min):	15



Queues  
1: Mountainview Road N & River Drive

Base Year  
PM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	63	220	446	157	352
v/c Ratio	0.19	0.82	0.45	0.20	0.20
Control Delay	10.3	50.4	13.3	2.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	50.4	13.3	2.9	9.9
Queue Length 50th (m)	1.6	29.5	34.7	0.0	11.9
Queue Length 95th (m)	9.3	44.6	76.4	9.7	25.5
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	534	433	1002	790	1784
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.51	0.45	0.20	0.20

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Base Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	2	10	45	138	12	49	26	375	141	23	288	5
Future Volume (vph)	2	10	45	138	12	49	26	375	141	23	288	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1			9.1			9.5		9.5		9.5	
Lane Util. Factor	1.00			1.00			1.00		1.00		0.95	
Frbp, ped/bikes	0.99			0.99			1.00		0.97		1.00	
Flpb, ped/bikes	1.00			1.00			1.00		1.00		1.00	
Frt	0.89			0.97			1.00		0.85		1.00	
Flt Protected	1.00			0.97			1.00		1.00		1.00	
Satd. Flow (prot)	1564			1658			1816		1261		3429	
Flt Permitted	0.99			0.75			0.96		1.00		0.90	
Satd. Flow (perm)	1548			1292			1748		1261		3107	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	11	50	153	13	54	29	417	157	26	320	6
RTOR Reduction (vph)	0	40	0	0	18	0	0	0	67	0	1	0
Lane Group Flow (vph)	0	23	0	0	202	0	0	446	90	0	351	0
Confl. Peds. (#/hr)	13		1	1		13	2		9	9		2
Heavy Vehicles (%)	50%	0%	7%	8%	0%	2%	8%	4%	24%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	4		4		4		2		2		2	
Permitted Phases	4		4		2		2		2		2	
Actuated Green, G (s)	18.5		18.5		48.9		48.9		48.9		48.9	
Effective Green, g (s)	15.5		15.5		45.9		45.9		45.9		45.9	
Actuated g/C Ratio	0.19		0.19		0.57		0.57		0.57		0.57	
Clearance Time (s)	6.1		6.1		6.5		6.5		6.5		6.5	
Vehicle Extension (s)	3.0		3.0		4.5		4.5		4.5		4.5	
Lane Grp Cap (vph)	299		250		1002		723		1782			
v/s Ratio Prot												
v/s Ratio Perm	0.01		c0.16		c0.26		0.07		0.11			
v/c Ratio	0.08		0.81		0.45		0.12		0.20			
Uniform Delay, d1	26.4		30.8		9.8		7.8		8.2			
Progression Factor	1.00		1.00		1.00		1.00		1.00			
Incremental Delay, d2	0.1		17.3		1.4		0.4		0.2			
Delay (s)	26.5		48.1		11.2		8.2		8.4			
Level of Service	C		D		B		A		A			
Approach Delay (s)	26.5		48.1		10.4		8.4		8.4			
Approach LOS	C		D		B		A		A			
<b>Intersection Summary</b>												
HCM 2000 Control Delay	17.4		HCM 2000 Level of Service				B					
HCM 2000 Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	80.0		Sum of lost time (s)				18.6					
Intersection Capacity Utilization	82.3%		ICU Level of Service				E					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Base Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	23	10	47	23	17	13	107	319	27	6	236	21
Future Volume (vph)	23	10	47	23	17	13	107	319	27	6	236	21
Satd. Flow (prot)	0	1724	0	0	1797	0	1711	1877	0	1745	1877	0
Fit Permitted	0.986		0.979		0.950		0.950		0.950		0.950	
Satd. Flow (perm)	0	1724	0	0	1797	0	1711	1877	0	1745	1877	0
Lane Group Flow (vph)	0	83	0	0	56	0	111	360	0	6	268	0
Sign Control	Stop		Stop		Stop		Stop		Stop		Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 44.9%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
2: Mountainview Road N & John Street

Base Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↔			↔			↔	↔		↔	↔	↔		
Sign Control	Stop			Stop			Stop	Stop		Stop	Stop	Stop		
Traffic Volume (vph)	23	10	47	23	17	13	107	319	27	6	236	21		
Future Volume (vph)	23	10	47	23	17	13	107	319	27	6	236	21		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		
Hourly flow rate (vph)	24	10	49	24	18	14	111	332	28	6	246	22		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>								
Volume Total (vph)	83	56	111	360	6	268								
Volume Left (vph)	24	24	111	0	6	0								
Volume Right (vph)	49	14	0	28	0	22								
Hadj (s)	-0.30	-0.06	0.53	-0.05	0.50	-0.06								
Departure Headway (s)	5.4	5.7	5.7	5.1	5.9	5.3								
Degree Utilization, x	0.12	0.09	0.18	0.51	0.01	0.40								
Capacity (veh/h)	590	555	612	687	584	653								
Control Delay (s)	9.2	9.2	8.7	12.2	7.7	10.6								
Approach Delay (s)	9.2	9.2	11.3	10.5										
Approach LOS	A	A	B	B										
<b>Intersection Summary</b>														
Delay			10.7											
Level of Service			B											
Intersection Capacity Utilization			44.9%		ICU Level of Service		A							
Analysis Period (min)			15											

Lanes, Volumes, Timings  
3: River Drive & Daniella Street

Base Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Volume (vph)	4	43	42	12	6	2
Future Volume (vph)	4	43	42	12	6	2
Satd. Flow (prot)	0	1733	1774	0	1775	0
Fit Permitted		0.995			0.963	
Satd. Flow (perm)	0	1733	1774	0	1775	0
Lane Group Flow (vph)	0	54	62	0	9	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 20.6%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Base Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	4	43	42	12	6	2
Future Volume (Veh/h)	4	43	42	12	6	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	5	49	48	14	7	2
Pedestrians					4	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	66				118	59
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	66				118	59
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1543				877	1009
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	54	62	9			
Volume Left	5	0	7			
Volume Right	0	14	2			
cSH	1543	1700	903			
Volume to Capacity	0.00	0.04	0.01			
Queue Length 95th (m)	0.1	0.0	0.2			
Control Delay (s)	0.7	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	0.7	0.0	9.0			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.0			
Intersection Capacity Utilization		20.6%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Base Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	38	30	7	6	2
Future Volume (vph)	0	38	30	7	6	2
Satd. Flow (prot)	0	1712	1807	0	1775	0
Fit Permitted					0.963	
Satd. Flow (perm)	0	1712	1807	0	1775	0
Lane Group Flow (vph)	0	45	44	0	9	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.3%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Base Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	38	30	7	6	2
Future Volume (Veh/h)	0	38	30	7	6	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	45	36	8	7	2
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	47				88	43
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	47				88	43
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1569				915	1030
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	45	44	9			
Volume Left	0	0	7			
Volume Right	0	8	2			
cSH	1569	1700	939			
Volume to Capacity	0.00	0.03	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	8.9			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.9			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization		19.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Base Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	29	29	2	5	0
Future Volume (vph)	0	29	29	2	5	0
Satd. Flow (prot)	0	1712	1887	0	1504	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	1712	1887	0	1504	0
Lane Group Flow (vph)	0	35	37	0	6	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.0%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
5: Victoria Street/River Drive & St Michaels Street

Base Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	29	29	2	5	0
Future Volume (Veh/h)	0	29	29	2	5	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	35	35	2	6	0
Pedestrians					2	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	39				73	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39				73	38
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1581				886	1038
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	35	37	6			
Volume Left	0	0	6			
Volume Right	0	2	0			
cSH	1581	1700	886			
Volume to Capacity	0.00	0.02	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	9.1			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization		19.0%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
6: Rosset Valley Court & John Street

Base Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	90	5	16	119	2	14
Future Volume (vph)	90	5	16	119	2	14
Satd. Flow (prot)	1769	0	0	1628	1662	0
Fit Permitted				0.994	0.995	
Satd. Flow (perm)	1769	0	0	1628	1662	0
Lane Group Flow (vph)	113	0	0	161	19	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 29.8%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Base Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	90	5	16	119	2	14
Future Volume (Veh/h)	90	5	16	119	2	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	107	6	19	142	2	17
Pedestrians	1			3	6	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			119		297	119
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			119		297	119
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	98
cM capacity (veh/h)			1473		685	930
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	113	161	19			
Volume Left	0	19	2			
Volume Right	6	0	17			
cSH	1700	1473	897			
Volume to Capacity	0.07	0.01	0.02			
Queue Length 95th (m)	0.0	0.3	0.5			
Control Delay (s)	0.0	1.0	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.0	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization		29.8%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Base Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	3	34	1	6	31	78	9	16	1	58	18	3
Future Volume (vph)	3	34	1	6	31	78	9	16	1	58	18	3
Satd. Flow (prot)	0	1887	0	0	1459	0	0	1858	0	0	1665	0
Fit Permitted		0.996			0.997			0.983			0.964	
Satd. Flow (perm)	0	1887	0	0	1459	0	0	1858	0	0	1665	0
Lane Group Flow (vph)	0	42	0	0	130	0	0	29	0	0	88	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 29.0%							ICU Level of Service A					
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Base Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	3	34	1	6	31	78	9	16	1	58	18	3
Future Volume (vph)	3	34	1	6	31	78	9	16	1	58	18	3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	38	1	7	35	88	10	18	1	65	20	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	42	130	29	88								
Volume Left (vph)	3	7	10	65								
Volume Right (vph)	1	88	1	3								
Hadj (s)	0.00	-0.29	0.05	0.29								
Departure Headway (s)	4.3	3.9	4.4	4.6								
Degree Utilization, x	0.05	0.14	0.04	0.11								
Capacity (veh/h)	803	885	772	745								
Control Delay (s)	7.5	7.6	7.6	8.2								
Approach Delay (s)	7.5	7.6	7.6	8.2								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.8								
Level of Service				A								
Intersection Capacity Utilization			29.0%	ICU Level of Service			A					
Analysis Period (min)				15								

Queuing and Blocking Report

Base Year  
PM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	22.7	75.2	69.6	25.1	30.6	31.4
Average Queue (m)	8.3	39.0	28.6	6.8	13.2	6.6
95th Queue (m)	18.4	64.4	57.0	18.9	25.7	18.1
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	15.8	15.6	32.0	48.2	8.8	19.9
Average Queue (m)	8.5	8.2	11.9	18.7	1.4	13.0
95th Queue (m)	13.1	14.1	23.2	33.0	6.6	19.2
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			30.0		40.0	
Storage Blk Time (%)			0	1		
Queuing Penalty (veh)			0	1		

Intersection: 3: River Drive & Daniella Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.1
Average Queue (m)	1.8
95th Queue (m)	7.8
Link Distance (m)	120.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	



Queuing and Blocking Report

Base Year  
PM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.0
95th Queue (m)	8.1
Link Distance (m)	106.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.8
Average Queue (m)	1.2
95th Queue (m)	6.1
Link Distance (m)	72.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	11.4	8.2
Average Queue (m)	0.8	2.8
95th Queue (m)	5.6	8.9
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Base Year  
PM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	14.0	23.5	9.2	18.0
Average Queue (m)	7.1	11.5	4.9	9.9
95th Queue (m)	13.7	18.7	12.2	16.1
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1

# Appendix D

## TTS Origin-Destination Data



Mon Mar 28 2022 17:13:09 GMT-0300 (Atlantic Daylight Time) - Run Time: 3532ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06\_orig  
Column: 2006 GTA zone of destination - gta06\_dest  
Table: No. of trips made by person - n\_pers\_trip

RowG:  
ColG:(4164)  
TblG:(1-99)

Filters:  
Start time of trip - start\_time In 700-900

Trip 2016  
Table: 1

	1
67	8
3012	23
3102	18
3196	32
3362	6
3369	13
3379	15
3386	12
3417	9
3434	58
3436	20
3620	13
3646	20
3677	9
3716	22
4034	53
4036	4
4105	17
4158	22
4159	8
4160	12
4162	63
4163	70
4164	301
4166	5
4193	8
4194	4
8021	17
8365	18

Mon Mar 28 2022 17:08:11 GMT-0300 (Atlantic Daylight Time) - Run Time: 3609ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06\_dest

Column: 2006 GTA zone of origin - gta06\_orig

Table: No. of trips made by person - n\_pers\_trip

RowG:

ColG:(4164)

TblG:(1-99)

Filters:

Start time of trip - start\_time In 700-900

Trip 2016

Table: 1

	1
37	6
55	5
57	15
68	53
157	25
357	30
399	11
3006	90
3014	56
3343	6
3346	4
3434	70
3436	59
3480	4
3605	4
3612	87
3704	28
3721	46
3825	11
4014	45
4016	4
4029	16
4060	99
4063	13
4144	45
4145	81
4157	8
4158	12

4160	14
4161	88
4162	348
4163	256
4164	301
4168	6
4194	58
4197	38
7132	8
8415	12

Mon Mar 28 2022 17:45:42 GMT-0300 (Atlantic Daylight Time) - Run Time: 3316ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06\_orig

Column: 2006 GTA zone of destination - gta06\_dest

Table: No. of trips made by person - n\_pers\_trip

RowG:

ColG:(4164)

TblG:(1-99)

Filters:

Start time of trip - start\_time In 1500-1800

Trip 2016

Table: 1

	1
37	6
60	6
68	53
90	71
356	99
357	30
358	5
399	11
3014	56
3325	17
3328	18
3343	6
3346	4
3375	8
3429	80
3434	109
3436	59
3461	110
3480	4
3605	4
3612	33
3621	17
3633	29
3653	35
3704	56
3707	22
3721	46
3722	46

4014	45
4016	4
4060	99
4063	13
4105	5
4110	45
4127	15
4144	45
4155	20
4157	8
4161	4
4162	170
4163	207
4164	250
4168	6
4174	90
4176	41
4177	39
4183	8
4193	5
4194	142
4197	38
5153	13
6044	33
7132	8
8024	21
8144	8
8415	12
8619	71
9998	15

Mon Mar 28 2022 17:09:19 GMT-0300 (Atlantic Daylight Time) - Run Time: 3247ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06\_dest

Column: 2006 GTA zone of origin - gta06\_orig

Table: No. of trips made by person - n\_pers\_trip

RowG:

ColG:(4164)

TblG:(1-99)

Filters:

Start time of trip - start\_time In 1500-1800

Trip 2016

Table: 1

	1
67	8
3102	18
3196	32
3350	45
3362	6
3369	19
3375	13
3378	23
3379	31
3386	12
3417	19
3432	20
3436	58
3604	34
3615	28
3620	13
3621	7
3637	7
3646	20
3653	35
3707	9
4024	9
4034	56
4105	17
4119	27
4127	15
4158	22
4159	8

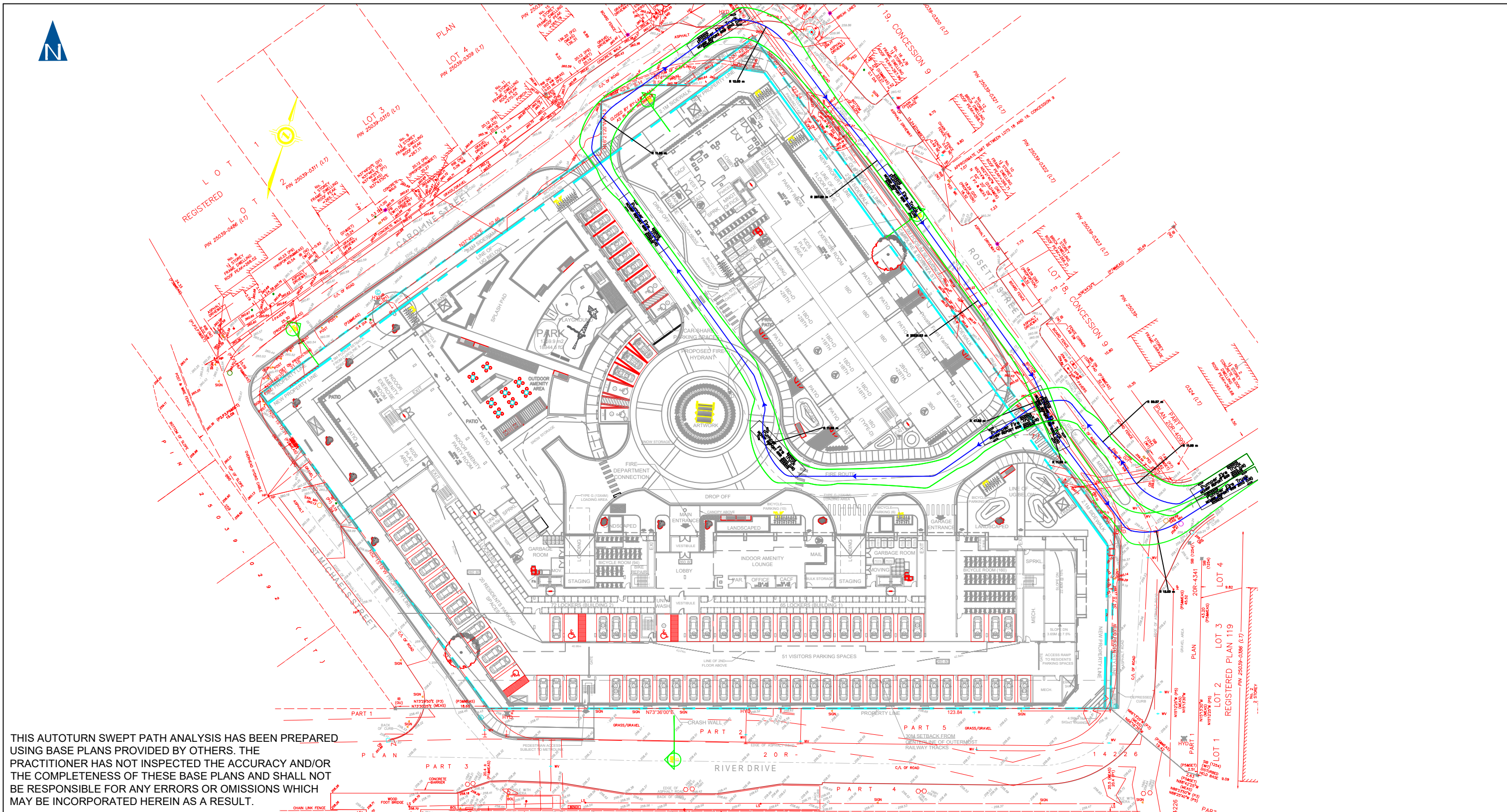


4160	12
4161	4
4162	126
4163	15
4164	250
4172	9
4176	91
4177	39
4193	12
4194	186
4197	12
8021	17
8365	18
8375	5
8597	20

# Appendix E

## AutoTURN Analysis & Signage Plan





THIS AUTOTURN SWEEP 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
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

DESIGN VEHICLE:

Pumper Fire Truck

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

## AUTOTURN ASSESSMENT 1 ROSETTA STREET TOWN OF HALTON HILLS (GEORGETOWN)

PROJECT NO.: 210781

DATE: JANUARY 2022

SCALE: 1:750

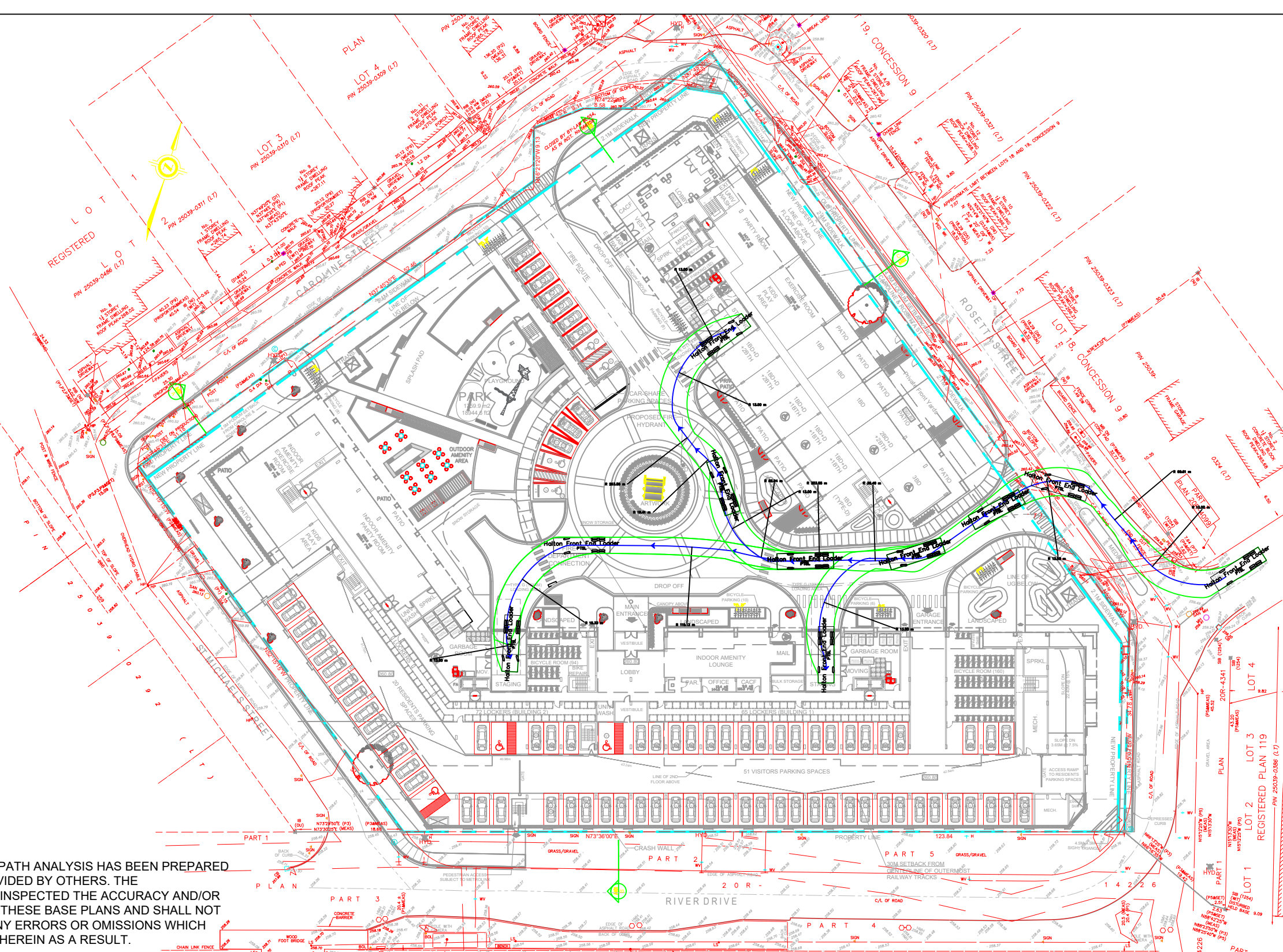
DRAWN: SC

DESIGN: SC

CHECK: ASo

DRAWING NO.:

# AT1



THIS AUTOTURN SWEEP 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
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

DESIGN VEHICLE:

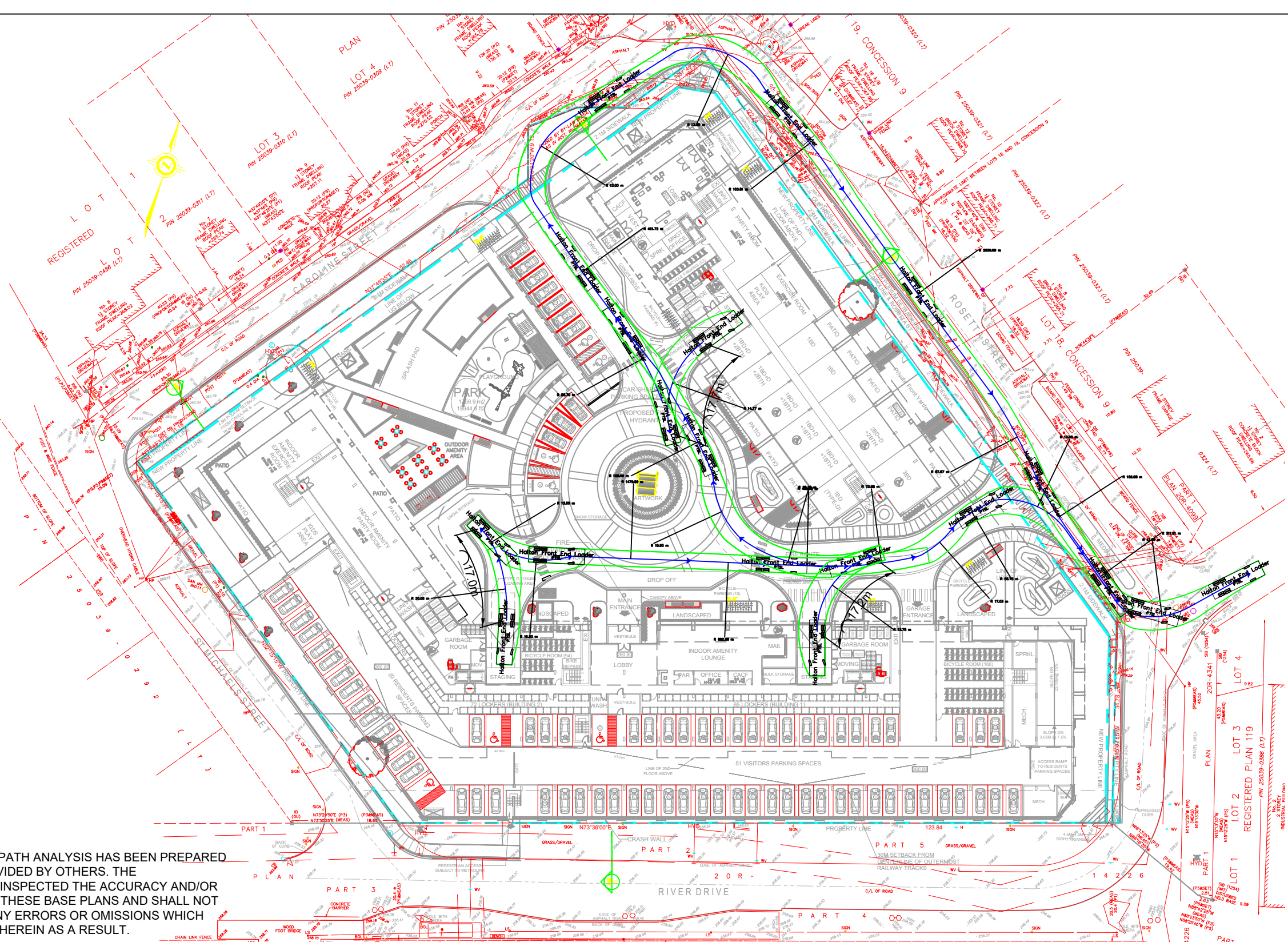
Halton Front End Loader

Width : 2.70  
Track : 2.70  
Lock to Lock Time : 6.0  
Steering Angle : 24.5

## AUTOTURN ASSESSMENT 1 ROSETTA STREET TOWN OF HALTON HILLS (GEORGETOWN)

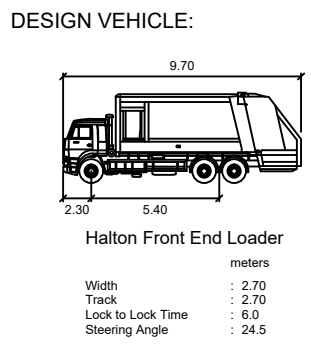


PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>AT2</b>
DRAWN: SC	DESIGN: SC	CHECK: ASo	



THIS AUTOTURN SWEEP 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
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN



## AUTOTURN ASSESSMENT 1 ROSETTA STREET TOWN OF HALTON HILLS (GEORGETOWN)

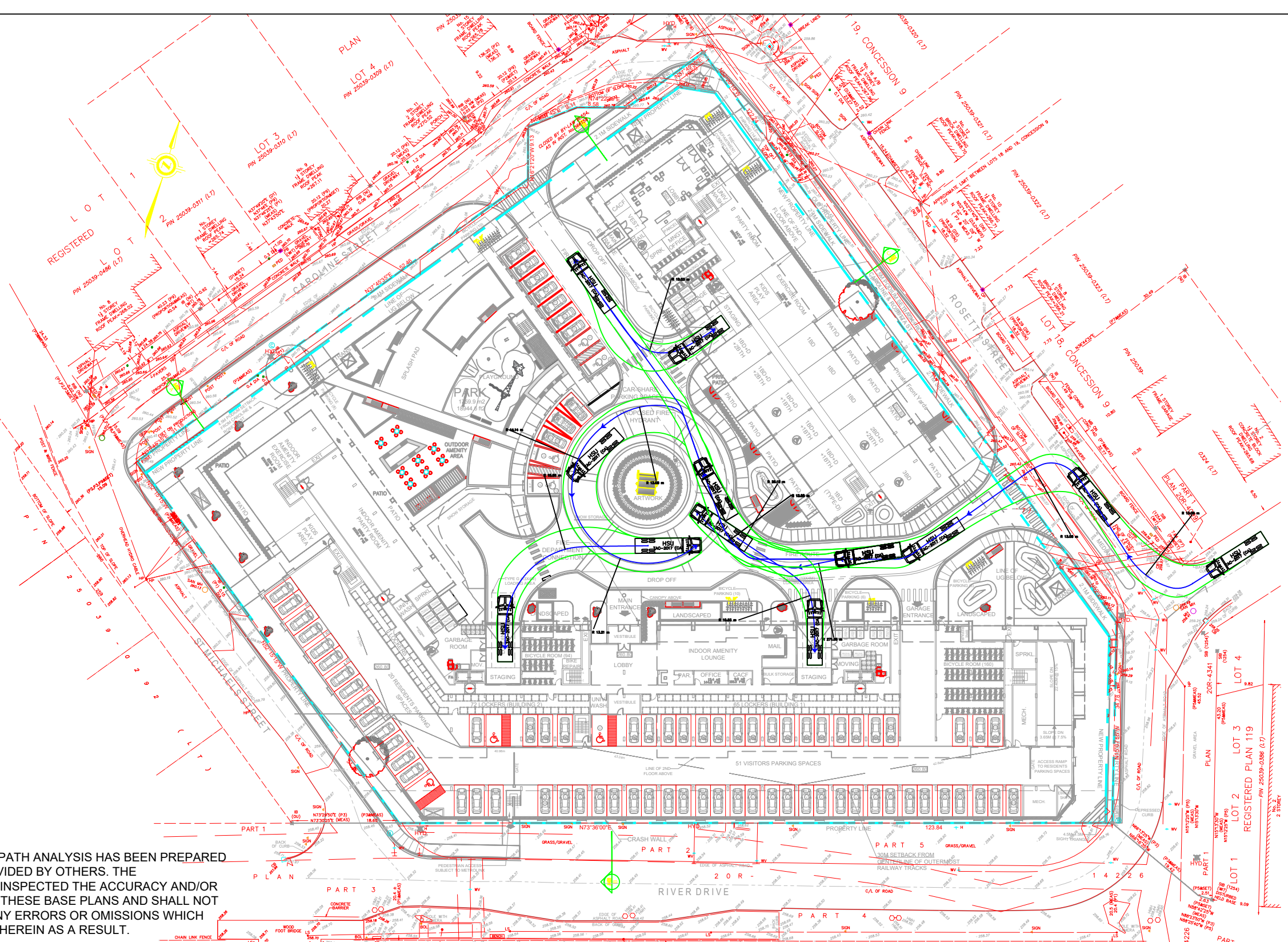


PROJECT NO.: 210781  
DRAWN: SC

DATE: JANUARY 2022  
DESIGN: SC

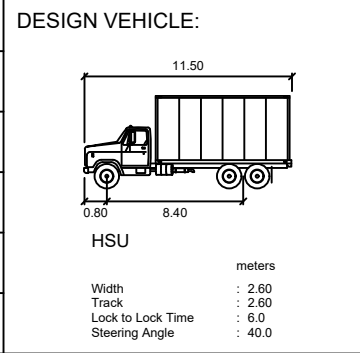
SCALE: 1:750  
CHECK: ASo

DRAWING NO.:  
**AT3**



THIS AUTOTURN SWEEP 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.

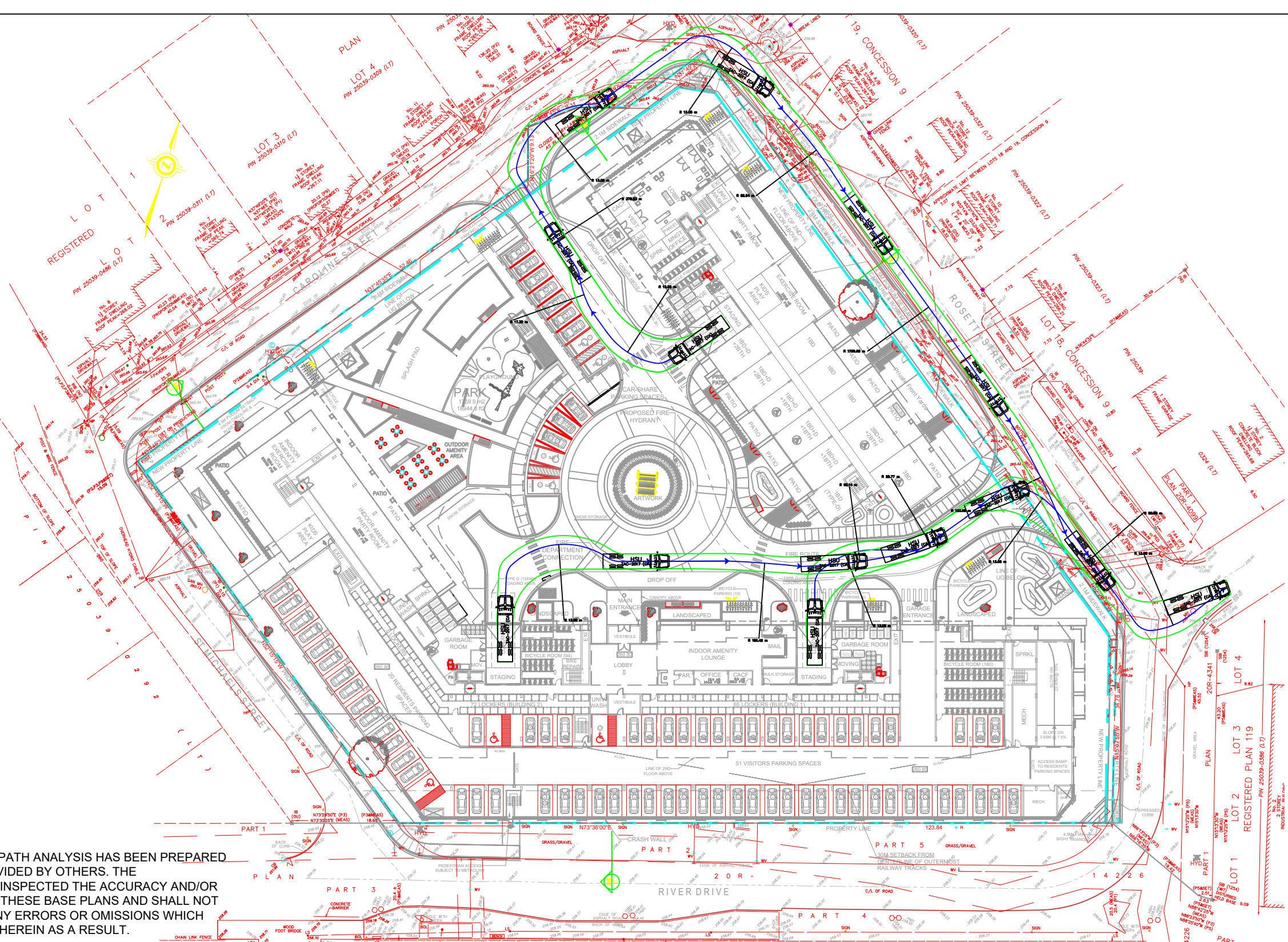
NO.	DATE	INITIAL	REVISION DETAIL
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN



## AUTOTURN ASSESSMENT 1 ROSETTA STREET TOWN OF HALTON HILLS (GEORGETOWN)

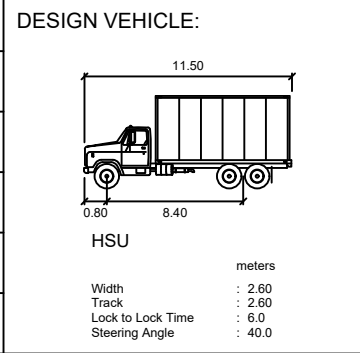


PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>AT4</b>
DRAWN: SC	DESIGN: SC	CHECK: ASo	



THIS AUTOTURN SWEEP 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.

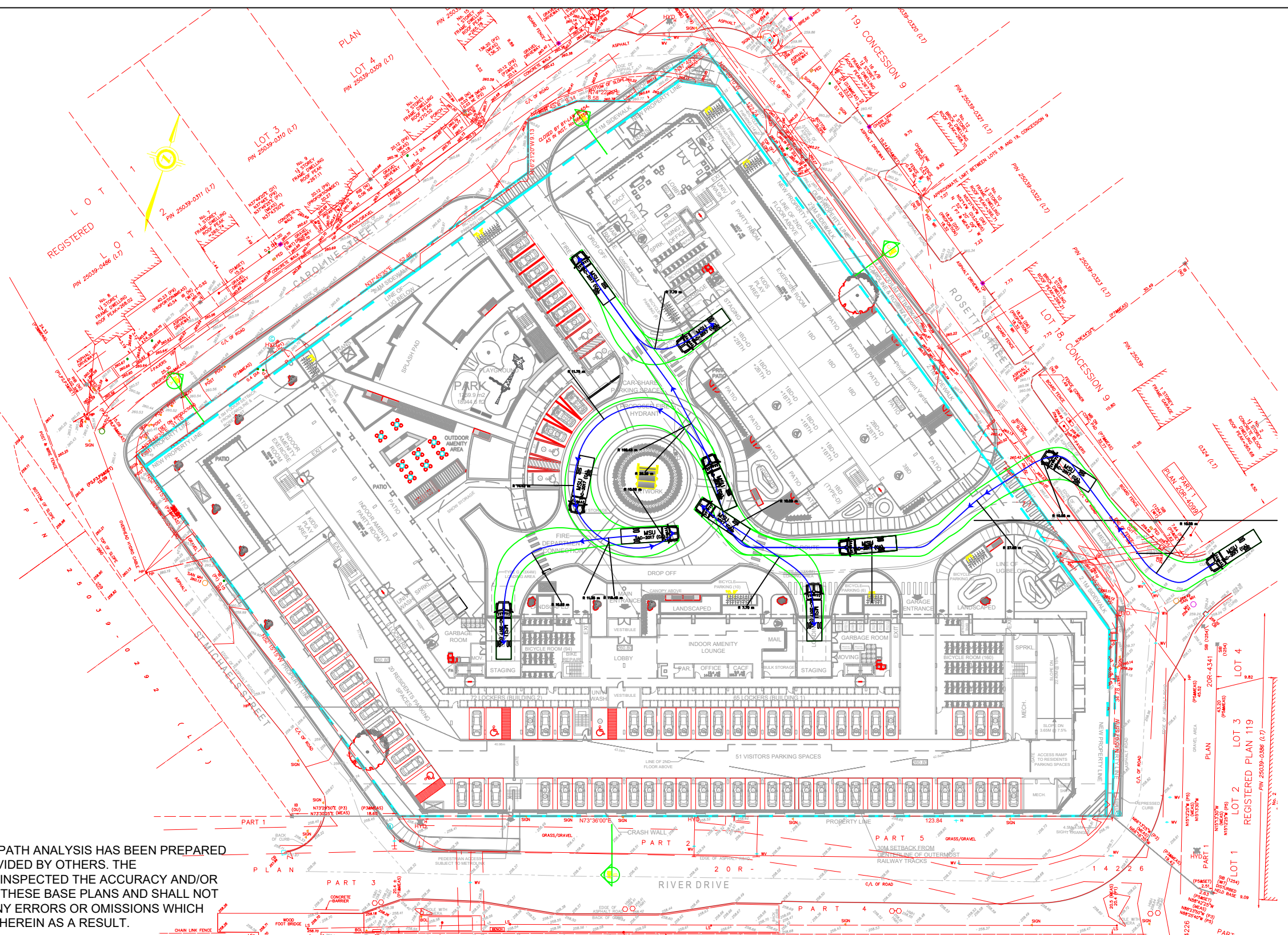
NO.	DATE	INITIAL	REVISION DETAIL
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN



## AUTOTURN ASSESSMENT 1 ROSETTA STREET TOWN OF HALTON HILLS (GEORGETOWN)

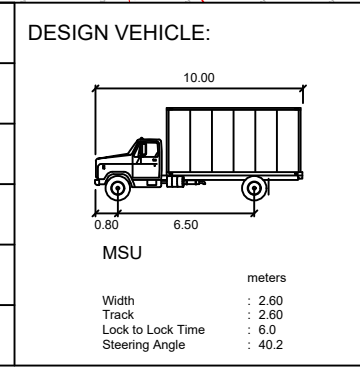


PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>AT5</b>
DRAWN: SC	DESIGN: SC	CHECK: ASo	



THIS AUTOTURN SWEEP 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
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

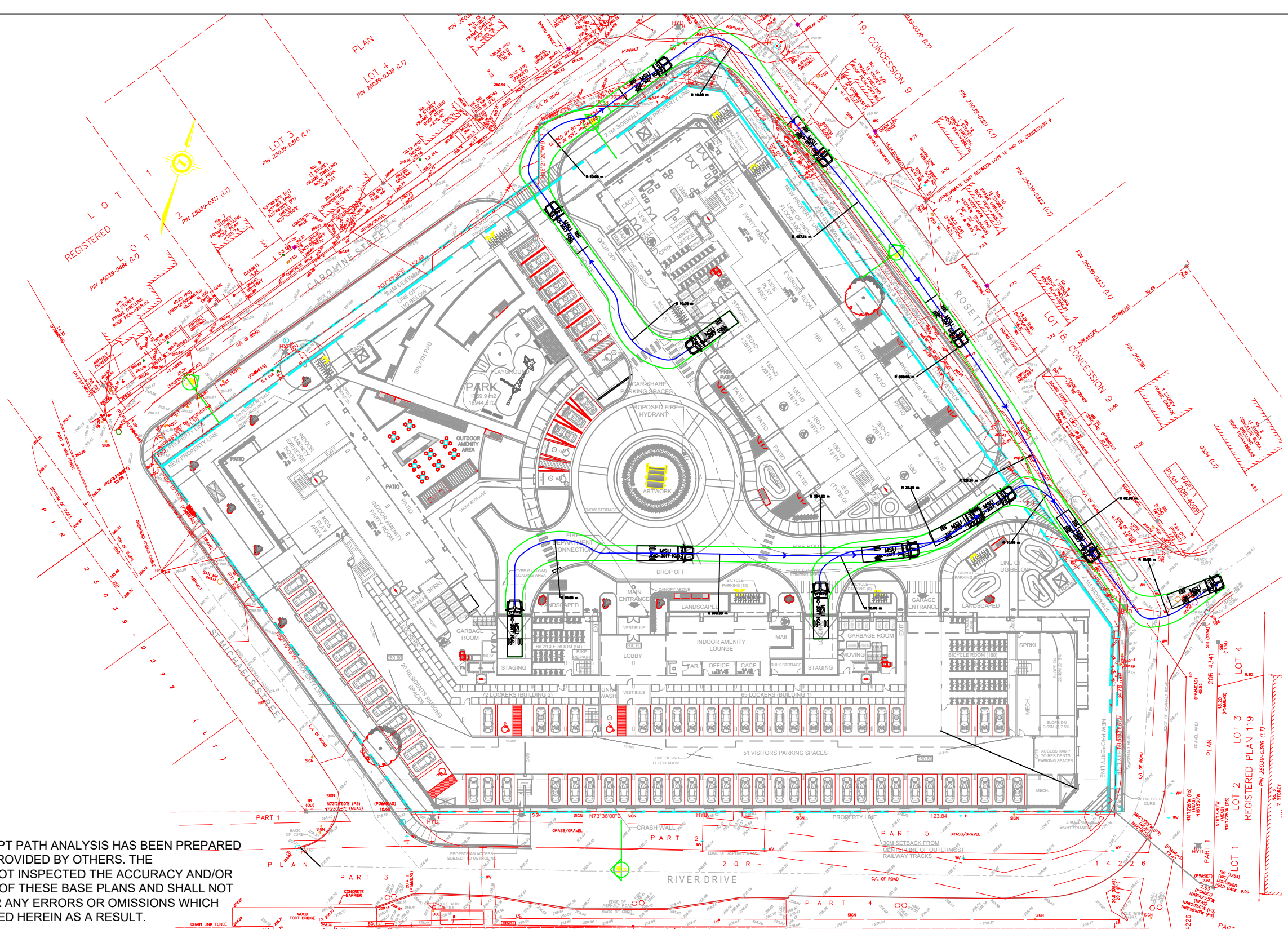


## AUTOTURN ASSESSMENT 1 ROSETTA STREET TOWN OF HALTON HILLS (GEORGETOWN)



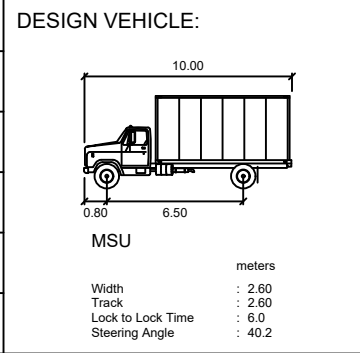
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DRAWN: SC	DESIGN: SC	CHECK: ASo	





THIS AUTOTURN SWEEP 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.

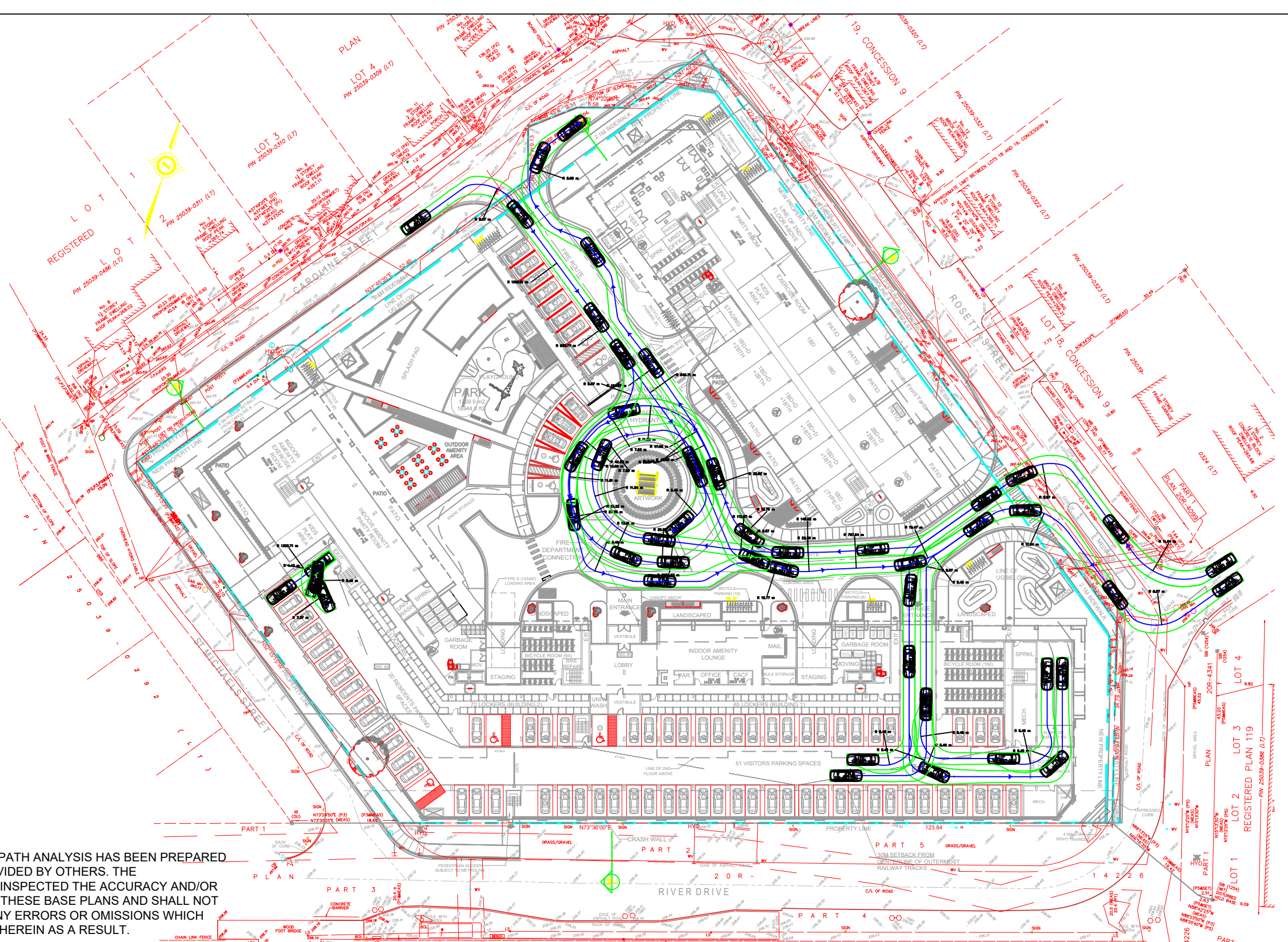
NO.	DATE	INITIAL	REVISION DETAIL
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN



## AUTOTURN ASSESSMENT 1 ROSETTA STREET TOWN OF HALTON HILLS (GEORGETOWN)



PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>AT8</b>
DRAWN: SC	DESIGN: SC	CHECK: ASo	



THIS AUTOTURN SWEEP 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
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

DESIGN VEHICLE:

P

Width : 2.00  
Track : 2.00  
Lock to Lock Time : 6.0  
Steering Angle : 35.9

## AUTOTURN ASSESSMENT 1 ROSETTA STREET TOWN OF HALTON HILLS (GEORGETOWN)



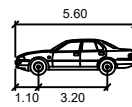
PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>AT9</b>
DRAWN: SC	DESIGN: SC	CHECK: ASo	



THIS AUTOTURN SWEEP 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
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



P  
 Width : 2.00 meters  
 Track : 2.00  
 Lock to Lock Time : 6.0  
 Steering Angle : 35.9

## AUTOTURN ASSESSMENT 1 ROSETTA STREET TOWN OF HALTON HILLS (GEORGETOWN)



PROJECT NO.: 210781

DATE: JANUARY 2022

SCALE: 1:750

DRAWING NO.:

DRAWN: SC

DESIGN: SC

CHECK: ASo

**AT10**



THIS AUTOTURN SWEEP 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
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

DESIGN VEHICLE:

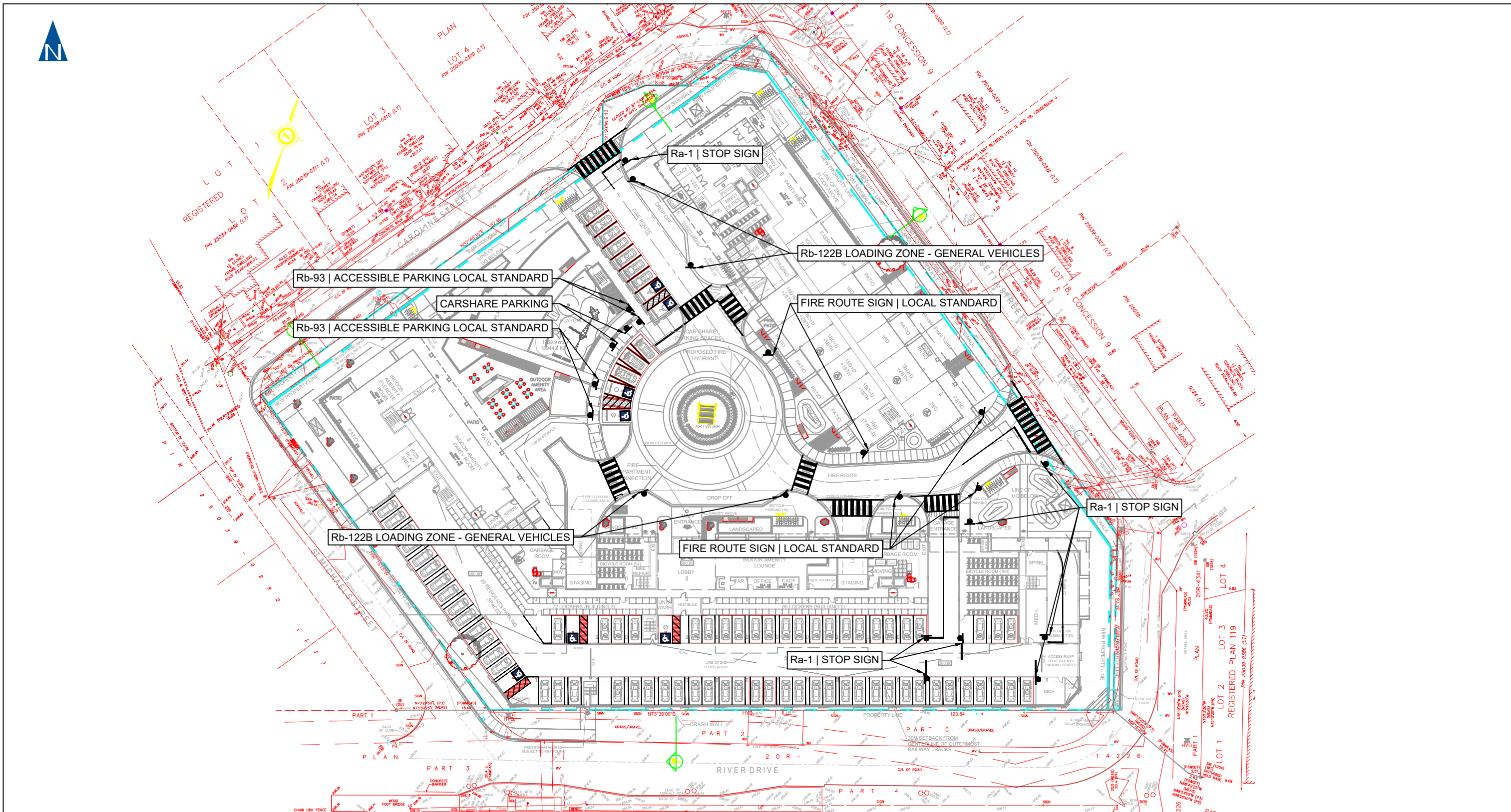
P

Width : 2.00 meters  
 Track : 2.00  
 Lock to Lock Time : 6.0  
 Steering Angle : 35.9

## AUTOTURN ASSESSMENT 1 ROSETTA STREET TOWN OF HALTON HILLS (GEORGETOWN)



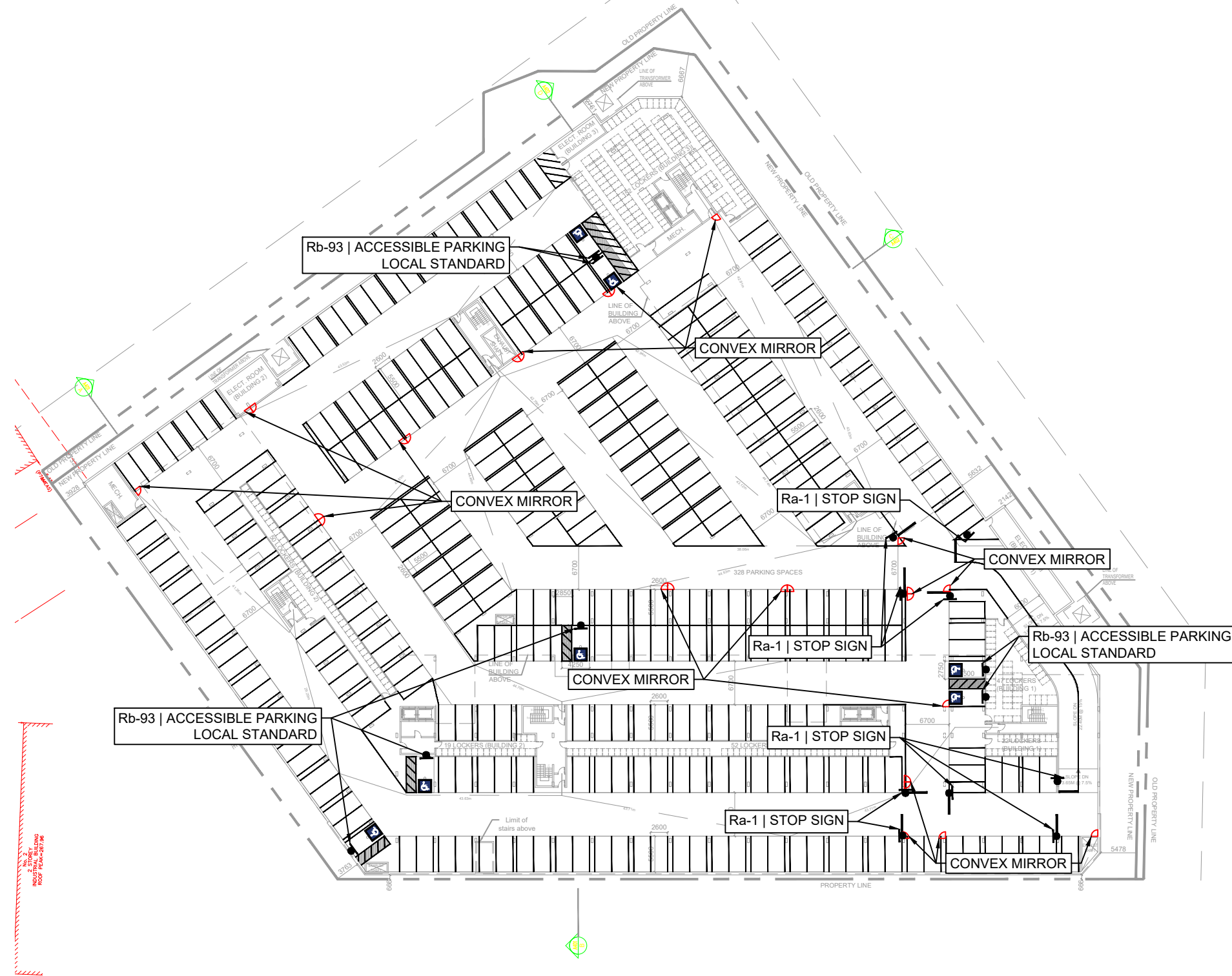
PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>AT11</b>
DRAWN: SC	DESIGN: SC	CHECK: ASo	



**SIGNAGE PLAN AT GRADE  
1 ROSETTA STREET  
TOWN OF HALTON HILLS (GEORGETOWN)**

NO.	DATE	INITIAL	REVISION DETAIL
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

	PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>SP1</b>
	DRAWN: SC	DESIGN: SC	CHECK: ASo	



**SIGNAGE PLAN UG1  
1 ROSETTA STREET  
TOWN OF HALTON HILLS (GEORGETOWN)**

NO.	DATE	INITIAL	REVISION DETAIL
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

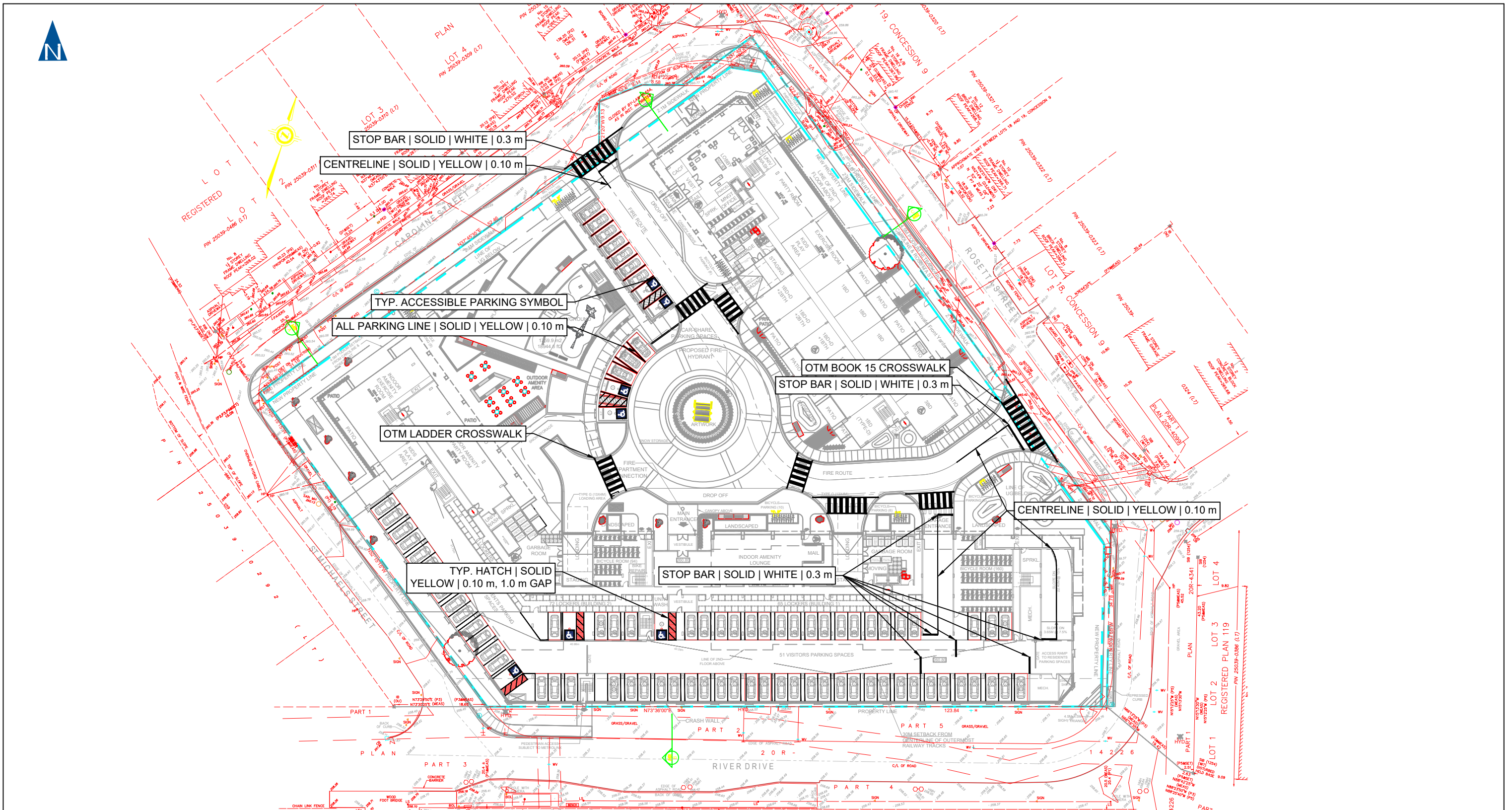
	PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>SP2</b>
	DRAWN: SC	DESIGN: SC	CHECK: ASo	



**SIGNAGE PLAN UG2  
1 ROSETTA STREET  
TOWN OF HALTON HILLS (GEORGETOWN)**

NO.	DATE	INITIAL	REVISION DETAIL
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

	PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>SP3</b>
	DRAWN: SC	DESIGN: SC	CHECK: ASo	



**PAVEMENT MARKING PLAN AT GRADE  
1 ROSETTA STREET  
TOWN OF HALTON HILLS (GEORGETOWN)**

NO.	DATE	INITIAL	REVISION DETAIL
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN



PROJECT NO.: 210781

DATE: JANUARY 2022

SCALE: 1:750

DRAWING NO.:

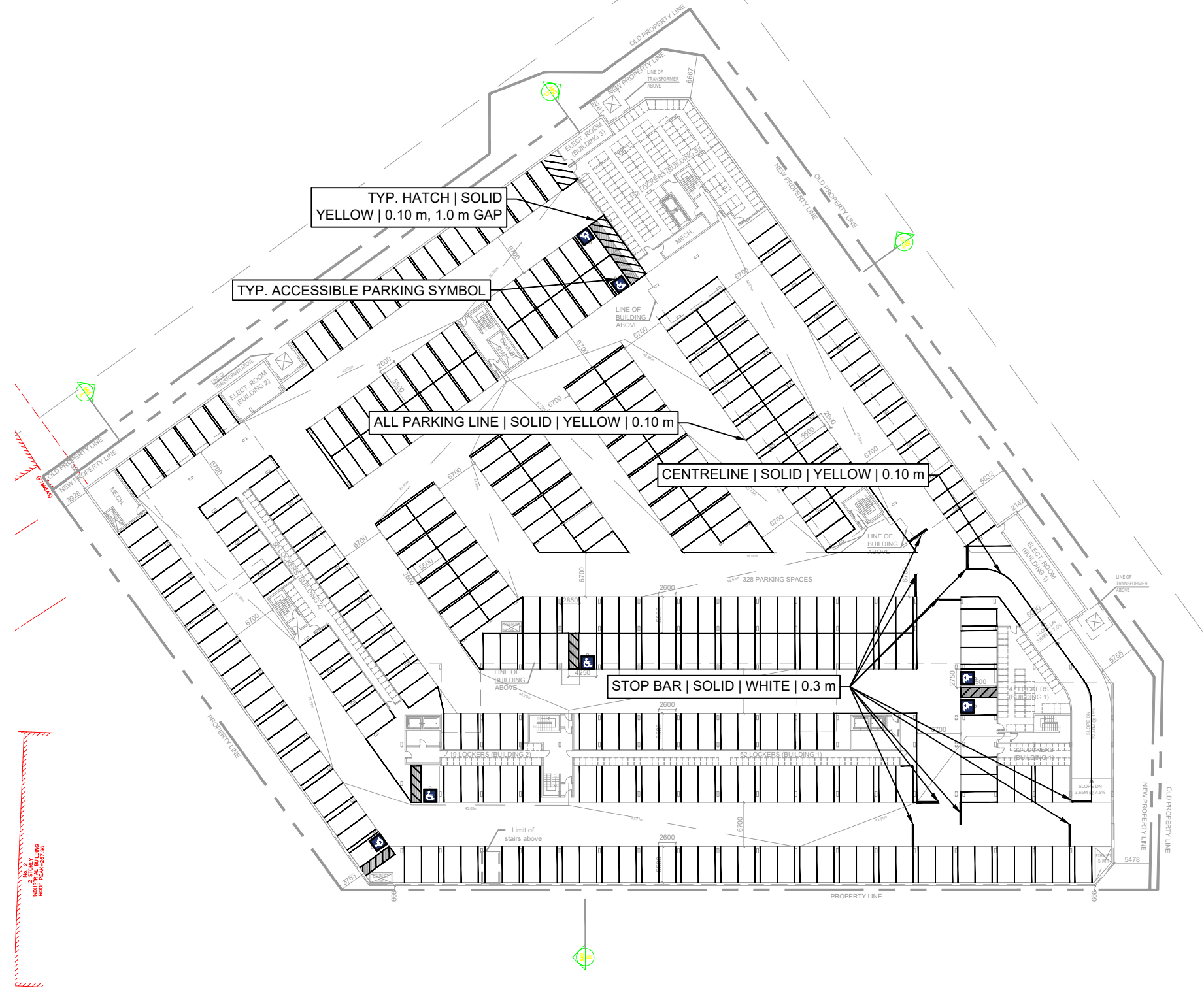
DRAWN: SC

DESIGN: SC

CHECK: ASO

**SP4**



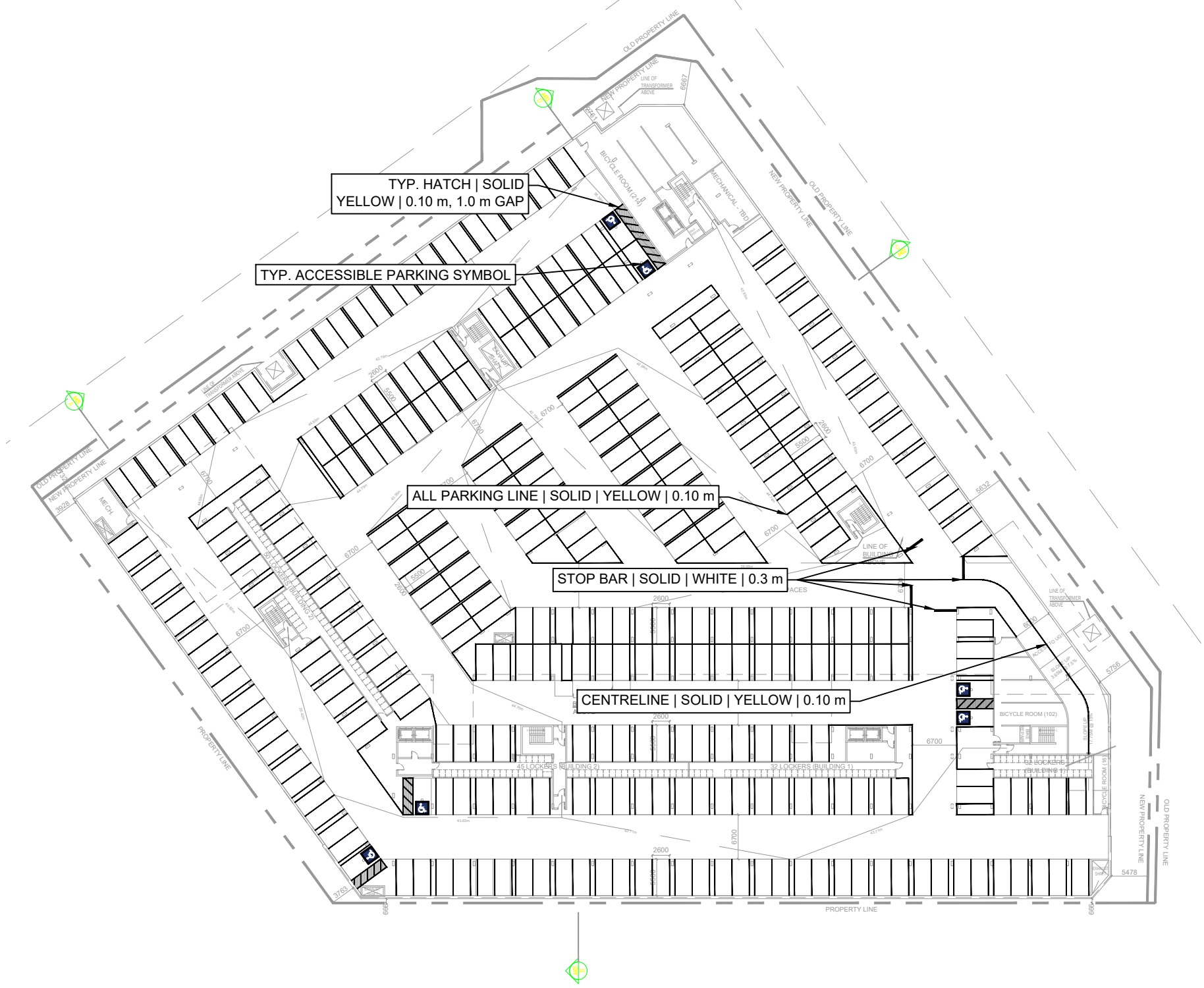


NO.	DATE	INITIAL	REVISION DETAIL
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

**PAVEMENT MARKING PLAN UG1  
1 ROSETTA STREET  
TOWN OF HALTON HILLS (GEORGETOWN)**



PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>SP5</b>
DRAWN: SC	DESIGN: SC	CHECK: ASo	



NO.	DATE	INITIAL	REVISION DETAIL
2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN

**PAVEMENT MARKING PLAN UG2  
1 ROSETTA STREET  
TOWN OF HALTON HILLS (GEORGETOWN)**



PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>SP6</b>
DRAWN: SC	DESIGN: SC	CHECK: ASo	

**NOTES**

EXISTING SIGN LOCATIONS TO BE CONFIRMED IN FIELD.

ONLY FIGURED DIMENSIONS ARE TO BE REFERENCED. ALL DIMENSIONS TO BE CONFIRMED IN FIELD.

ALL TRAFFIC SIGNS AND PAVEMENT MARKINGS MUST COMPLY WITH OTM.

**SIGNAGE NOTES**

REGULATORY SIGNS SHALL NORMALLY BE LOCATED IN ACCORDANCE WITH SECTION 12 (SIGN POSITION) OF BOOK 1B. HOWEVER, SPECIFIC OR ADDITIONAL REQUIREMENTS FOR CERTAIN REGULATORY SIGNS MAY PRE-EMPT OR REVISE DIRECTIONS OR SPECIFICATIONS PRESCRIBED UNDER THE GENERAL STANDARDS IN BOOK 1B. SUCH DEVIATIONS OR EXCEPTIONS FROM THE BOOK 1B LOCATION PRINCIPLES ARE NOTED IN THIS BOOK UNDER THE HEADING "LOCATION CRITERIA" FOR THE RESPECTIVE SIGNS TO WHICH THEY APPLY. IF FOR A GIVEN SIGN, EXCEPTIONS ARE NOT NOTED UNDER THIS HEADING, THE BOOK 1B LOCATION PRINCIPLES APPLY.

**SIGNAGE POSITION NOTES**

SIGNAGE SHOULD CONFORM TO ONTARIO TRAFFIC MANUAL STANDARDS WHERE POSSIBLE.

HORIZONTAL MOUNTING OFFSET

THE BASIC GUIDELINES FOR HORIZONTAL MOUNTING OFFSETS ARE AS FOLLOWS:

- URBAN OR RESIDENTIAL AREAS WITH RAISED CURBS: 30 CM TO 2 M FROM THE CURB LINE.

WHERE RESTRICTED BY PHYSICAL FEATURES SUCH AS CLIFFS, OR STRUCTURE FEATURES SUCH AS BRIDGE SUPPORTS, THE HORIZONTAL OFFSET SHOULD BE AS CLOSE AS POSSIBLE TO THE ABOVE GUIDELINES.

VERTICAL MOUNTING OFFSET

THE BASIC GUIDELINES FOR VERTICAL MOUNTING OFFSETS OF GROUND-MOUNTED SIGNS INCLUDE THE FOLLOWING:

- AREAS WITH NO PEDESTRIANS AND WITHOUT RAISED CURBS: 1.5 M TO 2.5 M FROM OUTER EDGE OF OUTER LANE TO BOTTOM OF PRINCIPAL SIGN, REGARDLESS OF WHETHER

THERE IS A TAB SIGN MOUNTED BENEATH PRINCIPAL SIGN.

- AREAS WITH NO PEDESTRIANS AND WITH RAISED CURBS: 1.5 M TO 2.5 M FROM CURB LINE TO BOTTOM OF PRINCIPAL SIGN, REGARDLESS OF WHETHER THERE IS A TAB SIGN MOUNTED BENEATH PRINCIPAL SIGN.
- AREAS WITH PEDESTRIANS: 2 M TO 3 M FROM GROUND ELEVATION AT THE BASE OF THE SIGN POST TO THE BOTTOM OF THE OVERALL SIGN, INCLUDING TAB IF PRESENT.

HORIZONTAL & VERTICAL ANGLING OF SIGN FACE

GENERALLY, SIGNS MUST BE MOUNTED AT APPROXIMATELY RIGHT ANGLES TO THE DIRECTION OF TRAFFIC, FACING THE TRAFFIC THAT THEY ARE INTENDED TO ADDRESS. EXCEPTIONS TO THIS RULE INCLUDE REGULATORY PARKING CONTROL SIGNS. THESE SIGNS SHOULD BE PLACED AT AN ANGLE OF 30 TO 45 DEGREES TO THE FLOW OF TRAFFIC, AND SHOULD ALWAYS BE VISIBLE TO APPROACHING TRAFFIC.

SIGN MOUNTING

MOUNTING TO BE DETERMINED IN FIELD.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING SERVICES AND UTILITIES IN WORKING AREA PRIOR TO CONSTRUCTION AND SHALL PROTECT THESE UTILITIES AND SERVICES TO THE SATISFACTION OF THE CONCERNED UTILITY COMPANIES AND OWNER. DAMAGES BY THE CONTRACTOR SHALL BE RESTORED TO THE SATISFACTION OF THE CONCERNED UTILITY COMPANY AT NO EXPENSE TO THE OWNER

**PAVEMENT MARKING NOTES**

PROVINCIAL LEGISLATION PROVIDES THAT MARKINGS MAY BE PLACED BY THE ROAD AUTHORITY HAVING JURISDICTION FOR THE PURPOSE OF REGULATING, WARNING OR GUIDING TRAFFIC (SECTION 182 OF THE HIGHWAY TRAFFIC ACT (R.S.O. 1990)).

PAVEMENT AND CURB MARKINGS, BEING EXCLUSIVELY WITHIN THE BOUNDARIES OF PUBLIC HIGHWAYS, SHOULD ONLY BE PLACED BY THE ROAD AUTHORITY. DELINEATORS AND OBJECT MARKERS THAT ARE WITHIN THE HIGHWAY RIGHT-OF-WAY ARE SUBJECT TO THE SAME JURISDICTIONAL REGULATIONS.

MARKINGS AND DELINEATION SERVE AN ADVISORY OR WARNING FUNCTION, AND DO NOT HAVE LEGAL FORCE OF THEIR OWN. THEY MAY BE USED TO COMPLEMENT OTHER TRAFFIC CONTROL DEVICES

ENFORCEABLE UNDER THE HTA, ITS REGULATIONS, OR A MUNICIPAL BY-LAW, BUT THEIR ENFORCEABILITY DERIVES FROM THE MAIN REGULATORY TRAFFIC CONTROL DEVICE, NOT FROM THE MARKINGS OR DELINEATION. TO AVOID POSSIBLE CONFLICT OR CONFUSION, THE MEANING OF MARKINGS AND DELINEATION SHOULD BE CHECKED AGAINST THE PREVAILING TRAFFIC LAWS AND REGULATIONS BEFORE THEY ARE INSTALLED OR REMOVED

**SIGNAGE LEGEND**

SIGN DETAIL	NAME
	Ra-1 STOP SIGN
	Rb-122B LOADING ZONE - GENERAL VEHICLES
	Rb-93 ACCESSIBLE PARKING PERMIT SIGN
	CUSTOM SIGN CARSHARE
	FIRE ROUTE (LOCAL STANDARD)

2	MAY 2023	SC	UPDATED SITE PLAN - SECOND SUBMISSION
1	MAR 2022	SC	UPDATED SITE PLAN
NO.	DATE	INITIAL	REVISION DETAIL

**SIGNAGE AND PAVEMENT MARKING PLAN NOTES  
1 ROSETTA STREET  
TOWN OF HALTON HILLS (GEORGETOWN)**

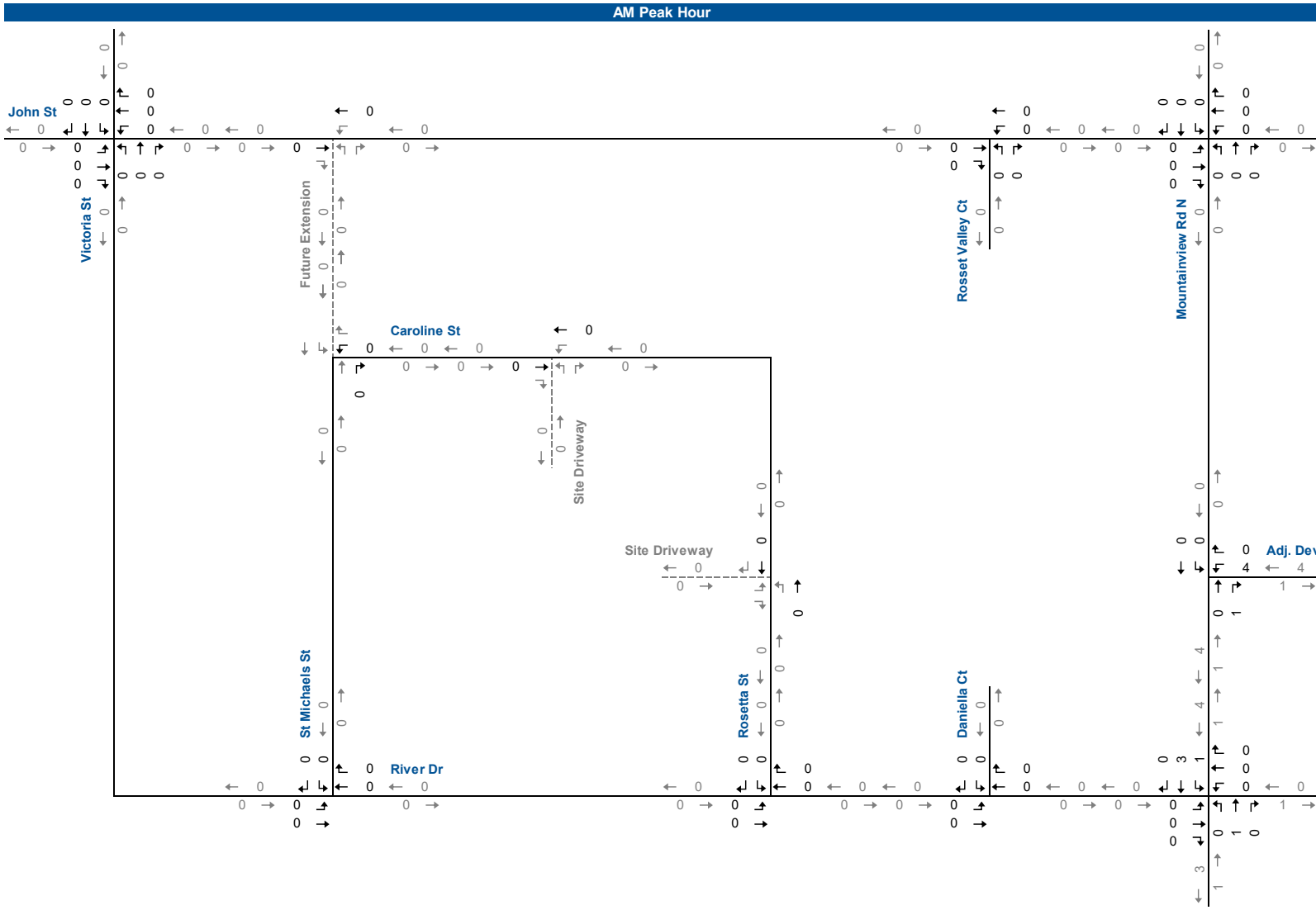


PROJECT NO.: 210781	DATE: JANUARY 2022	SCALE: 1:750	DRAWING NO.: <b>SP7</b>
DRAWN: SC	DESIGN: SC	CHECK: ASo	

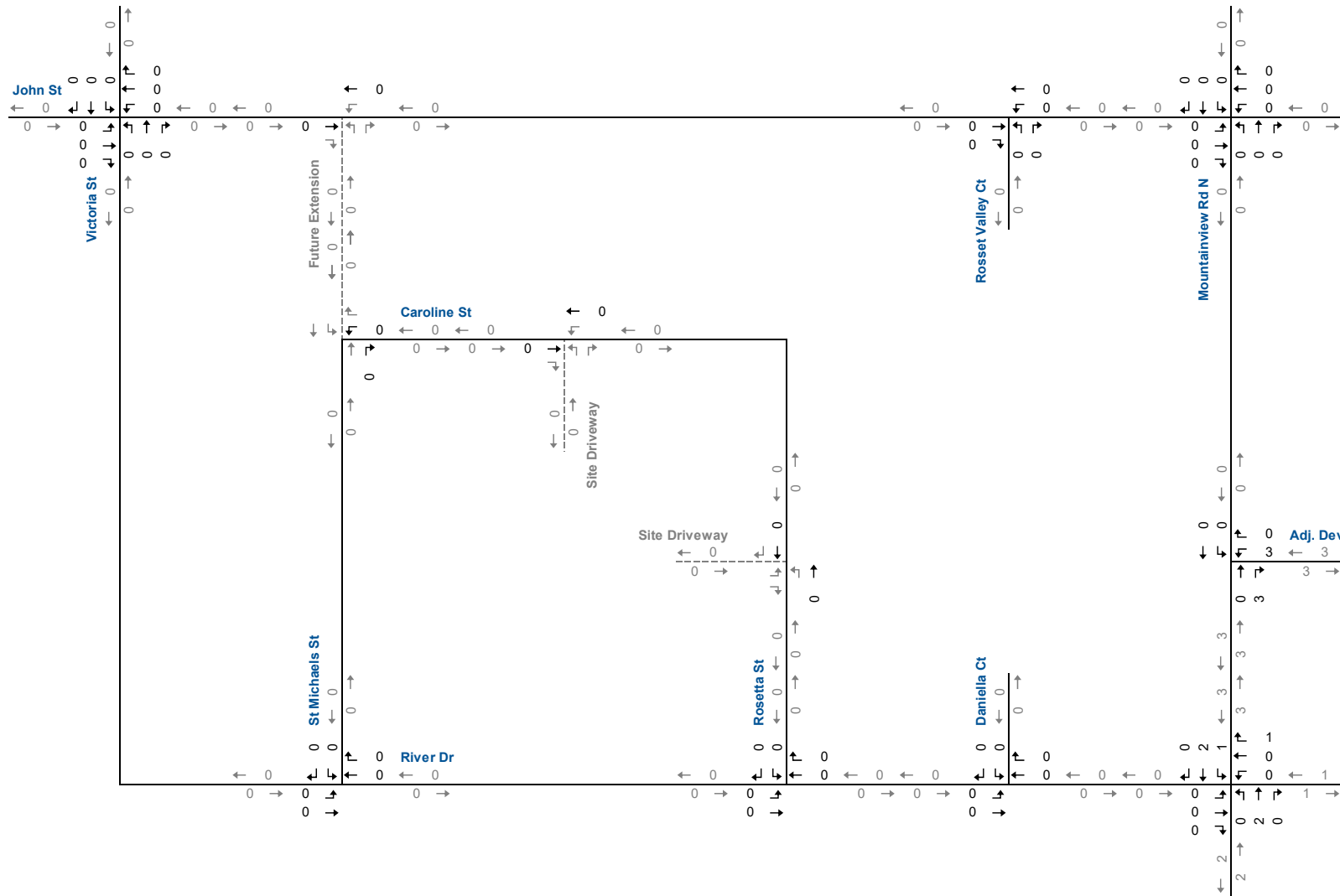
# Appendix F

## Adjacent Development Traffic Volumes





# Adjacent Development Traffic Volumes AM Peak Hour



# Adjacent Development Traffic Volumes PM Peak Hour

# Appendix G

## Background Five-Year Horizon Operations



Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	1	9	40	123	6	22	10	245	131	40	424	3
Future Volume (vph)	1	9	40	123	6	22	10	245	131	40	424	3
Satd. Flow (prot)	0	1491	0	0	1363	0	0	1785	1380	0	3503	0
Fit Permitted		0.994			0.728			0.976			0.901	
Satd. Flow (perm)	0	1484	0	0	1033	0	0	1746	1346	0	3168	0
Satd. Flow (RTOR)		43			11			139			1	
Lane Group Flow (vph)	0	54	0	0	160	0	0	272	139	0	497	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0	45.0	45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		15.0			15.0			46.4	46.4		46.4	
Actuated g/C Ratio		0.19			0.19			0.58	0.58		0.58	
v/c Ratio		0.17			0.79			0.27	0.17		0.27	
Control Delay		10.7			53.7			11.0	2.9		10.2	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		10.7			53.7			11.0	2.9		10.2	
LOS		B			D			B	A		B	
Approach Delay		10.7			53.7			8.2			10.2	
Approach LOS		B			D			A			B	
Queue Length 50th (m)		1.4			22.2			18.1	0.0		17.3	
Queue Length 95th (m)		8.5			35.4			43.5	9.1		36.2	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		509			341			1012	838		1837	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.11			0.47			0.27	0.17		0.27	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 81.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Mountainview Road N & River Drive



Queues  
1: Mountainview Road N & River Drive

Background 5 Year  
AM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	54	160	272	139	497
v/c Ratio	0.17	0.79	0.27	0.17	0.27
Control Delay	10.7	53.7	11.0	2.9	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	53.7	11.0	2.9	10.2
Queue Length 50th (m)	1.4	22.2	18.1	0.0	17.3
Queue Length 95th (m)	8.5	35.4	43.5	9.1	36.2
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	509	341	1012	838	1837
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.47	0.27	0.17	0.27

Intersection Summary

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 81.8%	ICU Level of Service D
Analysis Period (min) 15	



HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	1	9	40	123	6	22	10	245	131	40	424	3
Future Volume (vph)	1	9	40	123	6	22	10	245	131	40	424	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1			9.1			9.5			9.5		
Lane Util. Factor	1.00			1.00			1.00			0.95		
Frbp, ped/bikes	1.00			1.00			1.00			0.97		
Flpb, ped/bikes	1.00			1.00			1.00			1.00		
Frt	0.89			0.98			1.00			0.85		
Flt Protected	1.00			0.96			1.00			1.00		
Satd. Flow (prot)	1492			1362			1785			1346		
Flt Permitted	0.99			0.73			0.98			1.00		
Satd. Flow (perm)	1485			1032			1747			1346		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1	10	43	131	6	23	11	261	139	43	451	3
RTOR Reduction (vph)	0	35	0	0	9	0	0	0	58	0	0	0
Lane Group Flow (vph)	0	19	0	0	151	0	0	272	81	0	497	0
Confl. Peds. (#/hr)	5			5			4			4		
Heavy Vehicles (%)	0%	0%	17%	35%	40%	5%	11%	6%	17%	6%	2%	33%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	4			4			2			2		
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	18.0			18.0			49.4			49.4		
Effective Green, g (s)	15.0			15.0			46.4			46.4		
Actuated g/C Ratio	0.19			0.19			0.58			0.58		
Clearance Time (s)	6.1			6.1			6.5			6.5		
Vehicle Extension (s)	3.0			3.0			4.5			4.5		
Lane Grp Cap (vph)	278			193			1013			780		
v/s Ratio Prot												
v/s Ratio Perm	0.01			c0.15			0.16			0.06		
v/c Ratio	0.07			0.78			0.27			0.10		
Uniform Delay, d1	26.8			30.9			8.4			7.5		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.1			18.4			0.7			0.3		
Delay (s)	26.9			49.4			9.0			7.8		
Level of Service	C			D			A			A		
Approach Delay (s)	26.9			49.4			8.6			8.7		
Approach LOS	C			D			A			A		
<b>Intersection Summary</b>												
HCM 2000 Control Delay	15.3			HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio	0.39											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			18.6					
Intersection Capacity Utilization	81.8%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	17	8	87	21	11	9	52	198	18	18	350	19
Future Volume (vph)	17	8	87	21	11	9	52	198	18	18	350	19
Satd. Flow (prot)	0	1633	0	0	1704	0	1544	1802	0	1646	1816	0
Flt Permitted	0.993			0.976			0.950			0.950		
Satd. Flow (perm)	0	1633	0	0	1704	0	1544	1802	0	1646	1816	0
Lane Group Flow (vph)	0	120	0	0	44	0	55	230	0	19	392	0
Sign Control	Stop			Stop			Stop			Stop		
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 48.6% ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
 2: Mountainview Road N & John Street

Background 5 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕	↕		↕	↕	↕
Sign Control	Stop			Stop			Stop	Stop		Stop	Stop	Stop
Traffic Volume (vph)	17	8	87	21	11	9	52	198	18	18	350	19
Future Volume (vph)	17	8	87	21	11	9	52	198	18	18	350	19
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	18	9	93	22	12	10	55	211	19	19	372	20
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	120	44	55	230	19	392						
Volume Left (vph)	18	22	55	0	19	0						
Volume Right (vph)	93	10	0	19	0	20						
Hadj (s)	-0.38	0.06	0.72	0.01	0.60	0.03						
Departure Headway (s)	5.3	5.9	6.1	5.4	5.9	5.3						
Degree Utilization, x	0.18	0.07	0.09	0.35	0.03	0.58						
Capacity (veh/h)	604	530	564	641	588	662						
Control Delay (s)	9.4	9.4	8.6	10.1	7.9	14.2						
Approach Delay (s)	9.4	9.4	9.8		13.9							
Approach LOS	A	A	A		B							
<b>Intersection Summary</b>												
Delay	11.7											
Level of Service	B											
Intersection Capacity Utilization	48.6%		ICU Level of Service				A					
Analysis Period (min)	15											

Lanes, Volumes, Timings  
 3: River Drive & Daniella Street

Background 5 Year  
 AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕		↕		↕	↕
Traffic Volume (vph)	2	52	13	2	8	3
Future Volume (vph)	2	52	13	2	8	3
Satd. Flow (prot)	0	1589	1800	0	1769	0
Fit Permitted		0.998			0.964	
Satd. Flow (perm)	0	1589	1800	0	1769	0
Lane Group Flow (vph)	0	62	17	0	12	0
Sign Control	Free		Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.4%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	52	13	2	8	3
Future Volume (Veh/h)	2	52	13	2	8	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	2	60	15	2	9	3
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	20				83	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	20				83	19
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1605				920	1062
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	62	17	12			
Volume Left	2	0	9			
Volume Right	0	2	3			
cSH	1605	1700	952			
Volume to Capacity	0.00	0.01	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.2	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	8.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.3			
Intersection Capacity Utilization		19.4%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	45	9	2	4	0
Future Volume (vph)	0	45	9	2	4	0
Satd. Flow (prot)	0	1583	1437	0	1805	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	1583	1437	0	1805	0
Lane Group Flow (vph)	0	50	12	0	4	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 18.3%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	45	9	2	4	0
Future Volume (Veh/h)	0	45	9	2	4	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	50	10	2	4	0
Pedestrians			2			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	12				63	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	12				63	11
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1620				946	1076
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	50	12	4			
Volume Left	0	0	4			
Volume Right	0	2	0			
cSH	1620	1700	946			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (m)	0.0	0.0	0.1			
Control Delay (s)	0.0	0.0	8.8			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		18.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	42	4	1	1	0
Future Volume (vph)	1	42	4	1	1	0
Satd. Flow (prot)	0	1669	1536	0	1805	0
Fit Permitted		0.999			0.950	
Satd. Flow (perm)	0	1669	1536	0	1805	0
Lane Group Flow (vph)	0	50	6	0	1	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.6%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
 5: Victoria Street/River Drive & St Michaels Street

Background 5 Year  
 AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	42	4	1	1	0
Future Volume (Veh/h)	1	42	4	1	1	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	49	5	1	1	0
Pedestrians		1	1		3	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	9				60	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	9				60	10
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1620				947	1074
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	50	6	1			
Volume Left	1	0	1			
Volume Right	0	1	0			
cSH	1620	1700	947			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.1	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	8.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization		19.6%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 6: Rosset Valley Court & John Street

Background 5 Year  
 AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	87	0	15	65	3	19
Future Volume (vph)	87	0	15	65	3	19
Satd. Flow (prot)	1827	0	0	1568	1670	0
Fit Permitted				0.991	0.992	
Satd. Flow (perm)	1827	0	0	1568	1670	0
Lane Group Flow (vph)	102	0	0	94	26	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 25.9%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Background 5 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	87	0	15	65	3	19
Future Volume (Veh/h)	87	0	15	65	3	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	102	0	18	76	4	22
Pedestrians					8	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			110		222	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			110		222	110
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1482		756	942
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	102	94	26			
Volume Left	0	18	4			
Volume Right	0	0	22			
cSH	1700	1482	908			
Volume to Capacity	0.06	0.01	0.03			
Queue Length 95th (m)	0.0	0.3	0.7			
Control Delay (s)	0.0	1.5	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.5	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization		25.9%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Background 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	0	15	3	4	21	47	4	7	0	64	22	4
Future Volume (vph)	0	15	3	4	21	47	4	7	0	64	22	4
Satd. Flow (prot)	0	1862	0	0	1420	0	0	1864	0	0	1762	0
Fit Permitted					0.997			0.981			0.966	
Satd. Flow (perm)	0	1862	0	0	1420	0	0	1864	0	0	1762	0
Lane Group Flow (vph)	0	20	0	0	84	0	0	13	0	0	105	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 29.1% ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Background 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	0	15	3	4	21	47	4	7	0	64	22	4
Future Volume (vph)	0	15	3	4	21	47	4	7	0	64	22	4
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	17	3	5	24	55	5	8	0	74	26	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	20	84	13	105								
Volume Left (vph)	0	5	5	74								
Volume Right (vph)	3	55	0	5								
Hadj (s)	-0.09	-0.22	0.08	0.17								
Departure Headway (s)	4.2	4.0	4.3	4.3								
Degree Utilization, x	0.02	0.09	0.02	0.13								
Capacity (veh/h)	832	878	802	814								
Control Delay (s)	7.3	7.4	7.4	7.9								
Approach Delay (s)	7.3	7.4	7.4	7.9								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.6								
Level of Service				A								
Intersection Capacity Utilization				29.1%	ICU Level of Service	A						
Analysis Period (min)				15								

Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	21.9	79.9	33.4	20.6	36.9	33.2
Average Queue (m)	8.1	32.3	12.9	6.2	16.2	10.2
95th Queue (m)	17.4	61.1	30.1	15.9	30.7	25.0
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	21.6	19.9	26.3	27.6	12.9	39.8
Average Queue (m)	10.6	7.6	9.8	14.0	4.1	18.5
95th Queue (m)	17.2	15.6	19.7	23.0	11.7	29.7
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)				30.0	40.0	
Storage Blk Time (%)				0	0	
Queuing Penalty (veh)				0	0	

Intersection: 3: River Drive & Daniella Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.3
95th Queue (m)	8.7
Link Distance (m)	120.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	7.4
Average Queue (m)	0.9
95th Queue (m)	5.4
Link Distance (m)	106.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	5.6
Average Queue (m)	0.3
95th Queue (m)	2.5
Link Distance (m)	72.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	5.4	12.2
Average Queue (m)	0.4	4.1
95th Queue (m)	3.5	10.9
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Background 5 Year  
AM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.0	22.5	10.5	20.7
Average Queue (m)	3.7	9.8	2.5	9.8
95th Queue (m)	10.8	17.7	9.2	16.6
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0



Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	2	11	50	152	13	55	29	416	156	26	320	6
Future Volume (vph)	2	11	50	152	13	55	29	416	156	26	320	6
Satd. Flow (prot)	0	1566	0	0	1658	0	0	1817	1302	0	3428	0
Fit Permitted		0.989			0.750			0.955			0.895	
Satd. Flow (perm)	0	1550	0	0	1285	0	0	1740	1261	0	3079	0
Satd. Flow (RTOR)		56			22			173			3	
Lane Group Flow (vph)	0	70	0	0	244	0	0	494	173	0	392	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0	45.0		
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		16.6			16.6			44.8	44.8		44.8	
Actuated g/C Ratio		0.21			0.21			0.56	0.56		0.56	
v/c Ratio		0.19			0.86			0.51	0.22		0.23	
Control Delay		9.8			53.9			14.9	3.0		10.5	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		9.8			53.9			14.9	3.0		10.5	
LOS		A			D			B	A		B	
Approach Delay		9.8			53.9			11.8			10.5	
Approach LOS		A			D			B			B	
Queue Length 50th (m)		1.7			33.0			42.3	0.0		14.3	
Queue Length 95th (m)		9.7			50.0			87.5	10.1		28.4	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		539			430			974	782		1725	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.13			0.57			0.51	0.22		0.23	

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBSB, Start of Green
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.86
Intersection Signal Delay:	18.8
Intersection LOS:	B
Intersection Capacity Utilization:	82.6%
ICU Level of Service:	E
Analysis Period (min):	15



Queues  
1: Mountainview Road N & River Drive

Background 5 Year  
PM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	70	244	494	173	392
v/c Ratio	0.19	0.86	0.51	0.22	0.23
Control Delay	9.8	53.9	14.9	3.0	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	53.9	14.9	3.0	10.5
Queue Length 50th (m)	1.7	33.0	42.3	0.0	14.3
Queue Length 95th (m)	9.7	50.0	87.5	10.1	28.4
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	539	430	974	782	1725
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.57	0.51	0.22	0.23

Intersection Summary

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBSB, Start of Green
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.86
Intersection Signal Delay:	18.8
Intersection LOS:	B
Intersection Capacity Utilization:	82.6%
ICU Level of Service:	E
Analysis Period (min):	15

HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕	↕		↕↔	
Traffic Volume (vph)	2	11	50	152	13	55	29	416	156	26	320	6
Future Volume (vph)	2	11	50	152	13	55	29	416	156	26	320	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1			9.1			9.5			9.5		
Lane Util. Factor	1.00			1.00			1.00			0.95		
Frbp, ped/bikes	0.99			0.99			1.00			0.97		
Flpb, ped/bikes	1.00			1.00			1.00			1.00		
Frt	0.89			0.97			1.00			0.85		
Flt Protected	1.00			0.97			1.00			1.00		
Satd. Flow (prot)	1565			1657			1816			1261		
Flt Permitted	0.99			0.75			0.95			1.00		
Satd. Flow (perm)	1550			1285			1739			1261		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	12	56	169	14	61	32	462	173	29	356	7
RTOR Reduction (vph)	0	44	0	0	17	0	0	0	76	0	1	0
Lane Group Flow (vph)	0	26	0	0	227	0	0	494	97	0	391	0
Confl. Peds. (#/hr)	13		1	1		13	2		9	9		2
Heavy Vehicles (%)	50%	0%	7%	8%	0%	2%	8%	4%	24%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	4		4		4		2		2		2	
Permitted Phases	4		4		2		2		2		2	
Actuated Green, G (s)	19.6		19.6		47.8		47.8		47.8		47.8	
Effective Green, g (s)	16.6		16.6		44.8		44.8		44.8		44.8	
Actuated g/C Ratio	0.21		0.21		0.56		0.56		0.56		0.56	
Clearance Time (s)	6.1		6.1		6.5		6.5		6.5		6.5	
Vehicle Extension (s)	3.0		3.0		4.5		4.5		4.5		4.5	
Lane Grp Cap (vph)	321		266		973		706		1724			
v/s Ratio Prot												
v/s Ratio Perm	0.02		c0.18		c0.28		0.08		0.13			
v/c Ratio	0.08		0.85		0.51		0.14		0.23			
Uniform Delay, d1	25.5		30.5		10.8		8.4		8.9			
Progression Factor	1.00		1.00		1.00		1.00		1.00			
Incremental Delay, d2	0.1		22.2		1.9		0.4		0.3			
Delay (s)	25.7		52.7		12.7		8.8		9.2			
Level of Service	C		D		B		A		A			
Approach Delay (s)	25.7		52.7		11.7		9.2		9.2			
Approach LOS	C		D		B		A		A			

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕	↕		↕↔	
Traffic Volume (vph)	25	11	52	25	19	14	118	352	30	7	261	23
Future Volume (vph)	25	11	52	25	19	14	118	352	30	7	261	23
Satd. Flow (prot)	0	1724	0	0	1799	0	1711	1877	0	1745	1877	0
Fit Permitted	0.986		0.979		0.950		0.950		0.950		0.950	
Satd. Flow (perm)	0	1724	0	0	1799	0	1711	1877	0	1745	1877	0
Lane Group Flow (vph)	0	91	0	0	61	0	123	398	0	7	296	0
Sign Control	Stop		Stop		Stop		Stop		Stop		Stop	

Intersection Summary	
Control Type:	Unsignalized
Intersection Capacity Utilization	47.4%
Analysis Period (min)	15
ICU Level of Service	A

HCM Unsignalized Intersection Capacity Analysis  
 2: Mountainview Road N & John Street

Background 5 Year  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕	↕		↕	↕	↕
Sign Control	Stop			Stop			Stop	Stop		Stop	Stop	Stop
Traffic Volume (vph)	25	11	52	25	19	14	118	352	30	7	261	23
Future Volume (vph)	25	11	52	25	19	14	118	352	30	7	261	23
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	26	11	54	26	20	15	123	367	31	7	272	24
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	91	61	123	398	7	296						
Volume Left (vph)	26	26	123	0	7	0						
Volume Right (vph)	54	15	0	31	0	24						
Hadj (s)	-0.30	-0.06	0.53	-0.05	0.50	-0.06						
Departure Headway (s)	5.6	5.9	5.8	5.2	6.0	5.5						
Degree Utilization, x	0.14	0.10	0.20	0.58	0.01	0.45						
Capacity (veh/h)	566	531	601	675	570	638						
Control Delay (s)	9.5	9.6	9.1	13.9	7.9	11.7						
Approach Delay (s)	9.5	9.6	12.8	11.6								
Approach LOS	A	A	B	B								
<b>Intersection Summary</b>												
Delay			11.9									
Level of Service			B									
Intersection Capacity Utilization			47.4%		ICU Level of Service		A					
Analysis Period (min)			15									

Lanes, Volumes, Timings  
 3: River Drive & Daniella Street

Background 5 Year  
 PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	4	47	46	13	7	2
Future Volume (vph)	4	47	46	13	7	2
Satd. Flow (prot)	0	1734	1774	0	1778	0
Fit Permitted		0.996		0.962		
Satd. Flow (perm)	0	1734	1774	0	1778	0
Lane Group Flow (vph)	0	59	68	0	10	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 20.8%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	4	47	46	13	7	2
Future Volume (Veh/h)	4	47	46	13	7	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	5	54	53	15	8	2
Pedestrians					4	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	72				128	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	72				128	64
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1535				865	1002
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	59	68	10			
Volume Left	5	0	8			
Volume Right	0	15	2			
cSH	1535	1700	889			
Volume to Capacity	0.00	0.04	0.01			
Queue Length 95th (m)	0.1	0.0	0.3			
Control Delay (s)	0.6	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.6	0.0	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization		20.8%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	42	33	8	7	2
Future Volume (vph)	0	42	33	8	7	2
Satd. Flow (prot)	0	1712	1795	0	1778	0
Fit Permitted					0.962	
Satd. Flow (perm)	0	1712	1795	0	1778	0
Lane Group Flow (vph)	0	50	49	0	10	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.3%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	42	33	8	7	2
Future Volume (Veh/h)	0	42	33	8	7	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	50	39	10	8	2
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	52				97	47
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	52				97	47
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1563				905	1025
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	50	49	10			
Volume Left	0	0	8			
Volume Right	0	10	2			
eSH	1563	1700	926			
Volume to Capacity	0.00	0.03	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	8.9			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.9			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization		19.3%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	32	32	2	6	0
Future Volume (vph)	0	32	32	2	6	0
Satd. Flow (prot)	0	1712	1887	0	1504	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	1712	1887	0	1504	0
Lane Group Flow (vph)	0	38	40	0	7	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.0%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
5: Victoria Street/River Drive & St Michaels Street

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	32	32	2	6	0
Future Volume (Veh/h)	0	32	32	2	6	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	38	38	2	7	0
Pedestrians					2	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	42				79	41
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	42				79	41
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1577				879	1034
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	38	40	7			
Volume Left	0	0	7			
Volume Right	0	2	0			
cSH	1577	1700	879			
Volume to Capacity	0.00	0.02	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	9.1			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization		19.0%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
6: Rosset Valley Court & John Street

Background 5 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	99	6	18	131	2	15
Future Volume (vph)	99	6	18	131	2	15
Satd. Flow (prot)	1768	0	0	1628	1660	0
Fit Permitted				0.994	0.995	
Satd. Flow (perm)	1768	0	0	1628	1660	0
Lane Group Flow (vph)	125	0	0	177	20	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 30.5%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Background 5 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	99	6	18	131	2	15
Future Volume (Veh/h)	99	6	18	131	2	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	118	7	21	156	2	18
Pedestrians	1			3	6	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			131		326	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			131		326	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	98
cM capacity (veh/h)			1459		658	917
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	125	177	20			
Volume Left	0	21	2			
Volume Right	7	0	18			
cSH	1700	1459	882			
Volume to Capacity	0.07	0.01	0.02			
Queue Length 95th (m)	0.0	0.3	0.5			
Control Delay (s)	0.0	1.0	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.0	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization		30.5%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Background 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	3	38	1	7	34	86	10	18	1	64	20	3
Future Volume (vph)	3	38	1	7	34	86	10	18	1	64	20	3
Satd. Flow (prot)	0	1889	0	0	1456	0	0	1860	0	0	1666	0
Fit Permitted		0.997			0.997			0.983			0.964	
Satd. Flow (perm)	0	1889	0	0	1456	0	0	1860	0	0	1666	0
Lane Group Flow (vph)	0	47	0	0	143	0	0	32	0	0	97	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 30.8%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Background 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	3	38	1	7	34	86	10	18	1	64	20	3
Future Volume (vph)	3	38	1	7	34	86	10	18	1	64	20	3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	43	1	8	38	97	11	20	1	72	22	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	47	143	32	97								
Volume Left (vph)	3	8	11	72								
Volume Right (vph)	1	97	1	3								
Hadj (s)	0.00	-0.29	0.05	0.29								
Departure Headway (s)	4.4	4.0	4.5	4.6								
Degree Utilization, x	0.06	0.16	0.04	0.12								
Capacity (veh/h)	792	874	759	735								
Control Delay (s)	7.6	7.7	7.7	8.3								
Approach Delay (s)	7.6	7.7	7.7	8.3								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				30.8%	ICU Level of Service	A						
Analysis Period (min)				15								

Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	28.4	112.2	83.6	27.0	38.0	32.1
Average Queue (m)	9.1	49.1	33.6	7.8	15.0	8.3
95th Queue (m)	21.0	90.4	67.0	19.5	30.6	22.1
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	15.9	14.3	28.2	40.4	14.8	28.2
Average Queue (m)	9.0	7.8	11.7	18.5	1.9	14.2
95th Queue (m)	13.6	14.0	22.1	30.8	9.3	24.2
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)				30.0	40.0	
Storage Blk Time (%)				0	1	0
Queuing Penalty (veh)				0	1	0

Intersection: 3: River Drive & Daniella Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	3.5	9.1
Average Queue (m)	0.1	2.3
95th Queue (m)	1.8	8.6
Link Distance (m)	161.8	120.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		



Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.1
Average Queue (m)	2.1
95th Queue (m)	8.4
Link Distance (m)	106.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	8.3
Average Queue (m)	1.0
95th Queue (m)	5.4
Link Distance (m)	72.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	7.4	9.6
Average Queue (m)	0.6	3.3
95th Queue (m)	4.2	9.8
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Background 5 Year  
PM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.4	26.1	10.6	22.2
Average Queue (m)	6.2	11.5	5.1	10.8
95th Queue (m)	13.0	20.0	12.6	18.8
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1

# Appendix H

## Background Ten-Year Horizon Operations



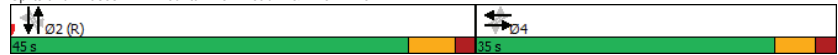
Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	1	10	44	135	6	24	11	270	145	44	467	4
Future Volume (vph)	1	10	44	135	6	24	11	270	145	44	467	4
Satd. Flow (prot)	0	1491	0	0	1363	0	0	1785	1380	0	3502	0
Fit Permitted		0.995			0.724			0.973			0.896	
Satd. Flow (perm)	0	1485	0	0	1027	0	0	1741	1346	0	3149	0
Satd. Flow (RTOR)		47			12			154			1	
Lane Group Flow (vph)	0	59	0	0	176	0	0	299	154	0	548	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0		45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		15.8			15.8			45.6	45.6		45.6	
Actuated g/C Ratio		0.20			0.20			0.57	0.57		0.57	
v/c Ratio		0.18			0.83			0.30	0.18		0.31	
Control Delay		10.3			57.3			11.7	2.9		10.8	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		10.3			57.3			11.7	2.9		10.8	
LOS		B			E			B	A		B	
Approach Delay		10.3			57.3			8.7			10.8	
Approach LOS		B			E			A			B	
Queue Length 50th (m)		1.5			24.4			21.3	0.0		20.5	
Queue Length 95th (m)		8.9			39.2			48.0	9.6		40.2	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		512			340			993	833		1796	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.12			0.52			0.30	0.18		0.31	

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBSB, Start of Green
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	16.6
Intersection LOS:	B
Intersection Capacity Utilization:	81.8%
ICU Level of Service D	
Analysis Period (min)	15

Splits and Phases: 1: Mountainview Road N & River Drive



Queues  
1: Mountainview Road N & River Drive

Background 10 Year  
AM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	59	176	299	154	548
v/c Ratio	0.18	0.83	0.30	0.18	0.31
Control Delay	10.3	57.3	11.7	2.9	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	57.3	11.7	2.9	10.8
Queue Length 50th (m)	1.5	24.4	21.3	0.0	20.5
Queue Length 95th (m)	8.9	39.2	48.0	9.6	40.2
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	512	340	993	833	1796
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.52	0.30	0.18	0.31

Intersection Summary

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBSB, Start of Green
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	16.6
Intersection LOS:	B
Intersection Capacity Utilization:	81.8%
ICU Level of Service D	
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Background 10 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	1	10	44	135	6	24	11	270	145	44	467	4
Future Volume (vph)	1	10	44	135	6	24	11	270	145	44	467	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1			9.1			9.5			9.5		
Lane Util. Factor	1.00			1.00			1.00			0.95		
Frbp, ped/bikes	1.00			1.00			1.00			0.97		
Flpb, ped/bikes	1.00			1.00			1.00			1.00		
Frt	0.89			0.98			1.00			0.85		
Flt Protected	1.00			0.96			1.00			1.00		
Satd. Flow (prot)	1492			1363			1785			1346		
Flt Permitted	0.99			0.72			0.97			1.00		
Satd. Flow (perm)	1485			1028			1741			1346		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1	11	47	144	6	26	12	287	154	47	497	4
RTOR Reduction (vph)	0	38	0	0	10	0	0	0	66	0	0	0
Lane Group Flow (vph)	0	21	0	0	166	0	0	299	88	0	548	0
Confl. Peds. (#/hr)	5			5			4			4		
Heavy Vehicles (%)	0%	0%	17%	35%	40%	5%	11%	6%	17%	6%	2%	33%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	4			4			2			2		
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	18.8			18.8			48.6			48.6		
Effective Green, g (s)	15.8			15.8			45.6			45.6		
Actuated g/C Ratio	0.20			0.20			0.57			0.57		
Clearance Time (s)	6.1			6.1			6.5			6.5		
Vehicle Extension (s)	3.0			3.0			4.5			4.5		
Lane Grp Cap (vph)	293			203			992			767		
v/s Ratio Prot												
v/s Ratio Perm	0.01			c0.16			0.17			0.07		
v/c Ratio	0.07			0.82			0.30			0.11		
Uniform Delay, d1	26.1			30.7			8.9			7.9		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.1			22.0			0.8			0.3		
Delay (s)	26.2			52.8			9.7			8.2		
Level of Service	C			D			A			A		
Approach Delay (s)	26.2			52.8			9.2			9.4		
Approach LOS	C			D			A			A		

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	18	9	96	23	12	10	57	218	20	20	386	21
Future Volume (vph)	18	9	96	23	12	10	57	218	20	20	386	21
Satd. Flow (prot)	0	1634	0	0	1704	0	1544	1802	0	1646	1816	0
Flt Permitted	0.993			0.976			0.950			0.950		
Satd. Flow (perm)	0	1634	0	0	1704	0	1544	1802	0	1646	1816	0
Lane Group Flow (vph)	0	131	0	0	48	0	61	253	0	21	433	0
Sign Control	Stop			Stop			Stop			Stop		

Intersection Summary	
Control Type: Unsignalized	
Intersection Capacity Utilization 51.2%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis  
 2: Mountainview Road N & John Street

Background 10 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕	↕		↕	↕	↕
Sign Control	Stop			Stop			Stop	Stop		Stop	Stop	Stop
Traffic Volume (vph)	18	9	96	23	12	10	57	218	20	20	386	21
Future Volume (vph)	18	9	96	23	12	10	57	218	20	20	386	21
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	19	10	102	24	13	11	61	232	21	21	411	22
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	131	48	61	253	21	433						
Volume Left (vph)	19	24	61	0	21	0						
Volume Right (vph)	102	11	0	21	0	22						
Hadj (s)	-0.38	0.06	0.72	0.01	0.60	0.03						
Departure Headway (s)	5.5	6.1	6.3	5.6	6.0	5.4						
Degree Utilization, x	0.20	0.08	0.11	0.39	0.04	0.65						
Capacity (veh/h)	580	504	552	626	577	640						
Control Delay (s)	9.9	9.7	8.8	10.9	8.0	16.9						
Approach Delay (s)	9.9	9.7	10.5	16.5								
Approach LOS	A	A	B	C								
<b>Intersection Summary</b>												
Delay			13.2									
Level of Service			B									
Intersection Capacity Utilization			51.2%		ICU Level of Service		A					
Analysis Period (min)			15									

Lanes, Volumes, Timings  
 3: River Drive & Daniella Street

Background 10 Year  
 AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕		↕	↕	↕	
Traffic Volume (vph)	2	57	15	2	9	4
Future Volume (vph)	2	57	15	2	9	4
Satd. Flow (prot)	0	1590	1811	0	1756	0
Fit Permitted			0.999			0.968
Satd. Flow (perm)	0	1590	1811	0	1756	0
Lane Group Flow (vph)	0	68	19	0	15	0
Sign Control	Free		Free	Stop		
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.6%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Background 10 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	57	15	2	9	4
Future Volume (Veh/h)	2	57	15	2	9	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	2	66	17	2	10	5
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	22				91	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	22				91	21
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1602				911	1059
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	68	19	15			
Volume Left	2	0	10			
Volume Right	0	2	5			
cSH	1602	1700	955			
Volume to Capacity	0.00	0.01	0.02			
Queue Length 95th (m)	0.0	0.0	0.4			
Control Delay (s)	0.2	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	8.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.4			
Intersection Capacity Utilization		19.6%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	50	10	2	5	0
Future Volume (vph)	0	50	10	2	5	0
Satd. Flow (prot)	0	1583	1444	0	1805	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	1583	1444	0	1805	0
Lane Group Flow (vph)	0	56	13	0	6	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 18.3%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Background 10 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	50	10	2	5	0
Future Volume (Veh/h)	0	50	10	2	5	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	56	11	2	6	0
Pedestrians			2			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	13				70	12
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	13				70	12
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1619				938	1074
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	56	13	6			
Volume Left	0	0	6			
Volume Right	0	2	0			
cSH	1619	1700	938			
Volume to Capacity	0.00	0.01	0.01			
Queue Length 95th (m)	0.0	0.0	0.1			
Control Delay (s)	0.0	0.0	8.9			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.9			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization		18.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	46	5	1	1	0
Future Volume (vph)	1	46	5	1	1	0
Satd. Flow (prot)	0	1669	1535	0	1805	0
Fit Permitted		0.999			0.950	
Satd. Flow (perm)	0	1669	1535	0	1805	0
Lane Group Flow (vph)	0	55	7	0	1	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.6%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
 5: Victoria Street/River Drive & St Michaels Street

Background 10 Year  
 AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	46	5	1	1	0
Future Volume (Veh/h)	1	46	5	1	1	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	54	6	1	1	0
Pedestrians		1	1		3	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	10				66	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	10				66	10
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1618				940	1073
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	55	7	1			
Volume Left	1	0	1			
Volume Right	0	1	0			
cSH	1618	1700	940			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.1	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	8.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization		19.6%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 6: Rosset Valley Court & John Street

Background 10 Year  
 AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	96	0	17	72	4	21
Future Volume (vph)	96	0	17	72	4	21
Satd. Flow (prot)	1827	0	0	1568	1672	0
Fit Permitted				0.991	0.992	
Satd. Flow (perm)	1827	0	0	1568	1672	0
Lane Group Flow (vph)	113	0	0	105	30	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 26.4%					ICU Level of Service A	
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Background 10 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	96	0	17	72	4	21
Future Volume (Veh/h)	96	0	17	72	4	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	113	0	20	85	5	25
Pedestrians					8	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			121		246	121
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			121		246	121
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	97
cM capacity (veh/h)			1468		731	929
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	113	105	30			
Volume Left	0	20	5			
Volume Right	0	0	25			
cSH	1700	1468	889			
Volume to Capacity	0.07	0.01	0.03			
Queue Length 95th (m)	0.0	0.3	0.8			
Control Delay (s)	0.0	1.5	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.5	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.8			
Intersection Capacity Utilization		26.4%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Background 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	0	17	4	5	23	52	5	7	0	71	24	5
Future Volume (vph)	0	17	4	5	23	52	5	7	0	71	24	5
Satd. Flow (prot)	0	1849	0	0	1419	0	0	1860	0	0	1760	0
Fit Permitted					0.997			0.979			0.966	
Satd. Flow (perm)	0	1849	0	0	1419	0	0	1860	0	0	1760	0
Lane Group Flow (vph)	0	25	0	0	93	0	0	14	0	0	117	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 30.4%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Background 10 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	0	17	4	5	23	52	5	7	0	71	24	5
Future Volume (vph)	0	17	4	5	23	52	5	7	0	71	24	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	20	5	6	27	60	6	8	0	83	28	6
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	25	93	14	117								
Volume Left (vph)	0	6	6	83								
Volume Right (vph)	5	60	0	6								
Hadj (s)	-0.12	-0.21	0.09	0.17								
Departure Headway (s)	4.2	4.0	4.4	4.3								
Degree Utilization, x	0.03	0.10	0.02	0.14								
Capacity (veh/h)	827	865	788	806								
Control Delay (s)	7.3	7.5	7.4	8.0								
Approach Delay (s)	7.3	7.5	7.4	8.0								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.7								
Level of Service				A								
Intersection Capacity Utilization				30.4%	ICU Level of Service	A						
Analysis Period (min)				15								

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	25.1	93.4	45.8	26.2	33.9	39.4
Average Queue (m)	9.5	38.5	15.2	6.0	18.6	12.9
95th Queue (m)	20.4	72.6	35.0	17.1	32.9	30.3
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	24.1	18.4	22.9	31.8	11.1	47.4
Average Queue (m)	10.8	8.0	9.4	15.4	4.5	20.9
95th Queue (m)	17.9	15.7	19.0	26.4	11.9	34.9
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)				30.0	40.0	
Storage Blk Time (%)				0	0	1
Queuing Penalty (veh)				0	0	0

Intersection: 3: River Drive & Daniella Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	10.7
Average Queue (m)	3.6
95th Queue (m)	10.8
Link Distance (m)	120.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	1.4
95th Queue (m)	6.8
Link Distance (m)	106.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	5.5
Average Queue (m)	0.3
95th Queue (m)	2.7
Link Distance (m)	72.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	9.1	10.7
Average Queue (m)	0.4	4.5
95th Queue (m)	3.6	11.1
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Background 10 Year  
AM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.0	21.6	10.5	20.2
Average Queue (m)	4.7	11.1	2.8	10.3
95th Queue (m)	11.9	18.9	9.7	16.8
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1

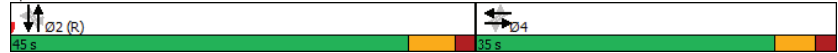
Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	2	12	55	168	15	61	32	459	172	29	353	6
Future Volume (vph)	2	12	55	168	15	61	32	459	172	29	353	6
Satd. Flow (prot)	0	1567	0	0	1659	0	0	1817	1302	0	3431	0
Fit Permitted		0.990			0.747			0.948			0.886	
Satd. Flow (perm)	0	1552	0	0	1281	0	0	1727	1261	0	3051	0
Satd. Flow (RTOR)		61			22			191			3	
Lane Group Flow (vph)	0	76	0	0	272	0	0	546	191	0	431	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0		45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		18.0			18.0			43.4	43.4		43.4	
Actuated g/C Ratio		0.22			0.22			0.54	0.54		0.54	
v/c Ratio		0.19			0.89			0.58	0.25		0.26	
Control Delay		9.3			57.2			17.1	3.0		11.4	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		9.3			57.2			17.1	3.0		11.4	
LOS		A			E			B	A		B	
Approach Delay		9.3			57.2			13.5			11.4	
Approach LOS		A			E			B			B	
Queue Length 50th (m)		1.8			37.0			52.2	0.0		17.1	
Queue Length 95th (m)		10.2			57.4			101.4	10.7		31.4	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		543			429			937	771		1658	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.14			0.63			0.58	0.25		0.26	

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBSB, Start of Green
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	20.5
Intersection LOS:	C
Intersection Capacity Utilization:	88.2%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 1: Mountainview Road N & River Drive



Queues  
1: Mountainview Road N & River Drive

Background 10 Year  
PM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	76	272	546	191	431
v/c Ratio	0.19	0.89	0.58	0.25	0.26
Control Delay	9.3	57.2	17.1	3.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	57.2	17.1	3.0	11.4
Queue Length 50th (m)	1.8	37.0	52.2	0.0	17.1
Queue Length 95th (m)	10.2	57.4	101.4	10.7	31.4
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	543	429	937	771	1658
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.63	0.58	0.25	0.26

Intersection Summary

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBSB, Start of Green
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	20.5
Intersection LOS:	C
Intersection Capacity Utilization:	88.2%
ICU Level of Service:	E
Analysis Period (min):	15

HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	2	12	55	168	15	61	32	459	172	29	353	6
Future Volume (vph)	2	12	55	168	15	61	32	459	172	29	353	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1			9.1			9.5			9.5		
Lane Util. Factor	1.00			1.00			1.00			0.95		
Frbp, ped/bikes	0.99			0.99			1.00			0.97		
Flpb, ped/bikes	1.00			1.00			1.00			1.00		
Frt	0.89			0.97			1.00			0.85		
Flt Protected	1.00			0.97			1.00			1.00		
Satd. Flow (prot)	1566			1658			1816			1261		
Flt Permitted	0.99			0.75			0.95			1.00		
Satd. Flow (perm)	1552			1282			1727			1261		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	13	61	187	17	68	36	510	191	32	392	7
RTOR Reduction (vph)	0	47	0	0	17	0	0	0	87	0	1	0
Lane Group Flow (vph)	0	29	0	0	255	0	0	546	104	0	430	0
Confl. Peds. (#/hr)	13		1	1		13	2		9	9		2
Heavy Vehicles (%)	50%	0%	7%	8%	0%	2%	8%	4%	24%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	4		4		4		2		2		2	
Permitted Phases	4		4		2		2		2		2	
Actuated Green, G (s)	21.0		21.0		46.4		46.4		46.4		46.4	
Effective Green, g (s)	18.0		18.0		43.4		43.4		43.4		43.4	
Actuated g/C Ratio	0.22		0.22		0.54		0.54		0.54		0.54	
Clearance Time (s)	6.1		6.1		6.5		6.5		6.5		6.5	
Vehicle Extension (s)	3.0		3.0		4.5		4.5		4.5		4.5	
Lane Grp Cap (vph)	349		288		936		684		1654			
v/s Ratio Prot												
v/s Ratio Perm	0.02		c0.20		c0.32		0.08		0.14			
v/c Ratio	0.08		0.89		0.58		0.15		0.26			
Uniform Delay, d1	24.5		30.0		12.2		9.1		9.7			
Progression Factor	1.00		1.00		1.00		1.00		1.00			
Incremental Delay, d2	0.1		25.9		2.7		0.5		0.4			
Delay (s)	24.6		55.9		14.9		9.6		10.1			
Level of Service	C		E		B		A		B			
Approach Delay (s)	24.6		55.9		13.5		10.1		10.1			
Approach LOS	C		E		B		B		B			
<b>Intersection Summary</b>												
HCM 2000 Control Delay	20.7			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.67											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			18.6					
Intersection Capacity Utilization	88.2%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	28	12	57	28	21	16	130	389	33	7	288	26
Future Volume (vph)	28	12	57	28	21	16	130	389	33	7	288	26
Satd. Flow (prot)	0	1725	0	0	1797	0	1711	1877	0	1745	1877	0
Fit Permitted	0.986		0.979		0.950		0.950		0.950		0.950	
Satd. Flow (perm)	0	1725	0	0	1797	0	1711	1877	0	1745	1877	0
Lane Group Flow (vph)	0	101	0	0	68	0	135	439	0	7	327	0
Sign Control	Stop		Stop		Stop		Stop		Stop		Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 50.1%						ICU Level of Service A						
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
2: Mountainview Road N & John Street

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	28	12	57	28	21	16	130	389	33	7	288	26
Future Volume (vph)	28	12	57	28	21	16	130	389	33	7	288	26
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	29	12	59	29	22	17	135	405	34	7	300	27
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	100	68	135	439	7	327						
Volume Left (vph)	29	29	135	0	7	0						
Volume Right (vph)	59	17	0	34	0	27						
Hadj (s)	-0.30	-0.06	0.53	-0.05	0.50	-0.06						
Departure Headway (s)	5.9	6.2	5.9	5.4	6.2	5.6						
Degree Utilization, x	0.16	0.12	0.22	0.65	0.01	0.51						
Capacity (veh/h)	541	507	589	661	555	621						
Control Delay (s)	10.0	10.0	9.4	16.6	8.1	13.2						
Approach Delay (s)	10.0	10.0	14.9	13.1								
Approach LOS	A	A	B	B								
<b>Intersection Summary</b>												
Delay			13.6									
Level of Service			B									
Intersection Capacity Utilization			50.1%		ICU Level of Service		A					
Analysis Period (min)			15									

Lanes, Volumes, Timings  
3: River Drive & Daniella Street

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕		↕		↕	
Traffic Volume (vph)	5	52	51	15	7	2
Future Volume (vph)	5	52	51	15	7	2
Satd. Flow (prot)	0	1733	1774	0	1778	0
Fit Permitted	0.995		0.962			
Satd. Flow (perm)	0	1733	1774	0	1778	0
Lane Group Flow (vph)	0	66	76	0	10	0
Sign Control	Free		Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 21.9%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	5	52	51	15	7	2
Future Volume (Veh/h)	5	52	51	15	7	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	60	59	17	8	2
Pedestrians					4	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	80				144	72
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	80				144	72
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1525				847	993
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	66	76	10			
Volume Left	6	0	8			
Volume Right	0	17	2			
cSH	1525	1700	873			
Volume to Capacity	0.00	0.04	0.01			
Queue Length 95th (m)	0.1	0.0	0.3			
Control Delay (s)	0.7	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	0.7	0.0	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization		21.9%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	46	37	9	7	2
Future Volume (vph)	0	46	37	9	7	2
Satd. Flow (prot)	0	1712	1798	0	1778	0
Fit Permitted					0.962	
Satd. Flow (perm)	0	1712	1798	0	1778	0
Lane Group Flow (vph)	0	55	55	0	10	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.3%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	46	37	9	7	2
Future Volume (Veh/h)	0	46	37	9	7	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	55	44	11	8	2
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	58				108	52
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	58				108	52
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1555				892	1018
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	55	55	10			
Volume Left	0	0	8			
Volume Right	0	11	2			
cSH	1555	1700	915			
Volume to Capacity	0.00	0.03	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.0	0.0	9.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.0			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization		19.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	35	35	2	6	0
Future Volume (vph)	0	35	35	2	6	0
Satd. Flow (prot)	0	1712	1889	0	1504	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	1712	1889	0	1504	0
Lane Group Flow (vph)	0	42	44	0	7	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.0%					ICU Level of Service A	
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
5: Victoria Street/River Drive & St Michaels Street

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	35	35	2	6	0
Future Volume (Veh/h)	0	35	35	2	6	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	42	42	2	7	0
Pedestrians					2	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	46				87	45
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	46				87	45
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1572				870	1029
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	42	44	7			
Volume Left	0	0	7			
Volume Right	0	2	0			
cSH	1572	1700	870			
Volume to Capacity	0.00	0.03	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	9.2			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.7			
Intersection Capacity Utilization		19.0%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
6: Rosset Valley Court & John Street

Background 10 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	110	6	20	145	2	17
Future Volume (vph)	110	6	20	145	2	17
Satd. Flow (prot)	1769	0	0	1628	1658	0
Fit Permitted				0.994	0.995	
Satd. Flow (perm)	1769	0	0	1628	1658	0
Lane Group Flow (vph)	138	0	0	197	22	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 31.4%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Background 10 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	110	6	20	145	2	17
Future Volume (Veh/h)	110	6	20	145	2	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	131	7	24	173	2	20
Pedestrians	1			3	6	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			144		362	144
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			144		362	144
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	98
cM capacity (veh/h)			1443		626	902
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	138	197	22			
Volume Left	0	24	2			
Volume Right	7	0	20			
cSH	1700	1443	867			
Volume to Capacity	0.08	0.02	0.03			
Queue Length 95th (m)	0.0	0.4	0.6			
Control Delay (s)	0.0	1.0	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.0	9.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization		31.4%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Background 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	4	41	1	7	38	95	11	20	1	71	22	4
Future Volume (vph)	4	41	1	7	38	95	11	20	1	71	22	4
Satd. Flow (prot)	0	1887	0	0	1461	0	0	1860	0	0	1667	0
Fit Permitted		0.996			0.997			0.983			0.965	
Satd. Flow (perm)	0	1887	0	0	1461	0	0	1860	0	0	1667	0
Lane Group Flow (vph)	0	51	0	0	158	0	0	35	0	0	109	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 32.3%							ICU Level of Service A					
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Background 10 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	4	41	1	7	38	95	11	20	1	71	22	4
Future Volume (vph)	4	41	1	7	38	95	11	20	1	71	22	4
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	46	1	8	43	107	12	22	1	80	25	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	51	158	35	109								
Volume Left (vph)	4	8	12	80								
Volume Right (vph)	1	107	1	4								
Hadj (s)	0.00	-0.29	0.05	0.29								
Departure Headway (s)	4.4	4.0	4.5	4.7								
Degree Utilization, x	0.06	0.18	0.04	0.14								
Capacity (veh/h)	778	863	746	727								
Control Delay (s)	7.7	7.9	7.7	8.5								
Approach Delay (s)	7.7	7.9	7.7	8.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				8.0								
Level of Service				A								
Intersection Capacity Utilization				32.3%	ICU Level of Service	A						
Analysis Period (min)				15								

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	24.7	105.1	66.4	23.5	39.5	31.6
Average Queue (m)	8.8	48.2	33.0	7.6	16.4	10.2
95th Queue (m)	19.7	86.7	59.4	18.6	33.0	24.5
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	16.9	15.8	32.2	43.4	8.8	33.1
Average Queue (m)	9.2	8.4	13.2	20.8	1.3	15.2
95th Queue (m)	14.4	14.4	25.9	34.9	6.3	24.8
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)				30.0	40.0	
Storage Blk Time (%)				0	2	0
Queuing Penalty (veh)				0	2	0

Intersection: 3: River Drive & Daniella Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.2
95th Queue (m)	8.6
Link Distance (m)	120.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.5
95th Queue (m)	9.1
Link Distance (m)	106.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	8.6
Average Queue (m)	0.7
95th Queue (m)	4.6
Link Distance (m)	72.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	1.8	9.3	10.8
Average Queue (m)	0.1	0.8	3.7
95th Queue (m)	1.3	5.1	10.4
Link Distance (m)	457.2	84.3	140.1
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

Background 10 Year  
PM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.3	24.1	12.0	22.8
Average Queue (m)	7.0	11.9	5.8	10.9
95th Queue (m)	13.1	19.7	13.2	18.1
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 2

# Appendix I

## Total Five-Year Horizon Operations



Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	4	19	75	123	9	22	22	245	131	40	424	4
Future Volume (vph)	4	19	75	123	9	22	22	245	131	40	424	4
Satd. Flow (prot)	0	1503	0	0	1363	0	0	1778	1380	0	3501	0
Fit Permitted		0.986			0.700			0.941			0.900	
Satd. Flow (perm)	0	1484	0	0	992	0	0	1680	1346	0	3163	0
Satd. Flow (RTOR)		80			11			139			1	
Lane Group Flow (vph)	0	104	0	0	164	0	0	284	139	0	498	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0		45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		15.5			15.5			45.9	45.9		45.9	
Actuated g/C Ratio		0.19			0.19			0.57	0.57		0.57	
v/c Ratio		0.30			0.82			0.29	0.17		0.27	
Control Delay		10.5			57.0			11.5	2.9		10.5	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		10.5			57.0			11.5	2.9		10.5	
LOS		B			E			B	A		B	
Approach Delay		10.5			57.0			8.7			10.5	
Approach LOS		B			E			A			B	
Queue Length 50th (m)		3.1			22.7			19.8	0.0		18.0	
Queue Length 95th (m)		12.7			36.9			45.9	9.1		36.3	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		534			328			964	831		1816	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.19			0.50			0.29	0.17		0.27	

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBSB, Start of Green
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.82
Intersection Signal Delay:	16.3
Intersection LOS:	B
Intersection Capacity Utilization:	81.8%
ICU Level of Service D	
Analysis Period (min)	15



Queues  
1: Mountainview Road N & River Drive

Total 5 Year  
AM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	104	164	284	139	498
v/c Ratio	0.30	0.82	0.29	0.17	0.27
Control Delay	10.5	57.0	11.5	2.9	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	57.0	11.5	2.9	10.5
Queue Length 50th (m)	3.1	22.7	19.8	0.0	18.0
Queue Length 95th (m)	12.7	36.9	45.9	9.1	36.3
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	534	328	964	831	1816
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.50	0.29	0.17	0.27

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Total 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	4	19	75	123	9	22	22	245	131	40	424	4
Future Volume (vph)	4	19	75	123	9	22	22	245	131	40	424	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1				9.1				9.5			
Lane Util. Factor	1.00				1.00				1.00			
Frbp, ped/bikes	1.00				1.00				0.97			
Flpb, ped/bikes	1.00				1.00				1.00			
Frt	0.90				0.98				1.00			
Flt Protected	1.00				0.96				1.00			
Satd. Flow (prot)	1503				1362				1778			
Flt Permitted	0.99				0.70				0.94			
Satd. Flow (perm)	1484				992				1680			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	4	20	80	131	10	23	23	261	139	43	451	4
RTOR Reduction (vph)	0	65	0	0	9	0	0	0	59	0	0	0
Lane Group Flow (vph)	0	40	0	0	155	0	0	284	80	0	498	0
Confl. Peds. (#/hr)	5				5				4			
Heavy Vehicles (%)	0%	0%	17%	35%	40%	5%	11%	6%	17%	6%	2%	33%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	4				4				2			
Permitted Phases	4				4				2			
Actuated Green, G (s)	18.5				18.5				48.9			
Effective Green, g (s)	15.5				15.5				45.9			
Actuated g/C Ratio	0.19				0.19				0.57			
Clearance Time (s)	6.1				6.1				6.5			
Vehicle Extension (s)	3.0				3.0				4.5			
Lane Grp Cap (vph)	287				192				963			
v/s Ratio Prot												
v/s Ratio Perm	0.03				c0.16				c0.17			
v/c Ratio	0.14				0.81				0.29			
Uniform Delay, d1	26.7				30.8				8.7			
Progression Factor	1.00				1.00				1.00			
Incremental Delay, d2	0.2				21.5				0.8			
Delay (s)	26.9				52.3				9.5			
Level of Service	C				D				A			
Approach Delay (s)	26.9				52.3				9.0			
Approach LOS	C				D				A			
<b>Intersection Summary</b>												
HCM 2000 Control Delay	16.6				HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio	0.42											
Actuated Cycle Length (s)	80.0				Sum of lost time (s)				18.6			
Intersection Capacity Utilization	81.8%				ICU Level of Service				D			
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	17	8	87	21	11	9	52	201	18	18	351	19
Future Volume (vph)	17	8	87	21	11	9	52	201	18	18	351	19
Satd. Flow (prot)	0	1633	0	0	1704	0	1544	1802	0	1646	1816	0
Fit Permitted	0.993				0.976				0.950			
Satd. Flow (perm)	0	1633	0	0	1704	0	1544	1802	0	1646	1816	0
Lane Group Flow (vph)	0	120	0	0	44	0	55	233	0	19	393	0
Sign Control	Stop				Stop				Stop			
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 48.7% ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
 2: Mountainview Road N & John Street

Total 5 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↖	↗		↖	↗	
Sign Control	Stop			Stop			Stop	Stop		Stop	Stop	
Traffic Volume (vph)	17	8	87	21	11	9	52	201	18	18	351	19
Future Volume (vph)	17	8	87	21	11	9	52	201	18	18	351	19
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	18	9	93	22	12	10	55	214	19	19	373	20
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	120	44	55	233	19	393						
Volume Left (vph)	18	22	55	0	19	0						
Volume Right (vph)	93	10	0	19	0	20						
Hadj (s)	-0.38	0.06	0.72	0.01	0.60	0.03						
Departure Headway (s)	5.3	5.9	6.1	5.4	5.9	5.3						
Degree Utilization, x	0.18	0.07	0.09	0.35	0.03	0.58						
Capacity (veh/h)	603	529	564	641	587	661						
Control Delay (s)	9.5	9.4	8.6	10.1	7.9	14.2						
Approach Delay (s)	9.5	9.4	9.8		14.0							
Approach LOS	A	A	A		B							
<b>Intersection Summary</b>												
Delay			11.7									
Level of Service			B									
Intersection Capacity Utilization			48.7%		ICU Level of Service		A					
Analysis Period (min)			15									

Lanes, Volumes, Timings  
 3: River Drive & Daniella Street

Total 5 Year  
 AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	2	100	29	2	8	3
Future Volume (vph)	2	100	29	2	8	3
Satd. Flow (prot)	0	1586	1851	0	1769	0
Fit Permitted		0.999			0.964	
Satd. Flow (perm)	0	1586	1851	0	1769	0
Lane Group Flow (vph)	0	118	36	0	12	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 21.9%			ICU Level of Service A			
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Total 5 Year  
AM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	100	29	2	8	3
Future Volume (Veh/h)	2	100	29	2	8	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	2	116	34	2	9	3
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	39				158	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39				158	38
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1580				835	1037
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	118	36	12			
Volume Left	2	0	9			
Volume Right	0	2	3			
cSH	1580	1700	877			
Volume to Capacity	0.00	0.02	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.1	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization		21.9%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Total 5 Year  
AM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	45	9	18	52	1
Future Volume (vph)	0	45	9	18	52	1
Satd. Flow (prot)	0	1583	1220	0	1807	0
Fit Permitted					0.953	
Satd. Flow (perm)	0	1583	1220	0	1807	0
Lane Group Flow (vph)	0	50	30	0	59	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 18.3%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Total 5 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	45	9	18	52	1
Future Volume (Veh/h)	0	45	9	18	52	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	50	10	20	58	1
Pedestrians			2			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	30				72	20
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30				72	20
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1596				935	1064
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	50	30	59			
Volume Left	0	0	58			
Volume Right	0	20	1			
cSH	1596	1700	937			
Volume to Capacity	0.00	0.02	0.06			
Queue Length 95th (m)	0.0	0.0	1.5			
Control Delay (s)	0.0	0.0	9.1			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			3.9			
Intersection Capacity Utilization		18.3%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	2	42	5	1	1	1
Future Volume (vph)	2	42	5	1	1	1
Satd. Flow (prot)	0	1671	1535	0	1728	0
Fit Permitted		0.998			0.976	
Satd. Flow (perm)	0	1671	1535	0	1728	0
Lane Group Flow (vph)	0	51	7	0	2	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.6%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
 5: Victoria Street/River Drive & St Michaels Street

Total 5 Year  
 AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	42	5	1	1	1
Future Volume (Veh/h)	2	42	5	1	1	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	49	6	1	1	1
Pedestrians		1	1		3	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	10				64	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	10				64	10
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1618				943	1073
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	51	7	2			
Volume Left	2	0	1			
Volume Right	0	1	1			
cSH	1618	1700	1004			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.3	0.0	8.6			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	8.6			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		19.6%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
 6: Rosset Valley Court & John Street

Total 5 Year  
 AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	87	0	15	65	3	19
Future Volume (vph)	87	0	15	65	3	19
Satd. Flow (prot)	1827	0	0	1568	1670	0
Fit Permitted				0.991	0.992	
Satd. Flow (perm)	1827	0	0	1568	1670	0
Lane Group Flow (vph)	102	0	0	94	26	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 25.9%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Total 5 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	87	0	15	65	3	19
Future Volume (Veh/h)	87	0	15	65	3	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	102	0	18	76	4	22
Pedestrians					8	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			110		222	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			110		222	110
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1482		756	942
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	102	94	26			
Volume Left	0	18	4			
Volume Right	0	0	22			
cSH	1700	1482	908			
Volume to Capacity	0.06	0.01	0.03			
Queue Length 95th (m)	0.0	0.3	0.7			
Control Delay (s)	0.0	1.5	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.5	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization		25.9%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	0	15	3	4	21	47	4	9	0	64	23	4
Future Volume (vph)	0	15	3	4	21	47	4	9	0	64	23	4
Satd. Flow (prot)	0	1862	0	0	1420	0	0	1870	0	0	1763	0
Fit Permitted					0.997			0.984			0.966	
Satd. Flow (perm)	0	1862	0	0	1420	0	0	1870	0	0	1763	0
Lane Group Flow (vph)	0	20	0	0	84	0	0	15	0	0	106	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 30.3% ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Total 5 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	0	15	3	4	21	47	4	9	0	64	23	4
Future Volume (vph)	0	15	3	4	21	47	4	9	0	64	23	4
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	17	3	5	24	55	5	10	0	74	27	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	20	84	15	106								
Volume Left (vph)	0	5	5	74								
Volume Right (vph)	3	55	0	5								
Hadj (s)	-0.09	-0.22	0.07	0.17								
Departure Headway (s)	4.2	4.0	4.3	4.3								
Degree Utilization, x	0.02	0.09	0.02	0.13								
Capacity (veh/h)	830	876	804	814								
Control Delay (s)	7.3	7.4	7.4	7.9								
Approach Delay (s)	7.3	7.4	7.4	7.9								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.6								
Level of Service				A								
Intersection Capacity Utilization				30.3%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings  
8: Rosetta Street & Site

Total 5 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	0	44	14	4	9	0
Future Volume (vph)	0	44	14	4	9	0
Satd. Flow (prot)	1611	0	0	1792	1863	0
Fit Permitted				0.962		
Satd. Flow (perm)	1611	0	0	1792	1863	0
Lane Group Flow (vph)	48	0	0	19	10	0
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 24.3%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
8: Rosetta Street & Site

Total 5 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↕	↕	
Traffic Volume (veh/h)	0	44	14	4	9	0
Future Volume (Veh/h)	0	44	14	4	9	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	48	15	4	10	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	44	10	10			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	44	10	10			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	99			
cM capacity (veh/h)	958	1071	1610			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	48	19	10			
Volume Left	0	15	0			
Volume Right	48	0	0			
cSH	1071	1610	1700			
Volume to Capacity	0.04	0.01	0.01			
Queue Length 95th (m)	1.1	0.2	0.0			
Control Delay (s)	8.5	5.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.5	5.7	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		6.7				
Intersection Capacity Utilization		24.3%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings  
9: Site & Caroline Street

Total 5 Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	4	1	2	2	1	5
Future Volume (vph)	4	1	2	2	1	5
Satd. Flow (prot)	1812	0	0	1818	1639	0
Fit Permitted				0.976	0.992	
Satd. Flow (perm)	1812	0	0	1818	1639	0
Lane Group Flow (vph)	5	0	0	4	6	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 20.0%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
9: Site & Caroline Street

Total 5 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	4	1	2	2	1	5
Future Volume (Veh/h)	4	1	2	2	1	5
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	1	2	2	1	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			5	10	4	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			5	10	4	
tC, single (s)			4.1	6.4	6.2	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	100	100	
cM capacity (veh/h)			1616	1008	1079	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	5	4	6			
Volume Left	0	2	1			
Volume Right	1	0	5			
cSH	1700	1616	1066			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.0	0.1			
Control Delay (s)	0.0	3.6	8.4			
Lane LOS	A		A			
Approach Delay (s)	0.0	3.6	8.4			
Approach LOS	A		A			
<b>Intersection Summary</b>						
Average Delay			4.3			
Intersection Capacity Utilization			20.0%	ICU Level of Service	A	
Analysis Period (min)			15			

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	28.8	81.2	38.5	20.3	32.4	30.3
Average Queue (m)	13.0	35.2	15.7	5.7	15.5	9.5
95th Queue (m)	25.6	65.3	32.5	15.3	28.5	22.8
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	22.1	16.8	22.3	31.4	13.7	35.4
Average Queue (m)	10.3	7.7	9.4	15.0	3.8	17.6
95th Queue (m)	17.3	15.0	18.8	25.0	11.4	27.8
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)				30.0	40.0	
Storage Blk Time (%)				0	0	0
Queuing Penalty (veh)				0	0	0

Intersection: 3: River Drive & Daniella Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.6
95th Queue (m)	9.3
Link Distance (m)	120.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	4.0	10.8
Average Queue (m)	0.1	7.1
95th Queue (m)	2.8	13.5
Link Distance (m)	38.5	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	5.5
Average Queue (m)	0.4
95th Queue (m)	2.9
Link Distance (m)	73.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	5.4	9.6
Average Queue (m)	0.2	3.7
95th Queue (m)	2.3	10.1
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 5 Year  
AM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.0	21.1	10.6	19.7
Average Queue (m)	3.7	9.6	3.3	9.8
95th Queue (m)	10.8	17.4	10.5	15.2
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Rosetta Street & Site

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	16.3	3.2
Average Queue (m)	6.7	0.1
95th Queue (m)	14.2	2.3
Link Distance (m)	38.2	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site & Caroline Street

Movement	NB
Directions Served	LR
Maximum Queue (m)	7.0
Average Queue (m)	1.2
95th Queue (m)	6.2
Link Distance (m)	27.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0
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Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	4	17	70	152	23	55	64	416	156	26	320	9
Future Volume (vph)	4	17	70	152	23	55	64	416	156	26	320	9
Satd. Flow (prot)	0	1567	0	0	1669	0	0	1805	1302	0	3425	0
Fit Permitted		0.983			0.740			0.887			0.891	
Satd. Flow (perm)	0	1542	0	0	1275	0	0	1612	1261	0	3063	0
Satd. Flow (RTOR)		78			21				173		4	
Lane Group Flow (vph)	0	101	0	0	256	0	0	533	173	0	395	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0	45.0		
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		17.3			17.3			44.1	44.1		44.1	
Actuated g/C Ratio		0.22			0.22			0.55	0.55		0.55	
v/c Ratio		0.26			0.88			0.60	0.22		0.23	
Control Delay		9.6			55.7			17.6	3.0		10.9	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		9.6			55.7			17.6	3.0		10.9	
LOS		A			E			B	A		B	
Approach Delay		9.6			55.7			14.1			10.9	
Approach LOS		A			E			B			B	
Queue Length 50th (m)		2.8			34.8			50.5	0.0		14.9	
Queue Length 95th (m)		12.4			53.6			103.1	10.1		28.6	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		551			426			888	772		1690	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.18			0.60			0.60	0.22		0.23	

Intersection Summary	
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBSB, Start of Green
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	20.2
Intersection LOS:	C
Intersection Capacity Utilization:	95.6%
ICU Level of Service:	F
Analysis Period (min):	15



Queues  
1: Mountainview Road N & River Drive

Total 5 Year  
PM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	101	256	533	173	395
v/c Ratio	0.26	0.88	0.60	0.22	0.23
Control Delay	9.6	55.7	17.6	3.0	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	55.7	17.6	3.0	10.9
Queue Length 50th (m)	2.8	34.8	50.5	0.0	14.9
Queue Length 95th (m)	12.4	53.6	103.1	10.1	28.6
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	551	426	888	772	1690
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.60	0.60	0.22	0.23

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Total 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	4	17	70	152	23	55	64	416	156	26	320	9
Future Volume (vph)	4	17	70	152	23	55	64	416	156	26	320	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)		9.1			9.1			9.5	9.5		9.5	
Lane Util. Factor		1.00			1.00			1.00	1.00		0.95	
Frbp, ped/bikes		0.99			0.99			1.00	0.97		1.00	
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	
Frt		0.90			0.97			1.00	0.85		1.00	
Flt Protected		1.00			0.97			0.99	1.00		1.00	
Satd. Flow (prot)		1565			1668			1805	1261		3425	
Flt Permitted		0.98			0.74			0.89	1.00		0.89	
Satd. Flow (perm)		1542			1275			1611	1261		3064	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	19	78	169	26	61	71	462	173	29	356	10
RTOR Reduction (vph)	0	61	0	0	16	0	0	0	78	0	2	0
Lane Group Flow (vph)	0	40	0	0	240	0	0	533	95	0	393	0
Confl. Peds. (#/hr)	13		1	1		13	2		9	9		2
Heavy Vehicles (%)	50%	0%	7%	8%	0%	2%	8%	4%	24%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Actuated Green, G (s)		20.3			20.3			47.1	47.1		47.1	
Effective Green, g (s)		17.3			17.3			44.1	44.1		44.1	
Actuated g/C Ratio		0.22			0.22			0.55	0.55		0.55	
Clearance Time (s)		6.1			6.1			6.5	6.5		6.5	
Vehicle Extension (s)		3.0			3.0			4.5	4.5		4.5	
Lane Grp Cap (vph)		333			275			888	695		1689	
v/s Ratio Prot												
v/s Ratio Perm		0.03			c0.19			c0.33	0.08		0.13	
v/c Ratio		0.12			0.87			0.60	0.14		0.23	
Uniform Delay, d1		25.2			30.3			12.0	8.7		9.2	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.2			24.6			3.0	0.4		0.3	
Delay (s)		25.4			54.9			15.0	9.1		9.6	
Level of Service		C			D			B	A		A	
Approach Delay (s)		25.4			54.9			13.6			9.6	
Approach LOS		C			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	25	11	52	25	19	14	118	354	30	7	264	23
Future Volume (vph)	25	11	52	25	19	14	118	354	30	7	264	23
Satd. Flow (prot)	0	1724	0	0	1799	0	1711	1877	0	1745	1877	0
Flt Permitted		0.986			0.979		0.950			0.950		
Satd. Flow (perm)	0	1724	0	0	1799	0	1711	1877	0	1745	1877	0
Lane Group Flow (vph)	0	91	0	0	61	0	123	400	0	7	299	0
Sign Control	Stop			Stop			Stop			Stop		

Intersection Summary	
Control Type:	Unsignalized
Intersection Capacity Utilization	47.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis  
 2: Mountainview Road N & John Street

Total 5 Year  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕	↕		↕	↕	↕
Sign Control	Stop			Stop			Stop	Stop		Stop	Stop	Stop
Traffic Volume (vph)	25	11	52	25	19	14	118	354	30	7	264	23
Future Volume (vph)	25	11	52	25	19	14	118	354	30	7	264	23
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	26	11	54	26	20	15	123	369	31	7	275	24
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	91	61	123	400	7	299						
Volume Left (vph)	26	26	123	0	7	0						
Volume Right (vph)	54	15	0	31	0	24						
Hadj (s)	-0.30	-0.06	0.53	-0.05	0.50	-0.06						
Departure Headway (s)	5.6	5.9	5.8	5.2	6.0	5.5						
Degree Utilization, x	0.14	0.10	0.20	0.58	0.01	0.45						
Capacity (veh/h)	565	530	601	674	570	637						
Control Delay (s)	9.6	9.6	9.1	14.0	7.9	11.8						
Approach Delay (s)	9.6	9.6	12.9		11.7							
Approach LOS	A	A	B		B							
<b>Intersection Summary</b>												
Delay			12.0									
Level of Service			B									
Intersection Capacity Utilization			47.5%		ICU Level of Service		A					
Analysis Period (min)			15									

Lanes, Volumes, Timings  
 3: River Drive & Daniella Street

Total 5 Year  
 PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	4	75	94	13	7	2
Future Volume (vph)	4	75	94	13	7	2
Satd. Flow (prot)	0	1731	1791	0	1778	0
Fit Permitted		0.997		0.962		
Satd. Flow (perm)	0	1731	1791	0	1778	0
Lane Group Flow (vph)	0	91	123	0	10	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 22.2%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Total 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	4	75	94	13	7	2
Future Volume (Veh/h)	4	75	94	13	7	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	5	86	108	15	8	2
Pedestrians					4	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	127				216	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	127				216	120
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1466				772	934
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	91	123	10			
Volume Left	5	0	8			
Volume Right	0	15	2			
cSH	1466	1700	800			
Volume to Capacity	0.00	0.07	0.01			
Queue Length 95th (m)	0.1	0.0	0.3			
Control Delay (s)	0.4	0.0	9.6			
Lane LOS	A		A			
Approach Delay (s)	0.4	0.0	9.6			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization		22.2%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	42	33	56	35	3
Future Volume (vph)	1	42	33	56	35	3
Satd. Flow (prot)	0	1713	1597	0	1795	0
Fit Permitted		0.999			0.956	
Satd. Flow (perm)	0	1713	1597	0	1795	0
Lane Group Flow (vph)	0	51	106	0	46	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 21.1%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Total 5 Year  
PM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	42	33	56	35	3
Future Volume (Veh/h)	1	42	33	56	35	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	1	50	39	67	42	4
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	109				128	76
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	109				128	76
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1490				869	989
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	51	106	46			
Volume Left	1	0	42			
Volume Right	0	67	4			
cSH	1490	1700	878			
Volume to Capacity	0.00	0.06	0.05			
Queue Length 95th (m)	0.0	0.0	1.3			
Control Delay (s)	0.2	0.0	9.3			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	9.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			2.2			
Intersection Capacity Utilization		21.1%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Total 5 Year  
PM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	33	33	2	6	1
Future Volume (vph)	1	33	33	2	6	1
Satd. Flow (prot)	0	1714	1887	0	1523	0
Fit Permitted		0.999			0.958	
Satd. Flow (perm)	0	1714	1887	0	1523	0
Lane Group Flow (vph)	0	40	41	0	8	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.0%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
5: Victoria Street/River Drive & St Michaels Street

Total 5 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	33	33	2	6	1
Future Volume (Veh/h)	1	33	33	2	6	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	1	39	39	2	7	1
Pedestrians					2	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	43				83	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	43				83	42
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1576				874	1033
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	40	41	8			
Volume Left	1	0	7			
Volume Right	0	2	1			
cSH	1576	1700	891			
Volume to Capacity	0.00	0.02	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.2	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	9.1			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization		19.0%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
6: Rosset Valley Court & John Street

Total 5 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	99	6	18	131	2	15
Future Volume (vph)	99	6	18	131	2	15
Satd. Flow (prot)	1768	0	0	1628	1660	0
Fit Permitted				0.994	0.995	
Satd. Flow (perm)	1768	0	0	1628	1660	0
Lane Group Flow (vph)	125	0	0	177	20	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 30.5%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Total 5 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	99	6	18	131	2	15
Future Volume (Veh/h)	99	6	18	131	2	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	118	7	21	156	2	18
Pedestrians	1			3	6	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			131		326	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			131		326	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	98
cM capacity (veh/h)			1459		658	917
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	125	177	20			
Volume Left	0	21	2			
Volume Right	7	0	18			
cSH	1700	1459	882			
Volume to Capacity	0.07	0.01	0.02			
Queue Length 95th (m)	0.0	0.3	0.5			
Control Delay (s)	0.0	1.0	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.0	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization		30.5%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	3	38	1	7	34	86	10	20	1	64	22	3
Future Volume (vph)	3	38	1	7	34	86	10	20	1	64	22	3
Satd. Flow (prot)	0	1889	0	0	1456	0	0	1862	0	0	1669	0
Fit Permitted		0.997			0.997			0.984			0.965	
Satd. Flow (perm)	0	1889	0	0	1456	0	0	1862	0	0	1669	0
Lane Group Flow (vph)	0	47	0	0	143	0	0	34	0	0	100	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 31.3%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Total 5 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	3	38	1	7	34	86	10	20	1	64	22	3
Future Volume (vph)	3	38	1	7	34	86	10	20	1	64	22	3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	43	1	8	38	97	11	22	1	72	25	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	47	143	34	100								
Volume Left (vph)	3	8	11	72								
Volume Right (vph)	1	97	1	3								
Hadj (s)	0.00	-0.29	0.05	0.29								
Departure Headway (s)	4.4	4.0	4.5	4.6								
Degree Utilization, x	0.06	0.16	0.04	0.13								
Capacity (veh/h)	789	871	759	735								
Control Delay (s)	7.6	7.7	7.7	8.3								
Approach Delay (s)	7.6	7.7	7.7	8.3								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				31.3%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings  
8: Rosetta Street & Site

Total 5 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	0	26	44	13	12	0
Future Volume (vph)	0	26	44	13	12	0
Satd. Flow (prot)	1611	0	0	1794	1863	0
Fit Permitted	0.963					
Satd. Flow (perm)	1611	0	0	1794	1863	0
Lane Group Flow (vph)	28	0	0	62	13	0
Sign Control	Stop			Free	Free	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 26.5%				ICU Level of Service A		
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
8: Rosetta Street & Site

Total 5 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↑	↑	
Traffic Volume (veh/h)	0	26	44	13	12	0
Future Volume (Veh/h)	0	26	44	13	12	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	28	48	14	13	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	123	13	13			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	123	13	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	97			
cM capacity (veh/h)	846	1067	1606			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	28	62	13			
Volume Left	0	48	0			
Volume Right	28	0	0			
cSH	1067	1606	1700			
Volume to Capacity	0.03	0.03	0.01			
Queue Length 95th (m)	0.6	0.7	0.0			
Control Delay (s)	8.5	5.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.5	5.7	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			5.7			
Intersection Capacity Utilization		26.5%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
9: Site & Caroline Street

Total 5 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	9	1	5	8	1	3
Future Volume (vph)	9	1	5	8	1	3
Satd. Flow (prot)	1840	0	0	1829	1655	0
Fit Permitted				0.982	0.988	
Satd. Flow (perm)	1840	0	0	1829	1655	0
Lane Group Flow (vph)	11	0	0	14	4	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 21.5%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
9: Site & Caroline Street

Total 5 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	9	1	5	8	1	3
Future Volume (Veh/h)	9	1	5	8	1	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	1	5	9	1	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			11		30	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			11		30	10
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1608		982	1071
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	11	14	4			
Volume Left	0	5	1			
Volume Right	1	0	3			
cSH	1700	1608	1047			
Volume to Capacity	0.01	0.00	0.00			
Queue Length 95th (m)	0.0	0.1	0.1			
Control Delay (s)	0.0	2.6	8.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.6	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			21.5%		ICU Level of Service	A
Analysis Period (min)			15			

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	34.6	112.5	79.7	23.4	35.8	30.7
Average Queue (m)	13.2	45.0	35.5	6.7	15.1	9.8
95th Queue (m)	27.2	88.0	65.8	17.3	30.4	24.0
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	16.2	14.8	30.8	35.4	8.8	32.9
Average Queue (m)	9.3	8.1	11.4	17.7	1.5	14.2
95th Queue (m)	14.8	13.9	21.4	28.4	6.9	24.8
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			30.0		40.0	
Storage Blk Time (%)			0	1		0
Queuing Penalty (veh)			0	1		0

Intersection: 3: River Drive & Daniella Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	1.8	9.2
Average Queue (m)	0.1	2.4
95th Queue (m)	1.3	8.9
Link Distance (m)	162.0	120.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	10.4
Average Queue (m)	6.8
95th Queue (m)	13.3
Link Distance (m)	29.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	13.9
Average Queue (m)	1.3
95th Queue (m)	6.9
Link Distance (m)	73.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	5.5	8.3
Average Queue (m)	0.4	3.6
95th Queue (m)	3.6	10.0
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 5 Year  
PM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	11.9	21.7	14.6	22.5
Average Queue (m)	6.7	11.8	6.3	11.0
95th Queue (m)	13.5	18.7	13.6	18.9
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Rosetta Street & Site

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	15.9	3.6
Average Queue (m)	6.1	0.1
95th Queue (m)	14.3	1.8
Link Distance (m)	38.2	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site & Caroline Street

Movement	NB
Directions Served	LR
Maximum Queue (m)	8.8
Average Queue (m)	0.7
95th Queue (m)	4.6
Link Distance (m)	27.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 1
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# Appendix J

## Total Ten-Year Horizon Operations



Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	8	38	142	135	16	24	44	270	145	44	467	6
Future Volume (vph)	8	38	142	135	16	24	44	270	145	44	467	6
Satd. Flow (prot)	0	1509	0	0	1362	0	0	1768	1380	0	3495	0
Fit Permitted		0.980			0.668			0.867			0.891	
Satd. Flow (perm)	0	1482	0	0	945	0	0	1544	1346	0	3125	0
Satd. Flow (RTOR)		151			11				154		2	
Lane Group Flow (vph)	0	200	0	0	187	0	0	334	154	0	550	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0		45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		16.8			16.8			44.6	44.6		44.6	
Actuated g/C Ratio		0.21			0.21			0.56	0.56		0.56	
v/c Ratio		0.47			0.91			0.39	0.19		0.32	
Control Delay		10.8			69.8			13.5	3.0		11.5	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		10.8			69.8			13.5	3.0		11.5	
LOS		B			E			B	A		B	
Approach Delay		10.8			69.8			10.2			11.5	
Approach LOS		B			E			B			B	
Queue Length 50th (m)		6.1			26.2			26.7	0.0		21.8	
Queue Length 95th (m)		19.5			43.7			57.0	9.6		40.4	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		581			313			861	818		1743	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.34			0.60			0.39	0.19		0.32	

Intersection Summary

Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 98.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Mountainview Road N & River Drive



Queues  
1: Mountainview Road N & River Drive

Total 10 Year  
AM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	200	187	334	154	550
v/c Ratio	0.47	0.91	0.39	0.19	0.32
Control Delay	10.8	69.8	13.5	3.0	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	69.8	13.5	3.0	11.5
Queue Length 50th (m)	6.1	26.2	26.7	0.0	21.8
Queue Length 95th (m)	19.5	43.7	57.0	9.6	40.4
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	581	313	861	818	1743
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.34	0.60	0.39	0.19	0.32

Intersection Summary

Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 98.0%	ICU Level of Service F
Analysis Period (min) 15	

HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Total 10 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	8	38	142	135	16	24	44	270	145	44	467	6
Future Volume (vph)	8	38	142	135	16	24	44	270	145	44	467	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1			9.1			9.5		9.5		9.5	
Lane Util. Factor	1.00			1.00			1.00		1.00		0.95	
Frbp, ped/bikes	1.00			1.00			1.00		0.97		1.00	
Flpb, ped/bikes	1.00			1.00			1.00		1.00		1.00	
Frt	0.90			0.98			1.00		0.85		1.00	
Flt Protected	1.00			0.96			0.99		1.00		1.00	
Satd. Flow (prot)	1509			1362			1768		1346		3494	
Flt Permitted	0.98			0.67			0.87		1.00		0.89	
Satd. Flow (perm)	1482			944			1543		1346		3127	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	9	40	151	144	17	26	47	287	154	47	497	6
RTOR Reduction (vph)	0	119	0	0	9	0	0	0	68	0	1	0
Lane Group Flow (vph)	0	81	0	0	178	0	0	334	86	0	549	0
Confl. Peds. (#/hr)	5			5			4		4		4	
Heavy Vehicles (%)	0%	0%	17%	35%	40%	5%	11%	6%	17%	6%	2%	33%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	4			4			2		2		2	
Permitted Phases	4			4			2		2		2	
Actuated Green, G (s)	19.8			19.8			47.6		47.6		47.6	
Effective Green, g (s)	16.8			16.8			44.6		44.6		44.6	
Actuated g/C Ratio	0.21			0.21			0.56		0.56		0.56	
Clearance Time (s)	6.1			6.1			6.5		6.5		6.5	
Vehicle Extension (s)	3.0			3.0			4.5		4.5		4.5	
Lane Grp Cap (vph)	311			198			860		750		1743	
v/s Ratio Prot												
v/s Ratio Perm	0.05			c0.19			c0.22		0.06		0.18	
v/c Ratio	0.26			0.90			0.39		0.11		0.32	
Uniform Delay, d1	26.4			30.8			10.0		8.4		9.5	
Progression Factor	1.00			1.00			1.00		1.00		1.00	
Incremental Delay, d2	0.4			37.6			1.3		0.3		0.5	
Delay (s)	26.8			68.4			11.3		8.7		10.0	
Level of Service	C			E			B		A		A	
Approach Delay (s)	26.8			68.4			10.5				10.0	
Approach LOS	C			E			B				A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay	20.2			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.53											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			18.6					
Intersection Capacity Utilization	98.0%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	18	9	96	23	12	10	57	225	20	20	388	21
Future Volume (vph)	18	9	96	23	12	10	57	225	20	20	388	21
Satd. Flow (prot)	0	1634	0	0	1704	0	1544	1802	0	1646	1816	0
Flt Permitted	0.993			0.976			0.950		0.950			
Satd. Flow (perm)	0	1634	0	0	1704	0	1544	1802	0	1646	1816	0
Lane Group Flow (vph)	0	131	0	0	48	0	61	260	0	21	435	0
Sign Control	Stop			Stop			Stop		Stop		Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 51.3% ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
 2: Mountainview Road N & John Street

Total 10 Year  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↖	↗		↖	↗	
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	18	9	96	23	12	10	57	225	20	20	388	21
Future Volume (vph)	18	9	96	23	12	10	57	225	20	20	388	21
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	19	10	102	24	13	11	61	239	21	21	413	22
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	131	48	61	260	21	435						
Volume Left (vph)	19	24	61	0	21	0						
Volume Right (vph)	102	11	0	21	0	22						
Hadj (s)	-0.38	0.06	0.72	0.01	0.60	0.03						
Departure Headway (s)	5.5	6.2	6.3	5.6	6.0	5.4						
Degree Utilization, x	0.20	0.08	0.11	0.40	0.04	0.66						
Capacity (veh/h)	577	501	551	625	576	639						
Control Delay (s)	9.9	9.7	8.8	11.0	8.0	17.1						
Approach Delay (s)	9.9	9.7	10.6	16.7								
Approach LOS	A	A	B	C								
<b>Intersection Summary</b>												
Delay			13.4									
Level of Service			B									
Intersection Capacity Utilization			51.3%		ICU Level of Service		A					
Analysis Period (min)			15									

Lanes, Volumes, Timings  
 3: River Drive & Daniella Street

Total 10 Year  
 AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	2	190	60	2	9	4
Future Volume (vph)	2	190	60	2	9	4
Satd. Flow (prot)	0	1586	1875	0	1756	0
Fit Permitted					0.968	
Satd. Flow (perm)	0	1586	1875	0	1756	0
Lane Group Flow (vph)	0	223	72	0	15	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 26.6%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Total 10 Year  
AM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Movement						
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	190	60	2	9	4
Future Volume (Veh/h)	2	190	60	2	9	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	2	221	70	2	10	5
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	75				299	74
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	75				299	74
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1533				694	991
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	223	72	15			
Volume Left	2	0	10			
Volume Right	0	2	5			
eSH	1533	1700	771			
Volume to Capacity	0.00	0.04	0.02			
Queue Length 95th (m)	0.0	0.0	0.5			
Control Delay (s)	0.1	0.0	9.8			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	9.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		26.6%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Total 10 Year  
AM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group						
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	50	10	47	138	6
Future Volume (vph)	1	50	10	47	138	6
Satd. Flow (prot)	0	1586	1160	0	1802	0
Fit Permitted		0.999			0.954	
Satd. Flow (perm)	0	1586	1160	0	1802	0
Lane Group Flow (vph)	0	57	63	0	160	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 23.1%				ICU Level of Service A		
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Total 10 Year  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	50	10	47	138	6
Future Volume (Veh/h)	1	50	10	47	138	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	56	11	52	153	7
Pedestrians			2			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	63				97	37
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	63				97	37
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				83	99
cM capacity (veh/h)	1553				905	1041
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	57	63	160			
Volume Left	1	0	153			
Volume Right	0	52	7			
cSH	1553	1700	910			
Volume to Capacity	0.00	0.04	0.18			
Queue Length 95th (m)	0.0	0.0	4.8			
Control Delay (s)	0.1	0.0	9.8			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	9.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.6			
Intersection Capacity Utilization		23.1%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	2	47	11	1	1	1
Future Volume (vph)	2	47	11	1	1	1
Satd. Flow (prot)	0	1671	1527	0	1728	0
Fit Permitted		0.998			0.976	
Satd. Flow (perm)	0	1671	1527	0	1728	0
Lane Group Flow (vph)	0	57	14	0	2	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.6%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
 5: Victoria Street/River Drive & St Michaels Street

Total 10 Year  
 AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	47	11	1	1	1
Future Volume (Veh/h)	2	47	11	1	1	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	55	13	1	1	1
Pedestrians		1	1		3	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	17				76	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	17				76	18
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1609				927	1063
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	57	14	2			
Volume Left	2	0	1			
Volume Right	0	1	1			
cSH	1609	1700	990			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.3	0.0	8.6			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	8.6			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization		19.6%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 6: Rosset Valley Court & John Street

Total 10 Year  
 AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	96	0	17	72	4	21
Future Volume (vph)	96	0	17	72	4	21
Satd. Flow (prot)	1827	0	0	1568	1672	0
Fit Permitted				0.991	0.992	
Satd. Flow (perm)	1827	0	0	1568	1672	0
Lane Group Flow (vph)	113	0	0	105	30	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 26.4%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Total 10 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	96	0	17	72	4	21
Future Volume (Veh/h)	96	0	17	72	4	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	113	0	20	85	5	25
Pedestrians					8	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			121		246	121
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			121		246	121
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	97
cM capacity (veh/h)			1468		731	929
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	113	105	30			
Volume Left	0	20	5			
Volume Right	0	0	25			
cSH	1700	1468	889			
Volume to Capacity	0.07	0.01	0.03			
Queue Length 95th (m)	0.0	0.3	0.8			
Control Delay (s)	0.0	1.5	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.5	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.8			
Intersection Capacity Utilization		26.4%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	0	17	4	5	23	52	5	14	0	71	26	5
Future Volume (vph)	0	17	4	5	23	52	5	14	0	71	26	5
Satd. Flow (prot)	0	1849	0	0	1419	0	0	1875	0	0	1761	0
Fit Permitted					0.997			0.987			0.966	
Satd. Flow (perm)	0	1849	0	0	1419	0	0	1875	0	0	1761	0
Lane Group Flow (vph)	0	25	0	0	93	0	0	22	0	0	119	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 33.4%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Total 10 Year  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	0	17	4	5	23	52	5	14	0	71	26	5
Future Volume (vph)	0	17	4	5	23	52	5	14	0	71	26	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	20	5	6	27	60	6	16	0	83	30	6
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	25	93	22	119								
Volume Left (vph)	0	6	6	83								
Volume Right (vph)	5	60	0	6								
Hadj (s)	-0.12	-0.21	0.05	0.17								
Departure Headway (s)	4.2	4.0	4.3	4.3								
Degree Utilization, x	0.03	0.10	0.03	0.14								
Capacity (veh/h)	820	858	793	805								
Control Delay (s)	7.3	7.5	7.5	8.1								
Approach Delay (s)	7.3	7.5	7.5	8.1								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.7								
Level of Service				A								
Intersection Capacity Utilization	33.4%			ICU Level of Service	A							
Analysis Period (min)				15								

Lanes, Volumes, Timings  
8: Rosetta Street & Site

Total 10 Year  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	0	126	42	6	18	0
Future Volume (vph)	0	126	42	6	18	0
Satd. Flow (prot)	1611	0	0	1785	1863	0
Fit Permitted				0.958		
Satd. Flow (perm)	1611	0	0	1785	1863	0
Lane Group Flow (vph)	137	0	0	53	20	0
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 30.4%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
8: Rosetta Street & Site

Total 10 Year  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↑	↑	
Traffic Volume (veh/h)	0	126	42	6	18	0
Future Volume (Veh/h)	0	126	42	6	18	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	137	46	7	20	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	119	20	20			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	119	20	20			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	87	97			
cM capacity (veh/h)	851	1058	1596			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	137	53	20			
Volume Left	0	46	0			
Volume Right	137	0	0			
cSH	1058	1596	1700			
Volume to Capacity	0.13	0.03	0.01			
Queue Length 95th (m)	3.4	0.7	0.0			
Control Delay (s)	8.9	6.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.9	6.4	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			7.4			
Intersection Capacity Utilization		30.4%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
9: Site & Caroline Street

Total 10 Year  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	5	1	4	2	1	13
Future Volume (vph)	5	1	4	2	1	13
Satd. Flow (prot)	1820	0	0	1803	1623	0
Fit Permitted				0.968	0.997	
Satd. Flow (perm)	1820	0	0	1803	1623	0
Lane Group Flow (vph)	6	0	0	6	15	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 20.3%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
9: Site & Caroline Street

Total 10 Year  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	5	1	4	2	1	13
Future Volume (Veh/h)	5	1	4	2	1	13
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	4	2	1	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			6		16	6
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			6		16	6
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1615		1000	1077
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	6	6	15			
Volume Left	0	4	1			
Volume Right	1	0	14			
sSH	1700	1615	1072			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.3			
Control Delay (s)	0.0	4.8	8.4			
Lane LOS	A		A			
Approach Delay (s)	0.0	4.8	8.4			
Approach LOS	A		A			
<b>Intersection Summary</b>						
Average Delay			5.7			
Intersection Capacity Utilization			20.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	72.7	92.8	59.6	20.0	43.2	40.6
Average Queue (m)	24.0	39.3	23.2	5.3	19.8	14.8
95th Queue (m)	51.7	78.4	48.8	14.2	35.3	32.3
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	22.6	19.3	28.1	36.4	16.6	38.1
Average Queue (m)	11.2	8.5	9.3	16.4	4.4	19.9
95th Queue (m)	18.3	16.0	19.4	27.7	12.5	31.9
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)				30.0	40.0	
Storage Blk Time (%)				0	0	0
Queuing Penalty (veh)				0	0	0

Intersection: 3: River Drive & Daniella Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.5
95th Queue (m)	9.1
Link Distance (m)	120.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	1.8	16.6
Average Queue (m)	0.1	9.6
95th Queue (m)	1.2	12.5
Link Distance (m)	38.5	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	5.5
Average Queue (m)	0.3
95th Queue (m)	2.5
Link Distance (m)	73.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	6.7	11.0
Average Queue (m)	0.5	4.2
95th Queue (m)	4.0	10.8
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 10 Year  
AM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.0	21.5	9.2	21.7
Average Queue (m)	4.3	10.0	4.0	10.2
95th Queue (m)	11.4	17.1	11.3	16.0
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Rosetta Street & Site

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	20.1	7.0
Average Queue (m)	11.2	0.4
95th Queue (m)	18.0	3.9
Link Distance (m)	38.2	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site & Caroline Street

Movement	NB
Directions Served	LR
Maximum Queue (m)	10.2
Average Queue (m)	2.6
95th Queue (m)	9.4
Link Distance (m)	27.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 1
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Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	6	29	112	168	42	61	125	459	172	29	353	13
Future Volume (vph)	6	29	112	168	42	61	125	459	172	29	353	13
Satd. Flow (prot)	0	1567	0	0	1682	0	0	1792	1302	0	3422	0
Fit Permitted		0.979			0.748			0.794			0.875	
Satd. Flow (perm)	0	1537	0	0	1296	0	0	1438	1261	0	3005	0
Satd. Flow (RTOR)		124			19			191			5	
Lane Group Flow (vph)	0	163	0	0	302	0	0	649	191	0	438	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0		45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		20.2			20.2			41.2	41.2		41.2	
Actuated g/C Ratio		0.25			0.25			0.52	0.52		0.52	
v/c Ratio		0.34			0.88			0.88	0.26		0.28	
Control Delay		8.8			53.1			35.5	3.2		12.6	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		8.8			53.1			35.5	3.2		12.6	
LOS		A			D			D	A		B	
Approach Delay		8.8			53.1			28.1			12.6	
Approach LOS		A			D			C			B	
Queue Length 50th (m)		4.5			40.8			84.7	0.0		19.0	
Queue Length 95th (m)		16.9			#71.4			#166.3	10.7		31.8	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		581			432			739	741		1548	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.28			0.70			0.88	0.26		0.28	

Intersection Summary

Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 26.8      Intersection LOS: C  
 Intersection Capacity Utilization 115.3%      ICU Level of Service H  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Mountainview Road N & River Drive



Queues  
1: Mountainview Road N & River Drive

Total 10 Year  
PM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	163	302	649	191	438
v/c Ratio	0.34	0.88	0.88	0.26	0.28
Control Delay	8.8	53.1	35.5	3.2	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	53.1	35.5	3.2	12.6
Queue Length 50th (m)	4.5	40.8	84.7	0.0	19.0
Queue Length 95th (m)	16.9	#71.4	#166.3	10.7	31.8
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	581	432	739	741	1548
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.28	0.70	0.88	0.26	0.28

Intersection Summary

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



HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Total 10 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	6	29	112	168	42	61	125	459	172	29	353	13
Future Volume (vph)	6	29	112	168	42	61	125	459	172	29	353	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1			9.1			9.5		9.5		9.5	
Lane Util. Factor	1.00			1.00			1.00		1.00		0.95	
Frbp, ped/bikes	0.99			0.99			1.00		0.97		1.00	
Flpb, ped/bikes	1.00			1.00			1.00		1.00		1.00	
Frt	0.90			0.97			1.00		0.85		1.00	
Flt Protected	1.00			0.97			0.99		1.00		1.00	
Satd. Flow (prot)	1567			1681			1792		1261		3423	
Flt Permitted	0.98			0.75			0.79		1.00		0.87	
Satd. Flow (perm)	1537			1297			1438		1261		3004	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	32	124	187	47	68	139	510	191	32	392	14
RTOR Reduction (vph)	0	93	0	0	14	0	0	0	93	0	2	0
Lane Group Flow (vph)	0	70	0	0	288	0	0	649	98	0	436	0
Confl. Peds. (#/hr)	13		1	1		13	2		9	9		2
Heavy Vehicles (%)	50%	0%	7%	8%	0%	2%	8%	4%	24%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	4		4		4		2		2		2	
Permitted Phases	4		4		2		2		2		2	
Actuated Green, G (s)	23.2		23.2		44.2		44.2		44.2		44.2	
Effective Green, g (s)	20.2		20.2		41.2		41.2		41.2		41.2	
Actuated g/C Ratio	0.25		0.25		0.52		0.52		0.52		0.52	
Clearance Time (s)	6.1		6.1		6.5		6.5		6.5		6.5	
Vehicle Extension (s)	3.0		3.0		4.5		4.5		4.5		4.5	
Lane Grp Cap (vph)	388		327		740		649		1547			
v/s Ratio Prot												
v/s Ratio Perm	0.05		c0.22		c0.45		0.08		0.14			
v/c Ratio	0.18		0.88		0.88		0.15		0.28			
Uniform Delay, d1	23.4		28.7		17.2		10.2		11.0			
Progression Factor	1.00		1.00		1.00		1.00		1.00			
Incremental Delay, d2	0.2		22.9		13.9		0.5		0.5			
Delay (s)	23.6		51.7		31.0		10.7		11.5			
Level of Service	C		D		C		B		B			
Approach Delay (s)	23.6		51.7		26.4		11.5		11.5			
Approach LOS	C		D		C		B		B			
<b>Intersection Summary</b>												
HCM 2000 Control Delay	26.8		HCM 2000 Level of Service				C					
HCM 2000 Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	80.0		Sum of lost time (s)				18.6					
Intersection Capacity Utilization	115.3%		ICU Level of Service				H					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	28	12	57	28	21	16	130	393	33	7	295	26
Future Volume (vph)	28	12	57	28	21	16	130	393	33	7	295	26
Satd. Flow (prot)	0	1725	0	0	1797	0	1711	1877	0	1745	1877	0
Flt Permitted	0.986		0.979		0.950		0.950		0.950		0.950	
Satd. Flow (perm)	0	1725	0	0	1797	0	1711	1877	0	1745	1877	0
Lane Group Flow (vph)	0	101	0	0	68	0	135	443	0	7	334	0
Sign Control	Stop		Stop		Stop		Stop		Stop		Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 50.3%						ICU Level of Service A						
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
 2: Mountainview Road N & John Street

Total 10 Year  
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↕			↕			↕	↕		↕	↕	↕		
Sign Control	Stop			Stop			Stop	Stop		Stop	Stop	Stop		
Traffic Volume (vph)	28	12	57	28	21	16	130	393	33	7	295	26		
Future Volume (vph)	28	12	57	28	21	16	130	393	33	7	295	26		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		
Hourly flow rate (vph)	29	12	59	29	22	17	135	409	34	7	307	27		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2								
Volume Total (vph)	100	68	135	443	7	334								
Volume Left (vph)	29	29	135	0	7	0								
Volume Right (vph)	59	17	0	34	0	27								
Hadj (s)	-0.30	-0.06	0.53	-0.05	0.50	-0.06								
Departure Headway (s)	5.9	6.2	6.0	5.4	6.2	5.6								
Degree Utilization, x	0.16	0.12	0.22	0.66	0.01	0.52								
Capacity (veh/h)	538	504	588	650	554	620								
Control Delay (s)	10.0	10.0	9.5	16.9	8.1	13.5								
Approach Delay (s)	10.0	10.0	15.2	13.3										
Approach LOS	B	B	C	B										
<b>Intersection Summary</b>														
Delay			13.8											
Level of Service			B											
Intersection Capacity Utilization			50.3%		ICU Level of Service		A							
Analysis Period (min)			15											

Lanes, Volumes, Timings  
 3: River Drive & Daniella Street

Total 10 Year  
 PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	5	130	178	15	7	2
Future Volume (vph)	5	130	178	15	7	2
Satd. Flow (prot)	0	1730	1798	0	1778	0
Fit Permitted		0.998		0.962		
Satd. Flow (perm)	0	1730	1798	0	1778	0
Lane Group Flow (vph)	0	155	222	0	10	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 25.9%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Total 10 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	5	130	178	15	7	2
Future Volume (Veh/h)	5	130	178	15	7	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	149	205	17	8	2
Pedestrians					4	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	226				378	218
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	226				378	218
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1349				622	824
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	155	222	10			
Volume Left	6	0	8			
Volume Right	0	17	2			
cSH	1349	1700	654			
Volume to Capacity	0.00	0.13	0.02			
Queue Length 95th (m)	0.1	0.0	0.4			
Control Delay (s)	0.3	0.0	10.6			
Lane LOS	A		B			
Approach Delay (s)	0.3	0.0	10.6			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization		25.9%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	5	46	37	136	85	5
Future Volume (vph)	5	46	37	136	85	5
Satd. Flow (prot)	0	1720	1530	0	1800	0
Fit Permitted		0.995			0.955	
Satd. Flow (perm)	0	1720	1530	0	1800	0
Lane Group Flow (vph)	0	61	206	0	107	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 27.5%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Total 10 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	5	46	37	136	85	5
Future Volume (Veh/h)	5	46	37	136	85	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	55	44	162	101	6
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	209				195	128
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	209				195	128
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	99
cM capacity (veh/h)	1370				793	925
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	61	206	107			
Volume Left	6	0	101			
Volume Right	0	162	6			
cSH	1370	1700	799			
Volume to Capacity	0.00	0.12	0.13			
Queue Length 95th (m)	0.1	0.0	3.5			
Control Delay (s)	0.8	0.0	10.2			
Lane LOS	A		B			
Approach Delay (s)	0.8	0.0	10.2			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			3.0			
Intersection Capacity Utilization		27.5%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	40	38	2	6	1
Future Volume (vph)	1	40	38	2	6	1
Satd. Flow (prot)	0	1713	1889	0	1523	0
Fit Permitted		0.999			0.958	
Satd. Flow (perm)	0	1713	1889	0	1523	0
Lane Group Flow (vph)	0	49	47	0	8	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.0%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
5: Victoria Street/River Drive & St Michaels Street

Total 10 Year  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	40	38	2	6	1
Future Volume (Veh/h)	1	40	38	2	6	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	1	48	45	2	7	1
Pedestrians					2	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	49				98	48
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	49				98	48
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1568				857	1025
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	49	47	8			
Volume Left	1	0	7			
Volume Right	0	2	1			
cSH	1568	1700	875			
Volume to Capacity	0.00	0.03	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.2	0.0	9.2			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization		19.0%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
6: Rosset Valley Court & John Street

Total 10 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	110	6	20	145	2	17
Future Volume (vph)	110	6	20	145	2	17
Satd. Flow (prot)	1769	0	0	1628	1658	0
Fit Permitted				0.994	0.995	
Satd. Flow (perm)	1769	0	0	1628	1658	0
Lane Group Flow (vph)	138	0	0	197	22	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 31.4%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Total 10 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	110	6	20	145	2	17
Future Volume (Veh/h)	110	6	20	145	2	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	131	7	24	173	2	20
Pedestrians	1			3	6	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			144		362	144
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			144		362	144
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	98
cM capacity (veh/h)			1443		626	902
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	138	197	22			
Volume Left	0	24	2			
Volume Right	7	0	20			
cSH	1700	1443	867			
Volume to Capacity	0.08	0.02	0.03			
Queue Length 95th (m)	0.0	0.4	0.6			
Control Delay (s)	0.0	1.0	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.0	9.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization		31.4%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	4	41	1	7	38	95	11	24	1	71	28	4
Future Volume (vph)	4	41	1	7	38	95	11	24	1	71	28	4
Satd. Flow (prot)	0	1887	0	0	1461	0	0	1866	0	0	1671	0
Fit Permitted		0.996			0.997			0.985			0.966	
Satd. Flow (perm)	0	1887	0	0	1461	0	0	1866	0	0	1671	0
Lane Group Flow (vph)	0	51	0	0	158	0	0	40	0	0	115	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 33.3%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Total 10 Year  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	4	41	1	7	38	95	11	24	1	71	28	4
Future Volume (vph)	4	41	1	7	38	95	11	24	1	71	28	4
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	46	1	8	43	107	12	27	1	80	31	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	51	158	40	115								
Volume Left (vph)	4	8	12	80								
Volume Right (vph)	1	107	1	4								
Hadj (s)	0.00	-0.29	0.05	0.28								
Departure Headway (s)	4.4	4.0	4.5	4.7								
Degree Utilization, x	0.06	0.18	0.05	0.15								
Capacity (veh/h)	771	856	745	727								
Control Delay (s)	7.7	7.9	7.8	8.5								
Approach Delay (s)	7.7	7.9	7.8	8.5								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				8.1								
Level of Service				A								
Intersection Capacity Utilization	33.3%			ICU Level of Service	A							
Analysis Period (min)				15								

Lanes, Volumes, Timings  
8: Rosetta Street & Site

Total 10 Year  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	0	73	119	22	17	0
Future Volume (vph)	0	73	119	22	17	0
Satd. Flow (prot)	1611	0	0	1788	1863	0
Fit Permitted				0.960		
Satd. Flow (perm)	1611	0	0	1788	1863	0
Lane Group Flow (vph)	79	0	0	153	18	0
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 32.3%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
8: Rosetta Street & Site

Total 10 Year  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			T	T	
Traffic Volume (veh/h)	0	73	119	22	17	0
Future Volume (Veh/h)	0	73	119	22	17	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	79	129	24	18	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	300	18	18			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	300	18	18			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	92			
cM capacity (veh/h)	636	1061	1599			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	79	153	18			
Volume Left	0	129	0			
Volume Right	79	0	0			
cSH	1061	1599	1700			
Volume to Capacity	0.07	0.08	0.01			
Queue Length 95th (m)	1.8	2.0	0.0			
Control Delay (s)	8.7	6.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	6.4	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			6.6			
Intersection Capacity Utilization		32.3%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
9: Site & Caroline Street

Total 10 Year  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	T			T	T	
Traffic Volume (vph)	9	1	13	9	1	8
Future Volume (vph)	9	1	13	9	1	8
Satd. Flow (prot)	1840	0	0	1811	1627	0
Fit Permitted				0.972	0.995	
Satd. Flow (perm)	1840	0	0	1811	1627	0
Lane Group Flow (vph)	11	0	0	24	10	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 24.5%					ICU Level of Service A	
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
9: Site & Caroline Street

Total 10 Year  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	9	1	13	9	1	8
Future Volume (Veh/h)	9	1	13	9	1	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	1	14	10	1	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			11		48	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			11		48	10
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			1608		953	1071
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	11	24	10			
Volume Left	0	14	1			
Volume Right	1	0	9			
cSH	1700	1608	1058			
Volume to Capacity	0.01	0.01	0.01			
Queue Length 95th (m)	0.0	0.2	0.2			
Control Delay (s)	0.0	4.3	8.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	4.3	8.4			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			4.1			
Intersection Capacity Utilization		24.5%		ICU Level of Service		A
Analysis Period (min)			15			

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	63.5	129.6	119.4	41.6	44.0	36.6
Average Queue (m)	19.9	54.9	51.1	10.2	17.8	11.2
95th Queue (m)	41.6	105.2	95.3	27.1	32.6	26.7
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)		0				
Queuing Penalty (veh)		0				
Storage Bay Dist (m)						40.0
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	18.1	14.8	32.1	48.6	8.8	26.8
Average Queue (m)	9.3	8.5	14.0	21.5	1.4	16.0
95th Queue (m)	15.2	15.0	26.9	36.5	6.5	23.7
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			30.0		40.0	
Storage Blk Time (%)			0	2		
Queuing Penalty (veh)			0	2		

Intersection: 3: River Drive & Daniella Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	5.2	9.2
Average Queue (m)	0.2	2.3
95th Queue (m)	2.6	8.8
Link Distance (m)	162.0	120.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	5.2	14.8
Average Queue (m)	0.4	8.8
95th Queue (m)	3.4	13.5
Link Distance (m)	38.5	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	8.4
Average Queue (m)	1.1
95th Queue (m)	5.4
Link Distance (m)	73.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	9.1	9.6
Average Queue (m)	0.6	3.6
95th Queue (m)	4.3	10.1
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 10 Year  
PM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	13.0	23.2	11.8	25.3
Average Queue (m)	7.5	12.4	6.4	11.7
95th Queue (m)	13.6	19.9	13.4	20.4
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Rosetta Street & Site

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	20.5	9.1
Average Queue (m)	9.4	0.5
95th Queue (m)	16.9	4.1
Link Distance (m)	38.2	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site & Caroline Street

Movement	NB
Directions Served	LR
Maximum Queue (m)	8.8
Average Queue (m)	2.1
95th Queue (m)	8.3
Link Distance (m)	27.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 3

# Appendix K

## Sensitivity Analysis Synchro Operations Reports



Lanes, Volumes, Timings

Total 10 Year - Extension Sensitivity

1: Mountainview Road N & River Drive

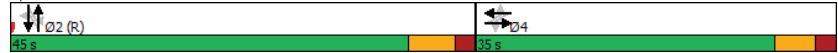
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	1	38	142	135	16	24	44	270	145	44	467	4
Future Volume (vph)	1	38	142	135	16	24	44	270	145	44	467	4
Satd. Flow (prot)	0	1498	0	0	1362	0	0	1768	1380	0	3502	0
Fit Permitted		0.998			0.681			0.867			0.891	
Satd. Flow (perm)	0	1495	0	0	963	0	0	1544	1346	0	3132	0
Satd. Flow (RTOR)		151			11			154			1	
Lane Group Flow (vph)	0	192	0	0	187	0	0	334	154	0	548	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0	45.0	45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		16.7			16.7			44.7	44.7		44.7	
Actuated g/C Ratio		0.21			0.21			0.56	0.56		0.56	
v/c Ratio		0.45			0.89			0.39	0.19		0.31	
Control Delay		10.1			66.8			13.5	3.0		11.4	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		10.1			66.8			13.5	3.0		11.4	
LOS		B			E			B	A		B	
Approach Delay		10.1			66.8			10.2			11.4	
Approach LOS		B			E			B			B	
Queue Length 50th (m)		5.1			26.2			26.5	0.0		21.7	
Queue Length 95th (m)		18.2			43.3			57.0	9.6		40.2	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		586			319			862	819		1749	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.33			0.59			0.39	0.19		0.31	

Intersection Summary

Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 18.1      Intersection LOS: B  
 Intersection Capacity Utilization 97.6%      ICU Level of Service F  
 Analysis Period (min) 15

Splits and Phases: 1: Mountainview Road N & River Drive



Queues

Total 10 Year - Extension Sensitivity

1: Mountainview Road N & River Drive

AM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	192	187	334	154	548
v/c Ratio	0.45	0.89	0.39	0.19	0.31
Control Delay	10.1	66.8	13.5	3.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	66.8	13.5	3.0	11.4
Queue Length 50th (m)	5.1	26.2	26.5	0.0	21.7
Queue Length 95th (m)	18.2	43.3	57.0	9.6	40.2
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	586	319	862	819	1749
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.33	0.59	0.39	0.19	0.31

Intersection Summary

HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	1	38	142	135	16	24	44	270	145	44	467	4
Future Volume (vph)	1	38	142	135	16	24	44	270	145	44	467	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1			9.1			9.5		9.5		9.5	
Lane Util. Factor	1.00			1.00			1.00		1.00		0.95	
Frpb, ped/bikes	1.00			1.00			1.00		0.97		1.00	
Flpb, ped/bikes	1.00			1.00			1.00		1.00		1.00	
Frt	0.89			0.98			1.00		0.85		1.00	
Flt Protected	1.00			0.96			0.99		1.00		1.00	
Satd. Flow (prot)	1498			1362			1768		1346		3500	
Flt Permitted	1.00			0.68			0.87		1.00		0.89	
Satd. Flow (perm)	1496			964			1544		1346		3132	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1	40	151	144	17	26	47	287	154	47	497	4
RTOR Reduction (vph)	0	119	0	0	9	0	0	0	68	0	0	0
Lane Group Flow (vph)	0	73	0	0	178	0	0	334	86	0	548	0
Confl. Peds. (#/hr)	5			5			4		4		4	
Heavy Vehicles (%)	0%	0%	17%	35%	40%	5%	11%	6%	17%	6%	2%	33%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	4			4			2		2		2	
Permitted Phases	4			4			2		2		2	
Actuated Green, G (s)	19.7			19.7			47.7		47.7		47.7	
Effective Green, g (s)	16.7			16.7			44.7		44.7		44.7	
Actuated g/C Ratio	0.21			0.21			0.56		0.56		0.56	
Clearance Time (s)	6.1			6.1			6.5		6.5		6.5	
Vehicle Extension (s)	3.0			3.0			4.5		4.5		4.5	
Lane Grp Cap (vph)	312			201			862		752		1750	
v/s Ratio Prot												
v/s Ratio Perm	0.05			c0.19			c0.22		0.06		0.17	
v/c Ratio	0.23			0.89			0.39		0.11		0.31	
Uniform Delay, d1	26.3			30.7			9.9		8.3		9.4	
Progression Factor	1.00			1.00			1.00		1.00		1.00	
Incremental Delay, d2	0.4			34.0			1.3		0.3		0.5	
Delay (s)	26.7			64.8			11.3		8.6		9.9	
Level of Service	C			E			B		A		A	
Approach Delay (s)	26.7			64.8			10.4				9.9	
Approach LOS	C			E			B				A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay	19.6			HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio	0.52											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			18.6					
Intersection Capacity Utilization	97.6%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	25	9	96	23	12	10	57	218	20	20	386	23
Future Volume (vph)	25	9	96	23	12	10	57	218	20	20	386	23
Satd. Flow (prot)	0	1637	0	0	1704	0	1544	1802	0	1646	1816	0
Flt Permitted	0.990			0.976			0.950		0.950		0.950	
Satd. Flow (perm)	0	1637	0	0	1704	0	1544	1802	0	1646	1816	0
Lane Group Flow (vph)	0	139	0	0	48	0	61	253	0	21	435	0
Sign Control	Stop			Stop			Stop		Stop		Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 51.8%						ICU Level of Service A						
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
 2: Mountainview Road N & John Street  
 Total 10 Year - Extension Sensitivity  
 AM Peak Hour


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕	↕		↕	↕	↕
Sign Control	Stop			Stop			Stop	Stop		Stop	Stop	Stop
Traffic Volume (vph)	25	9	96	23	12	10	57	218	20	20	386	23
Future Volume (vph)	25	9	96	23	12	10	57	218	20	20	386	23
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	27	10	102	24	13	11	61	232	21	21	411	24
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	139	48	61	253	21	435						
Volume Left (vph)	27	24	61	0	21	0						
Volume Right (vph)	102	11	0	21	0	24						
Hadj (s)	-0.34	0.06	0.72	0.01	0.60	0.03						
Departure Headway (s)	5.6	6.2	6.3	5.6	6.0	5.5						
Degree Utilization, x	0.21	0.08	0.11	0.39	0.04	0.66						
Capacity (veh/h)	576	500	548	621	573	636						
Control Delay (s)	10.1	9.7	8.9	11.0	8.1	17.2						
Approach Delay (s)	10.1	9.7	10.6	16.8								
Approach LOS	B	A	B	C								
<b>Intersection Summary</b>												
Delay			13.4									
Level of Service			B									
Intersection Capacity Utilization			51.8%		ICU Level of Service		A					
Analysis Period (min)			15									

Lanes, Volumes, Timings  
 3: River Drive & Daniella Street  
 Total 10 Year - Extension Sensitivity  
 AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕		↕		↕	
Traffic Volume (vph)	2	183	58	2	9	4
Future Volume (vph)	2	183	58	2	9	4
Satd. Flow (prot)	0	1586	1874	0	1756	0
Fit Permitted					0.968	
Satd. Flow (perm)	0	1586	1874	0	1756	0
Lane Group Flow (vph)	0	215	69	0	15	0
Sign Control	Free		Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 26.2%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

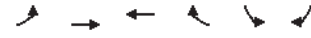
Total 10 Year - Extension Sensitivity  
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	183	58	2	9	4
Future Volume (Veh/h)	2	183	58	2	9	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	2	213	67	2	10	5
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	72				288	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	72				288	71
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1537				704	994
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	215	69	15			
Volume Left	2	0	10			
Volume Right	0	2	5			
eSH	1537	1700	780			
Volume to Capacity	0.00	0.04	0.02			
Queue Length 95th (m)	0.0	0.0	0.4			
Control Delay (s)	0.1	0.0	9.7			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	9.7			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		26.2%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street


Total 10 Year - Extension Sensitivity  
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	50	10	45	131	0
Future Volume (vph)	0	50	10	45	131	0
Satd. Flow (prot)	0	1583	1161	0	1805	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	1583	1161	0	1805	0
Lane Group Flow (vph)	0	56	61	0	146	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 22.3%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

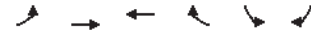
Total 10 Year - Extension Sensitivity  
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	50	10	45	131	0
Future Volume (Veh/h)	0	50	10	45	131	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	56	11	50	146	0
Pedestrians			2			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	61				94	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	61				94	36
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				84	100
cM capacity (veh/h)	1555				909	1042
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	56	61	146			
Volume Left	0	0	146			
Volume Right	0	50	0			
cSH	1555	1700	909			
Volume to Capacity	0.00	0.04	0.16			
Queue Length 95th (m)	0.0	0.0	4.3			
Control Delay (s)	0.0	0.0	9.7			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.7			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.4			
Intersection Capacity Utilization		22.3%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Total 10 Year - Extension Sensitivity  
AM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	46	5	1	1	0
Future Volume (vph)	1	46	5	1	1	0
Satd. Flow (prot)	0	1669	1535	0	1805	0
Fit Permitted		0.999			0.950	
Satd. Flow (perm)	0	1669	1535	0	1805	0
Lane Group Flow (vph)	0	55	7	0	1	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.6%					ICU Level of Service A	
Analysis Period (min) 15						



HCM Unsignalized Intersection Capacity Analysis  
 5: Victoria Street/River Drive & St Michaels Street  
 Total 10 Year - Extension Sensitivity  
 AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	46	5	1	1	0
Future Volume (Veh/h)	1	46	5	1	1	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	54	6	1	1	0
Pedestrians		1	1		3	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	10				66	10
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	10				66	10
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1618				940	1073
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	55	7	1			
Volume Left	1	0	1			
Volume Right	0	1	0			
cSH	1618	1700	940			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.1	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	8.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization		19.6%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
 6: Rosset Valley Court & John Street  
 Total 10 Year - Extension Sensitivity  
 AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	103	0	17	74	4	21
Future Volume (vph)	103	0	17	74	4	21
Satd. Flow (prot)	1827	0	0	1567	1672	0
Fit Permitted				0.991	0.992	
Satd. Flow (perm)	1827	0	0	1567	1672	0
Lane Group Flow (vph)	121	0	0	107	30	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 26.5%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	103	0	17	74	4	21
Future Volume (Veh/h)	103	0	17	74	4	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	121	0	20	87	5	25
Pedestrians					8	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			129		256	129
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			129		256	129
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	97
cM capacity (veh/h)			1459		722	920
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	121	107	30			
Volume Left	0	20	5			
Volume Right	0	0	25			
cSH	1700	1459	879			
Volume to Capacity	0.07	0.01	0.03			
Queue Length 95th (m)	0.0	0.3	0.8			
Control Delay (s)	0.0	1.5	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.5	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization		26.5%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	0	17	4	5	23	59	5	7	0	73	24	5
Future Volume (vph)	0	17	4	5	23	59	5	7	0	73	24	5
Satd. Flow (prot)	0	1849	0	0	1413	0	0	1860	0	0	1760	0
Fit Permitted					0.997			0.979			0.966	
Satd. Flow (perm)	0	1849	0	0	1413	0	0	1860	0	0	1760	0
Lane Group Flow (vph)	0	25	0	0	102	0	0	14	0	0	119	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 31.1%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis Total 10 Year - Extension Sensitivity  
 7: Victoria Street & John Street AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	0	17	4	5	23	59	5	7	0	73	24	5
Future Volume (vph)	0	17	4	5	23	59	5	7	0	73	24	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	20	5	6	27	69	6	8	0	85	28	6
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total (vph)	25	102	14	119								
Volume Left (vph)	0	6	6	85								
Volume Right (vph)	5	69	0	6								
Hadj (s)	-0.12	-0.23	0.09	0.17								
Departure Headway (s)	4.2	4.0	4.4	4.4								
Degree Utilization, x	0.03	0.11	0.02	0.14								
Capacity (veh/h)	823	867	783	801								
Control Delay (s)	7.3	7.5	7.5	8.1								
Approach Delay (s)	7.3	7.5	7.5	8.1								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.8								
Level of Service				A								
Intersection Capacity Utilization			31.1%	ICU Level of Service			A					
Analysis Period (min)				15								

Lanes, Volumes, Timings Total 10 Year - Extension Sensitivity  
 8: Rosetta Street & Site AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	0	126	43	2	5	0
Future Volume (vph)	0	126	43	2	5	0
Satd. Flow (prot)	1611	0	0	1777	1863	0
Fit Permitted				0.954		
Satd. Flow (perm)	1611	0	0	1777	1863	0
Lane Group Flow (vph)	137	0	0	49	5	0
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 30.3%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
8: Rosetta Street & Site

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↕	↕	
Traffic Volume (veh/h)	0	126	43	2	5	0
Future Volume (Veh/h)	0	126	43	2	5	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	137	47	2	5	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	101	5	5			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	101	5	5			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	87	97			
cM capacity (veh/h)	871	1078	1616			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	137	49	5			
Volume Left	0	47	0			
Volume Right	137	0	0			
cSH	1078	1616	1700			
Volume to Capacity	0.13	0.03	0.00			
Queue Length 95th (m)	3.3	0.7	0.0			
Control Delay (s)	8.8	7.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	7.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			8.1			
Intersection Capacity Utilization		30.3%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
9: Site & Caroline Street

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↕	↕	
Traffic Volume (vph)	5	4	0	2	14	0
Future Volume (vph)	5	4	0	2	14	0
Satd. Flow (prot)	1751	0	0	1863	1770	0
Fit Permitted					0.950	
Satd. Flow (perm)	1751	0	0	1863	1770	0
Lane Group Flow (vph)	9	0	0	2	15	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 20.0%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
9: Site & Caroline Street

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	5	4	0	2	14	0
Future Volume (Veh/h)	5	4	0	2	14	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	4	0	2	15	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			9		9	7
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			9		9	7
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1611		1011	1075
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	9	2	15			
Volume Left	0	0	15			
Volume Right	4	0	0			
cSH	1700	1611	1011			
Volume to Capacity	0.01	0.00	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.0	0.0	8.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.6			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.0			
Intersection Capacity Utilization			20.0%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
10: St Michaels Street/Extension & Caroline Street

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Volume (vph)	1	14	0	2	4	0
Future Volume (vph)	1	14	0	2	4	0
Satd. Flow (prot)	1621	0	1611	0	0	1770
Fit Permitted	0.997					0.950
Satd. Flow (perm)	1621	0	1611	0	0	1770
Lane Group Flow (vph)	16	0	2	0	0	4
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 20.0%						ICU Level of Service A
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
 10: St Michaels Street/Extension & Caroline Street  
 Total 10 Year - Extension Sensitivity  
 AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (veh/h)	1	14	0	2	4	0
Future Volume (Veh/h)	1	14	0	2	4	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	15	0	2	4	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None		None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	9	1			2	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	9	1			2	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	1009	1084			1620	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	16	2	4			
Volume Left	1	0	4			
Volume Right	15	2	0			
cSH	1079	1700	1620			
Volume to Capacity	0.01	0.00	0.00			
Queue Length 95th (m)	0.3	0.0	0.1			
Control Delay (s)	8.4	0.0	7.2			
Lane LOS	A		A			
Approach Delay (s)	8.4	0.0	7.2			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			7.4			
Intersection Capacity Utilization		20.0%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 11: Extension & John Street  
 Total 10 Year - Extension Sensitivity  
 AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	88	2	2	80	7	7
Future Volume (vph)	88	2	2	80	7	7
Satd. Flow (prot)	1857	0	0	1861	1694	0
Fit Permitted				0.999	0.976	
Satd. Flow (perm)	1857	0	0	1861	1694	0
Lane Group Flow (vph)	98	0	0	89	16	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 22.5%						ICU Level of Service A
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
11: Extension & John Street

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	88	2	2	80	7	7
Future Volume (Veh/h)	88	2	2	80	7	7
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	96	2	2	87	8	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			98		188	97
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			98		188	97
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1495		800	959
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	98	89	16			
Volume Left	0	2	8			
Volume Right	2	0	8			
cSH	1700	1495	872			
Volume to Capacity	0.06	0.00	0.02			
Queue Length 95th (m)	0.0	0.0	0.4			
Control Delay (s)	0.0	0.2	9.2			
Lane LOS			A			
Approach Delay (s)	0.0	0.2	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization			22.5%	ICU Level of Service		A
Analysis Period (min)			15			

Queuing and Blocking Report

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	74.0	105.8	56.3	21.7	38.5	38.7
Average Queue (m)	23.3	44.8	21.6	6.8	19.6	14.8
95th Queue (m)	49.0	85.6	44.0	17.3	34.2	31.1
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)						0
Queuing Penalty (veh)						0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	21.6	15.6	20.2	30.3	8.9	37.9
Average Queue (m)	10.7	7.4	8.2	15.1	3.9	19.5
95th Queue (m)	17.3	14.7	18.3	25.1	11.0	30.7
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)				30.0	40.0	
Storage Blk Time (%)				0	0	
Queuing Penalty (veh)				0	0	

Intersection: 3: River Drive & Daniella Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.4
95th Queue (m)	8.8
Link Distance (m)	120.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	16.0
Average Queue (m)	9.6
95th Queue (m)	13.1
Link Distance (m)	29.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	2.8
Average Queue (m)	0.1
95th Queue (m)	1.7
Link Distance (m)	71.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	8.4	9.3
Average Queue (m)	0.4	4.4
95th Queue (m)	3.6	10.8
Link Distance (m)	84.3	140.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.0	24.3	9.1	19.2
Average Queue (m)	4.6	11.2	2.9	10.3
95th Queue (m)	11.7	20.4	9.7	16.1
Link Distance (m)	139.7	90.2	108.9	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Rosetta Street & Site

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	22.9	1.8
Average Queue (m)	11.4	0.1
95th Queue (m)	18.7	1.2
Link Distance (m)	38.2	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site & Caroline Street

Movement	NB
Directions Served	LR
Maximum Queue (m)	10.4
Average Queue (m)	3.5
95th Queue (m)	10.7
Link Distance (m)	27.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	



Queuing and Blocking Report

Total 10 Year - Extension Sensitivity  
AM Peak Hour

Intersection: 10: St Michaels Street/Extension & Caroline Street

Movement	WB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	3.8
95th Queue (m)	11.1
Link Distance (m)	77.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: Extension & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	1.8	9.2
Average Queue (m)	0.1	3.7
95th Queue (m)	1.3	11.0
Link Distance (m)	356.5	89.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		


Network Summary

Network wide Queuing Penalty: 1
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Lanes, Volumes, Timings

Total 10 Year - Extension Sensitivity  
PM Peak Hour

1: Mountainview Road N & River Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	2	29	112	168	42	61	125	459	172	29	353	6
Future Volume (vph)	2	29	112	168	42	61	125	459	172	29	353	6
Satd. Flow (prot)	0	1583	0	0	1682	0	0	1792	1302	0	3431	0
Fit Permitted		0.995			0.745			0.796			0.874	
Satd. Flow (perm)	0	1576	0	0	1291	0	0	1442	1261	0	3010	0
Satd. Flow (RTOR)		124			19				191		3	
Lane Group Flow (vph)	0	158	0	0	302	0	0	649	191	0	431	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0	35.0		45.0	45.0	45.0	45.0	45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		20.1			20.1			41.3	41.3		41.3	
Actuated g/C Ratio		0.25			0.25			0.52	0.52		0.52	
v/c Ratio		0.32			0.89			0.87	0.26		0.28	
Control Delay		8.3			54.4			34.9	3.2		12.6	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		8.3			54.4			34.9	3.2		12.6	
LOS		A			D			C	A		B	
Approach Delay		8.3			54.4			27.7			12.6	
Approach LOS		A			D			C			B	
Queue Length 50th (m)		3.9			40.9			84.3	0.0		18.7	
Queue Length 95th (m)		16.0			#71.7			#166.0	10.7		31.4	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		594			430			743	742		1553	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.27			0.70			0.87	0.26		0.28	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 26.8
Intersection LOS: C
Intersection Capacity Utilization 115.1%
ICU Level of Service H
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Mountainview Road N & River Drive



Queues

1: Mountainview Road N & River Drive

Total 10 Year - Extension Sensitivity

PM Peak Hour

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	158	302	649	191	431
v/c Ratio	0.32	0.89	0.87	0.26	0.28
Control Delay	8.3	54.4	34.9	3.2	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.3	54.4	34.9	3.2	12.6
Queue Length 50th (m)	3.9	40.9	84.3	0.0	18.7
Queue Length 95th (m)	16.0	#71.7	#166.0	10.7	31.4
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	594	430	743	742	1553
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.27	0.70	0.87	0.26	0.28

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

1: Mountainview Road N & River Drive

Total 10 Year - Extension Sensitivity

PM Peak Hour

	↘	→	↙	↘	←	↙	↑	↘	↓	↘		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	2	29	112	168	42	61	125	459	172	29	353	6
Future Volume (vph)	2	29	112	168	42	61	125	459	172	29	353	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)		9.1			9.1			9.5	9.5		9.5	
Lane Util. Factor		1.00			1.00			1.00	1.00		0.95	
Frbp, ped/bikes		0.99			0.99			1.00	0.97		1.00	
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	
Flt		0.89			0.97			1.00	0.85		1.00	
Flt Protected		1.00			0.97			0.99	1.00		1.00	
Satd. Flow (prot)		1583			1681			1792	1261		3430	
Flt Permitted		1.00			0.74			0.80	1.00		0.87	
Satd. Flow (perm)		1577			1290			1442	1261		3007	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	32	124	187	47	68	139	510	191	32	392	7
RTOR Reduction (vph)	0	93	0	0	14	0	0	0	92	0	1	0
Lane Group Flow (vph)	0	65	0	0	288	0	0	649	99	0	430	0
Confl. Peds. (#/hr)	13		1	1		13	2		9	9		2
Heavy Vehicles (%)	50%	0%	7%	8%	0%	2%	8%	4%	24%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Actuated Green, G (s)		23.1			23.1			44.3	44.3		44.3	
Effective Green, g (s)		20.1			20.1			41.3	41.3		41.3	
Actuated g/C Ratio		0.25			0.25			0.52	0.52		0.52	
Clearance Time (s)		6.1			6.1			6.5	6.5		6.5	
Vehicle Extension (s)		3.0			3.0			4.5	4.5		4.5	
Lane Grp Cap (vph)		396			324			744	650		1552	
v/s Ratio Prot												
v/s Ratio Perm		0.04			0.22			0.45	0.08		0.14	
v/c Ratio		0.16			0.89			0.87	0.15		0.28	
Uniform Delay, d1		23.4			28.9			17.0	10.2		10.9	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.2			24.1			13.4	0.5		0.4	
Delay (s)		23.6			53.0			30.4	10.7		11.4	
Level of Service		C			D			C	B		B	
Approach Delay (s)		23.6			53.0			25.9			11.4	
Approach LOS		C			D			C			B	

Intersection Summary

HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	115.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings

Total 10 Year - Extension Sensitivity

2: Mountainview Road N & John Street

PM Peak Hour

Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	32	12	57	28	21	16	130	389	33	7	288	33
Future Volume (vph)	32	12	57	28	21	16	130	389	33	7	288	33
Satd. Flow (prot)	0	1729	0	0	1797	0	1711	1877	0	1745	1872	0
Fit Permitted		0.985			0.979		0.950			0.950		
Satd. Flow (perm)	0	1729	0	0	1797	0	1711	1877	0	1745	1872	0
Lane Group Flow (vph)	0	105	0	0	68	0	135	439	0	7	334	0
Sign Control	Stop			Stop			Stop			Stop		

Intersection Summary	
Control Type:	Unsignalized
Intersection Capacity Utilization	50.5%
ICU Level of Service A	
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

Total 10 Year - Extension Sensitivity

2: Mountainview Road N & John Street

PM Peak Hour


Lane Configurations		↕			↕		↕	↕		↕	↕	
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	32	12	57	28	21	16	130	389	33	7	288	33
Future Volume (vph)	32	12	57	28	21	16	130	389	33	7	288	33
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	33	12	59	29	22	17	135	405	34	7	300	34

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	104	68	135	439	7	334
Volume Left (vph)	33	29	135	0	7	0
Volume Right (vph)	59	17	0	34	0	34
Hadj (s)	-0.28	-0.06	0.53	-0.05	0.50	-0.07
Departure Headway (s)	5.9	6.2	6.0	5.4	6.2	5.6
Degree Utilization, x	0.17	0.12	0.22	0.66	0.01	0.52
Capacity (veh/h)	538	503	586	657	553	620
Control Delay (s)	10.1	10.0	9.5	16.8	8.1	13.5
Approach Delay (s)	10.1	10.0	15.1		13.3	
Approach LOS	B	B	C		B	

Intersection Summary	
Delay	13.8
Level of Service	B
Intersection Capacity Utilization	50.5%
ICU Level of Service A	
Analysis Period (min)	15

Lanes, Volumes, Timings  
3: River Drive & Daniella Street

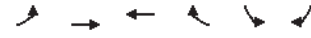
Total 10 Year - Extension Sensitivity  
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	5	126	171	15	7	2
Future Volume (vph)	5	126	171	15	7	2
Satd. Flow (prot)	0	1730	1796	0	1778	0
Fit Permitted		0.998			0.962	
Satd. Flow (perm)	0	1730	1796	0	1778	0
Lane Group Flow (vph)	0	151	214	0	10	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 25.7%      ICU Level of Service A						
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street


Total 10 Year - Extension Sensitivity  
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	5	126	171	15	7	2
Future Volume (Veh/h)	5	126	171	15	7	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	145	197	17	8	2
Pedestrians					4	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	218				366	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	218				366	210
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)					632	833
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	151	214	10			
Volume Left	6	0	8			
Volume Right	0	17	2			
eSH	1359	1700	664			
Volume to Capacity	0.00	0.13	0.02			
Queue Length 95th (m)	0.1	0.0	0.3			
Control Delay (s)	0.3	0.0	10.5			
Lane LOS	A		B			
Approach Delay (s)	0.3	0.0	10.5			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay      0.4						
Intersection Capacity Utilization      25.7%      ICU Level of Service      A						
Analysis Period (min)      15						

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street


Total 10 Year - Extension Sensitivity  
PM Peak Hour



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	46	37	129	81	2
Future Volume (vph)	0	46	37	129	81	2
Satd. Flow (prot)	0	1712	1534	0	1805	0
Fit Permitted					0.953	
Satd. Flow (perm)	0	1712	1534	0	1805	0
Lane Group Flow (vph)	0	55	198	0	98	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 26.7%      ICU Level of Service A						
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Total 10 Year - Extension Sensitivity  
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	46	37	129	81	2
Future Volume (Veh/h)	0	46	37	129	81	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	55	44	154	96	2
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	201				179	124
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	201				179	124
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				88	100
cM capacity (veh/h)	1379				813	930
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	55	198	98			
Volume Left	0	0	96			
Volume Right	0	154	2			
sSH	1379	1700	815			
Volume to Capacity	0.00	0.12	0.12			
Queue Length 95th (m)	0.0	0.0	3.1			
Control Delay (s)	0.0	0.0	10.0			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.0			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay      2.8						
Intersection Capacity Utilization      26.7%      ICU Level of Service      A						
Analysis Period (min)      15						

Lanes, Volumes, Timings Total 10 Year - Extension Sensitivity  
PM Peak Hour  
5: Victoria Street/River Drive & St Michaels Street

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	0	35	35	2	6	0
Future Volume (vph)	0	35	35	2	6	0
Satd. Flow (prot)	0	1712	1889	0	1504	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	1712	1889	0	1504	0
Lane Group Flow (vph)	0	42	44	0	7	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.0% <span style="float: right;">ICU Level of Service A</span>						
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis Total 10 Year - Extension Sensitivity  
PM Peak Hour  
5: Victoria Street/River Drive & St Michaels Street

	EBL	EBT	WBT	WBR	SBL	SBR
Movement		↕	↕		↕	
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	0	35	35	2	6	0
Future Volume (Veh/h)	0	35	35	2	6	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	42	42	2	7	0
Pedestrians					2	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	46				87	45
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	46				87	45
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1572				870	1029
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	42	44	7			
Volume Left	0	0	7			
Volume Right	0	2	0			
eSH	1572	1700	870			
Volume to Capacity	0.00	0.03	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	9.2			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay <span style="float: right;">0.7</span>						
Intersection Capacity Utilization 19.0% <span style="float: right;">ICU Level of Service A</span>						
Analysis Period (min) 15						

Lanes, Volumes, Timings  
6: Rosset Valley Court & John Street

Total 10 Year - Extension Sensitivity  
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Traffic Volume (vph)	114	6	20	152	2	17
Future Volume (vph)	114	6	20	152	2	17
Satd. Flow (prot)	1769	0	0	1628	1658	0
Fit Permitted				0.994	0.995	
Satd. Flow (perm)	1769	0	0	1628	1658	0
Lane Group Flow (vph)	143	0	0	205	22	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 31.7%						
ICU Level of Service A						
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Total 10 Year - Extension Sensitivity  
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Traffic Volume (veh/h)	114	6	20	152	2	17
Future Volume (Veh/h)	114	6	20	152	2	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	136	7	24	181	2	20
Pedestrians	1			3	6	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			149		376	148
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			149		376	148
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	98
cM capacity (veh/h)			1437		615	896
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	143	205	22			
Volume Left	0	24	2			
Volume Right	7	0	20			
sSH	1700	1437	860			
Volume to Capacity	0.08	0.02	0.03			
Queue Length 95th (m)	0.0	0.4	0.6			
Control Delay (s)	0.0	1.0	9.3			
Lane LOS	A	A	A			
Approach Delay (s)	0.0	1.0	9.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay 1.1						
Intersection Capacity Utilization 31.7%						
ICU Level of Service A						
Analysis Period (min) 15						

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Total 10 Year - Extension Sensitivity  
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	41	1	7	38	99	11	20	1	77	22	4
Future Volume (vph)	4	41	1	7	38	99	11	20	1	77	22	4
Satd. Flow (prot)	0	1887	0	0	1460	0	0	1860	0	0	1664	0
Fit Permitted		0.996			0.998			0.983			0.964	
Satd. Flow (perm)	0	1887	0	0	1460	0	0	1860	0	0	1664	0
Lane Group Flow (vph)	0	51	0	0	162	0	0	35	0	0	116	0
Sign Control	Stop			Stop			Stop			Stop		

Intersection Summary												
Control Type: Unsignalized												
Intersection Capacity Utilization 33.3%						ICU Level of Service A						
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Total 10 Year - Extension Sensitivity  
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	4	41	1	7	38	99	11	20	1	77	22	4
Future Volume (vph)	4	41	1	7	38	99	11	20	1	77	22	4
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	46	1	8	43	111	12	22	1	87	25	4

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	51	162	35	116
Volume Left (vph)	4	8	12	87
Volume Right (vph)	1	111	1	4
Hadj (s)	0.00	-0.30	0.05	0.29
Departure Headway (s)	4.4	4.0	4.6	4.7
Degree Utilization, x	0.06	0.18	0.04	0.15
Capacity (veh/h)	773	860	742	724
Control Delay (s)	7.7	7.9	7.8	8.5
Approach Delay (s)	7.7	7.9	7.8	8.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lanes, Volumes, Timings  
8: Rosetta Street & Site

Total 10 Year - Extension Sensitivity  
PM Peak Hour

Lane Configurations	W			U	U	
Traffic Volume (vph)	0	74	120	9	9	0
Future Volume (vph)	0	74	120	9	9	0
Satd. Flow (prot)	1611	0	0	1781	1863	0
Fit Permitted				0.956		
Satd. Flow (perm)	1611	0	0	1781	1863	0
Lane Group Flow (vph)	80	0	0	140	10	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Control Type:	Unsignalized
Intersection Capacity Utilization	31.7%      ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
8: Rosetta Street & Site

Total 10 Year - Extension Sensitivity  
PM Peak Hour

Lane Configurations	W			U	U	
Traffic Volume (veh/h)	0	74	120	9	9	0
Future Volume (Veh/h)	0	74	120	9	9	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	80	130	10	10	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	280	10	10			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	280	10	10			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	92			
cM capacity (veh/h)	653	1071	1610			

	EB 1	NB 1	SB 1
Direction, Lane #			
Volume Total	80	140	10
Volume Left	0	130	0
Volume Right	80	0	0
sSH	1071	1610	1700
Volume to Capacity	0.07	0.08	0.01
Queue Length 95th (m)	1.8	2.0	0.0
Control Delay (s)	8.6	6.9	0.0
Lane LOS	A	A	
Approach Delay (s)	8.6	6.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		7.2	
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)		15	

Lanes, Volumes, Timings  
9: Site & Caroline Street

Total 10 Year - Extension Sensitivity  
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Traffic Volume (vph)	9	13	0	9	8	0
Future Volume (vph)	9	13	0	9	8	0
Satd. Flow (prot)	1716	0	0	1863	1770	0
Fit Permitted					0.950	
Satd. Flow (perm)	1716	0	0	1863	1770	0
Lane Group Flow (vph)	24	0	0	10	9	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 20.0%						
ICU Level of Service A						
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
9: Site & Caroline Street

Total 10 Year - Extension Sensitivity  
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Traffic Volume (veh/h)	9	13	0	9	8	0
Future Volume (Veh/h)	9	13	0	9	8	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	14	0	10	9	0
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			24		27	17
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			24		27	17
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1591		988	1062
<b>Direction, Lane #</b>						
	EB 1	WB 1	NB 1			
Volume Total	24	10	9			
Volume Left	0	0	9			
Volume Right	14	0	0			
eSH	1700	1591	988			
Volume to Capacity	0.01	0.00	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	8.7			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.7			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay						
Intersection Capacity Utilization 20.0%						
ICU Level of Service A						
Analysis Period (min) 15						

Lanes, Volumes, Timings  
 10: St Michaels Street/Extension & Caroline Street

Total 10 Year - Extension Sensitivity  
 PM Peak Hour

	↙	↘	↑	↗	↖	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Volume (vph)	6	8	0	2	13	0
Future Volume (vph)	6	8	0	2	13	0
Satd. Flow (prot)	1685	0	1611	0	0	1770
Fit Permitted	0.979					0.950
Satd. Flow (perm)	1685	0	1611	0	0	1770
Lane Group Flow (vph)	16	0	2	0	0	14
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Control Type:	Unsignalized					
Intersection Capacity Utilization	24.1%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis  
 10: St Michaels Street/Extension & Caroline Street

Total 10 Year - Extension Sensitivity  
 PM Peak Hour

	↙	↘	↑	↗	↖	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Volume (veh/h)	6	8	0	2	13	0
Future Volume (Veh/h)	6	8	0	2	13	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	9	0	2	14	0
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	29	1			2	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	29	1			2	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
pD queue free %	99	99			99	
cM capacity (veh/h)	977	1084			1620	
<b>Direction, Lane #</b>						
	WB 1	NB 1	SB 1			
Volume Total	16	2	14			
Volume Left	7	0	14			
Volume Right	9	2	0			
sSH	1034	1700	1620			
Volume to Capacity	0.02	0.00	0.01			
Queue Length 95th (m)	0.4	0.0	0.2			
Control Delay (s)	8.5	0.0	7.2			
Lane LOS	A		A			
Approach Delay (s)	8.5	0.0	7.2			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	7.4					
Intersection Capacity Utilization	24.1%		ICU Level of Service		A	
Analysis Period (min)	15					

Lanes, Volumes, Timings  
11: Extension & John Street

Total 10 Year - Extension Sensitivity  
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Traffic Volume (vph)	113	6	7	140	4	4
Future Volume (vph)	113	6	7	140	4	4
Satd. Flow (prot)	1850	0	0	1859	1694	0
Fit Permitted				0.998	0.976	
Satd. Flow (perm)	1850	0	0	1859	1694	0
Lane Group Flow (vph)	130	0	0	160	8	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 29.7%						
ICU Level of Service A						
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
11: Extension & John Street

Total 10 Year - Extension Sensitivity  
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Traffic Volume (veh/h)	113	6	7	140	4	4
Future Volume (Veh/h)	113	6	7	140	4	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	123	7	8	152	4	4
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			130		294	126
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			130		294	126
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1455		693	924
<b>Direction, Lane #</b>						
	EB 1	WB 1	NB 1			
Volume Total	130	160	8			
Volume Left	0	8	4			
Volume Right	7	0	4			
eSH	1700	1455	792			
Volume to Capacity	0.08	0.01	0.01			
Queue Length 95th (m)	0.0	0.1	0.2			
Control Delay (s)	0.0	0.4	9.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.4	9.6			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay						
Intersection Capacity Utilization 29.7%						
ICU Level of Service A						
Analysis Period (min) 15						

Queuing and Blocking Report

Total 10 Year - Extension Sensitivity  
PM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	50.2	112.8	108.5	25.2	49.5	40.2
Average Queue (m)	19.9	61.2	53.2	8.7	18.1	11.8
95th Queue (m)	39.4	107.3	92.6	20.3	36.6	29.9
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						40.0
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	16.2	16.1	32.2	46.0	8.9	26.1
Average Queue (m)	9.0	8.4	13.2	20.9	2.1	15.3
95th Queue (m)	14.3	14.4	25.8	34.9	8.1	22.5
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			30.0		40.0	
Storage Blk Time (%)			0	1		
Queuing Penalty (veh)			0	2		

Intersection: 3: River Drive & Daniella Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	5.3	9.2
Average Queue (m)	0.2	2.6
95th Queue (m)	2.6	9.3
Link Distance (m)	162.0	120.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 10 Year - Extension Sensitivity  
PM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	13.2
Average Queue (m)	8.5
95th Queue (m)	13.2
Link Distance (m)	29.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	15.0
Average Queue (m)	1.7
95th Queue (m)	8.1
Link Distance (m)	71.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	10.5	11.1
Average Queue (m)	0.9	4.3
95th Queue (m)	5.6	10.8
Link Distance (m)	84.3	140.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 10 Year - Extension Sensitivity  
PM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.0	23.0	13.4	25.4
Average Queue (m)	7.1	12.0	6.1	10.6
95th Queue (m)	12.9	18.7	13.4	18.8
Link Distance (m)	139.7	90.2	108.9	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Rosetta Street & Site

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	19.7	6.9
Average Queue (m)	8.6	0.5
95th Queue (m)	15.5	4.1
Link Distance (m)	38.2	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site & Caroline Street

Movement	NB
Directions Served	LR
Maximum Queue (m)	8.8
Average Queue (m)	1.4
95th Queue (m)	6.8
Link Distance (m)	27.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Total 10 Year - Extension Sensitivity  
PM Peak Hour

Intersection: 10: St Michaels Street/Extension & Caroline Street

Movement	WB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.9
95th Queue (m)	9.8
Link Distance (m)	77.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: Extension & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	3.5	9.2
Average Queue (m)	0.2	1.7
95th Queue (m)	2.2	7.4
Link Distance (m)	356.5	89.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2

Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Total 10 Year Sensitivity 2  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	19	83	300	135	32	24	99	270	145	44	467	10
Future Volume (vph)	19	83	300	135	32	24	99	270	145	44	467	10
Satd. Flow (prot)	0	1513	0	0	1362	0	0	1747	1380	0	3482	0
Fit Permitted		0.978			0.453			0.714			0.881	
Satd. Flow (perm)	0	1482	0	0	639	0	0	1264	1346	0	3079	0
Satd. Flow (RTOR)		197			10			154			3	
Lane Group Flow (vph)	0	427	0	0	204	0	0	392	154	0	555	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0	45.0	45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		24.4			24.4			37.0	37.0		37.0	
Actuated g/C Ratio		0.30			0.30			0.46	0.46		0.46	
v/c Ratio		0.72			1.01			0.67	0.22		0.39	
Control Delay		20.6			96.2			24.6	3.3		15.5	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		20.6			96.2			24.6	3.3		15.5	
LOS		C			F			C	A		B	
Approach Delay		20.6			96.2			18.6			15.5	
Approach LOS		C			F			B			B	
Queue Length 50th (m)		29.3			28.8			46.2	0.0		28.7	
Queue Length 95th (m)		62.3			#70.2			79.0	9.6		41.1	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		613			213			583	704		1423	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.70			0.96			0.67	0.22		0.39	

**Intersection Summary**  
 Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.01  
 Intersection Signal Delay: 27.2      Intersection LOS: C  
 Intersection Capacity Utilization 117.8%      ICU Level of Service H  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.



Queues  
1: Mountainview Road N & River Drive

Total 10 Year Sensitivity 2  
AM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	427	204	392	154	555
v/c Ratio	0.72	1.01	0.67	0.22	0.39
Control Delay	20.6	96.2	24.6	3.3	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	96.2	24.6	3.3	15.5
Queue Length 50th (m)	29.3	28.8	46.2	0.0	28.7
Queue Length 95th (m)	62.3	#70.2	79.0	9.6	41.1
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	613	213	583	704	1423
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.70	0.96	0.67	0.22	0.39

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

HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Total 10 Year Sensitivity 2  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	19	83	300	135	32	24	99	270	145	44	467	10
Future Volume (vph)	19	83	300	135	32	24	99	270	145	44	467	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1			9.1			9.5		9.5		9.5	
Lane Util. Factor	1.00			1.00			1.00		1.00		0.95	
Frbp, ped/bikes	1.00			1.00			1.00		0.97		1.00	
Flpb, ped/bikes	1.00			1.00			1.00		1.00		1.00	
Frt	0.90			0.98			1.00		0.85		1.00	
Flt Protected	1.00			0.97			0.99		1.00		1.00	
Satd. Flow (prot)	1512			1362			1747		1346		3480	
Flt Permitted	0.98			0.45			0.71		1.00		0.88	
Satd. Flow (perm)	1481			639			1263		1346		3078	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	20	88	319	144	34	26	105	287	154	47	497	11
RTOR Reduction (vph)	0	137	0	0	7	0	0	0	83	0	2	0
Lane Group Flow (vph)	0	290	0	0	197	0	0	392	71	0	553	0
Confl. Peds. (#/hr)	5			5			4		4		4	
Heavy Vehicles (%)	0%	0%	17%	35%	40%	5%	11%	6%	17%	6%	2%	33%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	4		4		2		2		2		2	
Permitted Phases	4		4		2		2		2		2	
Actuated Green, G (s)	27.4		27.4		40.0		40.0		40.0		40.0	
Effective Green, g (s)	24.4		24.4		37.0		37.0		37.0		37.0	
Actuated g/C Ratio	0.30		0.30		0.46		0.46		0.46		0.46	
Clearance Time (s)	6.1		6.1		6.5		6.5		6.5		6.5	
Vehicle Extension (s)	3.0		3.0		4.5		4.5		4.5		4.5	
Lane Grp Cap (vph)	451		194		584		622		1423			
v/s Ratio Prot												
v/s Ratio Perm	0.20		c0.31		c0.31		0.05		0.18			
v/c Ratio	0.64		1.02		0.67		0.11		0.39			
Uniform Delay, d1	24.0		27.8		16.8		12.2		14.1			
Progression Factor	1.00		1.00		1.00		1.00		1.00			
Incremental Delay, d2	3.1		68.8		6.0		0.4		0.8			
Delay (s)	27.2		96.6		22.8		12.6		14.9			
Level of Service	C		F		C		B		B			
Approach Delay (s)	27.2		96.6		19.9		14.9					
Approach LOS	C		F		B		B					
<b>Intersection Summary</b>												
HCM 2000 Control Delay	29.1		HCM 2000 Level of Service				C					
HCM 2000 Volume to Capacity ratio	0.81											
Actuated Cycle Length (s)	80.0		Sum of lost time (s)				18.6					
Intersection Capacity Utilization	117.8%		ICU Level of Service				H					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	18	9	96	23	12	10	57	236	20	20	392	21
Future Volume (vph)	18	9	96	23	12	10	57	236	20	20	392	21
Satd. Flow (prot)	0	1634	0	0	1704	0	1544	1802	0	1646	1816	0
Flt Permitted	0.993		0.976		0.950		0.950		0.950		0.950	
Satd. Flow (perm)	0	1634	0	0	1704	0	1544	1802	0	1646	1816	0
Lane Group Flow (vph)	0	131	0	0	48	0	61	272	0	21	439	0
Sign Control	Stop		Stop		Stop		Stop		Stop		Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 51.5% ICU Level of Service A												
Analysis Period (min) 15												



HCM Unsignalized Intersection Capacity Analysis  
2: Mountainview Road N & John Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕	↕		↕	↕	↕
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	18	9	96	23	12	10	57	236	20	20	392	21
Future Volume (vph)	18	9	96	23	12	10	57	236	20	20	392	21
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	19	10	102	24	13	11	61	251	21	21	417	22
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	131	48	61	272	21	439						
Volume Left (vph)	19	24	61	0	21	0						
Volume Right (vph)	102	11	0	21	0	22						
Hadj (s)	-0.38	0.06	0.72	0.02	0.60	0.03						
Departure Headway (s)	5.6	6.2	6.3	5.6	6.0	5.5						
Degree Utilization, x	0.20	0.08	0.11	0.42	0.04	0.67						
Capacity (veh/h)	563	497	551	625	574	637						
Control Delay (s)	10.0	9.8	8.8	11.4	8.1	17.5						
Approach Delay (s)	10.0	9.8	10.9		17.1							
Approach LOS	A	A	B		C							
<b>Intersection Summary</b>												
Delay			13.6									
Level of Service			B									
Intersection Capacity Utilization			51.5%		ICU Level of Service		A					
Analysis Period (min)			15									

Lanes, Volumes, Timings  
3: River Drive & Daniella Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	2	194	71	2	9	4
Future Volume (vph)	2	194	71	2	9	4
Satd. Flow (prot)	0	1586	1880	0	1756	0
Fit Permitted					0.968	
Satd. Flow (perm)	0	1586	1880	0	1756	0
Lane Group Flow (vph)	0	228	85	0	15	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 26.8%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	194	71	2	9	4
Future Volume (Veh/h)	2	194	71	2	9	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	2	226	83	2	10	5
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	88				317	87
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	88				317	87
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1516				678	974
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	228	85	15			
Volume Left	2	0	10			
Volume Right	0	2	5			
cSH	1516	1700	754			
Volume to Capacity	0.00	0.05	0.02			
Queue Length 95th (m)	0.0	0.0	0.5			
Control Delay (s)	0.1	0.0	9.9			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	9.9			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.5			
Intersection Capacity Utilization		26.8%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	54	21	47	138	6
Future Volume (vph)	1	54	21	47	138	6
Satd. Flow (prot)	0	1586	1209	0	1802	0
Fit Permitted		0.999			0.954	
Satd. Flow (perm)	0	1586	1209	0	1802	0
Lane Group Flow (vph)	0	61	75	0	160	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 23.7%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	54	21	47	138	6
Future Volume (Veh/h)	1	54	21	47	138	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	60	23	52	153	7
Pedestrians			2			
Lane Width (m)			3.6			
Walking Speed (m/s)			1.1			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	75				113	49
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	75				113	49
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				83	99
cM capacity (veh/h)	1537				886	1025
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	61	75	160			
Volume Left	1	0	153			
Volume Right	0	52	7			
cSH	1537	1700	892			
Volume to Capacity	0.00	0.04	0.18			
Queue Length 95th (m)	0.0	0.0	5.0			
Control Delay (s)	0.1	0.0	9.9			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	9.9			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			5.4			
Intersection Capacity Utilization		23.7%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	2	51	22	1	1	1
Future Volume (vph)	2	51	22	1	1	1
Satd. Flow (prot)	0	1670	1524	0	1728	0
Fit Permitted		0.998			0.976	
Satd. Flow (perm)	0	1670	1524	0	1728	0
Lane Group Flow (vph)	0	62	27	0	2	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.6%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
5: Victoria Street/River Drive & St Michaels Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	51	22	1	1	1
Future Volume (Veh/h)	2	51	22	1	1	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	60	26	1	1	1
Pedestrians		1	1		3	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	30				94	30
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	30				94	30
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1592				906	1046
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	62	27	2			
Volume Left	2	0	1			
Volume Right	0	1	1			
cSH	1592	1700	971			
Volume to Capacity	0.00	0.02	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.2	0.0	8.7			
Lane LOS	A		A			
Approach Delay (s)	0.2	0.0	8.7			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization		19.6%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
6: Rosset Valley Court & John Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	96	0	17	72	4	21
Future Volume (vph)	96	0	17	72	4	21
Satd. Flow (prot)	1827	0	0	1568	1672	0
Fit Permitted				0.991	0.992	
Satd. Flow (perm)	1827	0	0	1568	1672	0
Lane Group Flow (vph)	113	0	0	105	30	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 26.4%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	96	0	17	72	4	21
Future Volume (Veh/h)	96	0	17	72	4	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	113	0	20	85	5	25
Pedestrians					8	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			121		246	121
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			121		246	121
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	97
cM capacity (veh/h)			1468		731	929
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	113	105	30			
Volume Left	0	20	5			
Volume Right	0	0	25			
cSH	1700	1468	889			
Volume to Capacity	0.07	0.01	0.03			
Queue Length 95th (m)	0.0	0.3	0.8			
Control Delay (s)	0.0	1.5	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.5	9.2			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.8			
Intersection Capacity Utilization		26.4%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	0	17	4	5	23	52	5	25	0	71	30	5
Future Volume (vph)	0	17	4	5	23	52	5	25	0	71	30	5
Satd. Flow (prot)	0	1849	0	0	1419	0	0	1885	0	0	1767	0
Fit Permitted					0.997			0.992			0.968	
Satd. Flow (perm)	0	1849	0	0	1419	0	0	1885	0	0	1767	0
Lane Group Flow (vph)	0	25	0	0	93	0	0	35	0	0	124	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 33.5%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	0	17	4	5	23	52	5	25	0	71	30	5
Future Volume (vph)	0	17	4	5	23	52	5	25	0	71	30	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	20	5	6	27	60	6	29	0	83	35	6
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	25	93	35	124								
Volume Left (vph)	0	6	6	83								
Volume Right (vph)	5	60	0	6								
Hadj (s)	-0.12	-0.21	0.03	0.16								
Departure Headway (s)	4.2	4.1	4.3	4.4								
Degree Utilization, x	0.03	0.11	0.04	0.15								
Capacity (veh/h)	809	846	796	803								
Control Delay (s)	7.4	7.6	7.5	8.1								
Approach Delay (s)	7.4	7.6	7.5	8.1								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				7.8								
Level of Service				A								
Intersection Capacity Utilization				33.5%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings  
8: Rosetta Street & Site

Total 10 Year Sensitivity 2  
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	0	126	42	6	18	0
Future Volume (vph)	0	126	42	6	18	0
Satd. Flow (prot)	1611	0	0	1785	1863	0
Fit Permitted				0.958		
Satd. Flow (perm)	1611	0	0	1785	1863	0
Lane Group Flow (vph)	137	0	0	53	20	0
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 30.4%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
8: Rosetta Street & Site

Total 10 Year Sensitivity 2  
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↕	↕	↔
Traffic Volume (veh/h)	0	126	42	6	18	0
Future Volume (Veh/h)	0	126	42	6	18	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	137	46	7	20	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	119	20	20			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	119	20	20			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	87	97			
cM capacity (veh/h)	851	1058	1596			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	137	53	20			
Volume Left	0	46	0			
Volume Right	137	0	0			
cSH	1058	1596	1700			
Volume to Capacity	0.13	0.03	0.01			
Queue Length 95th (m)	3.4	0.7	0.0			
Control Delay (s)	8.9	6.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.9	6.4	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			7.4			
Intersection Capacity Utilization		30.4%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
9: Site & Caroline Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↕	↕	↔
Traffic Volume (vph)	0	0	0	0	1	13
Future Volume (vph)	0	0	0	0	1	13
Satd. Flow (prot)	1863	0	0	1863	1623	0
Fit Permitted					0.997	
Satd. Flow (perm)	1863	0	0	1863	1623	0
Lane Group Flow (vph)	0	0	0	0	15	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 10.0%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
9: Site & Caroline Street

Total 10 Year Sensitivity 2  
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	0	0	0	0	1	13
Future Volume (Veh/h)	0	0	0	0	1	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	1	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			0	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0	0	0	
tC, single (s)			4.1	6.4	6.2	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	100	99	
cM capacity (veh/h)			1623	1023	1085	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	0	15			
Volume Left	0	0	1			
Volume Right	0	0	14			
cSH	1700	1700	1081			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.0	0.0	8.4			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.4			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			8.4			
Intersection Capacity Utilization			10.0%	ICU Level of Service		A
Analysis Period (min)			15			

Queuing and Blocking Report

Total 10 Year Sensitivity 2  
AM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	105.3	99.7	94.3	21.5	53.4	38.7
Average Queue (m)	62.3	43.2	35.7	8.4	24.8	19.0
95th Queue (m)	104.6	79.7	70.0	19.5	41.9	37.4
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)	2					
Queuing Penalty (veh)	3					
Storage Bay Dist (m)						40.0
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					1	0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	21.8	18.0	24.3	41.3	11.2	48.4
Average Queue (m)	10.8	8.1	9.0	17.0	4.5	21.1
95th Queue (m)	17.3	15.4	19.1	29.1	11.9	35.7
Link Distance (m)	84.3	165.0		230.9		166.6
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			30.0		40.0	
Storage Blk Time (%)			0	1		1
Queuing Penalty (veh)			0	0		0

Intersection: 3: River Drive & Daniella Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	21.2	9.2
Average Queue (m)	1.3	3.3
95th Queue (m)	12.2	10.4
Link Distance (m)	162.0	120.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		



Queuing and Blocking Report

Total 10 Year Sensitivity 2  
AM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	16.8
Average Queue (m)	9.9
95th Queue (m)	14.0
Link Distance (m)	29.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	2.8
Average Queue (m)	0.2
95th Queue (m)	2.3
Link Distance (m)	73.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	9.0	8.2
Average Queue (m)	0.4	4.4
95th Queue (m)	3.6	10.7
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 10 Year Sensitivity 2  
AM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.0	21.2	13.5	19.2
Average Queue (m)	4.3	10.3	5.7	10.2
95th Queue (m)	11.4	18.6	13.5	15.8
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Rosetta Street & Site

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	22.0	1.8
Average Queue (m)	11.4	0.1
95th Queue (m)	18.6	1.2
Link Distance (m)	38.2	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site & Caroline Street

Movement	NB
Directions Served	LR
Maximum Queue (m)	11.9
Average Queue (m)	2.9
95th Queue (m)	10.1
Link Distance (m)	27.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 5
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Lanes, Volumes, Timings  
1: Mountainview Road N & River Drive

Total 10 Year Sensitivity 2  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	
Traffic Volume (vph)	13	56	207	168	86	61	279	459	172	29	353	24
Future Volume (vph)	13	56	207	168	86	61	279	459	172	29	353	24
Satd. Flow (prot)	0	1570	0	0	1710	0	0	1767	1302	0	3410	0
Fit Permitted		0.973			0.648			0.680			0.695	
Satd. Flow (perm)	0	1530	0	0	1137	0	0	1224	1261	0	2379	0
Satd. Flow (RTOR)		201			16			191			10	
Lane Group Flow (vph)	0	306	0	0	351	0	0	820	191	0	451	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm		NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2		2	
Total Split (s)	35.0	35.0		35.0		45.0	45.0	45.0	45.0		45.0	
Total Lost Time (s)		9.1			9.1			9.5	9.5		9.5	
Act Effct Green (s)		24.4			24.4			37.0	37.0		37.0	
Actuated g/C Ratio		0.30			0.30			0.46	0.46		0.46	
v/c Ratio		0.50			0.98			1.45	0.28		0.41	
Control Delay		11.0			72.2			235.0	3.4		15.8	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		11.0			72.2			235.0	3.4		15.8	
LOS		B			E			F	A		B	
Approach Delay		11.0			72.2			191.3			15.8	
Approach LOS		B			E			F			B	
Queue Length 50th (m)		11.5			49.0			~176.1	0.0		23.2	
Queue Length 95th (m)		32.2			#99.6			#241.0	10.7		35.0	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)												
Base Capacity (vph)		631			378			566	686		1106	
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.48			0.93			1.45	0.28		0.41	

Intersection Summary

Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.45  
 Intersection Signal Delay: 108.2      Intersection LOS: F  
 Intersection Capacity Utilization 132.7%      ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Mountainview Road N & River Drive



Queues  
1: Mountainview Road N & River Drive

Total 10 Year Sensitivity 2  
PM Peak Hour

Lane Group	EBT	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	306	351	820	191	451
v/c Ratio	0.50	0.98	1.45	0.28	0.41
Control Delay	11.0	72.2	235.0	3.4	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	72.2	235.0	3.4	15.8
Queue Length 50th (m)	11.5	49.0	~176.1	0.0	23.2
Queue Length 95th (m)	32.2	#99.6	#241.0	10.7	35.0
Internal Link Dist (m)	103.8	188.6	388.3		220.6
Turn Bay Length (m)					
Base Capacity (vph)	631	378	566	686	1106
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.93	1.45	0.28	0.41

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
1: Mountainview Road N & River Drive

Total 10 Year Sensitivity 2  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	13	56	207	168	86	61	279	459	172	29	353	24
Future Volume (vph)	13	56	207	168	86	61	279	459	172	29	353	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)		9.1			9.1			9.5	9.5		9.5	
Lane Util. Factor		1.00			1.00			1.00	1.00		0.95	
Frbp, ped/bikes		0.99			0.99			1.00	0.97		1.00	
Flpb, ped/bikes		1.00			1.00			1.00	1.00		1.00	
Frt		0.90			0.97			1.00	0.85		0.99	
Flt Protected		1.00			0.97			0.98	1.00		1.00	
Satd. Flow (prot)		1568			1709			1766	1261		3411	
Flt Permitted		0.97			0.65			0.68	1.00		0.69	
Satd. Flow (perm)		1529			1137			1225	1261		2379	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	14	62	230	187	96	68	310	510	191	32	392	27
RTOR Reduction (vph)	0	140	0	0	11	0	0	0	103	0	5	0
Lane Group Flow (vph)	0	166	0	0	340	0	0	820	88	0	446	0
Confl. Peds. (#/hr)	13		1	1		13	2		9	9		2
Heavy Vehicles (%)	50%	0%	7%	8%	0%	2%	8%	4%	24%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		
Actuated Green, G (s)		27.4			27.4			40.0	40.0		40.0	
Effective Green, g (s)		24.4			24.4			37.0	37.0		37.0	
Actuated g/C Ratio		0.30			0.30			0.46	0.46		0.46	
Clearance Time (s)		6.1			6.1			6.5	6.5		6.5	
Vehicle Extension (s)		3.0			3.0			4.5	4.5		4.5	
Lane Grp Cap (vph)		466			346			566	583		1100	
v/s Ratio Prot												
v/s Ratio Perm		0.11			c0.30			c0.67	0.07		0.19	
v/c Ratio		0.36			0.98			1.45	0.15		0.41	
Uniform Delay, d1		21.7			27.6			21.5	12.4		14.2	
Progression Factor		1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2		0.5			43.4			211.7	0.6		1.1	
Delay (s)		22.2			71.0			233.2	13.0		15.3	
Level of Service		C			E			F	B		B	
Approach Delay (s)		22.2			71.0			191.6			15.3	
Approach LOS		C			E			F			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			109.6								F	
HCM 2000 Volume to Capacity ratio			1.26									
Actuated Cycle Length (s)			80.0						18.6			
Intersection Capacity Utilization			132.7%								H	
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings  
2: Mountainview Road N & John Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔	↔		↔	↔
Traffic Volume (vph)	28	12	57	28	21	16	130	400	33	7	306	26
Future Volume (vph)	28	12	57	28	21	16	130	400	33	7	306	26
Satd. Flow (prot)	0	1725	0	0	1797	0	1711	1879	0	1745	1877	0
Flt Permitted		0.986			0.979		0.950			0.950		
Satd. Flow (perm)	0	1725	0	0	1797	0	1711	1879	0	1745	1877	0
Lane Group Flow (vph)	0	101	0	0	68	0	135	451	0	7	346	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 50.7%												
Analysis Period (min) 15												
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis  
2: Mountainview Road N & John Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↖	↗		↖	↗	
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	28	12	57	28	21	16	130	400	33	7	306	26
Future Volume (vph)	28	12	57	28	21	16	130	400	33	7	306	26
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	29	12	59	29	22	17	135	417	34	7	319	27
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	100	68	135	451	7	346						
Volume Left (vph)	29	29	135	0	7	0						
Volume Right (vph)	59	17	0	34	0	27						
Hadj (s)	-0.30	-0.06	0.53	-0.05	0.50	-0.05						
Departure Headway (s)	5.9	6.2	6.0	5.4	6.2	5.7						
Degree Utilization, x	0.16	0.12	0.22	0.67	0.01	0.54						
Capacity (veh/h)	533	498	586	648	553	619						
Control Delay (s)	10.1	10.1	9.5	17.6	8.1	14.0						
Approach Delay (s)	10.1	10.1	15.7	13.9								
Approach LOS	B	B	C	B								
<b>Intersection Summary</b>												
Delay			14.3									
Level of Service			B									
Intersection Capacity Utilization			50.7%		ICU Level of Service		A					
Analysis Period (min)			15									

Lanes, Volumes, Timings  
3: River Drive & Daniella Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Volume (vph)	5	141	185	15	7	2
Future Volume (vph)	5	141	185	15	7	2
Satd. Flow (prot)	0	1729	1798	0	1778	0
Fit Permitted		0.998		0.962		
Satd. Flow (perm)	0	1729	1798	0	1778	0
Lane Group Flow (vph)	0	168	230	0	10	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 26.5%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
3: River Drive & Daniella Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	5	141	185	15	7	2
Future Volume (Veh/h)	5	141	185	15	7	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	162	213	17	8	2
Pedestrians					4	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			128			
pX, platoon unblocked						
vC, conflicting volume	234				400	226
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	234				400	226
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1340				605	816
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	168	230	10			
Volume Left	6	0	8			
Volume Right	0	17	2			
cSH	1340	1700	638			
Volume to Capacity	0.00	0.14	0.02			
Queue Length 95th (m)	0.1	0.0	0.4			
Control Delay (s)	0.3	0.0	10.7			
Lane LOS	A		B			
Approach Delay (s)	0.3	0.0	10.7			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			0.4			
Intersection Capacity Utilization		26.5%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
4: River Drive & Rosetta Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	5	57	44	136	85	5
Future Volume (vph)	5	57	44	136	85	5
Satd. Flow (prot)	0	1719	1543	0	1800	0
Fit Permitted		0.996			0.955	
Satd. Flow (perm)	0	1719	1543	0	1800	0
Lane Group Flow (vph)	0	74	214	0	107	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 27.8%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
4: River Drive & Rosetta Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	5	57	44	136	85	5
Future Volume (Veh/h)	5	57	44	136	85	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	68	52	162	101	6
Pedestrians					3	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)			300			
pX, platoon unblocked						
vC, conflicting volume	217				216	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	217				216	136
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	99
cM capacity (veh/h)	1361				771	916
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	74	214	107			
Volume Left	6	0	101			
Volume Right	0	162	6			
cSH	1361	1700	778			
Volume to Capacity	0.00	0.13	0.14			
Queue Length 95th (m)	0.1	0.0	3.6			
Control Delay (s)	0.7	0.0	10.4			
Lane LOS	A		B			
Approach Delay (s)	0.7	0.0	10.4			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			2.9			
Intersection Capacity Utilization		27.8%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings  
5: Victoria Street/River Drive & St Michaels Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	1	51	45	2	6	1
Future Volume (vph)	1	51	45	2	6	1
Satd. Flow (prot)	0	1713	1890	0	1523	0
Fit Permitted		0.999			0.958	
Satd. Flow (perm)	0	1713	1890	0	1523	0
Lane Group Flow (vph)	0	62	56	0	8	0
Sign Control		Free	Free		Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 19.0%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
5: Victoria Street/River Drive & St Michaels Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	51	45	2	6	1
Future Volume (Veh/h)	1	51	45	2	6	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	1	61	54	2	7	1
Pedestrians					2	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	58				120	57
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	58				120	57
tC, single (s)	4.1				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.7	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1556				832	1013
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	62	56	8			
Volume Left	1	0	7			
Volume Right	0	2	1			
cSH	1556	1700	851			
Volume to Capacity	0.00	0.03	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.1	0.0	9.3			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	9.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.6			
Intersection Capacity Utilization		19.0%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Rosset Valley Court & John Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	110	6	20	145	2	17
Future Volume (vph)	110	6	20	145	2	17
Satd. Flow (prot)	1769	0	0	1628	1658	0
Fit Permitted				0.994	0.995	
Satd. Flow (perm)	1769	0	0	1628	1658	0
Lane Group Flow (vph)	138	0	0	197	22	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 31.4%					ICU Level of Service A	
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
6: Rosset Valley Court & John Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	110	6	20	145	2	17
Future Volume (Veh/h)	110	6	20	145	2	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	131	7	24	173	2	20
Pedestrians	1			3	6	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			144		362	144
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			144		362	144
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	98
cM capacity (veh/h)			1443		626	902
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	138	197	22			
Volume Left	0	24	2			
Volume Right	7	0	20			
cSH	1700	1443	867			
Volume to Capacity	0.08	0.02	0.03			
Queue Length 95th (m)	0.0	0.4	0.6			
Control Delay (s)	0.0	1.0	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.0	9.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization		31.4%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
7: Victoria Street & John Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	4	41	1	7	38	95	11	31	1	71	39	4
Future Volume (vph)	4	41	1	7	38	95	11	31	1	71	39	4
Satd. Flow (prot)	0	1887	0	0	1461	0	0	1872	0	0	1685	0
Fit Permitted		0.996			0.997			0.988			0.970	
Satd. Flow (perm)	0	1887	0	0	1461	0	0	1872	0	0	1685	0
Lane Group Flow (vph)	0	51	0	0	158	0	0	48	0	0	128	0
Sign Control		Stop			Stop			Stop			Stop	
<b>Intersection Summary</b>												
Control Type: Unsignalized												
Intersection Capacity Utilization 34.6%							ICU Level of Service A					
Analysis Period (min) 15												



HCM Unsignalized Intersection Capacity Analysis  
7: Victoria Street & John Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	4	41	1	7	38	95	11	31	1	71	39	4
Future Volume (vph)	4	41	1	7	38	95	11	31	1	71	39	4
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	46	1	8	43	107	12	35	1	80	44	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	51	158	48	128								
Volume Left (vph)	4	8	12	80								
Volume Right (vph)	1	107	1	4								
Hadj (s)	0.00	-0.29	0.04	0.26								
Departure Headway (s)	4.5	4.1	4.6	4.7								
Degree Utilization, x	0.06	0.18	0.06	0.17								
Capacity (veh/h)	759	832	743	728								
Control Delay (s)	7.8	8.0	7.9	8.6								
Approach Delay (s)	7.8	8.0	7.9	8.6								
Approach LOS	A	A	A	A								
<b>Intersection Summary</b>												
Delay				8.2								
Level of Service				A								
Intersection Capacity Utilization				34.6%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings  
8: Rosetta Street & Site

Total 10 Year Sensitivity 2  
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	0	73	119	22	17	0
Future Volume (vph)	0	73	119	22	17	0
Satd. Flow (prot)	1611	0	0	1788	1863	0
Fit Permitted				0.960		
Satd. Flow (perm)	1611	0	0	1788	1863	0
Lane Group Flow (vph)	79	0	0	153	18	0
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 32.3%			ICU Level of Service A			
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
8: Rosetta Street & Site

Total 10 Year Sensitivity 2  
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↑	↑	
Traffic Volume (veh/h)	0	73	119	22	17	0
Future Volume (Veh/h)	0	73	119	22	17	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	79	129	24	18	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	300	18	18			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	300	18	18			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	92			
cM capacity (veh/h)	636	1061	1599			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	79	153	18			
Volume Left	0	129	0			
Volume Right	79	0	0			
cSH	1061	1599	1700			
Volume to Capacity	0.07	0.08	0.01			
Queue Length 95th (m)	1.8	2.0	0.0			
Control Delay (s)	8.7	6.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	6.4	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			6.6			
Intersection Capacity Utilization		32.3%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
9: Site & Caroline Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	0	0	0	0	1	8
Future Volume (vph)	0	0	0	0	1	8
Satd. Flow (prot)	1863	0	0	1863	1627	0
Fit Permitted					0.995	
Satd. Flow (perm)	1863	0	0	1863	1627	0
Lane Group Flow (vph)	0	0	0	0	10	0
Sign Control	Free			Free	Stop	
<b>Intersection Summary</b>						
Control Type: Unsignalized						
Intersection Capacity Utilization 10.0%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis  
9: Site & Caroline Street

Total 10 Year Sensitivity 2  
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	0	0	0	0	1	8
Future Volume (Veh/h)	0	0	0	0	1	8
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	1	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			0	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0	0	0	
tC, single (s)			4.1	6.4	6.2	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	100	99	
cM capacity (veh/h)			1623	1023	1085	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	0	10			
Volume Left	0	0	1			
Volume Right	0	0	9			
cSH	1700	1700	1078			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	8.4			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			8.4			
Intersection Capacity Utilization			10.0%	ICU Level of Service	A	
Analysis Period (min)			15			

Queuing and Blocking Report

Total 10 Year Sensitivity 2  
PM Peak Hour

Intersection: 1: Mountainview Road N & River Drive

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	R	LT	TR
Maximum Queue (m)	91.1	166.1	200.1	48.5	35.4	37.7
Average Queue (m)	44.9	79.2	99.3	11.5	19.2	13.9
95th Queue (m)	82.5	156.4	179.3	34.3	32.9	29.8
Link Distance (m)	108.4	202.6	404.1	404.1	230.9	
Upstream Blk Time (%)	0	0				
Queuing Penalty (veh)	0	0				
Storage Bay Dist (m)					40.0	
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 2: Mountainview Road N & John Street

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	16.0	17.3	32.2	48.6	8.8	27.2
Average Queue (m)	9.3	8.5	13.4	19.8	1.7	16.0
95th Queue (m)	13.3	15.1	25.9	35.5	7.3	24.4
Link Distance (m)	84.3	165.0	230.9		166.6	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			30.0	40.0		
Storage Blk Time (%)			0	2		
Queuing Penalty (veh)			0	2		

Intersection: 3: River Drive & Daniella Street

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (m)	8.6	9.2
Average Queue (m)	0.4	1.8
95th Queue (m)	3.8	7.7
Link Distance (m)	162.0	120.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 10 Year Sensitivity 2  
PM Peak Hour

Intersection: 4: River Drive & Rosetta Street

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (m)	5.3	1.2	14.8
Average Queue (m)	0.2	0.0	9.2
95th Queue (m)	2.2	0.8	13.0
Link Distance (m)	38.5	162.0	29.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Victoria Street/River Drive & St Michaels Street

Movement	SB
Directions Served	LR
Maximum Queue (m)	15.2
Average Queue (m)	1.6
95th Queue (m)	7.7
Link Distance (m)	73.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Rosset Valley Court & John Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	10.4	9.6
Average Queue (m)	0.5	3.6
95th Queue (m)	4.2	10.0
Link Distance (m)	84.3	140.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Total 10 Year Sensitivity 2  
PM Peak Hour

Intersection: 7: Victoria Street & John Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	11.8	22.2	13.1	21.6
Average Queue (m)	6.8	12.1	7.3	11.5
95th Queue (m)	13.4	19.4	14.0	19.3
Link Distance (m)	139.7	457.2	109.0	96.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Rosetta Street & Site

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	20.4	5.3
Average Queue (m)	9.5	0.4
95th Queue (m)	16.6	3.7
Link Distance (m)	38.2	29.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 9: Site & Caroline Street

Movement	NB
Directions Served	LR
Maximum Queue (m)	8.8
Average Queue (m)	2.0
95th Queue (m)	8.1
Link Distance (m)	27.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

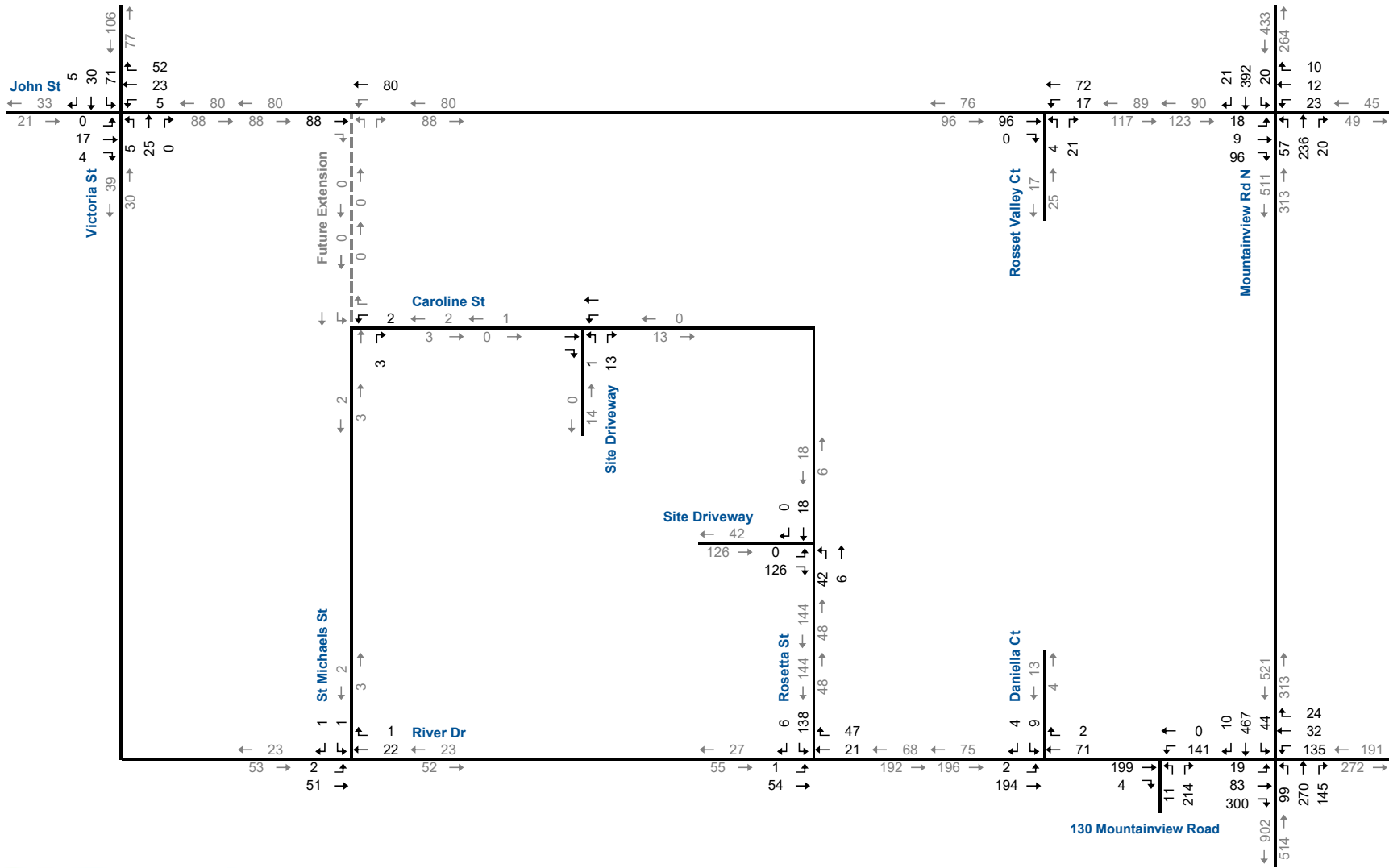
Network Summary

Network wide Queuing Penalty: 3
---------------------------------

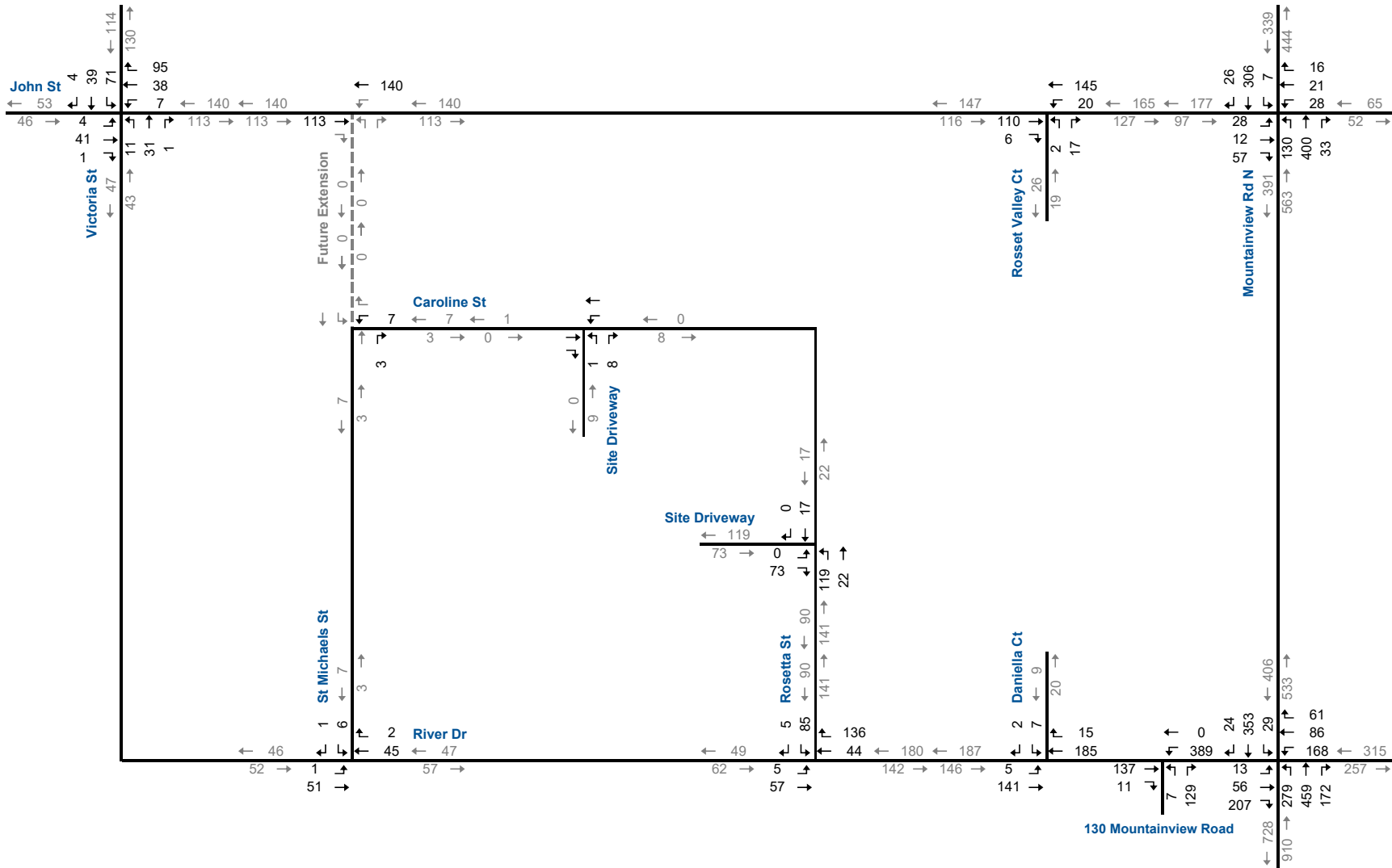
# Appendix L

## 130 Mountainview Road Development Traffic





## 2032 Total Traffic Volumes – Sensitivity Analysis With 130 Mountainview Drive - AM Peak Hour



## 2032 Total Traffic Volumes – Sensitivity Analysis With 130 Mountainview Drive - PM Peak Hour

# Appendix M

## Remedial Measures Synchro Operations Reports





Lanes, Volumes, Timings

Total 10 Year - Remedial Measures

1: Mountainview Road N & River Drive

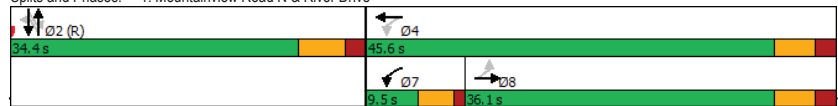
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔	↔	↔	↔	
Traffic Volume (vph)	8	38	142	135	16	24	44	270	145	44	467	6
Future Volume (vph)	8	38	142	135	16	24	44	270	145	44	467	6
Satd. Flow (prot)	0	1509	0	0	1362	0	1572	1792	1380	1703	1852	0
Fit Permitted		0.982			0.682		0.412		0.584			
Satd. Flow (perm)	0	1485	0	0	965	0	682	1792	1346	1043	1852	0
Satd. Flow (RTOR)		151			13				154		1	
Lane Group Flow (vph)	0	200	0	0	187	0	47	287	154	47	503	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		8		7	4			2			2	
Permitted Phases	8			4			2		2	2		
Total Split (s)	36.1	36.1		9.5	45.6		34.4	34.4	34.4	34.4	34.4	
Total Lost Time (s)		9.1			9.1		9.5	9.5	9.5	9.5	9.5	
Act Effct Green (s)		20.6			20.6		40.8	40.8	40.8	40.8	40.8	
Actuated g/C Ratio		0.26			0.26		0.51	0.51	0.51	0.51	0.51	
v/c Ratio		0.40			0.72		0.14	0.31	0.20	0.09	0.53	
Control Delay		8.2			39.2		15.9	15.3	3.9	14.7	18.8	
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		8.2			39.2		15.9	15.3	3.9	14.7	18.8	
LOS	A				D		B	B	A	B	B	
Approach Delay		8.2			39.2			11.7			18.4	
Approach LOS	A				D			B			B	
Queue Length 50th (m)		5.7			24.1		3.6	24.1	0.0	3.5	48.6	
Queue Length 95th (m)		16.6			36.7		12.7	53.7	11.3	11.9	#105.1	
Internal Link Dist (m)		103.8			188.6			388.3			220.6	
Turn Bay Length (m)								50.0		50.0		
Base Capacity (vph)		620			447		347	913	761	531	944	
Starvation Cap Reductn		0			0		0	0	0	0	0	
Spillback Cap Reductn		0			0		0	0	0	0	0	
Storage Cap Reductn		0			0		0	0	0	0	0	
Reduced v/c Ratio		0.32			0.42		0.14	0.31	0.20	0.09	0.53	

Intersection Summary

Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 17.4      Intersection LOS: B  
 Intersection Capacity Utilization 84.4%      ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Mountainview Road N & River Drive



Queues

Total 10 Year - Remedial Measures

1: Mountainview Road N & River Drive

AM Peak Hour

Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	200	187	47	287	154	47	503
v/c Ratio	0.40	0.72	0.14	0.31	0.20	0.09	0.53
Control Delay	8.2	39.2	15.9	15.3	3.9	14.7	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	39.2	15.9	15.3	3.9	14.7	18.8
Queue Length 50th (m)	5.7	24.1	3.6	24.1	0.0	3.5	48.6
Queue Length 95th (m)	16.6	36.7	12.7	53.7	11.3	11.9	#105.1
Internal Link Dist (m)	103.8	188.6		388.3			220.6
Turn Bay Length (m)			50.0			50.0	
Base Capacity (vph)	620	447	347	913	761	531	944
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.42	0.14	0.31	0.20	0.09	0.53

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
 1: Mountainview Road N & River Drive  
 Total 10 Year - Remedial Measures  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	8	38	142	135	16	24	44	270	145	44	467	6
Future Volume (vph)	8	38	142	135	16	24	44	270	145	44	467	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)	9.1			9.1			9.5	9.5	9.5	9.5	9.5	
Lane Util. Factor	1.00			1.00			1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00			1.00			1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00			1.00			1.00	1.00	1.00	1.00	1.00	
Frt	0.90	0.98			1.00			1.00	0.85	1.00	1.00	
Flt Protected	1.00	0.96			0.95			1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1509	1362			1572			1792	1346	1697	1853	
Flt Permitted	0.98	0.68			0.41			1.00	1.00	0.58	1.00	
Satd. Flow (perm)	1485	964			682			1792	1346	1043	1853	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	9	40	151	144	17	26	47	287	154	47	497	6
RTOR Reduction (vph)	0	112	0	0	10	0	0	0	75	0	0	0
Lane Group Flow (vph)	0	88	0	0	177	0	47	287	79	47	503	0
Confl. Peds. (#/hr)	5	5			5			4	4	4	4	
Heavy Vehicles (%)	0%	0%	17%	35%	40%	5%	11%	6%	17%	6%	2%	33%
Turn Type	Perm	NA	pm+pt		NA	Perm	NA	Perm	Perm	NA		
Protected Phases	8	7			4	2	2		2			
Permitted Phases	8	4			2		2		2			
Actuated Green, G (s)	23.6	23.6			43.8		43.8	43.8	43.8	43.8		
Effective Green, g (s)	20.6	20.6			40.8		40.8	40.8	40.8	40.8		
Actuated g/C Ratio	0.26	0.26			0.51		0.51	0.51	0.51	0.51		
Clearance Time (s)	6.1	6.1			6.5		6.5	6.5	6.5	6.5		
Vehicle Extension (s)	3.0	3.0			4.5		4.5	4.5	4.5	4.5		
Lane Grp Cap (vph)	382	248			347		913	686	531	945		
v/s Ratio Prot		c0.18			0.07		0.06	0.05	c0.27			
v/s Ratio Perm	0.06	0.72			0.14		0.31	0.11	0.09	0.53		
v/c Ratio	0.23	27.0			10.3		11.4	10.2	10.1	13.2		
Uniform Delay, d1	1.00	1.00			1.00		1.00	1.00	1.00	1.00		
Progression Factor	0.3	9.4			0.8		0.9	0.3	0.3	2.1		
Incremental Delay, d2	23.8	36.4			11.1		12.3	10.5	10.4	15.3		
Level of Service	C	D			B		B	B	B	B		
Approach Delay (s)	23.8	36.4			11.7					14.9		
Approach LOS	C	D			B					B		

**Intersection Summary**

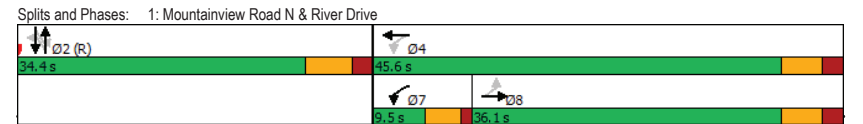
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	26.1
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings  
 1: Mountainview Road N & River Drive  
 Total 10 Year - Remedial Measures  
 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	6	29	112	168	42	61	125	459	172	29	353	13
Future Volume (vph)	6	29	112	168	42	61	125	459	172	29	353	13
Satd. Flow (prot)	0	1557	0	0	1682	0	1616	1827	1302	1805	1802	0
Flt Permitted		0.981			0.720		0.486			0.387		
Satd. Flow (perm)	0	1530	0	0	1248	0	825	1827	1261	732	1802	0
Satd. Flow (RTOR)		124			24		191		2			
Lane Group Flow (vph)	0	163	0	0	302	0	139	510	191	32	406	0
Turn Type	Perm	NA	pm+pt		NA	Perm	NA	Perm	Perm	NA		
Protected Phases	8	7			4	2		2				
Permitted Phases	8	4			2		2		2			
Total Split (s)	36.1	36.1	9.5		45.6	34.4	34.4	34.4	34.4	34.4	34.4	
Total Lost Time (s)	9.1			9.1			9.5	9.5	9.5	9.5	9.5	
Act Effct Green (s)	23.4			23.4			38.0	38.0	38.0	38.0	38.0	
Actuated g/C Ratio	0.29			0.29			0.48	0.48	0.48	0.48	0.48	
v/c Ratio	0.31			0.79			0.35	0.59	0.27	0.09	0.47	
Control Delay	7.0			37.9			19.9	21.8	4.1	16.5	18.9	
Queue Delay	0.0			0.0			0.0	0.0	0.0	0.0	0.0	
Total Delay	7.0			37.9			19.9	21.8	4.1	16.5	18.9	
LOS	A			D			B	C	A	B	B	
Approach Delay	7.0			37.9			17.5		18.7			
Approach LOS	A			D			B		B			
Queue Length 50th (m)	4.3			38.6			12.8	54.2	0.0	2.6	40.0	
Queue Length 95th (m)	14.0			54.7			33.8	#119.2	13.0	9.5	80.8	
Internal Link Dist (m)	103.8			188.6			388.3		220.6			
Turn Bay Length (m)				50.0			50.0					
Base Capacity (vph)	628			582			392	868	699	347	857	
Starvation Cap Reductn	0			0			0	0	0	0	0	
Spillover Cap Reductn	0			0			0	0	0	0	0	
Storage Cap Reductn	0			0			0	0	0	0	0	
Reduced v/c Ratio	0.26			0.52			0.35	0.59	0.27	0.09	0.47	

**Intersection Summary**

Cycle Length: 80  
 Actuated Cycle Length: 80  
 Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 20.4  
 Intersection Capacity Utilization 109.2%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.



Queues

Total 10 Year - Remedial Measures

1: Mountainview Road N & River Drive

PM Peak Hour

	→	←	↖	↑	↗	↘	↓
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	163	302	139	510	191	32	406
v/c Ratio	0.31	0.79	0.35	0.59	0.27	0.09	0.47
Control Delay	7.0	37.9	19.9	21.8	4.1	16.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	37.9	19.9	21.8	4.1	16.5	18.9
Queue Length 50th (m)	4.3	38.6	12.8	54.2	0.0	2.6	40.0
Queue Length 95th (m)	14.0	54.7	33.8	#119.2	13.0	9.5	80.8
Internal Link Dist (m)	103.8	188.6		388.3			220.6
Turn Bay Length (m)			50.0			50.0	
Base Capacity (vph)	628	582	392	868	699	347	857
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.52	0.35	0.59	0.27	0.09	0.47

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

Total 10 Year - Remedial Measures

1: Mountainview Road N & River Drive

PM Peak Hour

	↖	→	↘	↙	←	↖	↑	↗	↘	↓	↙	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↑	↗	↘	↙	
Traffic Volume (vph)	6	29	112	168	42	61	125	459	172	29	353	13
Future Volume (vph)	6	29	112	168	42	61	125	459	172	29	353	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.3	3.6	3.6	3.6	3.6	3.6
Total Lost time (s)		9.1			9.1		9.5	9.5	9.5	9.5	9.5	
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes		0.98			0.99		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	0.99	1.00	
Frt		0.90			0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected		1.00			0.97		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1557			1680		1613	1827	1261	1796	1802	
Flt Permitted		0.98			0.72		0.49	1.00	1.00	0.39	1.00	
Satd. Flow (perm)		1530			1248		825	1827	1261	731	1802	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	32	124	187	47	68	139	510	191	32	392	14
RTOR Reduction (vph)	0	88	0	0	17	0	0	0	100	0	1	0
Lane Group Flow (vph)	0	75	0	0	285	0	139	510	91	32	405	0
Confl. Peds. (#/hr)	13		1	1		13	2		9	9		2
Heavy Vehicles (%)	50%	0%	7%	8%	0%	2%	8%	4%	24%	0%	5%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		8		7	4			2			2	
Permitted Phases	8			4			2		2		2	
Actuated Green, G (s)		26.4			26.4		41.0	41.0	41.0	41.0	41.0	
Effective Green, g (s)		23.4			23.4		38.0	38.0	38.0	38.0	38.0	
Actuated g/C Ratio		0.29			0.29		0.48	0.48	0.48	0.48	0.48	
Clearance Time (s)		6.1			6.1		6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	
Lane Grp Cap (vph)		447			365		391	867	598	347	855	
v/s Ratio Prot								c0.28			0.22	
v/s Ratio Perm		0.05			c0.23		0.17		0.07	0.04		
v/c Ratio		0.17			0.78		0.36	0.59	0.15	0.09	0.47	
Uniform Delay, d1		21.1			25.9		13.3	15.3	11.9	11.5	14.2	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			10.4		2.5	2.9	0.5	0.5	1.9	
Delay (s)		21.2			36.3		15.8	18.2	12.4	12.1	16.1	
Level of Service		C			D		B	B	B	B	B	
Approach Delay (s)		21.2			36.3			16.5			15.8	
Approach LOS		C			D			B			B	

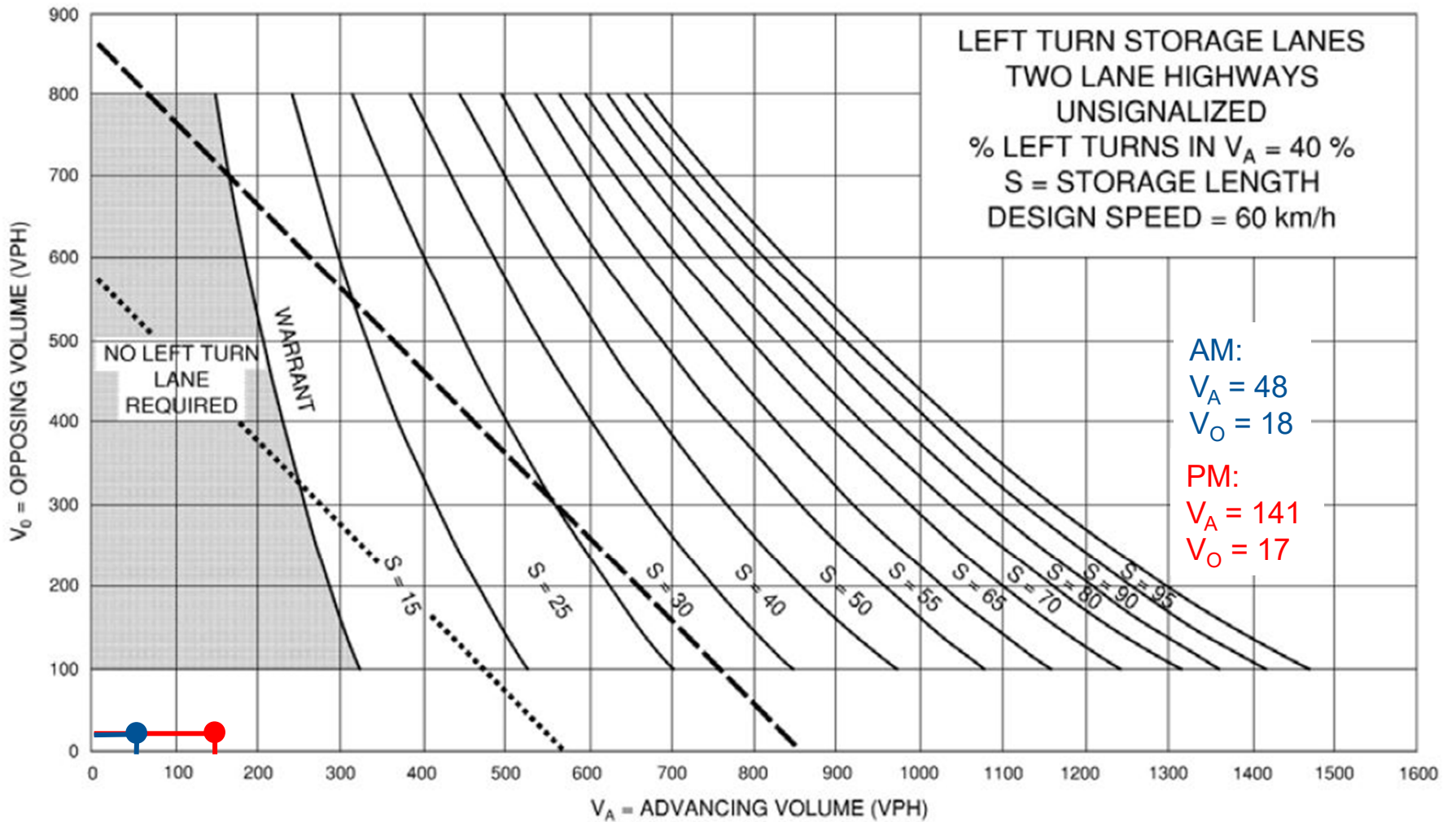
Intersection Summary

HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	26.1
Intersection Capacity Utilization	109.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

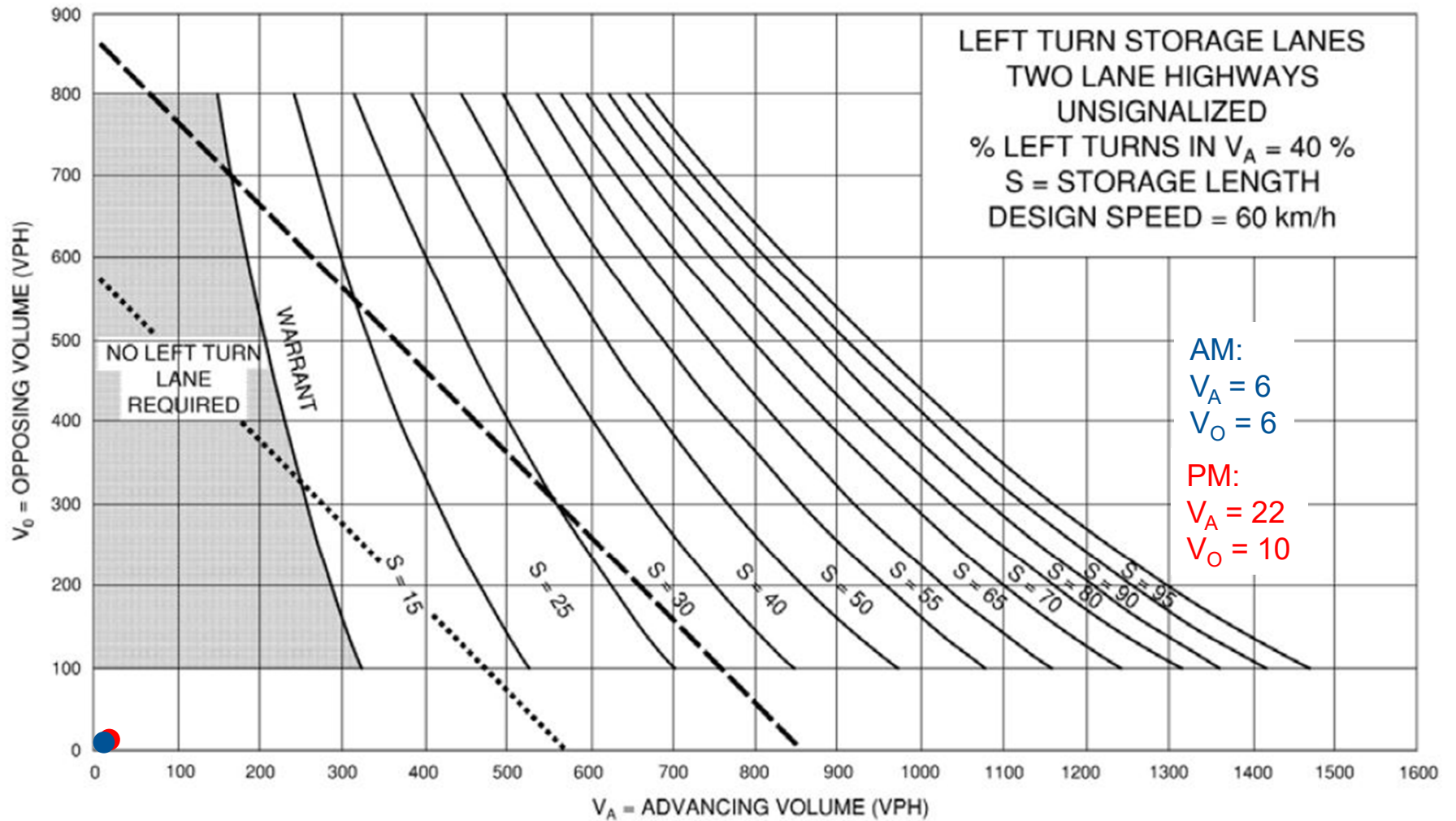
# Appendix N

## Left-Turn Lane Warrant Nomographs





## Rosetta Street Site Driveway Northbound Left-Turn Lane Warrant



## Caroline Street Site Driveway Northbound Left-Turn Lane Warrant

# Appendix O

## OTM Signal Justification



# Signal Justification Calculation for Existing Volumes (OTM Book 12 - Justification 7)



Horizon Year: 2033  
Region/City/Township: Town of Halton Hills

Major Street: Mountainview Road North/South: Y  
Minor Street: John Street

Number of Approach Lanes: 2 or more  
Tee Intersection? N  
Flow Conditions: Free  
  
PM Forecast Only? N

Warrant Results		
150% Satisfied	<b>No</b>	Justification for new intersections with forecast traffic
120% Satisfied	<b>No</b>	Justification for existing intersections with forecast traffic

Time Period	Major Street						Minor Street						Peds Crossing Main Road
	Mountainview Road						John Street						
	Northbound			Southbound			Eastbound			Westbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour	57	225	20	20	388	21	18	9	96	23	12	10	
PM Peak Hour	130	393	33	7	295	26	28	12	57	28	21	16	
<b>Average Hourly Volume</b>	<b>47</b>	<b>155</b>	<b>13</b>	<b>7</b>	<b>171</b>	<b>12</b>	<b>12</b>	<b>5</b>	<b>38</b>	<b>13</b>	<b>8</b>	<b>7</b>	<b>0</b>

## Warrant 1 - Minimum Vehicular Volume

Warrant	AHV
1A - All	486
1B - Minor	83
2A - Major	404
2B - Cross	33

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	All Approaches	480	720	600	900	
<b>% Fulfilled</b>						<b>81.0%</b>

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Minor Street Approaches	120	170	120	170	
<b>% Fulfilled</b>						<b>48.5%</b>

## Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Major Street Approaches	480	720	600	900	
<b>% Fulfilled</b>						<b>67.3%</b>

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Traffic Crossing Major Street	50	75	120	170	
<b>% Fulfilled</b>						<b>43.3%</b>



# Appendix P

## TTS Mode Share and Vehicle Ownership Data



Thu Mar 31 2022 13:07:06 GMT-0300 (Atlantic Daylight Time) - Run Time: 2377ms

Cross Tabulation Query Form - Trip - 2006,2011,2016 v1.1

Row: Planning district of household - pd\_hhld  
Column: Primary travel mode of trip - mode\_prime

RowG:(37)  
ColG:  
TblG:

Filters:  
No Filters

Trip 2006

ROW : pd\_hhld

COLUMN : mode\_prime

pd_hhld	mode_prime	total
1	B	291
1	C	371
1	D	87140
1	G	1000
1	J	309
1	O	86
1	P	16464
1	S	5377
1	T	262
1	W	4493

Trip 2011

ROW : pd\_hhld

COLUMN : mode\_prime

pd_hhld	mode_prime	total
1	B	573
1	C	342
1	D	99314
1	G	1520
1	J	448
1	M	124
1	O	133
1	P	17353
1	S	4080
1	T	220
1	W	4547

Trip 2016

ROW : pd\_hhld

COLUMN : mode\_prime

pd_hhld	mode_prime	total
1	B	422

1	C	1145
1	D	99378
1	G	998
1	J	524
1	M	33
1	O	367
1	P	18048
1	S	5204
1	T	366
1	U	18
1	W	4914

Thu Mar 31 2022 13:27:01 GMT-0300 (Atlantic Daylight Time) - Run Time: 4079ms

Cross Tabulation Query Form - Trip - 2006,2011,2016 v1.1

Row: 2006 GTA zone of household - gta06\_hhld  
Column: Primary travel mode of trip - mode\_prime

RowG: (7144,7145,7145,7146,4143,7134,7133,7136,7129,7128,4163,4166,4162,4194,4164,3463,3457,3456,3375,3482,3483,3431,8116,8115,8114,8113,8118,8121,4177,4197,4178,4176,4196)

ColG:

TblG:

Filters:  
No Filters

Trip 2006

ROW : gta06\_hhld

COLUMN : mode\_prime

gta06_hhld	mode_prime	total
1	B	146
1	D	3259
1	G	35
1	P	592
1	S	106
1	W	133

Trip 2011

ROW : gta06\_hhld

COLUMN : mode\_prime

gta06_hhld	mode_prime	total
1	B	65
1	D	2940
1	J	21
1	P	483
1	S	41
1	W	124

Trip 2016

ROW : gta06\_hhld

COLUMN : mode\_prime

gta06_hhld	mode_prime	total
1	B	291
1	D	4166
1	O	46
1	P	1023
1	S	217
1	W	177

Tue Mar 29 2022 13:24:48 GMT-0300 (Atlantic Daylight Time) - Run Time: 752ms

Cross Tabulation Query Form - Household - 2016 v1.1

Row: 2006 GTA zone of household - gta06\_hhld  
Column: No. of vehicles in household - n\_vehicle

RowG:(7144,7145,7145,7146,4143,7134,7133,7136,7129,7128,4163,4166,4162,4194,4164,3463,3457,3456,3375,3482,3483,3431,8116,8115,8114,8113,8118,8121,4177,4197,4178,4176,4196)  
ColG:  
TblG:

Filters:  
Type of dwelling unit - dwell\_type In 2,

Household 2016  
ROW : gta06\_hhld  
COLUMN : n\_vehicle

gta06_hhld	n_vehicle	total
1	0	170
1	1	257

# Appendix Q

## Parking Proxy Survey Data



Sunday Date

City	Address	Name	Type	Designation	Supply												Observed Maximum	Observed Time	Units	Maximum Observed Demand
					16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	1:00	2:00					
Branford	63-65 Sympatica Crescent	Lyden Park Towers	Resident / Tenant	232	74	77	78	79	85	94	100	101	104	106	107	11	0:00	168	0.64	
			Visitor	20	7	8	8	7	7	7	7	7	7	11	10	10	0	0:00	11	0.07
	9 Bonheur Court	lynden Manor	Resident / Tenant	252	81	85	86	86	92	101	109	111	115	116	117	128	118	0:00	144	0.89
			Visitor	75	112	117	122	121	124	123	126	127	128	128	128	128	141	21:00	144	0.89
Acton	192 Churchill Road South	The Winston	Resident / Tenant	202	121	135	130	131	135	136	137	138	136	135	135	141	141	0:00	22	1.14
			Visitor	40	16	17	17	21	22	24	25	24	24	24	24	24	24	23:00	22	1.14
	196 Churchill Road South	Churchill Court	Resident / Tenant	38	25	33	28	29	27	29	32	33	33	33	33	33	33	23:00	33	1.00
			Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0:00	0	0.00
Georgetown	200 Churchill Road South	The Valleyview	Resident / Tenant	50	30	41	33	38	25	40	42	40	40	40	40	40	42	22:00	36	1.17
			Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0:00	0	0.00
	21-35 Baylawn Crescent	N/A	Resident / Tenant	46	32	32	40	37	33	36	37	40	36	39	39	40	47	23:00	43	0.93
			Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0:00	0	0.00

Saturday, November 28, 2020

Sunday Date

City	Address	Name	Type	Designation	Supply												Observed Maximum	Observed Time	Units	Maximum Observed Demand	
					18:00	19:00	20:00	21:00	22:00	23:00	24:00	25:00	26:00	27:00	28:00	29:00					30:00
Orangeville	35 & 45 Bredin Parkway	N/A	Resident / Tenant	94	70	74	75	77	77	79	81	84	85	85	85	85	85	85	85	85	
			Visitor	31	14	10	10	10	10	9	8	8	7	6	6	6	6	6	6	6	
	16 4th Street	N/A	Resident / Tenant	72	40	40	38	39	40	39	38	40	39	38	39	40	40	40	40	40	40
			Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Saturday April 8, 2017

Sunday Date

City	Address	Name	Type	Designation	Supply												Observed Maximum	Observed Time	Units	Maximum Observed Demand	
					16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	0:00	1:00	2:00						
Branford	63-65 Sympatica Crescent	Lyden Park Towers	Resident / Tenant	232	67	80	86	96	103	108	111	110	114	114	114	114	114	0:00	168	0.68	
			Visitor	20	4	5	5	6	9	10	6	6	6	6	6	6	6	6	6	6	
	9 Bonheur Court	lynden Manor	Resident / Tenant	252	75	105	113	115	121	126	125	127	128	129	129	129	129	129	129	129	129
			Visitor	77	7	5	6	5	6	7	6	5	5	5	5	5	5	5	5	5	
Acton	192 Churchill Road South	The Winston	Resident / Tenant	40	15	19	22	22	23	21	23	23	23	23	23	23	23	23	23	23	23
			Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	196 Churchill Road South	Churchill Court	Resident / Tenant	38	28	25	32	32	36	36	37	37	37	37	37	37	37	37	37	37	37
			Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Georgetown	200 Churchill Road South	The Valleyview	Resident / Tenant	50	25	25	36	40	38	40	41	41	41	41	41	41	41	41	41	41	41
			Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21-35 Baylawn Crescent	N/A	Resident / Tenant	46	26	26	26	32	36	38	38	41	40	42	42	42	42	42	42	42	42
			Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Tuesday, December 1, 2020

Sunday Date

City	Address	Name	Type	Designation	Supply												Observed Maximum	Observed Time	Units	Maximum Observed Demand	
					18:00	19:00	20:00	21:00	22:00	23:00	24:00	25:00	26:00	27:00	28:00	29:00					30:00
Orangeville	35 & 45 Bredin Parkway	N/A	Resident / Tenant	94	73	77	78	78	79	79	80	84	83	83	83	84	84	86	86	86	
			Visitor	31	11	12	12	13	12	11	9	8	7	7	7	7	6	6	6	6	
	16 4th Street	N/A	Resident / Tenant	72	34	34	36	37	39	38	38	39	39	39	39	39	39	39	39	39	39
			Visitor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Friday April 7, 2017

## 16 Concord Place, Town of Grimsby

Aqua Zul - Parking Survey

Surveyor - Scott Catton

**Friday, 03 June 2022**

Area #	18:00	19:00	20:00	21:00	22:00	23:00	00:00	01:00
At Grade #1-2	16	14	16	15	15	18	24	20
At Grade #3	1	4	4	5	5	4	4	4
At Grade #4-5	16	12	12	13	9	12	12	12
At Grade #7	23	20	26	27	26	31	31	31
At Grade #8-9	27	36	34	37	38	41	37	37
U/G	123	147	158	170	185	198	211	216
Illegal	0	0	0	0	3	0	0	0
Aqua Blu (off site)	14	14	18	19	20	21	23	23

Aqua Zul	18:00	19:00	20:00	21:00	22:00	23:00	00:00	01:00
Visitor	59	62	62	65	65	71	73	69
Occupant	147	171	188	202	216	233	246	251
<b>Sum</b>	<b>206</b>	<b>233</b>	<b>250</b>	<b>267</b>	<b>281</b>	<b>304</b>	<b>319</b>	<b>320</b>
Overall Ratio	0.60	0.68	0.73	0.78	0.82	0.89	0.93	0.94
Visitor Ratio	0.17	0.18	0.18	0.19	0.19	0.21	0.21	0.20
Occupant Ratio	0.43	0.50	0.55	0.59	0.63	0.68	0.72	0.73

### Notes

- \*Areas 1 & 2 merged for counting purposes. All visitor parking
- \*Area 3 is not signed visitor parking = assume occupant
- \*Areas 4 & 5 merged for counting purposes. All visitor parking
- \*Area 6 does not exist
- \*Area 7 is not signed visitor parking = assume occupant
- \*Areas 8 & 9 merged for counting purposes. All visitor parking

### Observations

- \*On-demand transit service in use. Noticed 3 times
- \*pick-up/drop-off activity high around 18:00 (uber eats)
- \*some spaces in u/g have a car + motorcycle. Counted as 2
- \*Aqua Blu (off site) parking used by persons going to Aqua Zul, pick-up/drop-off, and Aqua Blu.
- \*one at grade space in #8 used by boat
- \*one at grade space in #8 used by large commercial truck
- \*sky jack on edge of site not counted
- \*Resident commented on occupants using at grade parking
- \*3 illegal parked trucks in fire route at front of site. Appear to be work trucks
- \*DeSantis truck parked in U/G



**16 Concord Place, Town of Grimsby**

Aqua Zul - Parking Survey

Surveyor - Scott Catton

**Saturday, 04 June 2022**

Area #	18:00	19:00	20:00	21:00	22:00	23:00	00:00	01:00
At Grade #1-2	17	15	16	16	17	17	20	20
At Grade #3	6	5	5	6	6	5	5	5
At Grade #4-5	12	13	13	13	10	12	13	13
At Grade #7	29	25	28	31	25	25	27	29
At Grade #8-9	40	37	39	45	39	37	42	40
U/G	142	142	147	156	163	179	191	197
Illegal	0	0	0	0	0	0	0	0
Aqua Blu (off site)	18	24	21	21	26	26	27	27

Aqua Zul	18:00	19:00	20:00	21:00	22:00	23:00	00:00	01:00
Visitor	69	65	68	74	66	66	75	73
Occupant	177	172	180	193	194	209	223	231
Sum	246	237	248	267	260	275	298	304
Overall Ratio	0.72	0.69	0.73	0.78	0.76	0.80	0.87	0.89
Visitor Ratio	0.20	0.19	0.20	0.22	0.19	0.19	0.22	0.21
Occupant Ratio	0.52	0.50	0.53	0.56	0.57	0.61	0.65	0.68

**Notes**

- Areas 1 & 2 merged for counting purposes. All visitor parking
- Area 3 is not signed visitor parking = assume occupant
- Areas 4 & 5 merged for counting purposes. All visitor parking
- Area 6 does not exist
- Area 7 is not signed visitor parking = assume occupant
- Areas 8 & 9 merged for counting purposes. All visitor parking

**Observations**

- \*some spaces in u/g have a car + motorcycle. Counted as 2
- \*Aqua Blu (off site) parking used by persons going to Aqua Zul, pick-up/drop-off, and Aqua Blu.
- \*one at grade space in #8 used by boat
- \*one at grade space in #8 used by large commercial truck
- \*sky jack on edge of site not counted
- \*DeSantis truck parked in U/G

**Parking Survey**  
**Sapphire Condominium**  
**101 & 125 Shoreview Place, Hamilton ON**  
**(456 Residential Units)**

Date	Occupant	Visitor	Overall
Thursday, 12 May 2022	0.75	0.19	0.94
Friday, 13 May 2022	0.65	0.20	0.85
Saturday, 14 May 2022	0.68	0.20	0.88
<b>Peak</b>	<b>0.75</b>	<b>0.20</b>	<b>0.95</b>

**Occupant Parking + On-Street – Buffer Calculations**

Date	Occupant + On-Street	20% Buffer	w Buffer
Thursday, 12 May 2022	0.85	0.17	1.02
Friday, 13 May 2022	0.75	0.15	0.90
Saturday, 14 May 2022	0.78	0.16	0.94
<b>Peak</b>	<b>0.85</b>	<b>0.17</b>	<b>1.02</b>

Parking Survey  
Sapphire Condominium  
101 & 125 Shoreview Place, Hamilton ON  
(456 Residential Units)

Time	Thursday, 12 May 2022								Friday, 13 May 2022								Saturday, 14 May 2022							
	Parked Vehicles				Ratio				Parked Vehicles				Ratio				Parked Vehicles				Ratio			
	Occupant	Visitor	On-Street	Overall	Occupant	Visitor	On-Street	Overall	Occupant	Visitor	On-Street	Overall	Occupant	Visitor	On-Street	Overall	Occupant	Visitor	On-Street	Overall	Occupant	Visitor	On-Street	Overall
5:00 PM	199	58	46	303	0.44	0.13	0.10	0.66	179	53	46	278	0.39	0.12	0.10	0.61	206	91	46	343	0.45	0.20	0.10	0.75
5:15 PM	204	62	46	312	0.45	0.14	0.10	0.68	180	56	46	282	0.39	0.12	0.10	0.62	204	87	46	337	0.45	0.19	0.10	0.74
5:30 PM	208	61	46	315	0.46	0.13	0.10	0.69	192	62	46	300	0.42	0.14	0.10	0.66	207	77	46	330	0.45	0.17	0.10	0.72
5:45 PM	218	63	46	327	0.48	0.14	0.10	0.72	195	56	46	297	0.43	0.12	0.10	0.65	213	79	46	338	0.47	0.17	0.10	0.74
6:00 PM	220	62	46	328	0.48	0.14	0.10	0.72	194	64	46	304	0.43	0.14	0.10	0.67	219	75	46	340	0.48	0.16	0.10	0.75
6:15 PM	227	63	46	336	0.50	0.14	0.10	0.74	200	65	46	311	0.44	0.14	0.10	0.68	218	74	46	338	0.48	0.16	0.10	0.74
6:30 PM	232	61	46	339	0.51	0.13	0.10	0.74	200	65	46	311	0.44	0.14	0.10	0.68	222	72	46	340	0.49	0.16	0.10	0.75
6:45 PM	239	60	46	345	0.52	0.13	0.10	0.76	209	67	46	322	0.46	0.15	0.10	0.71	223	75	46	344	0.49	0.16	0.10	0.75
7:00 PM	248	60	46	354	0.54	0.13	0.10	0.78	207	66	46	319	0.45	0.14	0.10	0.70	226	71	46	343	0.50	0.16	0.10	0.75
7:15 PM	258	63	46	367	0.57	0.14	0.10	0.80	212	64	46	322	0.46	0.14	0.10	0.71	229	72	46	347	0.50	0.16	0.10	0.76
7:30 PM	263	69	46	378	0.58	0.15	0.10	0.83	212	65	46	323	0.46	0.14	0.10	0.71	232	76	46	354	0.51	0.17	0.10	0.78
7:45 PM	273	70	46	389	0.60	0.15	0.10	0.85	215	67	46	328	0.47	0.15	0.10	0.72	235	77	46	358	0.52	0.17	0.10	0.79
8:00 PM	284	67	46	397	0.62	0.15	0.10	0.87	217	72	46	335	0.48	0.16	0.10	0.73	241	81	46	368	0.53	0.18	0.10	0.81
8:15 PM	287	65	46	398	0.63	0.14	0.10	0.87	229	76	46	351	0.50	0.17	0.10	0.77	245	79	46	370	0.54	0.17	0.10	0.81
8:30 PM	292	64	46	402	0.64	0.14	0.10	0.88	234	78	46	358	0.51	0.17	0.10	0.79	252	76	46	374	0.55	0.17	0.10	0.82
8:45 PM	303	67	46	416	0.66	0.15	0.10	0.91	243	79	46	368	0.53	0.17	0.10	0.81	256	80	46	382	0.56	0.18	0.10	0.84
9:00 PM	308	70	46	424	0.68	0.15	0.10	0.93	247	84	46	377	0.54	0.18	0.10	0.83	258	76	46	380	0.57	0.17	0.10	0.83
9:15 PM	313	72	46	431	0.69	0.16	0.10	0.95	259	85	46	390	0.57	0.19	0.10	0.86	264	78	46	388	0.58	0.17	0.10	0.85
9:30 PM	318	74	46	438	0.70	0.16	0.10	0.96	266	86	46	398	0.58	0.19	0.10	0.87	268	80	46	394	0.59	0.18	0.10	0.86
9:45 PM	326	74	46	446	0.71	0.16	0.10	0.98	269	82	46	397	0.59	0.18	0.10	0.87	273	78	46	397	0.60	0.17	0.10	0.87
10:00 PM	328	75	46	449	0.72	0.16	0.10	0.98	273	85	46	404	0.60	0.19	0.10	0.89	274	82	46	402	0.60	0.18	0.10	0.88
10:15 PM	332	76	46	454	0.73	0.17	0.10	1.00	278	87	46	411	0.61	0.19	0.10	0.90	282	85	46	413	0.62	0.19	0.10	0.91
10:30 PM	332	78	46	456	0.73	0.17	0.10	1.00	284	89	46	419	0.62	0.20	0.10	0.92	287	88	46	421	0.63	0.19	0.10	0.92
10:45 PM	334	77	46	457	0.73	0.17	0.10	1.00	287	91	46	424	0.63	0.20	0.10	0.93	296	81	46	423	0.65	0.18	0.10	0.93
11:00 PM	334	82	46	462	0.73	0.18	0.10	1.01	290	91	46	427	0.64	0.20	0.10	0.94	299	79	46	424	0.66	0.17	0.10	0.93
11:15 PM	341	85	46	472	0.75	0.19	0.10	1.04	293	87	46	426	0.64	0.19	0.10	0.93	302	78	46	426	0.66	0.17	0.10	0.93
11:30 PM	341	84	46	471	0.75	0.18	0.10	1.03	297	88	46	431	0.65	0.19	0.10	0.95	305	75	46	426	0.67	0.16	0.10	0.93
11:45 PM	343	88	46	477	0.75	0.19	0.10	1.05	296	88	46	430	0.65	0.19	0.10	0.94	309	76	46	431	0.68	0.17	0.10	0.95
<b>Peak</b>	<b>343</b>	<b>88</b>	<b>46</b>	<b>477</b>	<b>0.75</b>	<b>0.19</b>	<b>0.10</b>	<b>1.05</b>	<b>297</b>	<b>91</b>	<b>46</b>	<b>431</b>	<b>0.65</b>	<b>0.20</b>	<b>0.10</b>	<b>0.95</b>	<b>309</b>	<b>91</b>	<b>46</b>	<b>431</b>	<b>0.68</b>	<b>0.20</b>	<b>0.10</b>	<b>0.95</b>

115 John Street, Georgetown

Time		Surface Lot						Underground Lot	
		Tuesday			Saturday			Tuesday	Saturday
Tuesday	Saturday	Visitors (Supply 6 Spaces)	Accessible (Supply 2 Spaces)	Resident (Supply 44 Spaces)	Visitors (Supply 6 Spaces)	Accessible (Supply 2 Spaces)	Resident (Supply 44 Spaces)	Resident (Supply 23 Spaces)	
7:00	9:00	4	2	30	4	2	33	14	19
7:15	9:15	4	2	29	4	2	32	13	19
7:30	9:30	4	2	27	4	2	30	13	18
7:45	9:45	4	2	26	4	2	28	13	17
8:00	10:00	4	2	26	4	2	28	13	16
8:15	10:15	4	1	27	4	2	31	12	15
8:30	10:30	4	1	25	3	2	31	13	15
8:45	10:45	5	1	23	3	2	31	11	15
9:00	11:00	5	1	22	4	2	30	11	15
9:15	11:15	5	1	22	4	2	30	11	15
9:30	11:30	5	1	22	4	2	28	7	14
9:45	11:45	4	1	22	4	2	28	7	13
10:00	12:00	4	1	22	3	2	27	7	13
12:00	12:15	4	1	15	3	2	25	7	12
12:15	12:30	4	1	15	4	2	25	7	11
12:30	12:45	4	1	14	4	2	26	6	12
12:45	13:00	4	1	14	4	2	25	6	11
13:00	13:15	4	1	14	4	2	27	6	11
13:15	13:30	4	1	16	4	2	30	6	11
13:30	13:45	4	1	15	4	2	31	6	11
13:45	14:00	4	1	14	4	2	31	9	12
14:00	16:00	4	1	15	4	2	30	10	12
16:00	16:15	4	1	19	4	2	30	10	12
16:15	16:30	4	1	19	4	2	30	11	12
16:30	16:45	4	1	19	4	2	32	13	12
16:45	17:00	4	1	23	4	2	31	13	13
17:00	17:15	4	1	25	4	2	31	13	13
17:15	17:30	4	1	28	4	2	31	13	13
17:30	17:45	5	2	28	4	2	31	13	14
17:45	18:00	5	2	27	4	2	30	15	14
18:00	18:15	5	2	28	4	2	31	15	14
18:15	18:30	6	2	26	4	2	30	14	14
18:30	18:45	6	2	26	4	2	31	13	15
18:45	19:00	6	2	27	4	2	30	17	15
19:00	21:00	6	2	28	4	2	29	17	15
21:00	21:15	5	2	27	4	1	30	16	15
21:15	21:30	5	2	27	5	1	31	17	16
21:30	21:45	5	2	27	5	1	30	17	16
21:45	22:00	5	2	28	5	1	30	18	16
22:00	22:15	5	2	28	5	1	31	18	16
22:15	22:30	5	2	29	5	1	31	18	16
22:30	22:45	5	2	29	5	1	32	18	16
22:45	23:00	5	2	30	5	1	32	18	16
23:00		5	2	30				18	

# Appendix R

## Region of Waterloo TDM Checklist





# Parking Management Worksheet

Version 9/18/2013

Case Study: 210781 Site Context: Georgetown GO Station  
 Date: May 2023 Reduction Worksheet No: 1

"Urban Growth Centres - (UGC) area classification includes the Downtown / Uptown and RT Station Areas of Kitchener, Waterloo and Cambridge.  
 "Intensification Corridor" (IC) classification is applied to sites within 800 metres of the future CTC line  
 "Other" classification applies to all other sites

Please highlight the cell percentages applicable to your development under the appropriate classification. Please note that the Parking Management Worksheet and the Transportation Demand Management (TDM) Checklist are not designed for residential properties, but can be used for mixed-use developments. Local municipalities are the decision-making bodies with respect to consideration of parking reductions below Zoning By-law requirements.

TABLE A Pedestrian and Cyclist Orientation				
In creating an environment that supports pedestrian and cycling activity, the public realm must be accessible, safe, and comfortable to encourage movement on the street and in the surrounding area(s). These facilities and features should encourage walking and cycling.				
	Features	UGC	IC	Other
A1	Development incorporates functional building entrances that are oriented to public space or to locations where pedestrians and transit users arrive from such as a street, square, park or plaza.	1%	1%	1%
A2	Continuous sidewalks (1.5m min. width) are provided along both sides of all adjacent public streets and pedestrian walkways (1.5m min width) are provided through large parking areas to link the building with the public street sidewalk system	0%	0%	1%
A3	Non-Residential: Development provides secure bike storage for 4% of the building occupants	2%	2%	1%
A4	Shower and change facilities provided on-site consistent with LEED requirements.	1%	1%	1%
A5	Provision of active uses at-grade along street frontages.	1%	1%	1%
<b>Category Maximum</b>		<b>4%</b>	<b>4%</b>	<b>4%</b>
<b>Available Parking Reduction</b>			<b>1%</b>	

TABLE B Public Transportation Access				
The availability and proximity of convenient public transit service with direct pedestrian linkages to the building will provide viable travel options for employees, visitors and residents.				
	Features	UGC	IC	Other
B1	Bus shelters with seating are provided at the transit stop immediately adjacent to the development, in consultation with Transportation Planning at the Region of Waterloo	0%	0%	1%
B2	Information regarding public transit routes, schedules and fares are provided in an accessible and visible location on site and in adjacent bus stops	0%	0%	1%
B3a	Located in an UGC or within 800 m of a future Rapid Transit Station	24%	12%	0%
B3b	Located within 600m a transit route with 15 minute headways (or less) or is located in a designated mixed use corridor or node. <b>Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.</b>	-	-	3%
B3c	Located within 400 metres of a bus service with headways of 15 min to 30 min. <b>Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.</b>	-	-	1%
<b>Category Maximum</b>		<b>24%</b>	<b>12%</b>	<b>5%</b>
<b>Available Parking Reduction</b>			<b>0%</b>	

TABLE C Parking				
Vehicle parking facilities can affect the character, travel mode and cost of a development. Reducing parking supply to match expected demand can have a positive influence on the selection of alternative travel modes.				
	Features	UGC	IC	Other
C1	Provides priority parking for carpooling/vanpooling participants equivalent to 5% of employee spaces	0%	0%	5%
C2	Commercial Uses: Provide car-share spaces equivalent to 2% of building occupants	2%	2%	0%
C3	Implements paid parking system on all or part of the site (e.g. parking permits, paid parking zones near main entrances)	2%	2%	1%
C4	Parking is not located on major street frontage.	0%	0%	1%
C5	25% to 50% of parking is located underground or in a structure	2%	1%	0%
C6	50% to 75% of parking is located underground or in a structure	4%	2%	0%
C7	75% of parking or more is located underground or in a structure	5%	3%	0%
<b>Category Maximum</b>		<b>6%</b>	<b>4%</b>	<b>6%</b>
<b>Available Parking Reduction</b>			<b>3%</b>	



Case Study: 210781 Site Context: Georgetown GO Station  
 Date: May 2023 Worksheet No: 1

TABLE D Trip Reduction Incentives				
A formal TDM plan will identify specific initiatives that will be initiated in order to encourage reduced single occupant vehicle travel.				
	Features	UGC	IC	Other
D1	The building owner/occupant will provide a ride matching service for car/vanpooling	0%	0%	1%
D2	The building owner/occupant will provide emergency ride home options	3%	2%	1%
D3	The building owner/occupant will provide subsidized transit passes for all occupants for a period of two years	10%	4%	2%
D4	The building owner/occupant agrees to charge for parking as a separate cost to occupants	10%	5%	2%
D5	The building owner/occupant agrees to provide reduced cost for users of car/van pool, bicycle, moped/motorcycle spaces	0%	0%	1%
D6	The development agrees to join Travelwise (TMA) that provides the same services outlined under items D1 and D2	9%	6%	4%
<b>Category Maximum</b>		<b>23%</b>	<b>11%</b>	<b>7%</b>
<b>Available Parking Reduction</b>			<b>9%</b>	

TABLE E Parking Reduction Summary					
Please indicate the total reduction available based upon Tables A through D above.					
Category	Reduction Achieved	Maximum Achievable Reduction			Comments
		UGC	IC	Other	
Pedestrian & Cyclist Orientation	1%	4%	4%	4%	
Public Transit Access	0%	24%	12%	5%	
Parking	3%	6%	4%	6%	
Trip Reduction Incentives	9%	23%	11%	7%	
<b>TOTAL</b>	<b>13%</b>	<b>57%</b>	<b>31%</b>	<b>22%</b>	

TABLE F	TOTAL REDUCTION ACHIEVED	13%
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