644 Garrison Road (Phase 2), Fort Erie, ON
Transportation Impact Study

Paradigm Transportation Solutions Limited

December 2022
220819

ptsl.com

Project Summary

Project Number
220819

Date: December 2022
Version 1.0.0

644 Garrison Road (Phase 2), Fort Erie, ON Transportation Impact Study

Client
Antech Group
25 King Street, Suite 200
Brantford, ON N3T 3C4

Client Contact
Candice Micucci, MCIP, RPP

Consultant Project Team
Stew Elkins, B.E.S.
Adam J. Makarewicz, C.E.T.
Andrew Evans
Erica Bayley, P.Eng.

Erica Bayley, P.Eng.

Disclaimer

This document has been prepared for the titled project or named part thereof (the “project”) and except for approval and commenting municipalities and agencies in their review and approval of this project, should not be relied upon or used for any other project without an independent check being carried out as to its suitability and prior written authorization of Paradigm Transportation Solutions Limited being obtained. Paradigm Transportation Solutions Limited accepts no responsibility or liability for the consequence of this document being used for a purpose other than the project for which it was commissioned. Any person using or relying on the document for such other purpose agrees and will by such use or reliance be taken to confirm their agreement to indemnify Paradigm Transportation Solutions Limited for all loss or damage resulting there from. Paradigm Transportation Solutions Limited accepts no responsibility or liability for this document to any party other than the person by whom it was commissioned and the approval and commenting municipalities and agencies for the project.

To the extent that this report is based on information supplied by other parties, Paradigm Transportation Solutions Limited accepts no liability for any loss or damage suffered by the client, whether through contract or tort, stemming from any conclusions based on data supplied by parties other than Paradigm Transportation Solutions Limited and used by Paradigm Transportation Solutions Limited in preparing this report.

Copyright Notice

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road
Cambridge ON N1R 8J8
p: 519.896.3163
    905.381.2229
    416.479.9684
www.ptsl.com

Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study (TIS) in support of Phase 2 of the 644 Garrison Road development that proposes a multi-family building. For context, phase 1 of the development lands included three (3) fast-food restaurants with a total Gross Floor Area (GFA) of 5,800 square feet.

This Transportation Impact Study (TIS) includes an analysis of existing traffic conditions, a description of the proposed development, traffic forecasts for five-year horizon from full build-out (Year 2028), and any recommendations required to maintain or improve future traffic conditions based on the impact of the site-generated traffic volumes.

Development Concept

The development proposal includes a six-storey residential building with 190 units. External access is supported through the previous access arrangement developed for phase 1 that consists of; all-turns driveways to Garrison Road and Sims Avenue with additional points of access are proposed by the adjacent commercial development west of the subject site.

Conclusions

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

- **Existing Traffic Operations:** The study area intersections are currently operating at acceptable levels of service with no critical movements during the AM and PM peak hours.
- **Site Generated Traffic:** The development is forecast to generate 127 trips during the AM peak hour and 84 trips during the PM peak hour.
- **2028 Background Traffic Operations:** The study area intersections are forecast to operate at acceptable levels of service with no critical movements during the AM and PM peak hours under 2028 background traffic conditions.
- **Total Traffic Operations:** The study area intersections are forecast to operate at acceptable levels of service with no critical movements during the AM and PM peak hours under 2028 future total traffic conditions.

- The new proposed all-turns site driveway onto Garrison Road is expected to operate with an acceptable level of service and well below capacity in both the AM and PM peak hours with a shared left/right turn lane outbound and one (1) inbound lane.
- The new proposed all-turns site driveway onto Sims Avenue is expected to operate with an acceptable level of service and well below capacity in both the AM and PM peak hours with a shared left/right turn lane outbound and one (1) inbound lane.
- The analysis indicates the development of the subject site is forecast to have a negligible impact on traffic operations in the study area.
- **Queue Reach:** The forecasted queue reach from the southbound and westbound movements at the Garrison Road and Thompson Road/Helena Street intersection are not expected to impact existing commercial driveway on Thompson Road and the proposed site driveway onto Garrison Road.

Recommendations

Based on the findings of this study, it is found that no remedial measures are required at the study area intersections to accommodate the increase in traffic generated by the proposed development.

Contents

Appendices

Figures

Tables

1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study (TIS) in support of Phase 2 of the 644 Garrison Road development that proposes a multi-family building with 190 residential units. For context, phase 1 of the development lands included three (3) fast-food restaurants with a total Gross Floor Area (GFA) of 5,800 square feet. A TIS was prepared for this development in May 2019[1] that outlined the existing transportation network is sufficient to support this proposal.

Phase 2 is proposed to have internal connections to phase 1 with no new connections to the external roadway network. External access is supported through the previous access arrangement developed for phase 1 that consists of; all-turns driveways to Garrison Road and Sims Avenue with additional points of access are proposed by the adjacent commercial development west of the subject site.

Figure 1.1 details the location of the subject site.

This study analyzes the road network under existing traffic conditions (2021), and a five-year horizon from full build-out (2028). The municipal roadway intersections assessed in this study include:

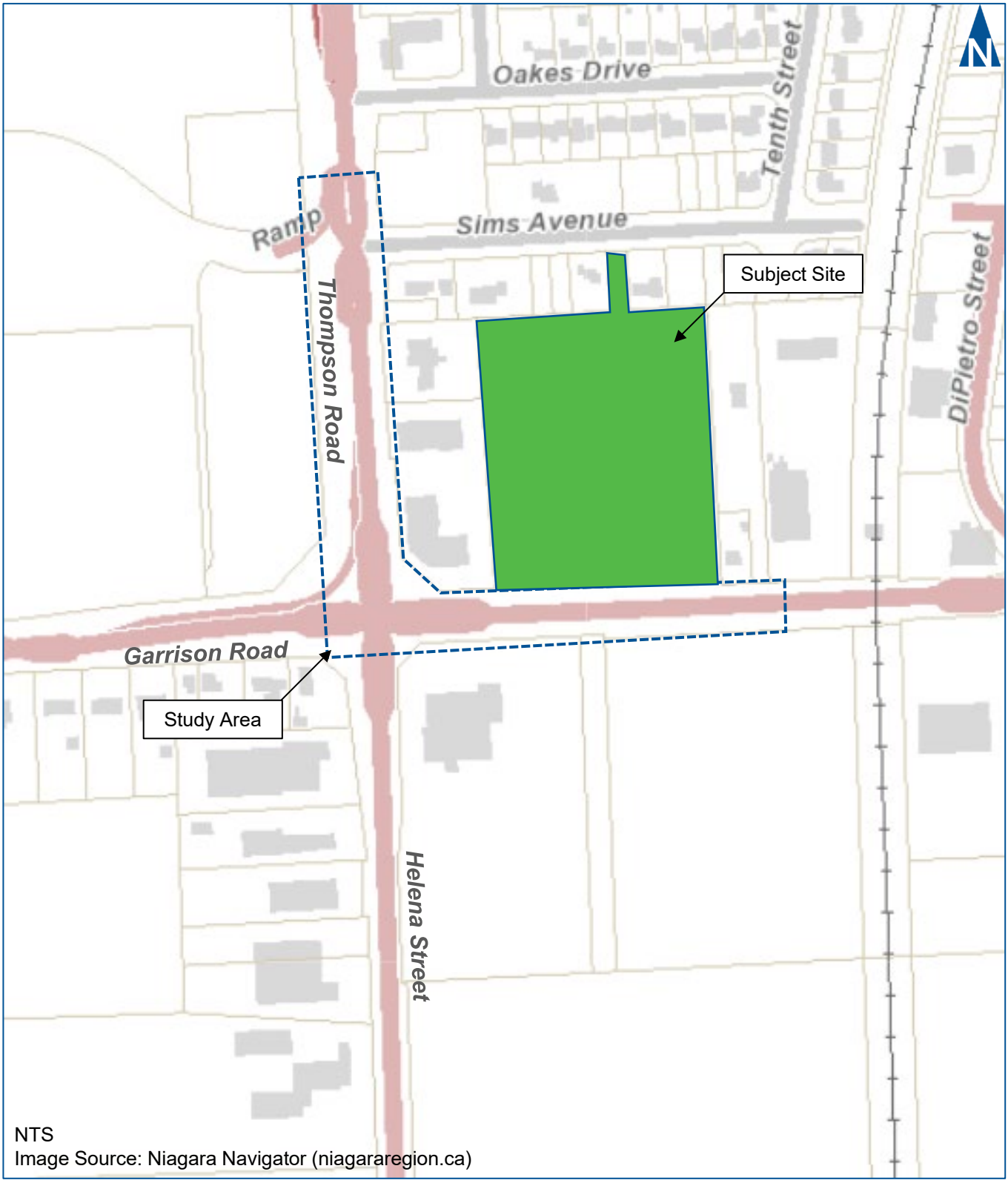
- Garrison Road at Thompson Road / Helena Street
- Thompson Road at Sims Avenue
- Thompson Road at adjacent Commercial Driveway
- Garrison Road at adjacent Commercial Driveway; and
- The site driveway connection to Garrison Road.

Based on a review of the anticipated trip generation and trip distribution for the proposed development, a study area and the parameters of the study was established through feedback received from Niagara Region. The scope and intent of this study is to:

- Assess the impacts (if any) of the site generated traffic on the surrounding road network; and

[1] Paradigm Transportation Solutions Limited, *644 Garrison Road, Fort Erie, Transportation Impact Study,* (PTSL May 2019).

- Make recommendations regarding any necessary remedial measures required to accommodate the increase in traffic in a satisfactory manner.



NTS
Image Source: Niagara Navigator (niagararegion.ca)

paradigm TRANSPORTATION SOLUTIONS LIMITED

Study Area & Subject Site Location

644 Garrison Road, Fort Erie TIS
220819

Figure 1.1

2 Existing Conditions

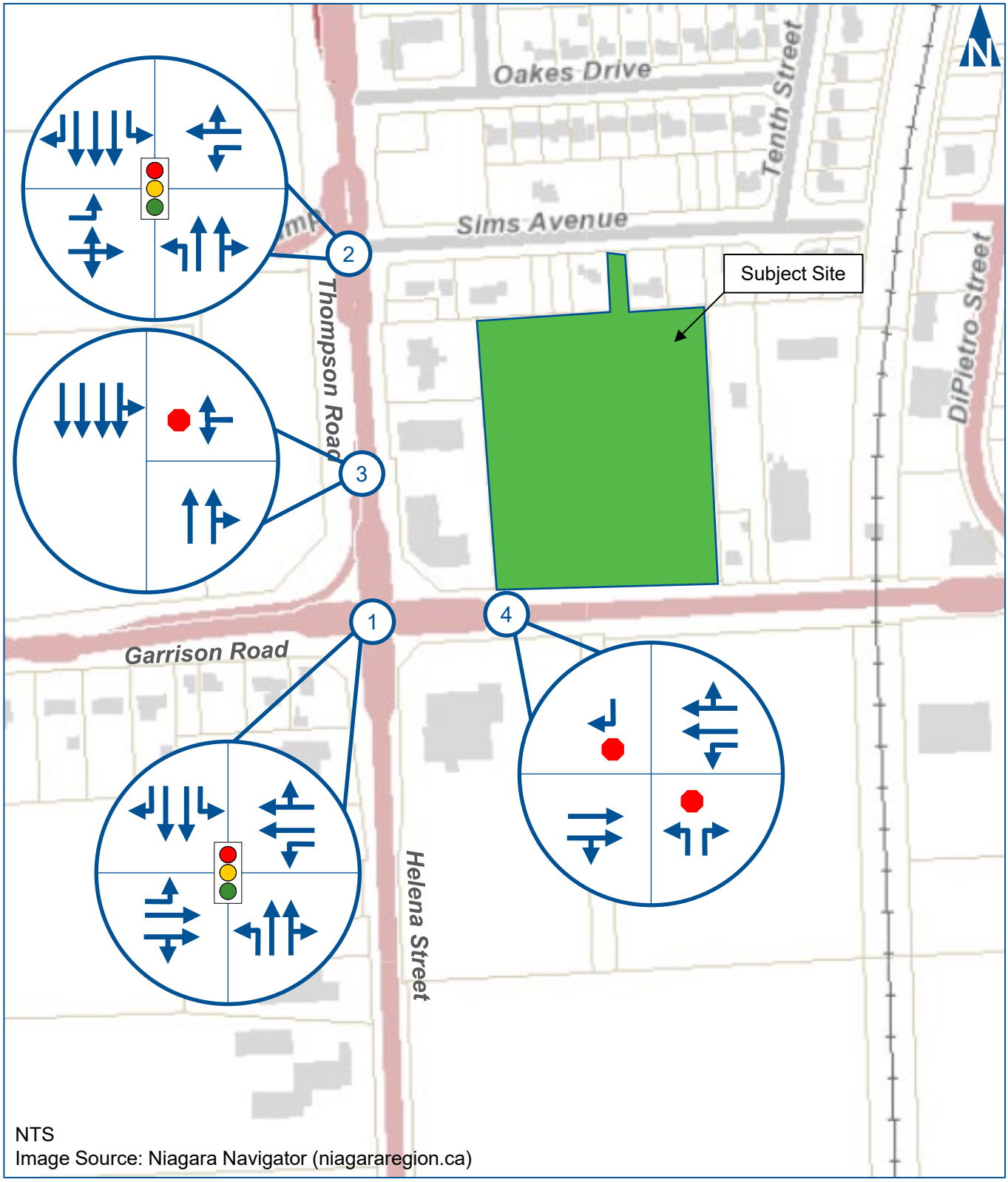
2.1 Road Characteristics

Garrison Road (Regional Road 3) and Thompson Road (Regional Road 122) are the roadways that will be directly impacted by the proposed development. he characteristics of these roadways are as follows:

- **Garrison Road** is an east-west arterial roadway with a four-lane to five-lane cross-section within the study area. The roadway has a centre two-way left-turn lane from east of Thompson Road to just west of Walden Boulevard/Alfred Street. The posted speed limit is 60 kilometres per hour within the study area and sidewalks are provided on both sides of the road. No visible cycling infrastructure is present along this roadway. The roadway is under the jurisdiction of Niagara Region[2].
- **Thompson Road** is a north-south roadway with a five-lane to six-lane cross-section within the study area. The posted speed limit is 70 kilometres per hour within the study area. Sidewalks are provided on both sides of the road between Sims Avenue and Garrison Road. No visible cycling infrastructure is present along this roadway. The roadway is under the jurisdiction of Niagara Region. South of Garrison Road, Thompson Road is named Helena Street. No sidewalks or visible cycling infrastructure is present along Helena Street.
- **Sims Avenue** is a two-lane local road under the jurisdiction of the Town of Fort Erie[3]. No sidewalks or visible cycling infrastructure is present along Helena Street.

The existing lane configurations and traffic control are shown in **Figure 2.1.**

[2] Niagara Region, *Niagara Region Official Plan,* (Niagara Region, May 2019). Schedule E1 Transportation Infrastructure.
[3] Town of Fort Erie, *Official Plan, (*Fort Erie). Schedule E Transportation Plan



NTS
Image Source: Niagara Navigator (niagararegion.ca)

paradigm TRANSPORTATION SOLUTIONS LIMITED

Existing Lane Configuration & Traffic Control

644 Garrison Road, Fort Erie TIS
220819

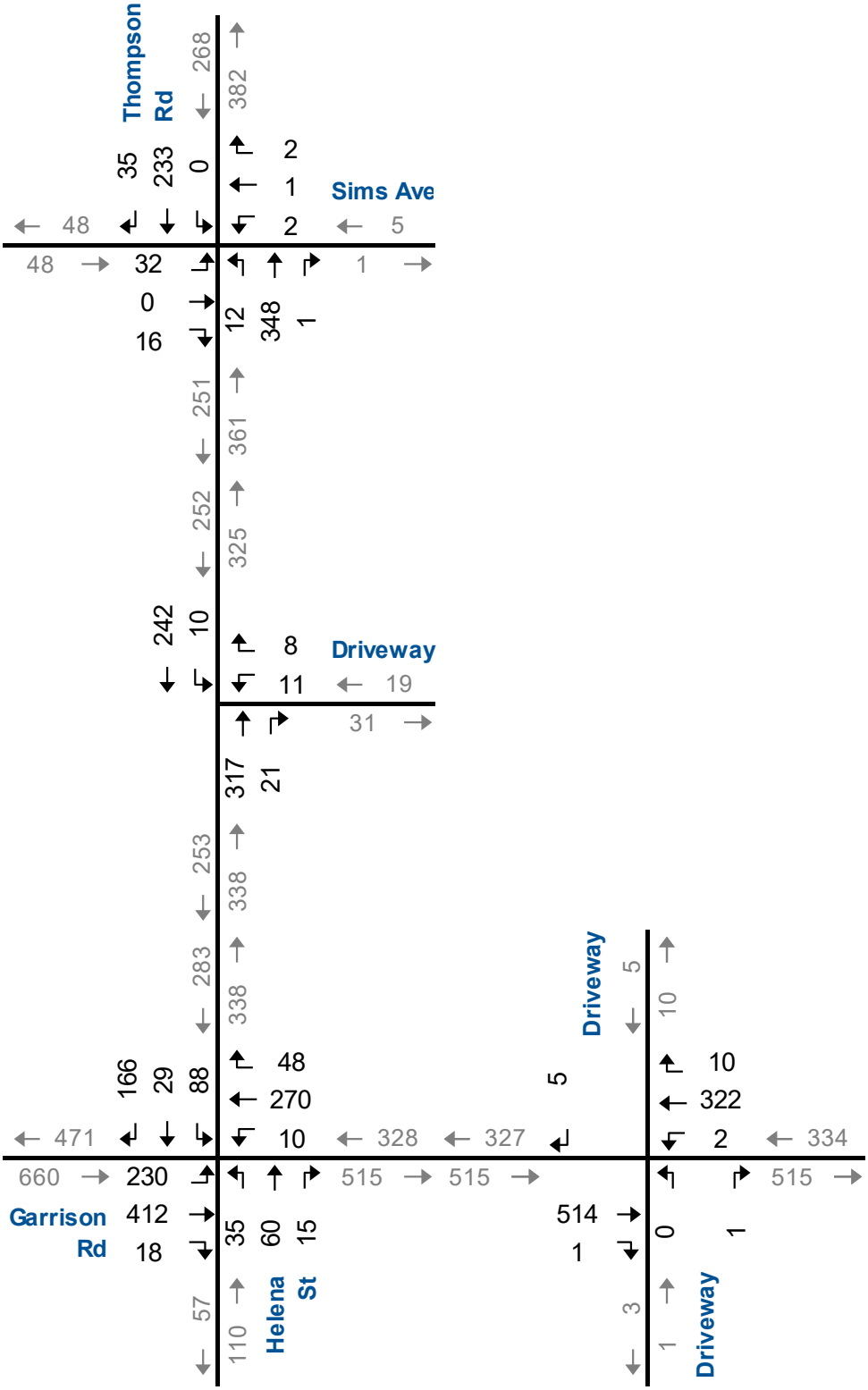
Figure 2.1

2.2 Existing Traffic Volumes

To assess intersection operations, turning movement counts are used to quantify the movement of vehicles. The counts are usually taken during peak periods to complete level of service analysis. With the outbreak of COVID-19 and the Provincial and Federal government implementing social distancing and stay at home orders, these measures significantly affected traffic volumes and patterns and eliminated the validity of collecting new traffic data at any of the study area intersections.

Therefore, Paradigm used existing traffic count data at the study area intersections from October 2018. The count information is provided in **Appendix A.** The observed traffic volumes were factored with a 2.0 percent per annum growth rate to obtain base year conditions as supported by the Region. The adjusted base year weekday AM, and PM peak hour traffic volumes are shown in **Figure 2.2**.

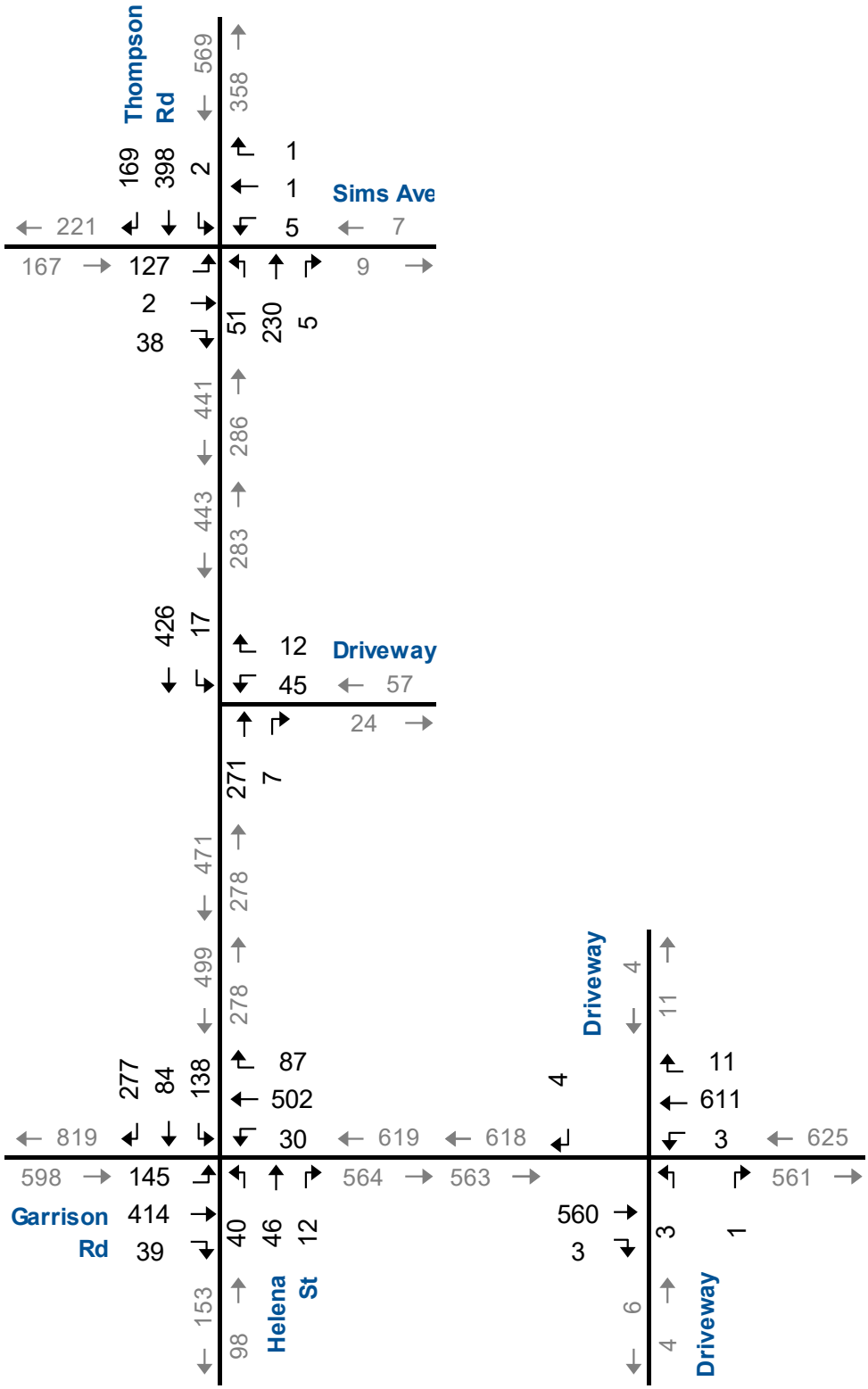
Through pre-consultation with the Region, a Saturday analysis has been requested. However, given the current lockdown and stay at home orders, obtaining/estimating reasonable Saturday traffic volumes is unattainable. Based on this, the Region has agreed that the Saturday Analysis be focused on the expected trip generation and assignment for the proposed development. Further details about this analysis are outlined in **sub-section 3.4**.



2021 Base Year Traffic Volumes AM Peak Hour

644 Garrison Road, Fort Erie TIS
220819

Figure 2.2A



2021 Base Year Traffic Volumes PM Peak Hour

644 Garrison Road, Fort Erie TIS
220819

Figure 2.2B

2.3 Existing Traffic Operations

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

The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections or when the volume to capacity ratio is greater than 1.0, the movement is classed as LOS F and remedial measures are usually implemented if they are feasible. LOS E is usually used as a guideline for the determination of road improvement needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on delays.

The operations of the study area intersections, including the site driveway connections, were evaluated under the existing traffic volumes using Synchro 10 and HCM 2000 procedures. The intersection analysis considered the following measures of performance:

- The v/c ratio for each movement
- The LOS for each turning movement based on the average control delay per vehicle; and
- The estimated 95th percentile queue length.

The key parameters used in the analysis, consistent with Regional Requirements include:

- Existing lane configurations
- Ideal saturation flow rate of 1,750 vehicles per hour per lane
- Total lost time of four (4) seconds (for signalized intersections)
- Peak hour factors (PHF) of 0.92
- Heavy vehicle percentages and conflicting pedestrian volumes as derived from the existing turning movement counts
- Signal timing plans as provided by the Region; and included in Appendix A for reference; and
- Synchro default values for all other inputs.

The existing AM and PM peak hour intersection operations are summarized in **Table 2.1** indicating the existing LOS, volume to capacity (v/c) ratios and 95th percentile back of queue estimates within the study area. The results indicate that the study area intersections are currently operating at acceptable levels of service with no critical movements during the AM and PM peak hour.

Detailed Synchro reports are provided in Appendix B.

TABLE 2.1: BASE YEAR INTERSECTION OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Garrison Road & Thomspon Road / Helena Street	TCS	LOS	B	B	>	**B**	A	B	>	**B**	B	B	>	**B**	B	B	B	**B**	**B**
			Delay	11	12	>	**12**	10	12	>	**12**	13	13	>	**13**	14	13	13	**14**	**12**
			V/C	0.57	0.40	>		0.03	0.31	>		0.11	0.08	>		0.30	0.04	0.14		**0.42**
			Q	23	27	>		2	20	>		9	7	>		18	4	12		
			Ex	40		>		50		>		35		>		60	60	60		
			Avail.	17		>		48		>		26		>		42	56	48		
	Thompson Road & Sims Avenue	TCS	LOS	B	B	>	**B**	B	B	>	**B**	B	B	>	**B**	A	B	B	**B**	**B**
			Delay	19	18	>	**19**	20	20	>	**20**	16	19	>	**19**	0	18	17	**18**	**18**
			V/C	0.09	0.02	>		0.01	0.00	>		0.04	0.48	>		0.00	0.23	0.03		**0.21**
			Q	9	0	>		2	2	>		4	31	>		0	14	0		
			Ex	40		>		20		>		40		>		30				
			Avail.	31		>		18		>		36		>		30				
	Thompson Road & Commercial Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	A	A		**A**	**A**
			Delay					11		>	**11**		0	>	**0**	2	0		**0**	**1**
			V/C					0.03		>			0.14	>		0.01	0.04			
			Q					1		>			0	>		0				
	Garrison Road & Commercial Driveway	TWSC	LOS		A	>	**A**	A	A	>	**A**	A		A	**A**			A	**A**	**A**
			Delay		0	>	**0**	8	0	>	**0**	0		9	**9**			9	**9**	**0**
			V/C		0.21	>		0.00	0.14	>		0.00		0.00				0.01		
			Q		0	>		0	0	>		0		0				0		
PM Peak Hour	Garrison Road & Thomspon Road / Helena Street	TCS	LOS	B	B	>	**B**	A	B	>	**B**	B	B	>	**B**	B	B	B	**B**	**B**
			Delay	11	12	>	**12**	10	13	>	**13**	15	15	>	**15**	17	15	16	**16**	**13**
			V/C	0.47	0.37	>		0.08	0.49	>		0.13	0.06	>		0.43	0.10	0.21		**0.46**
			Q	19	34	>		5	45	>		11	7	>		32	10	16		
			Ex	40		>		50		>		35		>		60	60	60		
			Avail.	21		>		45		>		24		>		28	50	44		
	Thompson Road & Sims Avenue	TCS	LOS	B	B	>	**B**	C	C	>	**C**	B	B	>	**B**	C	B	B	**B**	**B**
			Delay	19	19	>	**19**	21	21	>	**21**	17	19	>	**19**	20	20	19	**20**	**19**
			V/C	0.26	0.17	>		0.02	0.00	>		0.20	0.33	>		0.01	0.41	0.13		**0.25**
			Q	22	16	>		3	2	>		11	23	>		1	26	14		
			Ex	40		>		20		>		40		>		30				
			Avail.	18		>		17		>		29		>		29				
	Thompson Road & Commercial Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	A	A		**A**	**A**
			Delay					12		>	**12**		0	>	**0**	2	0		**0**	**1**
			V/C					0.11		>			0.12	>		0.03	0.08			
			Q					3		>			0	>		0				
	Garrison Road & Commercial Driveway	TWSC	LOS		A	>	**A**	A	A	>	**A**	B		A	**B**			B	**B**	**A**
			Delay		0	>	**0**	8	0	>	**0**	12		9	**12**			11	**11**	**0**
			V/C		0.24	>		0.00	0.26	>		0.01		0.00				0.01		
			Q		0	>		0		>		0		0				0		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length (m)
Ex. - Existing Available Storage (m)
Avail. - Available Storage (m)

TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

< - Shared Left-turn
> - Shared Right-turn

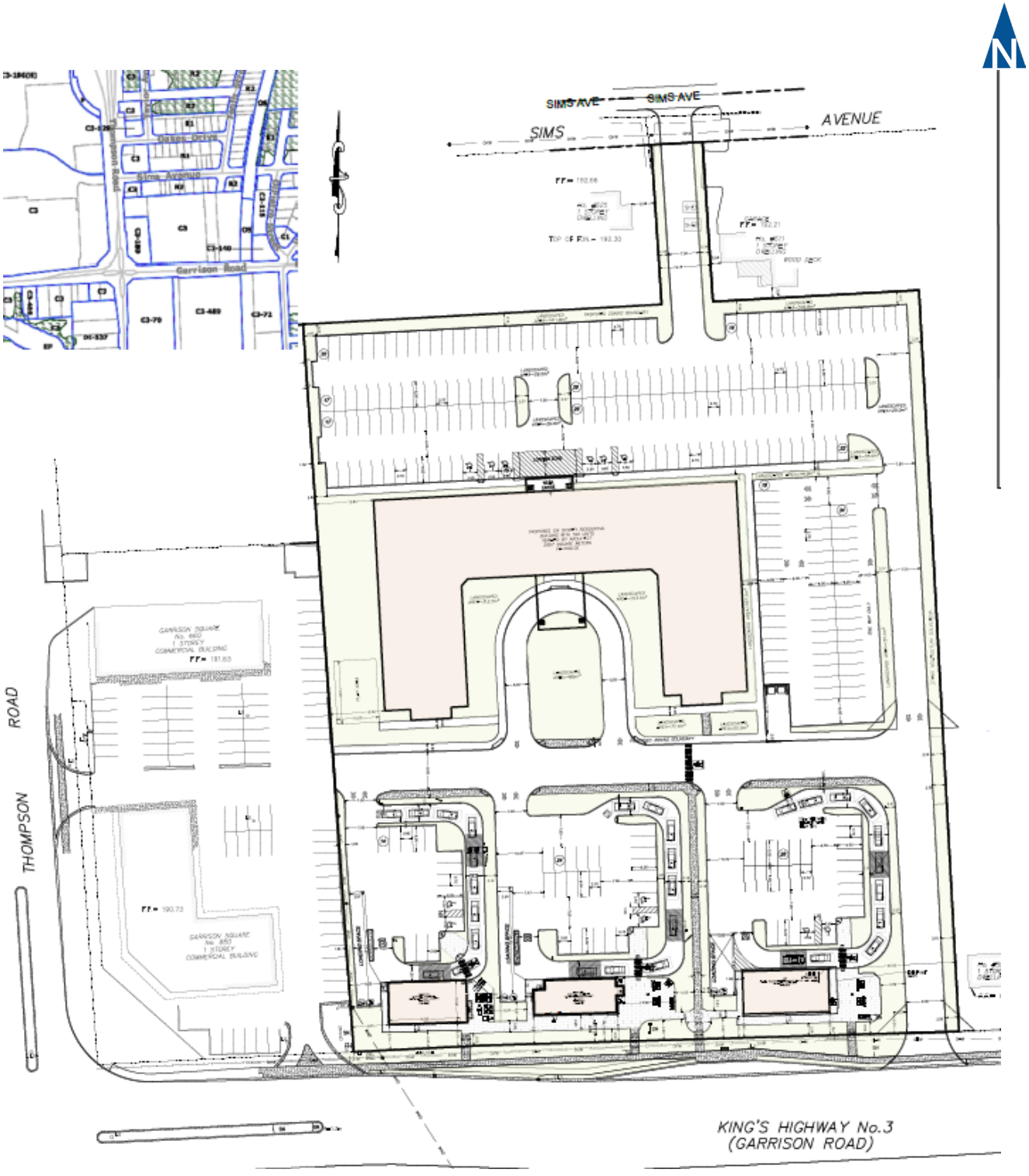
3 Development Concept

3.1 Development Description

The development proposal includes a six-storey residential building with 190 units. The subject site is expected to be developed by end of Year 2023.

External access is supported through the previous access arrangement developed for phase 1 that consists of; all-turns driveways to Garrison Road and Sims Avenue with additional points of access are proposed by the adjacent commercial development west of the subject site.

The site concept plan is shown in **Figure 3.1.**



NTS

paradigm TRANSPORTATION SOLUTIONS LIMITED

Site Concept Plan

644 Garrison Road, Fort Erie TIS
220819

Figure 3.1

3.2 Site Circulation

3.2.1 Vehicular

Passenger vehicle circulation for site has been assessed using AutoTURN swept path analysis software. The design vehicle used in the analysis include:

- A TAC passenger vehicle

The swept path figures are included in **Appendix C** and they indicate no conflicts are anticipated. However, it is recommended to implement one-way counter-clockwise circulation in front of the proposed residential six-storey building. To accommodate layby and pass-through traffic simultaneously, the drive aisle near the curve should be at least 6.2 metres wide.

3.2.2 Pedestrian

The proposed site plan includes sidewalk connections linking the subject site to the municipal sidewalk on the north side of Garrison Road. Internal sidewalk connections are provided through out the site with a painted pedestrian crossing of the main east-west drive aisle.

The site's landscaping plan should include additional amenities such as benches and lighting to enhance the pedestrian realm and to prioritize pedestrians.

All on-site sidewalks should be well-lit and should conform to the Town's design standards and the Accessibility for Ontarians with Disabilities Act (AODA) design standards.

3.3 Development Trip Generation

The trips estimated to be generated by the subject site were developed using land use data contained in the Institute of Transportation Engineers (ITE) Trip Generation Manual[4]. The LUC 221 (Multifamily Housing, Mid-Rise) was used in the analysis. The mid-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have been three and 10 levels (floors).

[4] Institute of Transportation Engineers, *Trip Generation Manual,* 10th ed., (Washington, DC: ITE, 2017).

Table 3.2 details the trip generation for the residential building. The subject site is forecast to generate a net total of 84 - 127 new vehicle trips during the AM and PM peak hours, respectively.

TABLE 3.2: TRIP GENERATION

Land Use Code	Units	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
221 - Multifamily Housing, Mid-Rise (Dwelling Units)	190	0.67	33	94	127	0.44	51	33	84
Total Trip Generation			**33**	**94**	**127**		**51**	**33**	**84**

3.4 Development Trip Distribution and Assignment

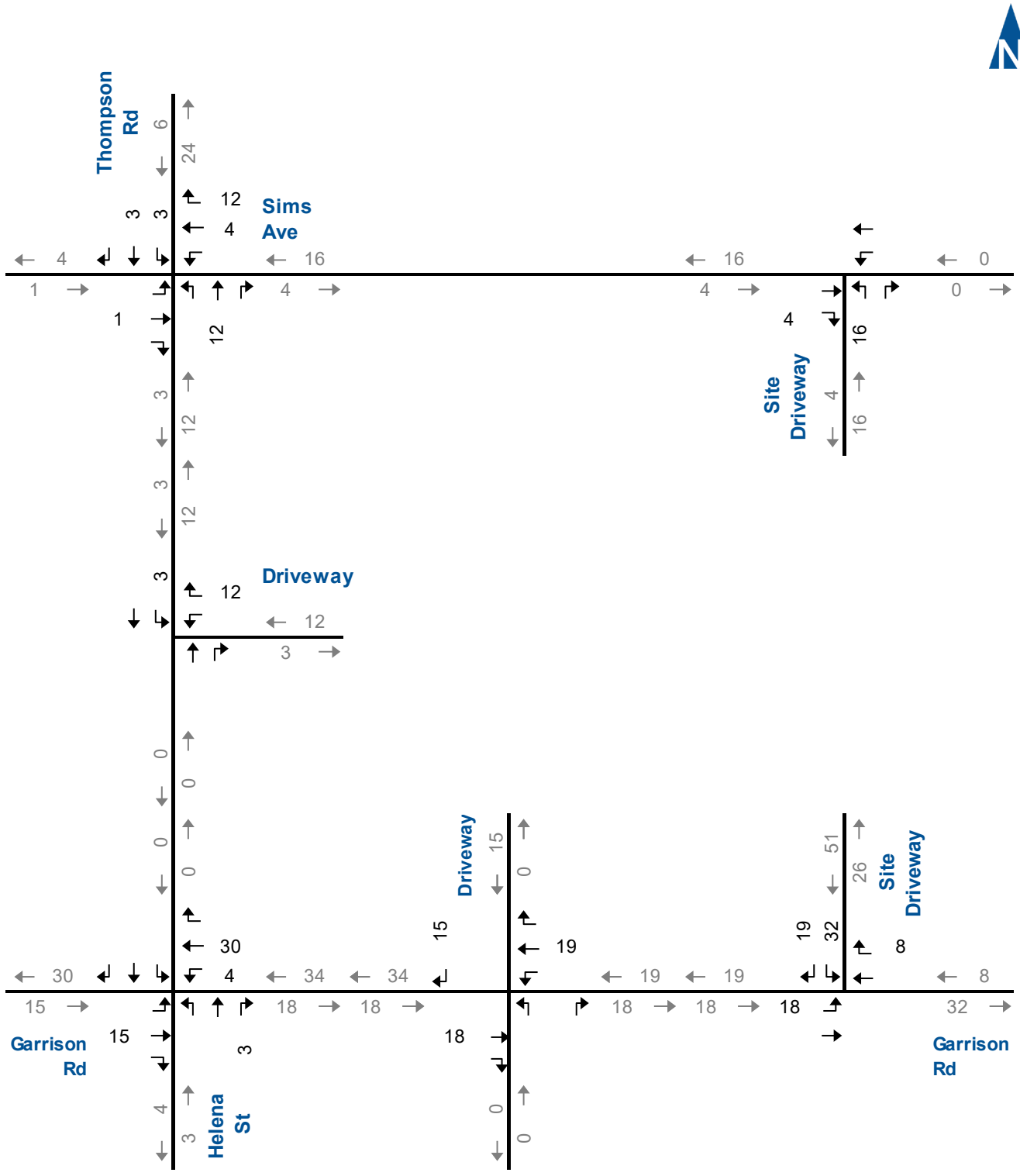
The site-generated trips were assigned to the road network based on the existing distribution of traffic at the study area intersections as documented in May 2019 TIS for Phase 1.

The estimated distribution is summarized in **Table 3.3**.

TABLE 3.3: TRIP DISTRIBUTION

Direction	Route	AM Peak Hour		PM Peak Hour	
		In	Out	In	Out
North	Thompson Road	19%	26%	28%	17%
South	Helena St	8%	4%	5%	8%
East	Garrison Road	23%	34%	30%	26%
	Sims Avenue	0%	0%	0%	0%
West	Garrison Road	46%	32%	29%	39%
	Sims Avenue	4%	4%	8%	10%
Total		**100%**	**100%**	**100%**	**100%**

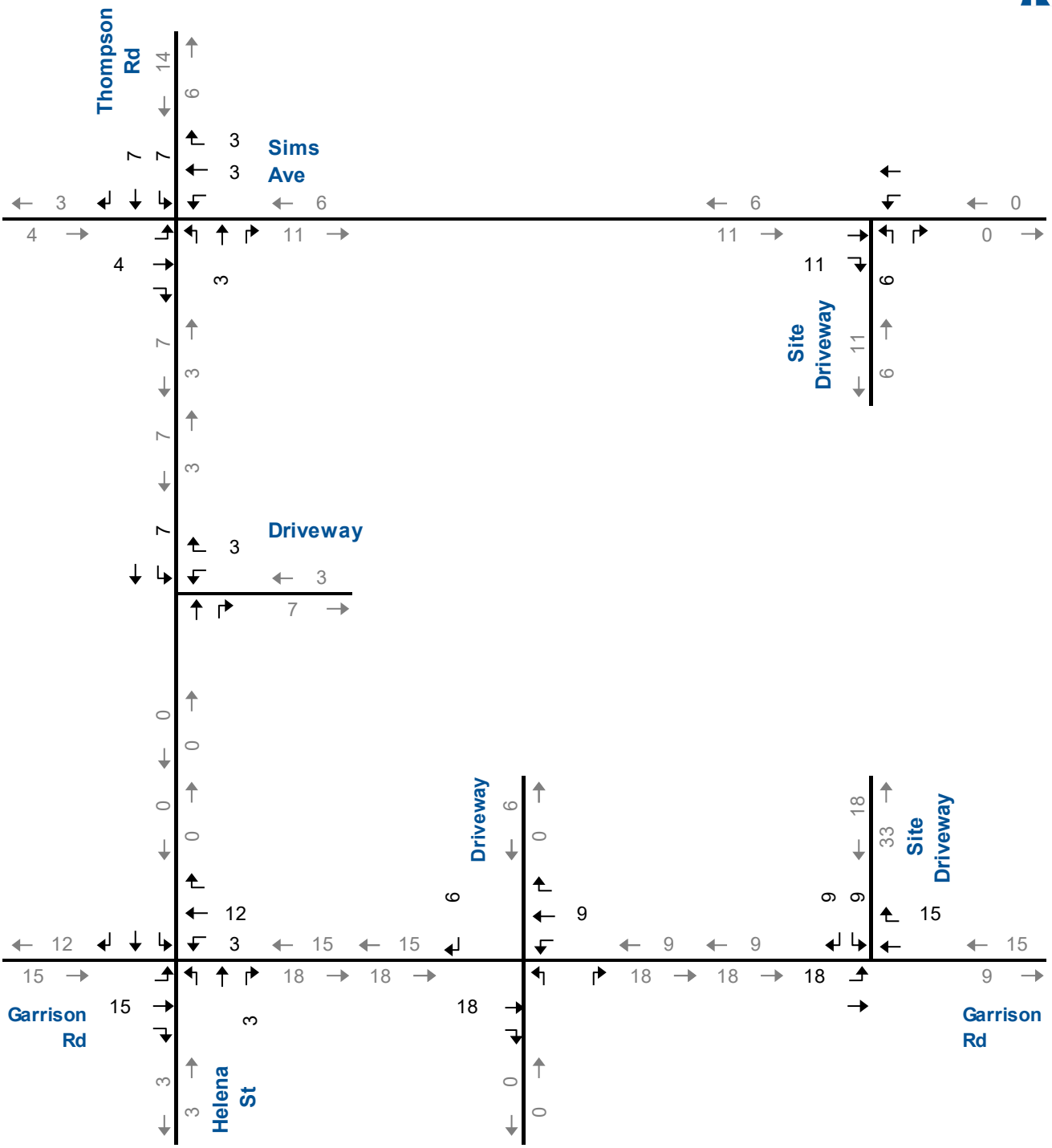
Figure 3.2 displays the resulting AM and PM peak hour site-generated trip assignments.



Site Generated Traffic Volumes
AM Peak Hour

644 Garrison Road, Fort Erie TIS
220819

Figure 3.2A



Site Generated Traffic Volumes
PM Peak Hour

644 Garrison Road, Fort Erie TIS
220819

Figure 3.2B

4 Evaluation of Future Traffic Conditions

The assessment of future traffic conditions contained in this section includes estimates of future background and total traffic and analysis for the 2028 horizon year. The future traffic volumes in the vicinity of the development will likely consist of increased non-site traffic volumes (background traffic), traffic generated by other developments (if any), and the traffic forecast to be generated by the proposed development.

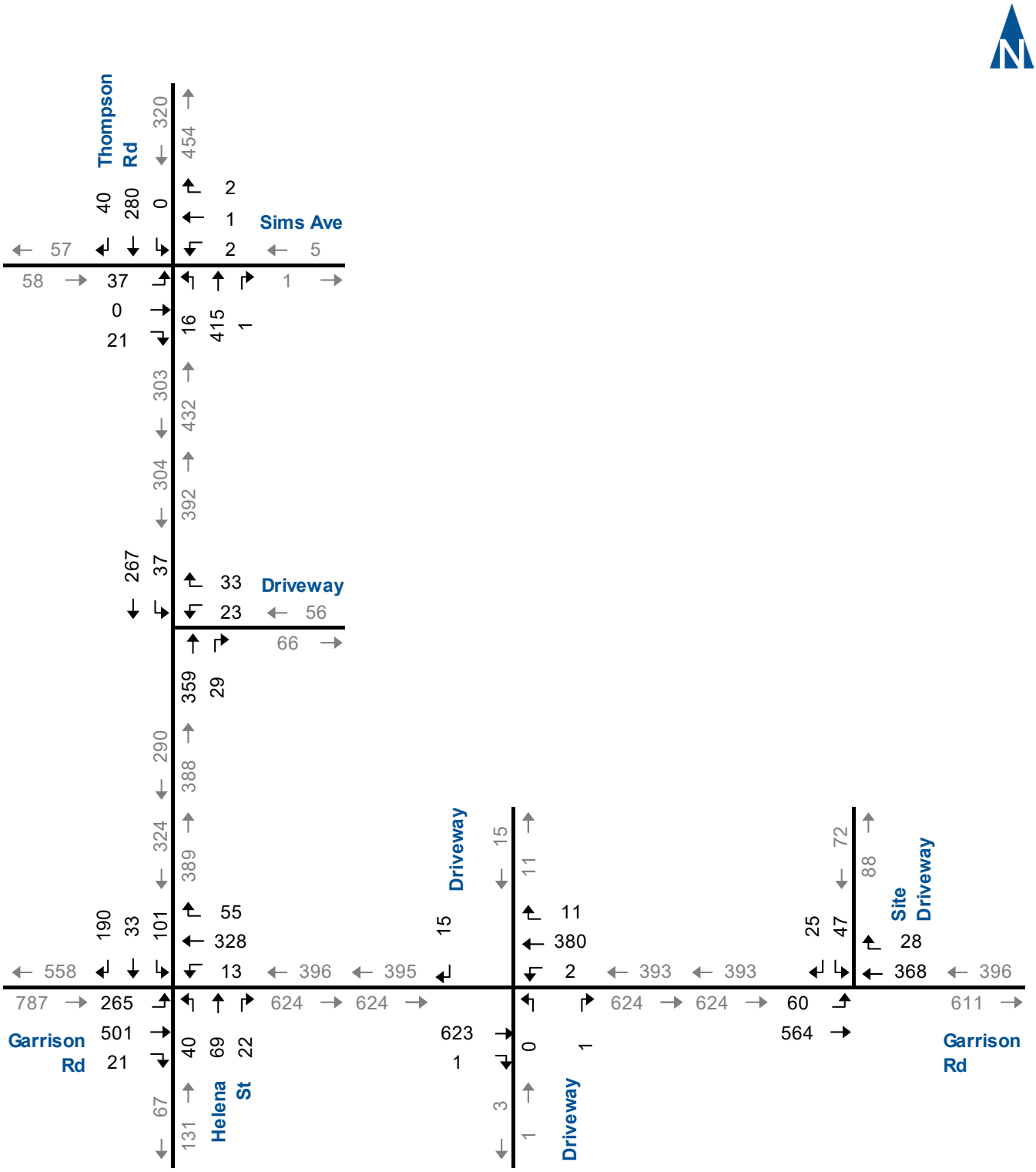
4.1 2028 Background Traffic Volumes

To obtain the background traffic volumes, a growth rate of 2.0% per annum was applied to the base year AM and PM peak hour traffic volumes as supported by the Region. In addition, traffic associated with phase 1 of the proposed development has been accounted for. The development details are noted as follows:

- 644 Garrison Road (Phase 1): Three Fast-Food Restaurants with a total Gross Floor Area (GFA) of 5,800 square feet. Traffic forecasts have been taken from the respective TIA[5];

Figure 4.1 shows the 2028 future background AM and PM peak hour volumes.

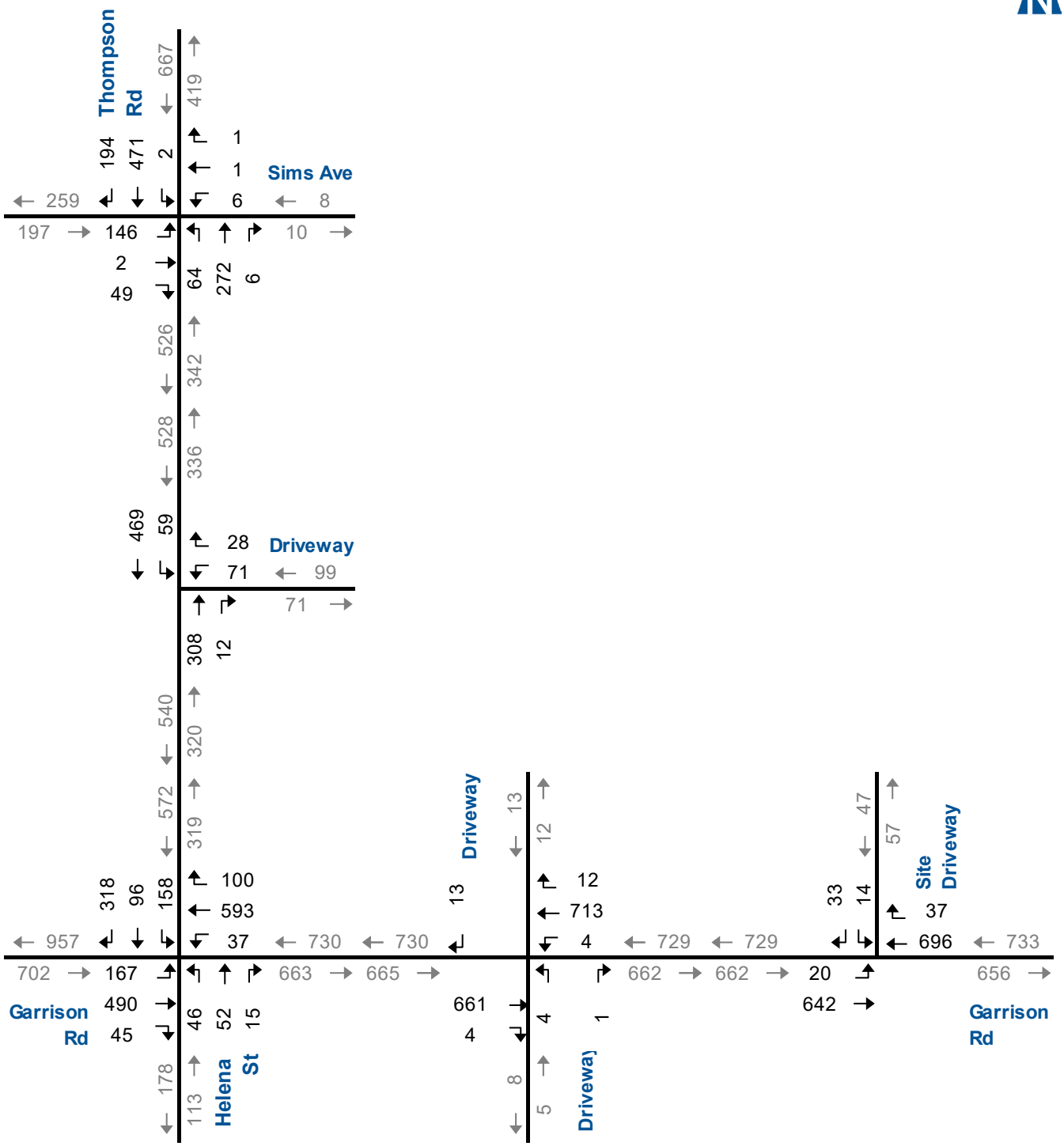
[5] Paradigm Transportation Solutions Limited, *644 Garrison Road, Fort Erie, Transportation Impact Study,* (PTSL May 2019).



2028 Background Traffic Volumes AM Peak Hour

644 Garrison Road, Fort Erie TIS
220819

Figure 4.1A



2028 Background Traffic Volumes PM Peak Hour

644 Garrison Road, Fort Erie TIS
220819

Figure 4.1B

4.2 2028 Background Traffic Operations

The operations of the study area intersections were evaluated under background traffic volumes using the same methodology and assumptions as the existing traffic operations.

The 2028 total background AM and PM peak hour intersection operations are summarized in **Table 4.1** indicating the future LOS, v/c ratios and 95th percentile back of queue estimates within the study area.

The results indicate that the study area intersections are forecast to operate with acceptable level of service with no critical movements.

Detailed Synchro reports are provided in **Appendix D**.

TABLE 4.1: 2028 BACKGROUND INTERSECTION OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Garrison Road & Thomspon Road / Helena Street	TCS	LOS	B	B	>	**B**	A	B	>	**B**	B	B	>	**B**	B	B	B	**B**	**B**
			Delay	14	12	>	**13**	10	12	>	**12**	14	14	>	**14**	15	13	14	**14**	**13**
			V/C	0.66	0.43	>		0.03	0.34	>		0.12	0.10	>		0.35	0.04	0.16		**0.50**
			Q	29	33	>		2	24	>		10	8	>		22	4	13		
			Ex	40		>		50		>		35		>		60	60	60		
			Avail.	11		>		48		>		25		>		38	56	47		
	Thompson Road & Sims Avenue	TCS	LOS	B	B	>	**B**	C	C	>	**C**	B	B	>	**B**	A	B	B	**B**	**B**
			Delay	19	19	>	**19**	20	20	>	**20**	15	19	>	**19**	0	18	17	**17**	**19**
			V/C	0.10	0.02	>		0.01	0.00	>		0.04	0.54	>		0.00	0.26	0.03		**0.24**
			Q	10	0	>		2	2	>		4	36	>		0	16	0		
			Ex	40		>		20		>		40		>		30				
			Avail.	30		>		18		>		36		>		30				
	Thompson Road & Commercial Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	A	A		**A**	**A**
			Delay					11		>	**11**		0	>	**0**	2	0		**0**	**1**
			V/C					0.04		>			0.16	>		0.01	0.05			
			Q					1		>			0	>		0				
	Garrison Road & Commercial Driveway	TWSC	LOS		A	>	**A**	A	A	>	**A**	A		A	**A**			A	**A**	**A**
			Delay		0	>	**0**	8	0	>	**0**	0		9	**9**			10	**10**	**0**
			V/C		0.25	>		0.00	0.16	>		0.00		0.00				0.01		
			Q		0	>		0	0	>		0		0				0		
PM Peak Hour	Garrison Road & Thomspon Road / Helena Street	TCS	LOS	B	B	>	**B**	A	B	>	**B**	B	B	>	**B**	B	B	B	**B**	**B**
			Delay	12	12	>	**12**	10	14	>	**14**	17	16	>	**16**	19	16	18	**18**	**15**
			V/C	0.58	0.40	>		0.10	0.54	>		0.15	0.07	>		0.49	0.11	0.31		**0.53**
			Q	24	43	>		6	57	>		14	8	>		39	12	25		
			Ex	40		>		50		>		35		>		60	60	60		
			Avail.	17		>		44		>		21		>		21	49	35		
	Thompson Road & Sims Avenue	TCS	LOS	B	B	>	**B**	C	C	>	**C**	B	B	>	**B**	C	C	B	**C**	**B**
			Delay	20	19	>	**20**	22	21	>	**22**	17	20	>	**19**	20	21	19	**20**	**20**
			V/C	0.30	0.19	>		0.03	0.00	>		0.24	0.38	>		0.01	0.46	0.15		**0.29**
			Q	26	18	>		4	2	>		13	27	>		1	30	15		
			Ex	40		>		20		>		40		>		30				
			Avail.	14		>		16		>		28		>		29				
	Thompson Road & Commercial Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	A	A		**A**	**A**
			Delay					13		>	**13**		0	>	**0**	2	0		**0**	**1**
			V/C					0.13		>			0.13	>		0.02	0.09			
			Q					4		>			0	>		0				
	Garrison Road & Commercial Driveway	TWSC	LOS		A	>	**A**	A	A	>	**A**	B		A	**B**			B	**B**	**A**
			Delay		0	>	**0**	9	0	>	**0**	14		9	**13**			11	**11**	**0**
			V/C		0.27	>		0.00	0.30	>		0.01		0.00				0.01		
			Q		0	>		0		>		0		0				0		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length (m)
Ex. - Existing Available Storage (m)
Avail. - Available Storage (m)

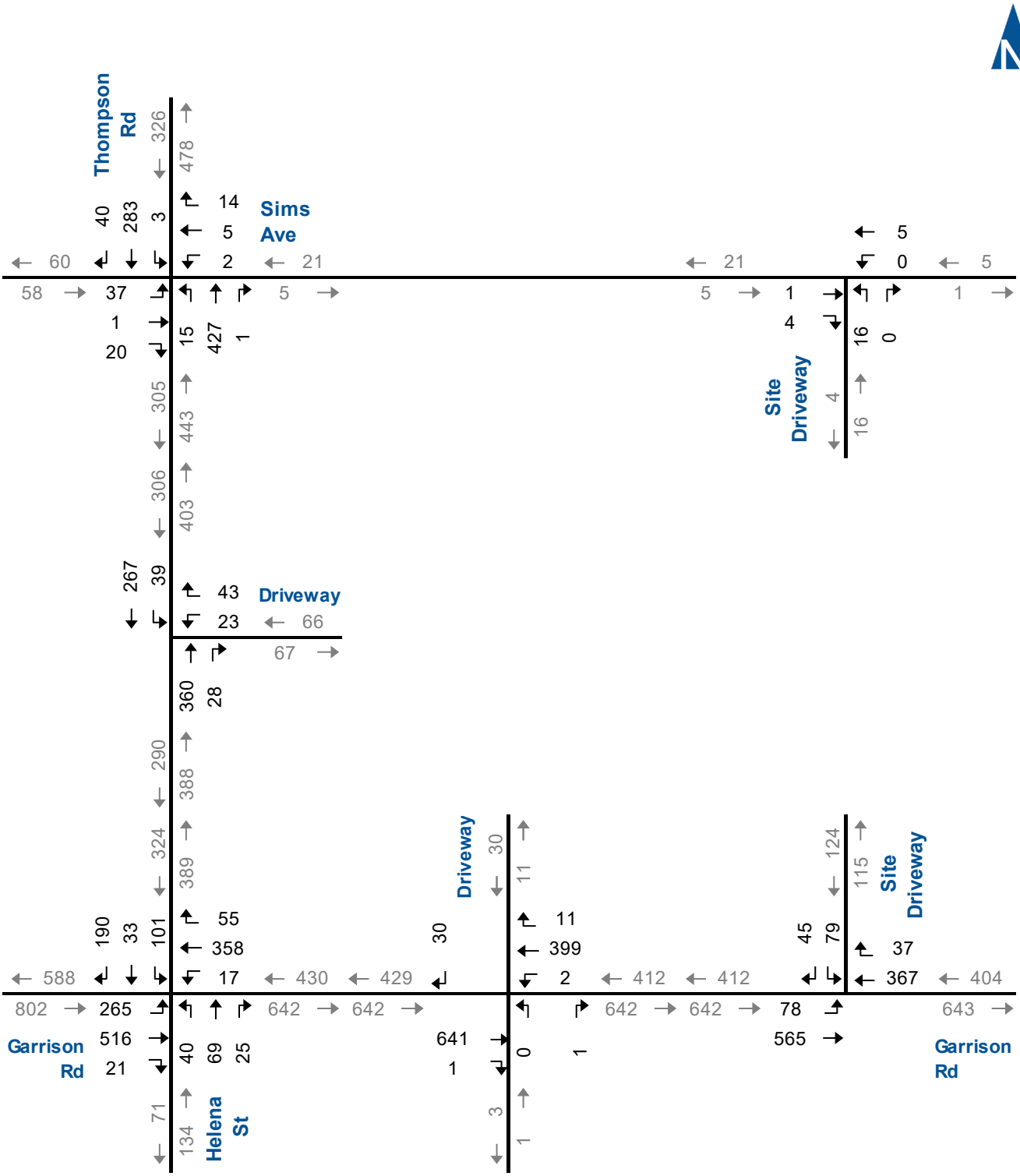
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

< - Shared Left-turn
> - Shared Right-turn

4.3 2028 Future Total Traffic Volumes

The site generated traffic was added to the 2028 background traffic to produce the 2028 future total traffic volumes.

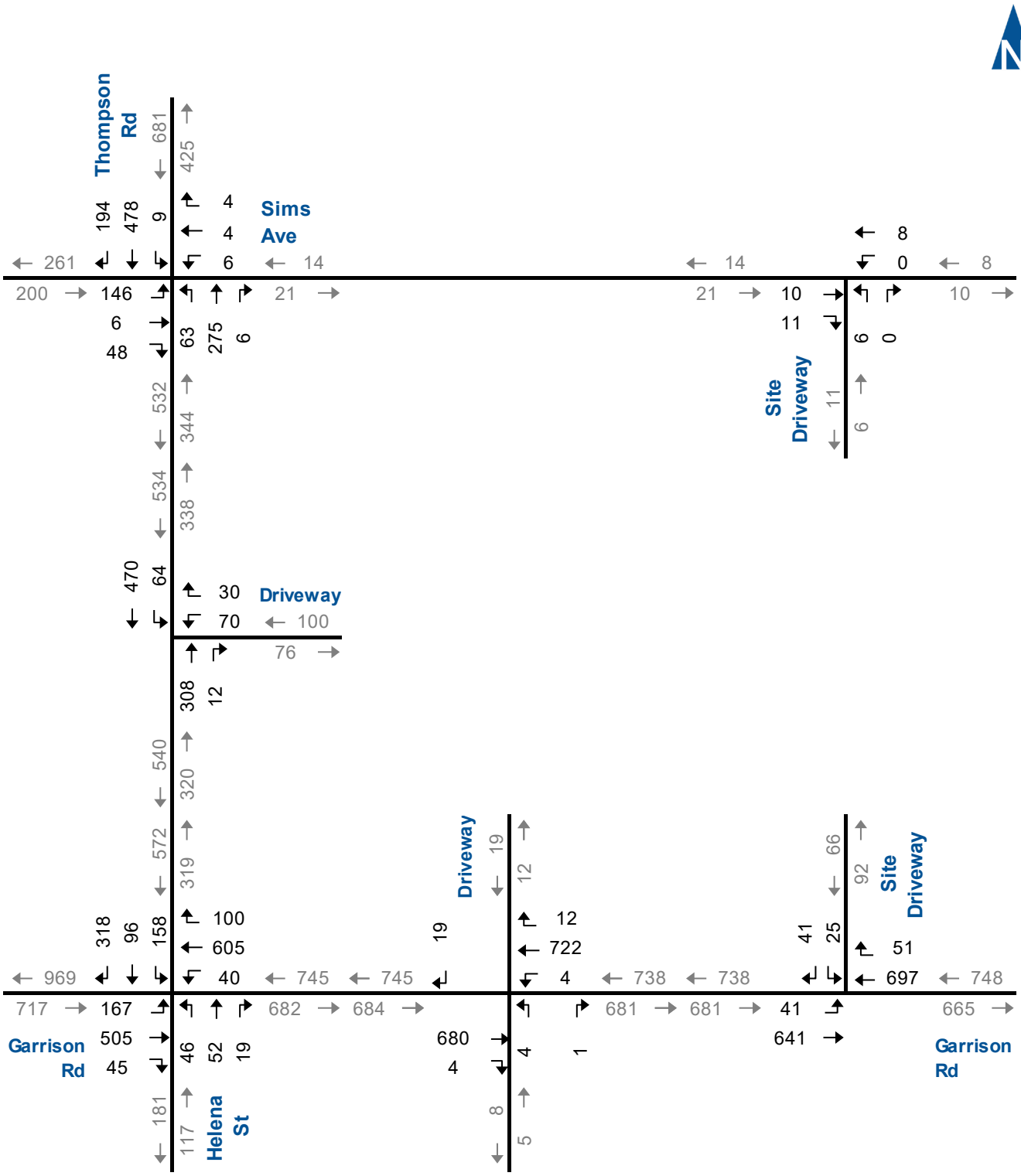
The AM and PM peak hour 2028 future total traffic volumes are shown in **Figure 4.2**.



2028 Total Traffic Volumes AM Peak Hour

644 Garrison Road, Fort Erie TIS
220819

Figure 4.2A



2028 Total Traffic Volumes PM Peak Hour

644 Garrison Road, Fort Erie TIS
220819

Figure 4.2B

4.4 2028 Future Total Traffic Operations

The operations of the study area intersections were evaluated under future total traffic volumes using the same methodology and assumptions as for the background traffic operations.

The future total AM and PM peak hour intersection operations are summarized in T**able 4.2** indicating the future LOS, v/c ratios and 95th percentile back of queue estimates within the study area. The following is noted:

- The results indicate that the study area intersections are forecast to operate at acceptable levels of service during the AM and PM peak hours with no critical movements.
- The southbound shared left/right-turn movement at the Site Driveway and Garrison Road is forecast to operate at LOS C or better and v/c ratios of 0.37 or lower during the AM and PM peak hours.
- The northbound shared left/right-turn movement at the Site Driveway and Sims Avenue is forecast to operate at LOS A and v/c ratio of 0.02 or lower during the AM and PM peak hours.
- The addition of the site generated traffic volumes increases the overall intersection delay by one second or less at the study area intersections during the AM and PM peak hours.

Detailed Synchro reports are provided in **Appendix E**.

TABLE 4.2: 2028 TOTAL INTERSECTION OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Garrison Road & Thomspon Road / Helena Street	TCS	LOS	B	B	>	B	A	B	>	B	B	B	>	B	B	B	B	B	B
			Delay	14	12	>	13	10	12	>	12	14	14	>	14	16	14	14	15	13
			V/C	0.69	0.46	>		0.05	0.38	>		0.12	0.10	>		0.36	0.04	0.16		0.52
			Q	29	37	>		3	28	>		11	8	>		23	5	13		
			Ex	40		>		50		>		35		>		60	60	60		
			Avail.	11		>		47		>		25		>		37	55	47		
	Thompson Road & Sims Avenue	TCS	LOS	B	B	>	B	C	C	>	C	B	B	>	B	B	B	B	B	B
			Delay	20	19	>	20	21	21	>	21	15	20	>	20	18	18	16	17	19
			V/C	0.11	0.05	>		0.01	0.03	>		0.05	0.56	>		0.02	0.26	0.03		0.26
			Q	11	7	>		2	6	>		4	39	>		2	17	0		
			Ex	40		>		20		>		40		>		30				
			Avail.	29		>		18		>		36		>		28				
	Thompson Road & Commercial Driveway	TWSC	LOS					B		>	B		A		A	A	A		A	A
			Delay					12		>	12		0		0	4	0		1	1
			V/C					0.12		>			0.15			0.04	0.05			
			Q					3		>			0			1				
	Garrison Road & Commercial Driveway	TWSC	LOS		A	>	A	A	A	>	A	A		A	A			A	A	A
			Delay		0	>	0	9	0	>	0	0		9	9			10	10	0
			V/C		0.27	>		0.00	0.17	>		0.00		0.00				0.04		
			Q		0	>		0	0	>		0		0				1		
	Garrison Road & Site Driveway	TWSC	LOS	A	A		A		A	>						B		>	B	A
			Delay	9	0		1		0	>						13		>	13	2
			V/C	0.08	0.18				0.16	>						0.24		>		
			Q	2					0	>						8		>		
	Sims Avenue & Site Driveway	TWSC	LOS		A	>	A	<	A		A	A		>	A					A
			Delay		0	>	0	<	0		0	9		>	9					5
			V/C		0.00	>		<	0.00			0.02		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Garrison Road & Thomspon Road / Helena Street	TCS	LOS	B	B	>	B	A	B	>	B	B	B	>	B	B	B	B	B	B
			Delay	13	13	>	13	10	14	>	14	17	16	>	17	20	17	18	18	15
			V/C	0.59	0.42	>		0.12	0.55	>		0.15	0.07	>		0.50	0.11	0.34		0.54
			Q	24	46	>		7	61	>		14	8	>		40	12	27		
			Ex	40		>		50		>		35		>		60	60	60		
			Avail.	16		>		43		>		21		>		21	49	33		
	Thompson Road & Sims Avenue	TCS	LOS	C	B	>	B	C	C	>	C	B	B	>	B	C	C	B	C	B
			Delay	20	19	>	20	22	22	>	22	17	20	>	19	21	21	19	20	20
			V/C	0.30	0.21	>		0.03	0.02	>		0.26	0.38	>		0.04	0.47	0.15		0.30
			Q	27	19	>		4	4	>		13	28	>		4	32	15		
			Ex	40		>		20		>		40		>		30				
			Avail.	13		>		16		>		27		>		26				
	Thompson Road & Commercial Driveway	TWSC	LOS					B		>	B		A		A	A	A		A	A
			Delay					15		>	15		0		0	4	0		1	2
			V/C					0.23		>			0.13			0.06	0.09			
			Q					7		>			0			2				
	Garrison Road & Commercial Driveway	TWSC	LOS		A	>	A	A	A	>	A	B		A	B			B	B	A
			Delay		0	>	0	9	0	>	0	14		9	13			11	11	0
			V/C		0.29	>		0.00	0.31	>		0.01		0.00				0.03		
			Q		0	>		0		>		0		0				1		
	Garrison Road & Site Driveway	TWSC	LOS	A	A		A		A	>	A					B		>	B	A
			Delay	10	0		1		0	>	0					14		>	14	1
			V/C	0.06	0.20				0.30	>						0.15		>		
			Q	1					0	>						4		>		
	Sims Avenue & Site Driveway	TWSC	LOS		A	>	A	<	A		A	A		>	A					A
			Delay		0	>	0	<	0		0	9		>	9					2
			V/C		0.01	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length (m)
Ex. - Existing Available Storage (m)
Avail. - Available Storage (m)

TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

< - Shared Left-turn
> - Shared Right-turn

4.5 Queuing Impacts

A review of queuing was conducted on the southbound and westbound movements at the Thompson Road and Garrison Road intersection to estimate the extent of possible queue reach impacting the existing commercial site driveway on Thompson Road and the proposed Site Driveway on Garrison Road.

SimTraffic was used rather than Synchro in this assessment as microscopic models, such as SimTraffic, individually track each vehicle in the traffic system through the model and collect comprehensive operational measures of effectiveness for every vehicle during each 0.1 second of the simulation. Unlike Synchro, SimTraffic measures the full impact of queuing and blocking. Synchro is best used to determine level of service and delay at the macro level but is not ideal for assessments simulating real-world conditions. The analysis consisted of ten (10) iterations of sixty (60) minute simulations to forecast the delay per vehicle in seconds.

Table 4.3 outlines the 95th percentile back of queue estimates for the future background and total traffic conditions. The 95th percentile queue reach is forecast to be approximately 40 metres for the southbound movements and 22 metres for the westbound left-turn movement and 46 metres for the westbound through/right-turn movement.

Based on these findings the commercial driveway to Thompson Road and the proposed Site Driveway to Garrison Road are not anticipated to be impacted by the queuing of vehicles generated by the downstream traffic control signal at Garrison Road and Thompson Road.

TABLE 4.3: 95TH PERCENTILE QUEUING ESTIMATES

Intersection	Movement	Existing Storage (m)	95th Percentile Queue (m)				Available Storage (m)
			2028 Background		2028 Total		
			AM	PM	AM	PM	
Garrison Road at Thompson Road / Helena Street	SBL	60	22	39	31	41	19
	SBT	60	4	12	18	28	32
	SBR	60	13	25	5	9	35
	WBL	60	2	6	11	22	38
	WBT/R	210	24	57	33	46	164

5 Conclusions and Recommendations

5.1 Conclusions

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

- **Existing Traffic Operations: The** study area intersections are currently operating at acceptable levels of service with no critical movements during the AM and PM peak hours.
- **Site Generated Traffic:** The development is forecast to generate 127 trips during the AM peak hour and84 trips during the PM peak hour.
- **2028 Background Traffic Operations:** The study area intersections are forecast to operate at acceptable levels of service with no critical movements during the AM and PM peak hours under 2028 background traffic conditions.
- **Total Traffic Operations:** The study area intersections are forecast to operate at acceptable levels of service with no critical movements during the AM and PM peak hours under 2028 future total traffic conditions.
- The new proposed all-turns site driveway onto Garrison Road is expected to operate with an acceptable level of service and well below capacity in both the AM and PM peak hours with a shared left/right turn lane outbound and one (1) inbound lane.
- The new proposed all-turns site driveway onto Sims Avenue is expected to operate with an acceptable level of service and well below capacity in both the AM and PM peak hours with a shared left/right turn lane outbound and one (1) inbound lane.
- The analysis indicates the development of the subject site is forecast to have a negligible impact on traffic operations in the study area.
- **Queue Reach:** The forecasted queue reach from the southbound and westbound movements at the Garrison Road and Thompson Road/Helena Street intersection are not expected to impact existing commercial driveway on Thompson Road and the proposed site driveway onto Garrison Road.

5.2 Recommendations

Based on the findings of this study, it is found that no remedial measures are required at the study area intersections to accommodate the increase in traffic generated by the proposed development.

Appendix A

Traffic Data

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018

Turning Movement Data

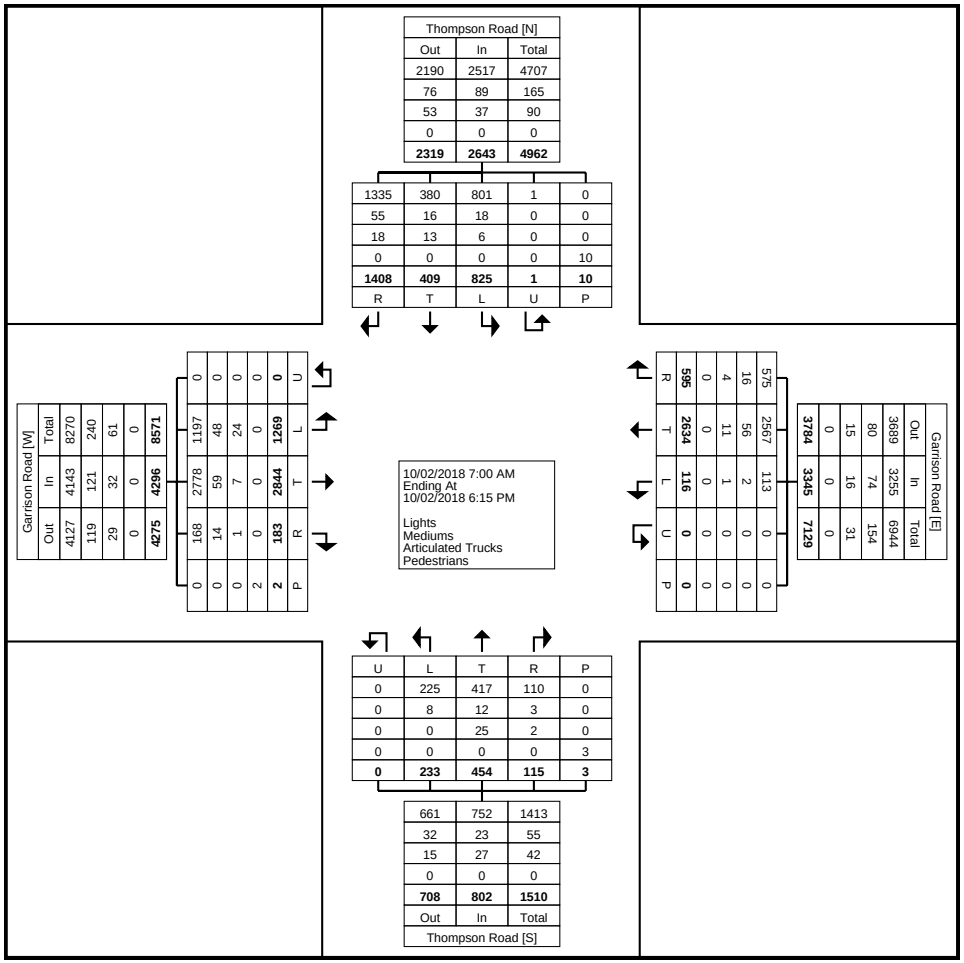
Start Time	Garrison Road Eastbound						Garrison Road Westbound						Thompson Road Northbound						Thompson Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	30	41	0	0	0	71	0	19	5	0	0	24	3	18	0	0	0	21	2	4	17	0	0	23	139
7:15 AM	38	47	2	0	0	87	2	31	13	0	0	46	4	16	3	0	0	23	5	4	21	0	0	30	186
7:30 AM	55	64	3	0	0	122	2	38	11	0	0	51	6	19	3	0	0	28	7	5	20	0	0	32	233
7:45 AM	53	70	4	0	0	127	1	50	9	0	0	60	7	19	0	0	0	26	10	9	31	0	0	50	263
Hourly Total	176	222	9	0	0	407	5	138	38	0	0	181	20	72	6	0	0	98	24	22	89	0	0	135	821
8:00 AM	50	77	9	0	0	136	1	62	3	0	0	66	9	16	1	0	1	26	7	6	49	0	0	62	290
8:15 AM	64	85	5	0	0	154	2	37	16	0	0	55	6	24	7	0	0	37	11	7	26	0	0	44	290
8:30 AM	57	87	8	0	0	152	1	55	10	0	0	66	13	12	0	0	0	25	23	6	41	0	0	70	313
8:45 AM	52	111	4	0	0	167	4	65	13	0	0	82	5	18	6	0	1	29	15	6	43	0	0	64	342
Hourly Total	223	360	26	0	0	609	8	219	42	0	0	269	33	70	14	0	2	117	56	25	159	0	0	240	1235
9:00 AM	67	95	2	0	0	164	2	67	13	0	0	82	7	15	1	0	0	23	24	6	38	0	0	68	337
9:15 AM	41	95	3	0	0	139	2	67	9	0	0	78	8	12	7	0	0	27	21	9	34	0	1	64	308
9:30 AM	46	75	2	0	0	123	1	73	14	0	0	88	4	14	4	0	0	22	23	5	29	0	0	57	290
9:45 AM	36	83	3	0	0	122	2	68	18	0	0	88	9	11	4	0	0	24	26	7	27	0	0	60	294
Hourly Total	190	348	10	0	0	548	7	275	54	0	0	336	28	52	16	0	0	96	94	27	128	0	1	249	1229
10:00 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
11:00 AM	26	97	4	0	0	127	2	86	15	0	0	103	5	13	3	0	0	21	32	10	28	0	0	70	321
11:15 AM	27	92	0	0	0	119	1	88	20	0	0	109	6	15	6	0	0	27	37	14	42	0	0	93	348
11:30 AM	33	89	2	0	0	124	4	93	21	0	0	118	3	14	7	0	0	24	41	12	37	0	1	90	356
11:45 AM	30	114	7	0	0	151	3	93	25	0	0	121	7	12	6	0	0	25	30	14	42	0	0	86	383
Hourly Total	116	392	13	0	0	521	10	360	81	0	0	451	21	54	22	0	0	97	140	50	149	0	1	339	1408
12:00 PM	42	115	8	0	0	165	7	86	24	0	0	117	9	14	4	0	0	27	41	20	43	0	0	104	413
12:15 PM	34	128	11	0	0	173	10	94	34	0	0	138	4	17	5	0	0	26	32	23	33	1	1	89	426
12:30 PM	47	107	7	0	0	161	11	109	27	0	0	147	7	15	7	0	0	29	37	12	38	0	0	87	424
12:45 PM	49	118	6	0	2	173	3	117	30	0	0	150	10	13	5	0	0	28	44	10	36	0	2	90	441
Hourly Total	172	468	32	0	2	672	31	406	115	0	0	552	30	59	21	0	0	110	154	65	150	1	3	370	1704
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	40	84	14	0	0	138	1	101	33	0	0	135	10	15	1	0	0	26	25	12	55	0	0	92	391
3:15 PM	34	82	6	0	0	122	2	94	31	0	0	127	13	23	5	0	0	41	31	9	45	0	0	85	375
3:30 PM	34	89	7	0	0	130	3	92	26	0	0	121	12	14	5	0	0	31	34	23	63	0	0	120	402
3:45 PM	36	82	4	0	0	122	4	98	21	0	0	123	5	8	2	0	0	15	35	16	61	0	0	112	372
Hourly Total	144	337	31	0	0	512	10	385	111	0	0	506	40	60	13	0	0	113	125	60	224	0	0	409	1540
4:00 PM	31	96	10	0	0	137	6	114	16	0	0	136	12	11	1	0	0	24	34	20	63	0	1	117	414

4:15 PM	36	98	5	0	0	139	5	123	16	0	0	144	9	10	3	0	0	22	30	24	57	0	1	111	416
4:30 PM	32	101	11	0	0	144	7	121	25	0	0	153	12	10	3	0	1	25	35	16	77	0	1	128	450
4:45 PM	38	95	11	0	0	144	10	115	25	0	0	150	5	12	4	0	0	21	31	19	64	0	0	114	429
Hourly Total	137	390	37	0	0	564	28	473	82	0	0	583	38	43	11	0	1	92	130	79	261	0	3	470	1709
5:00 PM	35	93	9	0	0	137	4	107	25	0	0	136	7	12	1	0	0	20	27	17	77	0	1	121	414
5:15 PM	19	81	5	0	0	105	4	107	17	0	0	128	7	8	4	0	0	19	22	27	65	0	1	114	366
5:30 PM	34	72	5	0	0	111	6	93	18	0	0	117	1	15	3	0	0	19	20	21	55	0	0	96	343
5:45 PM	23	78	6	0	0	107	3	71	12	0	0	86	8	9	4	0	0	21	33	16	51	0	0	100	314
Hourly Total	111	324	25	0	0	460	17	378	72	0	0	467	23	44	12	0	0	79	102	81	248	0	2	431	1437
6:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	1269	2844	183	0	2	4296	116	2634	595	0	0	3345	233	454	115	0	3	802	825	409	1408	1	10	2643	11086
Approach %	29.5	66.2	4.3	0.0	-	-	3.5	78.7	17.8	0.0	-	-	29.1	56.6	14.3	0.0	-	-	31.2	15.5	53.3	0.0	-	-	-
Total %	11.4	25.7	1.7	0.0	-	38.8	1.0	23.8	5.4	0.0	-	30.2	2.1	4.1	1.0	0.0	-	7.2	7.4	3.7	12.7	0.0	-	23.8	-
Lights	1197	2778	168	0	-	4143	113	2567	575	0	-	3255	225	417	110	0	-	752	801	380	1335	1	-	2517	10667
% Lights	94.3	97.7	91.8	-	-	96.4	97.4	97.5	96.6	-	-	97.3	96.6	91.9	95.7	-	-	93.8	97.1	92.9	94.8	100.0	-	95.2	96.2
Mediums	48	59	14	0	-	121	2	56	16	0	-	74	8	12	3	0	-	23	18	16	55	0	-	89	307
% Mediums	3.8	2.1	7.7	-	-	2.8	1.7	2.1	2.7	-	-	2.2	3.4	2.6	2.6	-	-	2.9	2.2	3.9	3.9	0.0	-	3.4	2.8
Articulated Trucks	24	7	1	0	-	32	1	11	4	0	-	16	0	25	2	0	-	27	6	13	18	0	-	37	112
% Articulated Trucks	1.9	0.2	0.5	-	-	0.7	0.9	0.4	0.7	-	-	0.5	0.0	5.5	1.7	-	-	3.4	0.7	3.2	1.3	0.0	-	1.4	1.0
Pedestrians	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	10	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018

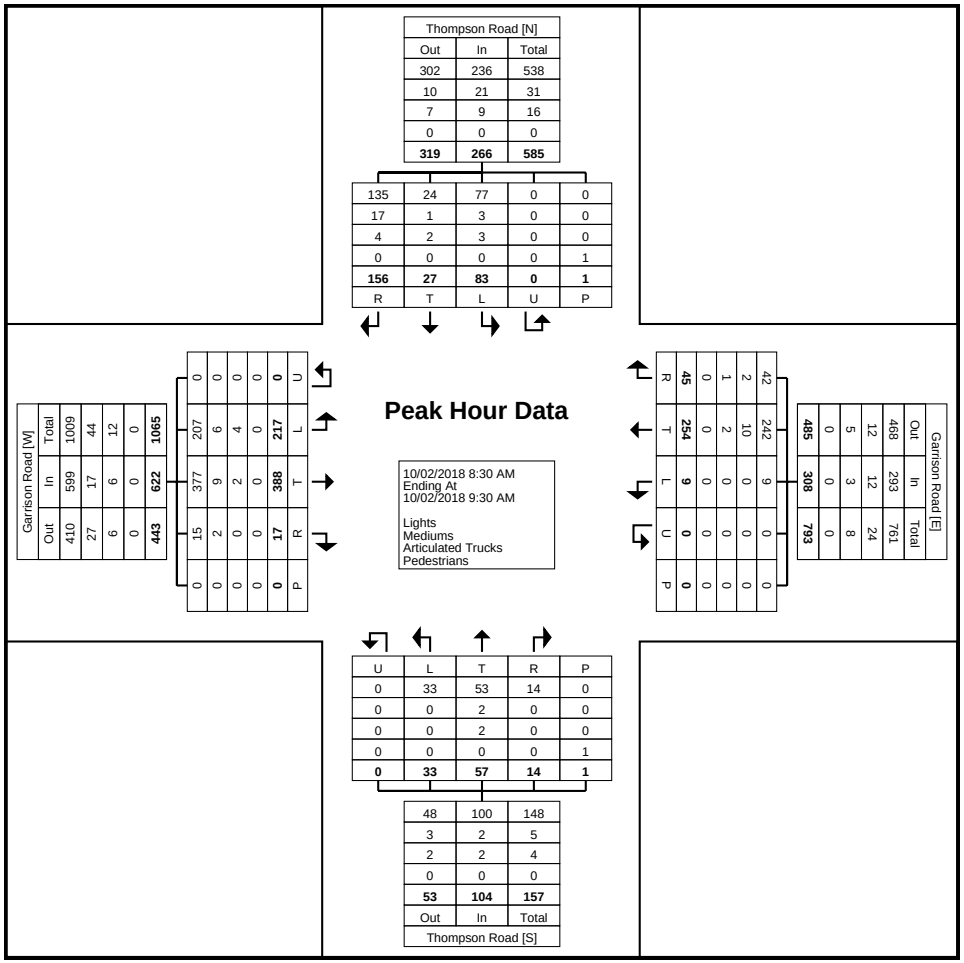
Turning Movement Peak Hour Data (8:30 AM)

Start Time	Garrison Road Eastbound						Garrison Road Westbound						Thompson Road Northbound						Thompson 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	
8:30 AM	57	87	8	0	0	152	1	55	10	0	0	66	13	12	0	0	0	25	23	6	41	0	0	70	313
8:45 AM	52	111	4	0	0	167	4	65	13	0	0	82	5	18	6	0	1	29	15	6	43	0	0	64	342
9:00 AM	67	95	2	0	0	164	2	67	13	0	0	82	7	15	1	0	0	23	24	6	38	0	0	68	337
9:15 AM	41	95	3	0	0	139	2	67	9	0	0	78	8	12	7	0	0	27	21	9	34	0	1	64	308
Total	217	388	17	0	0	622	9	254	45	0	0	308	33	57	14	0	1	104	83	27	156	0	1	266	1300
Approach %	34.9	62.4	2.7	0.0	-	-	2.9	82.5	14.6	0.0	-	-	31.7	54.8	13.5	0.0	-	-	31.2	10.2	58.6	0.0	-	-	-
Total %	16.7	29.8	1.3	0.0	-	47.8	0.7	19.5	3.5	0.0	-	23.7	2.5	4.4	1.1	0.0	-	8.0	6.4	2.1	12.0	0.0	-	20.5	-
PHF	0.810	0.874	0.531	0.000	-	0.931	0.563	0.948	0.865	0.000	-	0.939	0.635	0.792	0.500	0.000	-	0.897	0.865	0.750	0.907	0.000	-	0.950	0.950
Lights	207	377	15	0	-	599	9	242	42	0	-	293	33	53	14	0	-	100	77	24	135	0	-	236	1228
% Lights	95.4	97.2	88.2	-	-	96.3	100.0	95.3	93.3	-	-	95.1	100.0	93.0	100.0	-	-	96.2	92.8	88.9	86.5	-	-	88.7	94.5
Mediums	6	9	2	0	-	17	0	10	2	0	-	12	0	2	0	0	-	2	3	1	17	0	-	21	52
% Mediums	2.8	2.3	11.8	-	-	2.7	0.0	3.9	4.4	-	-	3.9	0.0	3.5	0.0	-	-	1.9	3.6	3.7	10.9	-	-	7.9	4.0
Articulated Trucks	4	2	0	0	-	6	0	2	1	0	-	3	0	2	0	0	-	2	3	2	4	0	-	9	20
% Articulated Trucks	1.8	0.5	0.0	-	-	1.0	0.0	0.8	2.2	-	-	1.0	0.0	3.5	0.0	-	-	1.9	3.6	7.4	2.6	-	-	3.4	1.5
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018



Turning Movement Peak Hour Data Plot (8:30 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018

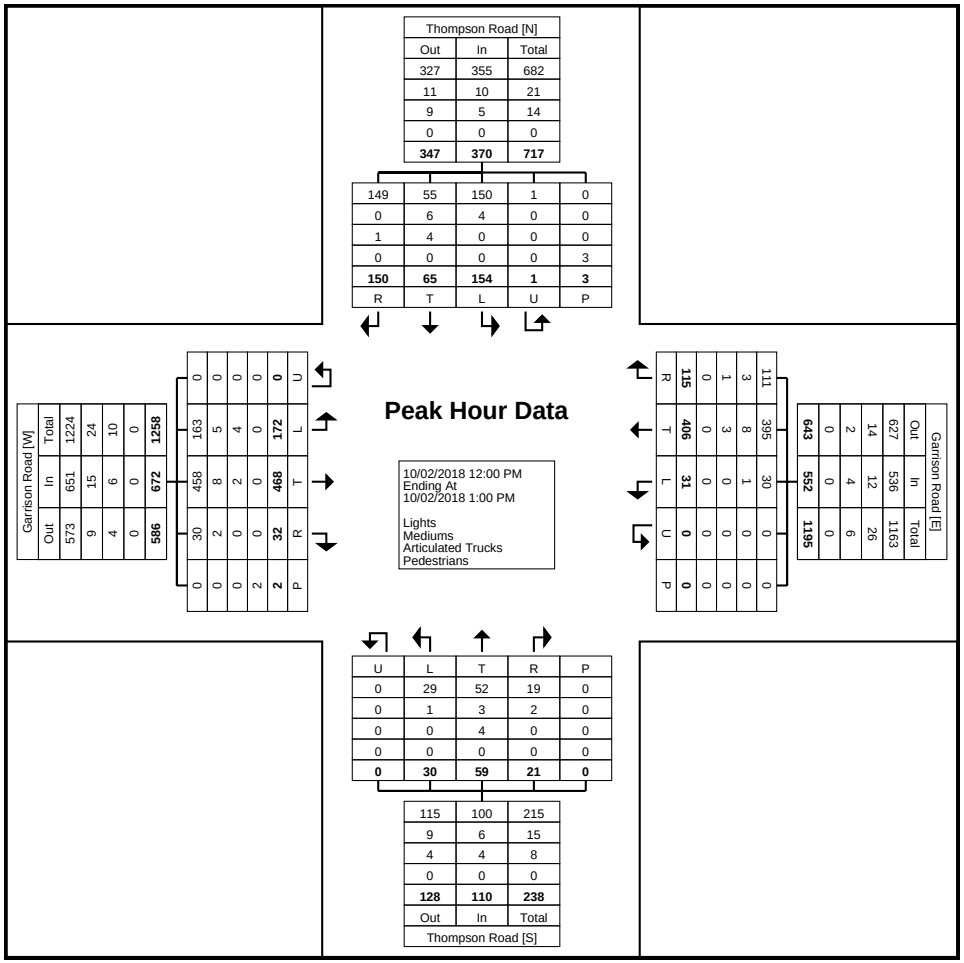
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Garrison Road Eastbound						Garrison Road Westbound						Thompson Road Northbound						Thompson Road Southbound						
	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	Int. Total
12:00 PM	42	115	8	0	0	165	7	86	24	0	0	117	9	14	4	0	0	27	41	20	43	0	0	104	413
12:15 PM	34	128	11	0	0	173	10	94	34	0	0	138	4	17	5	0	0	26	32	23	33	1	1	89	426
12:30 PM	47	107	7	0	0	161	11	109	27	0	0	147	7	15	7	0	0	29	37	12	38	0	0	87	424
12:45 PM	49	118	6	0	2	173	3	117	30	0	0	150	10	13	5	0	0	28	44	10	36	0	2	90	441
Total	172	468	32	0	2	672	31	406	115	0	0	552	30	59	21	0	0	110	154	65	150	1	3	370	1704
Approach %	25.6	69.6	4.8	0.0	-	-	5.6	73.6	20.8	0.0	-	-	27.3	53.6	19.1	0.0	-	-	41.6	17.6	40.5	0.3	-	-	-
Total %	10.1	27.5	1.9	0.0	-	39.4	1.8	23.8	6.7	0.0	-	32.4	1.8	3.5	1.2	0.0	-	6.5	9.0	3.8	8.8	0.1	-	21.7	-
PHF	0.878	0.914	0.727	0.000	-	0.971	0.705	0.868	0.846	0.000	-	0.920	0.750	0.868	0.750	0.000	-	0.948	0.875	0.707	0.872	0.250	-	0.889	0.966
Lights	163	458	30	0	-	651	30	395	111	0	-	536	29	52	19	0	-	100	150	55	149	1	-	355	1642
% Lights	94.8	97.9	93.8	-	-	96.9	96.8	97.3	96.5	-	-	97.1	96.7	88.1	90.5	-	-	90.9	97.4	84.6	99.3	100.0	-	95.9	96.4
Mediums	5	8	2	0	-	15	1	8	3	0	-	12	1	3	2	0	-	6	4	6	0	0	-	10	43
% Mediums	2.9	1.7	6.3	-	-	2.2	3.2	2.0	2.6	-	-	2.2	3.3	5.1	9.5	-	-	5.5	2.6	9.2	0.0	0.0	-	2.7	2.5
Articulated Trucks	4	2	0	0	-	6	0	3	1	0	-	4	0	4	0	0	-	4	0	4	1	0	-	5	19
% Articulated Trucks	2.3	0.4	0.0	-	-	0.9	0.0	0.7	0.9	-	-	0.7	0.0	6.8	0.0	-	-	3.6	0.0	6.2	0.7	0.0	-	1.4	1.1
Pedestrians	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018



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

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018

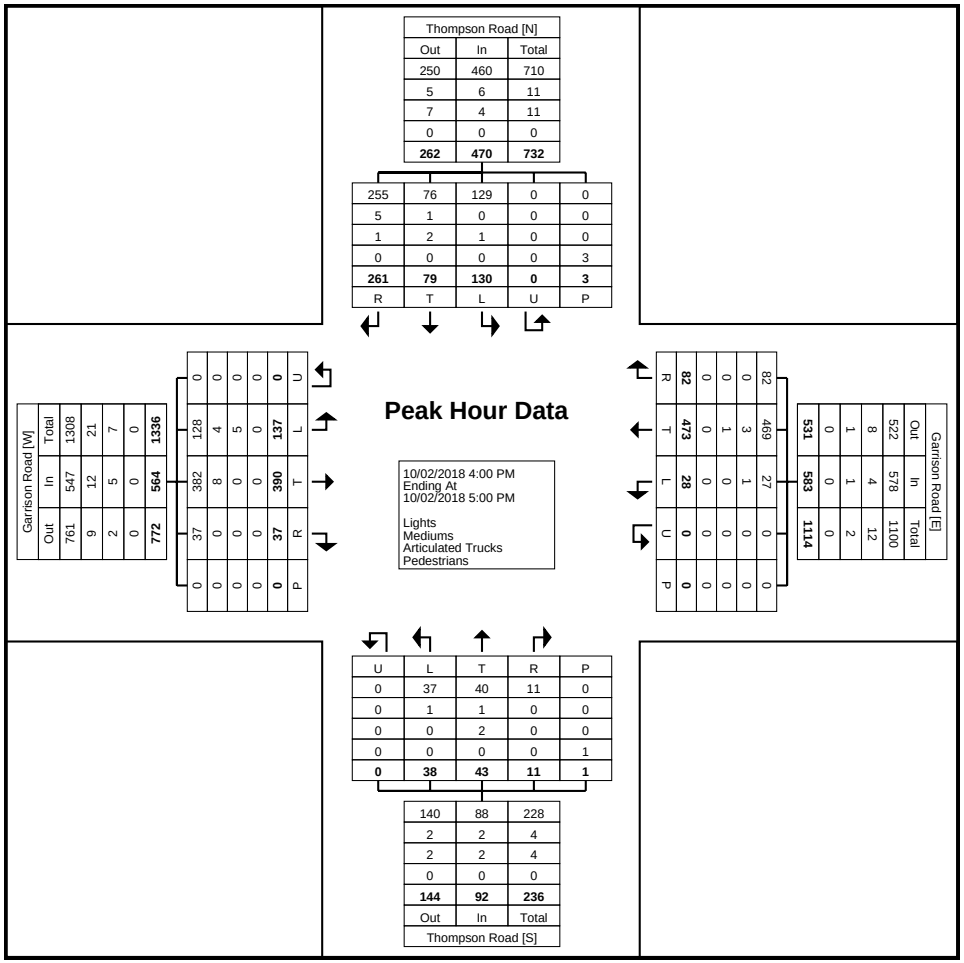
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Garrison Road Eastbound						Garrison Road Westbound						Thompson Road Northbound						Thompson 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	
4:00 PM	31	96	10	0	0	137	6	114	16	0	0	136	12	11	1	0	0	24	34	20	63	0	1	117	414
4:15 PM	36	98	5	0	0	139	5	123	16	0	0	144	9	10	3	0	0	22	30	24	57	0	1	111	416
4:30 PM	32	101	11	0	0	144	7	121	25	0	0	153	12	10	3	0	1	25	35	16	77	0	1	128	450
4:45 PM	38	95	11	0	0	144	10	115	25	0	0	150	5	12	4	0	0	21	31	19	64	0	0	114	429
Total	137	390	37	0	0	564	28	473	82	0	0	583	38	43	11	0	1	92	130	79	261	0	3	470	1709
Approach %	24.3	69.1	6.6	0.0	-	-	4.8	81.1	14.1	0.0	-	-	41.3	46.7	12.0	0.0	-	-	27.7	16.8	55.5	0.0	-	-	-
Total %	8.0	22.8	2.2	0.0	-	33.0	1.6	27.7	4.8	0.0	-	34.1	2.2	2.5	0.6	0.0	-	5.4	7.6	4.6	15.3	0.0	-	27.5	-
PHF	0.901	0.965	0.841	0.000	-	0.979	0.700	0.961	0.820	0.000	-	0.953	0.792	0.896	0.688	0.000	-	0.920	0.929	0.823	0.847	0.000	-	0.918	0.949
Lights	128	382	37	0	-	547	27	469	82	0	-	578	37	40	11	0	-	88	129	76	255	0	-	460	1673
% Lights	93.4	97.9	100.0	-	-	97.0	96.4	99.2	100.0	-	-	99.1	97.4	93.0	100.0	-	-	95.7	99.2	96.2	97.7	-	-	97.9	97.9
Mediums	4	8	0	0	-	12	1	3	0	0	-	4	1	1	0	0	-	2	0	1	5	0	-	6	24
% Mediums	2.9	2.1	0.0	-	-	2.1	3.6	0.6	0.0	-	-	0.7	2.6	2.3	0.0	-	-	2.2	0.0	1.3	1.9	-	-	1.3	1.4
Articulated Trucks	5	0	0	0	-	5	0	1	0	0	-	1	0	2	0	0	-	2	1	2	1	0	-	4	12
% Articulated Trucks	3.6	0.0	0.0	-	-	0.9	0.0	0.2	0.0	-	-	0.2	0.0	4.7	0.0	-	-	2.2	0.8	2.5	0.4	-	-	0.9	0.7
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018



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

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Garrison Road & Thompson Road
Site Code:
Start Date: 10/02/2018

Signal Code: 003122						
Intersection: RR3(Garrison) & RR122(Thompson Rd.)						
Municipality: forterie						
Owner: Region						
Last Modified: 1/11/2018 8:51:15 AM						
Timing Parameters	EBD & WBD ADVANCE GARRISON RD.	EBD & WBD THRU GARRISON RD.	NBD & SBD THRU THOMPSON RD./HELENA ST.	n/a	n/a	n/a
Min Green	6	10	10	0	0	0
Walk	0	12	12	0	0	0
Ped Clearance	0	20	20	0	0	0
Vehicle Ext.	2.5	5	3	0	0	0
Max Green	25	35	20	0	0	0
Yellow	3	5	4.1	0	0	0
All Red	0	2	2	0	0	0

		Offset
Minimum Cycle	33.1	0
Pedestrian Cycle	77.1	
Maximum Cycle	96.1	0
Operation	FA	

Installed On:
3/6/2004
Count Date:
10/13/2016

FA = Fully Actuated **SA = Semi Actuated** **FT = Fixed Time**

***Note: you need to change the paper orientation from Portriat to Landscape**

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Thompson Road & Sims Avenue
Site Code:
Start Date: 10/02/2018

Turning Movement Data

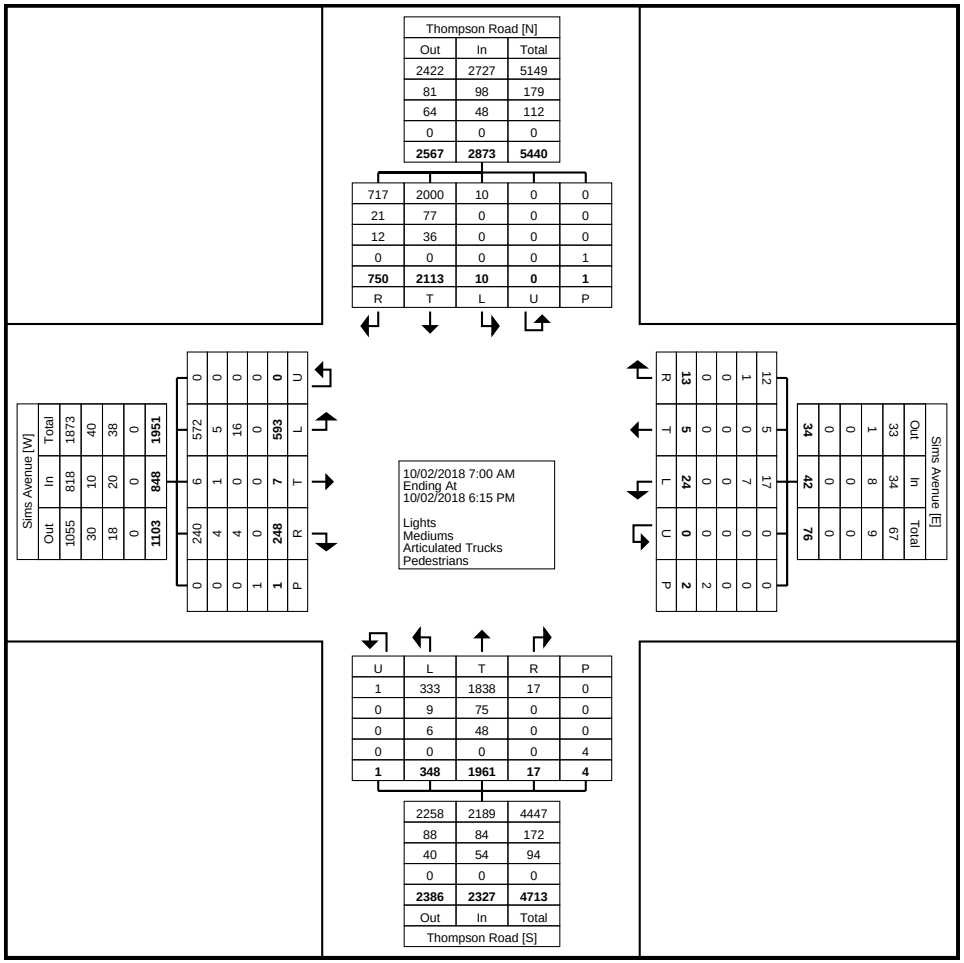
Start Time	Sims Avenue Eastbound						Sims Avenue Westbound						Thompson Road Northbound						Thompson Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	2	0	0	0	0	2	1	0	0	0	0	1	1	52	0	0	0	53	0	20	1	0	0	21	77
7:15 AM	2	0	0	0	0	2	0	0	0	0	0	0	1	59	0	0	0	60	0	35	2	0	0	37	99
7:30 AM	0	0	0	0	0	0	0	0	2	0	0	2	1	84	0	0	0	85	0	29	4	0	0	33	120
7:45 AM	3	0	1	0	0	4	1	0	0	0	0	1	1	85	0	0	0	86	0	51	5	0	0	56	147
Hourly Total	7	0	1	0	0	8	2	0	2	0	0	4	4	280	0	0	0	284	0	135	12	0	0	147	443
8:00 AM	5	0	1	0	0	6	1	0	0	0	0	1	2	59	0	0	0	61	0	57	6	0	0	63	131
8:15 AM	9	0	2	0	0	11	1	0	0	0	0	1	3	94	0	0	0	97	0	42	6	0	0	48	157
8:30 AM	6	0	5	0	0	11	1	0	0	0	0	1	2	75	0	0	0	77	0	67	6	0	0	73	162
8:45 AM	7	0	0	0	0	7	0	1	1	0	0	2	5	75	1	0	0	81	0	52	12	0	0	64	154
Hourly Total	27	0	8	0	0	35	3	1	1	0	0	5	12	303	1	0	0	316	0	218	30	0	0	248	604
9:00 AM	8	0	8	0	0	16	0	0	1	0	0	1	1	84	0	0	0	85	0	59	9	0	0	68	170
9:15 AM	8	0	4	0	0	12	0	1	0	0	0	1	4	59	0	0	0	63	0	63	8	0	0	71	147
9:30 AM	8	0	6	0	0	14	0	0	1	0	0	1	9	64	1	0	0	74	0	41	17	0	0	58	147
9:45 AM	14	0	6	0	0	20	0	0	0	0	0	0	11	54	0	0	0	65	0	42	20	0	0	62	147
Hourly Total	38	0	24	0	0	62	0	1	2	0	0	3	25	261	1	0	0	287	0	205	54	0	0	259	611
10:00 AM	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:00 AM	23	2	11	0	0	36	1	0	0	0	0	1	14	51	0	0	1	65	0	50	27	0	0	77	179
11:15 AM	30	0	18	0	0	48	1	0	1	0	0	2	12	49	1	0	0	62	0	60	25	0	0	85	197
11:30 AM	19	0	14	0	0	33	0	0	1	0	0	1	16	52	1	0	0	69	1	65	28	0	0	94	197
11:45 AM	29	0	8	0	0	37	1	0	0	0	0	1	18	48	0	0	0	66	1	59	27	0	0	87	191
Hourly Total	101	2	51	0	0	154	3	0	2	0	0	5	60	200	2	0	1	262	2	234	107	0	0	343	764
12:00 PM	25	0	11	0	0	36	0	0	0	0	0	0	16	65	1	0	0	82	0	76	26	0	0	102	220
12:15 PM	25	0	11	0	0	36	0	0	1	0	0	1	17	70	0	0	1	87	0	70	30	0	0	100	224
12:30 PM	23	1	9	0	0	33	1	0	1	0	0	2	16	62	1	0	1	79	0	65	34	0	0	99	213
12:45 PM	27	1	14	0	0	42	0	0	0	0	0	0	25	78	0	0	0	103	0	70	27	0	0	97	242
Hourly Total	100	2	45	0	0	147	1	0	2	0	0	3	74	275	2	0	2	351	0	281	117	0	0	398	899
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	24	0	9	0	0	33	1	0	0	0	0	1	21	64	2	0	0	87	1	74	35	0	0	110	231
3:15 PM	26	0	12	0	0	38	0	0	0	0	0	0	21	66	1	0	0	88	0	59	37	0	0	96	222
3:30 PM	27	0	11	0	0	38	3	1	0	0	0	4	12	69	0	0	0	81	0	87	30	0	0	117	240
3:45 PM	20	1	18	0	0	39	1	0	0	0	0	1	15	56	0	0	1	71	1	85	30	0	0	116	227
Hourly Total	97	1	50	0	0	148	5	1	0	0	0	6	69	255	3	0	1	327	2	305	132	0	0	439	920
4:00 PM	35	0	10	0	0	45	0	1	0	0	0	1	12	56	0	0	0	68	0	103	49	0	1	152	266

4:15 PM	35	1	8	0	0	44	2	0	0	0	1	2	12	51	2	0	0	65	1	82	33	0	0	116	227
4:30 PM	24	0	8	0	0	32	3	0	0	0	1	3	12	52	2	0	0	66	0	104	35	0	0	139	240
4:45 PM	26	1	10	0	1	37	0	0	1	0	0	1	12	58	1	0	0	71	1	86	42	0	0	129	238
Hourly Total	120	2	36	0	1	158	5	1	1	0	2	7	48	217	5	0	0	270	2	375	159	0	1	536	971
5:00 PM	23	0	14	0	0	37	0	1	1	0	0	2	17	59	0	0	0	76	0	105	42	0	0	147	262
5:15 PM	27	0	7	0	0	34	3	0	0	0	0	3	7	36	0	0	0	43	0	88	31	0	0	119	199
5:30 PM	30	0	1	0	0	31	0	0	1	0	0	1	19	43	2	1	0	65	1	91	40	0	0	132	229
5:45 PM	23	0	10	0	0	33	2	0	1	0	0	3	13	32	1	0	0	46	3	76	26	0	0	105	187
Hourly Total	103	0	32	0	0	135	5	1	3	0	0	9	56	170	3	1	0	230	4	360	139	0	0	503	877
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	593	7	248	0	1	848	24	5	13	0	2	42	348	1961	17	1	4	2327	10	2113	750	0	1	2873	6090
Approach %	69.9	0.8	29.2	0.0	-	-	57.1	11.9	31.0	0.0	-	-	15.0	84.3	0.7	0.0	-	-	0.3	73.5	26.1	0.0	-	-	-
Total %	9.7	0.1	4.1	0.0	-	13.9	0.4	0.1	0.2	0.0	-	0.7	5.7	32.2	0.3	0.0	-	38.2	0.2	34.7	12.3	0.0	-	47.2	-
Lights	572	6	240	0	-	818	17	5	12	0	-	34	333	1838	17	1	-	2189	10	2000	717	0	-	2727	5768
% Lights	96.5	85.7	96.8	-	-	96.5	70.8	100.0	92.3	-	-	81.0	95.7	93.7	100.0	100.0	-	94.1	100.0	94.7	95.6	-	-	94.9	94.7
Mediums	5	1	4	0	-	10	7	0	1	0	-	8	9	75	0	0	-	84	0	77	21	0	-	98	200
% Mediums	0.8	14.3	1.6	-	-	1.2	29.2	0.0	7.7	-	-	19.0	2.6	3.8	0.0	0.0	-	3.6	0.0	3.6	2.8	-	-	3.4	3.3
Articulated Trucks	16	0	4	0	-	20	0	0	0	0	-	0	6	48	0	0	-	54	0	36	12	0	-	48	122
% Articulated Trucks	2.7	0.0	1.6	-	-	2.4	0.0	0.0	0.0	-	-	0.0	1.7	2.4	0.0	0.0	-	2.3	0.0	1.7	1.6	-	-	1.7	2.0
Pedestrians	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	4	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Thompson Road & Sims Avenue
Site Code:
Start Date: 10/02/2018



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Thompson Road & Sims Avenue
Site Code:
Start Date: 10/02/2018

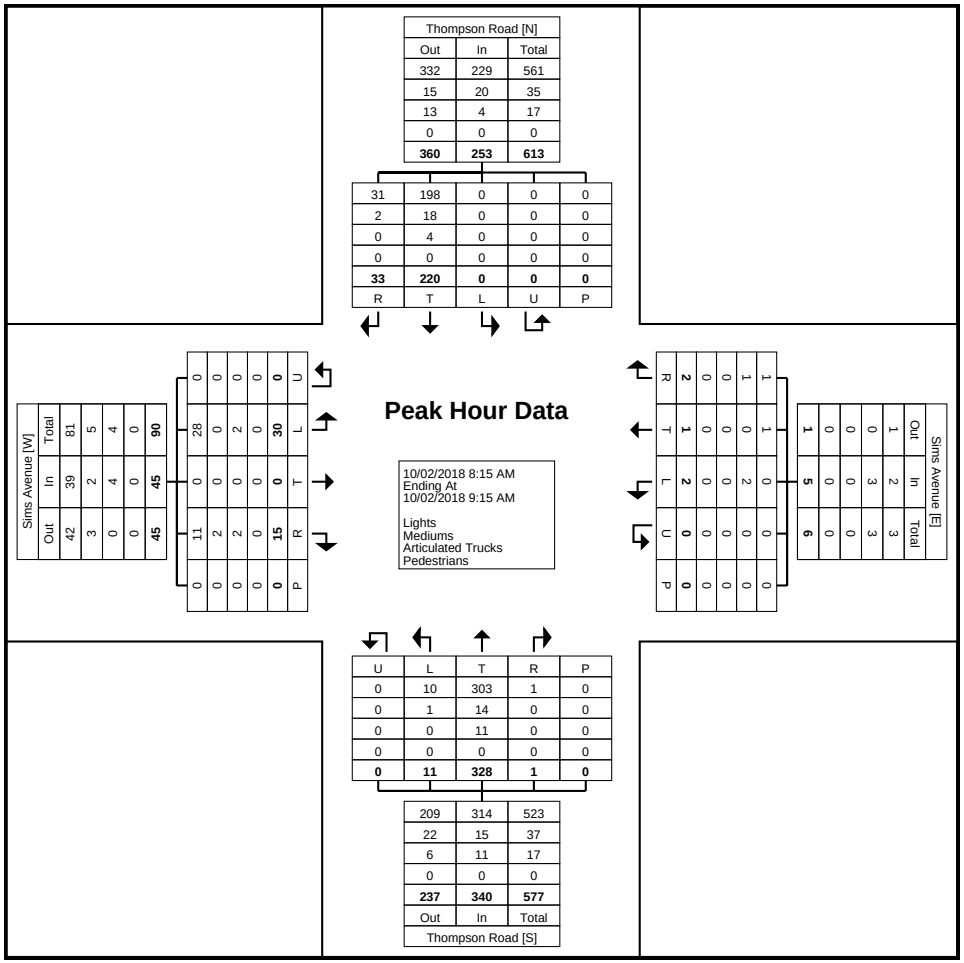
Turning Movement Peak Hour Data (8:15 AM)

Start Time	Sims Avenue Eastbound						Sims Avenue Westbound						Thompson Road Northbound						Thompson Road Southbound						
	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	Int. Total
8:15 AM	9	0	2	0	0	11	1	0	0	0	0	1	3	94	0	0	0	97	0	42	6	0	0	48	157
8:30 AM	6	0	5	0	0	11	1	0	0	0	0	1	2	75	0	0	0	77	0	67	6	0	0	73	162
8:45 AM	7	0	0	0	0	7	0	1	1	0	0	2	5	75	1	0	0	81	0	52	12	0	0	64	154
9:00 AM	8	0	8	0	0	16	0	0	1	0	0	1	1	84	0	0	0	85	0	59	9	0	0	68	170
Total	30	0	15	0	0	45	2	1	2	0	0	5	11	328	1	0	0	340	0	220	33	0	0	253	643
Approach %	66.7	0.0	33.3	0.0	-	-	40.0	20.0	40.0	0.0	-	-	3.2	96.5	0.3	0.0	-	-	0.0	87.0	13.0	0.0	-	-	-
Total %	4.7	0.0	2.3	0.0	-	7.0	0.3	0.2	0.3	0.0	-	0.8	1.7	51.0	0.2	0.0	-	52.9	0.0	34.2	5.1	0.0	-	39.3	-
PHF	0.833	0.000	0.469	0.000	-	0.703	0.500	0.250	0.500	0.000	-	0.625	0.550	0.872	0.250	0.000	-	0.876	0.000	0.821	0.688	0.000	-	0.866	0.946
Lights	28	0	11	0	-	39	0	1	1	0	-	2	10	303	1	0	-	314	0	198	31	0	-	229	584
% Lights	93.3	-	73.3	-	-	86.7	0.0	100.0	50.0	-	-	40.0	90.9	92.4	100.0	-	-	92.4	-	90.0	93.9	-	-	90.5	90.8
Mediums	0	0	2	0	-	2	2	0	1	0	-	3	1	14	0	0	-	15	0	18	2	0	-	20	40
% Mediums	0.0	-	13.3	-	-	4.4	100.0	0.0	50.0	-	-	60.0	9.1	4.3	0.0	-	-	4.4	-	8.2	6.1	-	-	7.9	6.2
Articulated Trucks	2	0	2	0	-	4	0	0	0	0	-	0	0	11	0	0	-	11	0	4	0	0	-	4	19
% Articulated Trucks	6.7	-	13.3	-	-	8.9	0.0	0.0	0.0	-	-	0.0	0.0	3.4	0.0	-	-	3.2	-	1.8	0.0	-	-	1.6	3.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Thompson Road & Sims Avenue
Site Code:
Start Date: 10/02/2018



Turning Movement Peak Hour Data Plot (8:15 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Thompson Road & Sims Avenue
Site Code:
Start Date: 10/02/2018

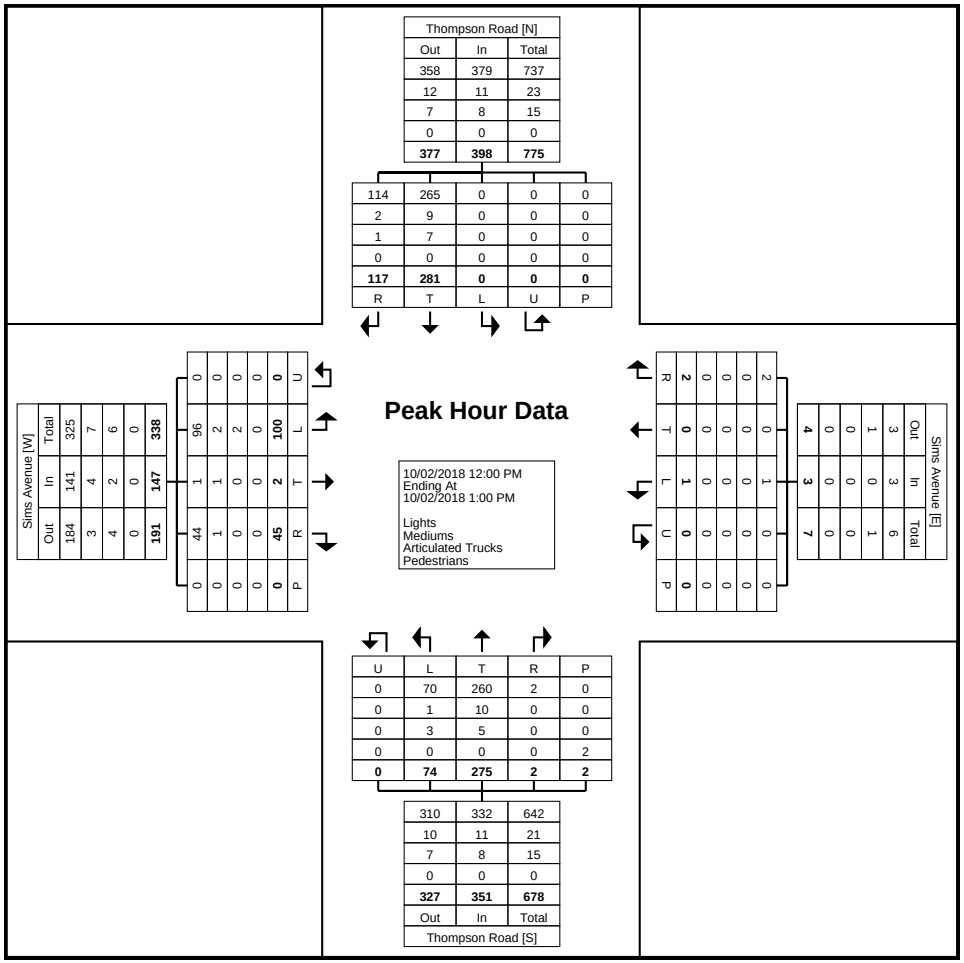
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Sims Avenue Eastbound						Sims Avenue Westbound						Thompson Road Northbound						Thompson Road Southbound						
	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	Int. Total
12:00 PM	25	0	11	0	0	36	0	0	0	0	0	0	16	65	1	0	0	82	0	76	26	0	0	102	220
12:15 PM	25	0	11	0	0	36	0	0	1	0	0	1	17	70	0	0	1	87	0	70	30	0	0	100	224
12:30 PM	23	1	9	0	0	33	1	0	1	0	0	2	16	62	1	0	1	79	0	65	34	0	0	99	213
12:45 PM	27	1	14	0	0	42	0	0	0	0	0	0	25	78	0	0	0	103	0	70	27	0	0	97	242
Total	100	2	45	0	0	147	1	0	2	0	0	3	74	275	2	0	2	351	0	281	117	0	0	398	899
Approach %	68.0	1.4	30.6	0.0	-	-	33.3	0.0	66.7	0.0	-	-	21.1	78.3	0.6	0.0	-	-	0.0	70.6	29.4	0.0	-	-	-
Total %	11.1	0.2	5.0	0.0	-	16.4	0.1	0.0	0.2	0.0	-	0.3	8.2	30.6	0.2	0.0	-	39.0	0.0	31.3	13.0	0.0	-	44.3	-
PHF	0.926	0.500	0.804	0.000	-	0.875	0.250	0.000	0.500	0.000	-	0.375	0.740	0.881	0.500	0.000	-	0.852	0.000	0.924	0.860	0.000	-	0.975	0.929
Lights	96	1	44	0	-	141	1	0	2	0	-	3	70	260	2	0	-	332	0	265	114	0	-	379	855
% Lights	96.0	50.0	97.8	-	-	95.9	100.0	-	100.0	-	-	100.0	94.6	94.5	100.0	-	-	94.6	-	94.3	97.4	-	-	95.2	95.1
Mediums	2	1	1	0	-	4	0	0	0	0	-	0	1	10	0	0	-	11	0	9	2	0	-	11	26
% Mediums	2.0	50.0	2.2	-	-	2.7	0.0	-	0.0	-	-	0.0	1.4	3.6	0.0	-	-	3.1	-	3.2	1.7	-	-	2.8	2.9
Articulated Trucks	2	0	0	0	-	2	0	0	0	0	-	0	3	5	0	0	-	8	0	7	1	0	-	8	18
% Articulated Trucks	2.0	0.0	0.0	-	-	1.4	0.0	-	0.0	-	-	0.0	4.1	1.8	0.0	-	-	2.3	-	2.5	0.9	-	-	2.0	2.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Thompson Road & Sims Avenue
Site Code:
Start Date: 10/02/2018



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

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Thompson Road & Sims Avenue
Site Code:
Start Date: 10/02/2018

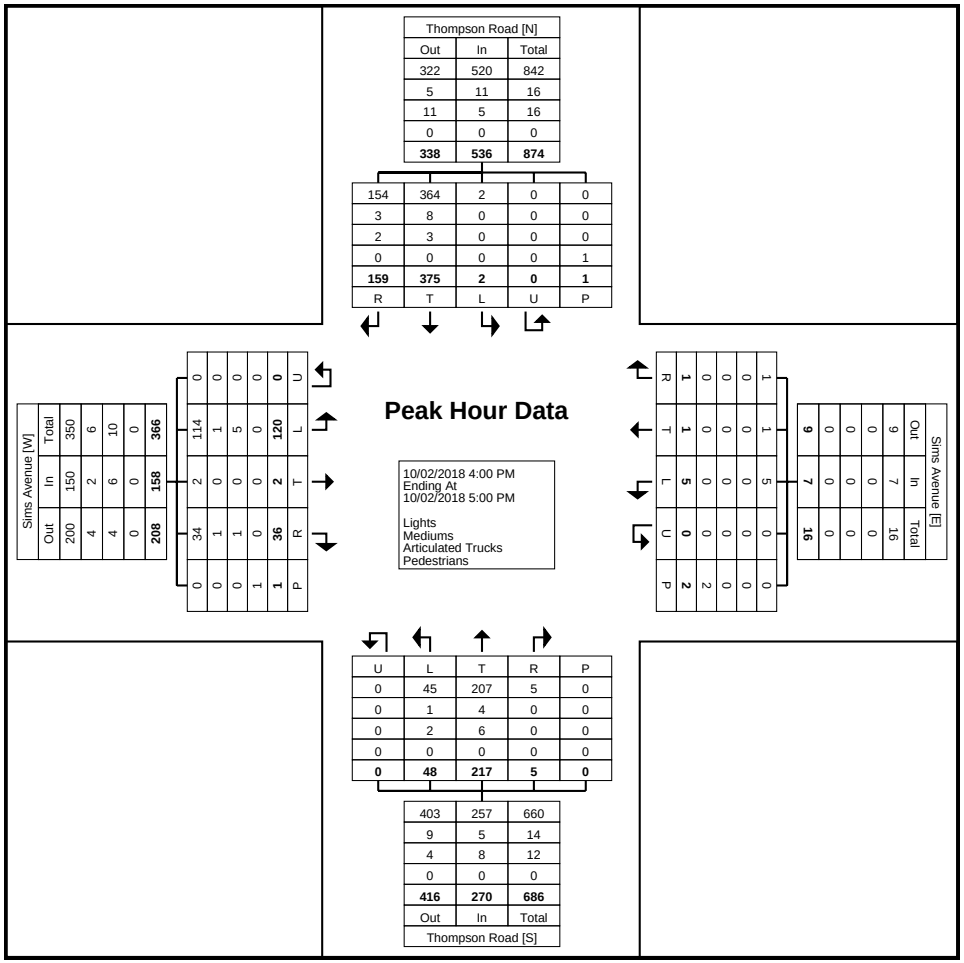
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Sims Avenue Eastbound						Sims Avenue Westbound						Thompson Road Northbound						Thompson Road Southbound						
	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	Int. Total
4:00 PM	35	0	10	0	0	45	0	1	0	0	0	1	12	56	0	0	0	68	0	103	49	0	1	152	266
4:15 PM	35	1	8	0	0	44	2	0	0	0	1	2	12	51	2	0	0	65	1	82	33	0	0	116	227
4:30 PM	24	0	8	0	0	32	3	0	0	0	1	3	12	52	2	0	0	66	0	104	35	0	0	139	240
4:45 PM	26	1	10	0	1	37	0	0	1	0	0	1	12	58	1	0	0	71	1	86	42	0	0	129	238
Total	120	2	36	0	1	158	5	1	1	0	2	7	48	217	5	0	0	270	2	375	159	0	1	536	971
Approach %	75.9	1.3	22.8	0.0	-	-	71.4	14.3	14.3	0.0	-	-	17.8	80.4	1.9	0.0	-	-	0.4	70.0	29.7	0.0	-	-	-
Total %	12.4	0.2	3.7	0.0	-	16.3	0.5	0.1	0.1	0.0	-	0.7	4.9	22.3	0.5	0.0	-	27.8	0.2	38.6	16.4	0.0	-	55.2	-
PHF	0.857	0.500	0.900	0.000	-	0.878	0.417	0.250	0.250	0.000	-	0.583	1.000	0.935	0.625	0.000	-	0.951	0.500	0.901	0.811	0.000	-	0.882	0.913
Lights	114	2	34	0	-	150	5	1	1	0	-	7	45	207	5	0	-	257	2	364	154	0	-	520	934
% Lights	95.0	100.0	94.4	-	-	94.9	100.0	100.0	100.0	-	-	100.0	93.8	95.4	100.0	-	-	95.2	100.0	97.1	96.9	-	-	97.0	96.2
Mediums	1	0	1	0	-	2	0	0	0	0	-	0	1	4	0	0	-	5	0	8	3	0	-	11	18
% Mediums	0.8	0.0	2.8	-	-	1.3	0.0	0.0	0.0	-	-	0.0	2.1	1.8	0.0	-	-	1.9	0.0	2.1	1.9	-	-	2.1	1.9
Articulated Trucks	5	0	1	0	-	6	0	0	0	0	-	0	2	6	0	0	-	8	0	3	2	0	-	5	19
% Articulated Trucks	4.2	0.0	2.8	-	-	3.8	0.0	0.0	0.0	-	-	0.0	4.2	2.8	0.0	-	-	3.0	0.0	0.8	1.3	-	-	0.9	2.0
Pedestrians	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Thompson Road & Sims Avenue
Site Code:
Start Date: 10/02/2018



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

Signal Code: 122SMS						
Intersection: RR122(Thompson Rd.) & Sims Ave./Walmart Ent.						
Municipality: forterie						
Owner: region						
Last Modified: 6/18/2013 1:54:25 PM						
Timing Parameters	**NBD/SBD Left Thompson**	**SBD/NBD Thru Thompson**	**EBD Walmart Ent. (Split)**	**WBD Sims (Split)**	**n/a**	**n/a**
Min Green	**6**	**10**	**8**	**8**	**0**	**0**
Walk	**0**	**8**	**11**	**0**	**0**	**0**
Ped Clearance	**0**	**13**	**18**	**0**	**0**	**0**
Vehicle Ext.	**2.5**	**2.3**	**4**	**2.5**	**0**	**0**
Max Green	**10**	**40**	**30**	**12**	**0**	**0**
Yellow	**3**	**4.1**	**4.1**	**4.1**	**0**	**0**
All Red	**0**	**2.6**	**4**	**2.5**	**0**	**0**

		Offset
Minimum Cycle	**32.8**	**0**
Pedestrian Cycle	**64.8**	
Maximum Cycle	**116.4**	**0**
Operation	**FA**	

Installed On:
--/--/----
Count Date:
--/--/----

FA = Fully Actuated **SA = Semi Actuated** **FT = Fixed Time**

***Note: you need to change the paper orientation from Portriat to Landscape**

Thompson at Driveway

	Driveway 2 (South)			
	RIGHT In	**Left In**	**Right Out**	**Left Out**
7:00-7:15	2	0	0	0
7:15-7:30	3	1	1	0
7:30-7:45	1	3	2	2
7:45-8:00	4	3	2	1
8:00-8:15	3	0	2	1
8:15-8:30	2	1	2	3
8:30-8:45	9	0	2	2
8:45-9:00	5	3	3	2
9:00-9:15	5	3	0	2
9:15-9:30	1	3	3	4
9:30-9:45	3	3	2	2
9:45-10:00	5	1	8	4
11:00-11:15	4	3	4	4
11:15-11:30	1	2	4	4
11:30-11:45	3	1	3	3
11:45-12:00	2	2	3	3
12:00-12:15	4	6	2	4
12:15-12:30	2	3	5	3
12:30-12:45	0	2	4	6
12:45-1:00	1	1	1	4
3:00-3:15	2	3	4	5
3:15-3:30	1	1	5	3
3:30-3:45	5	1	3	0
3:45-4:00	1	0	4	3
4:00-4:15	1	5	4	5
4:15-4:30	2	1	4	1
4:30-4:45	1	1	2	1
4:45-5:00	1	2	2	0
5:00-5:15	1	1	3	3
5:15-5:30	2	1	1	4
5:30-5:45	0	1	1	0
5:45-6:00	0	0	1	3

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Commercial Driveway on Garrison Road
Site Code:
Start Date: 10/02/2018

Turning Movement Data

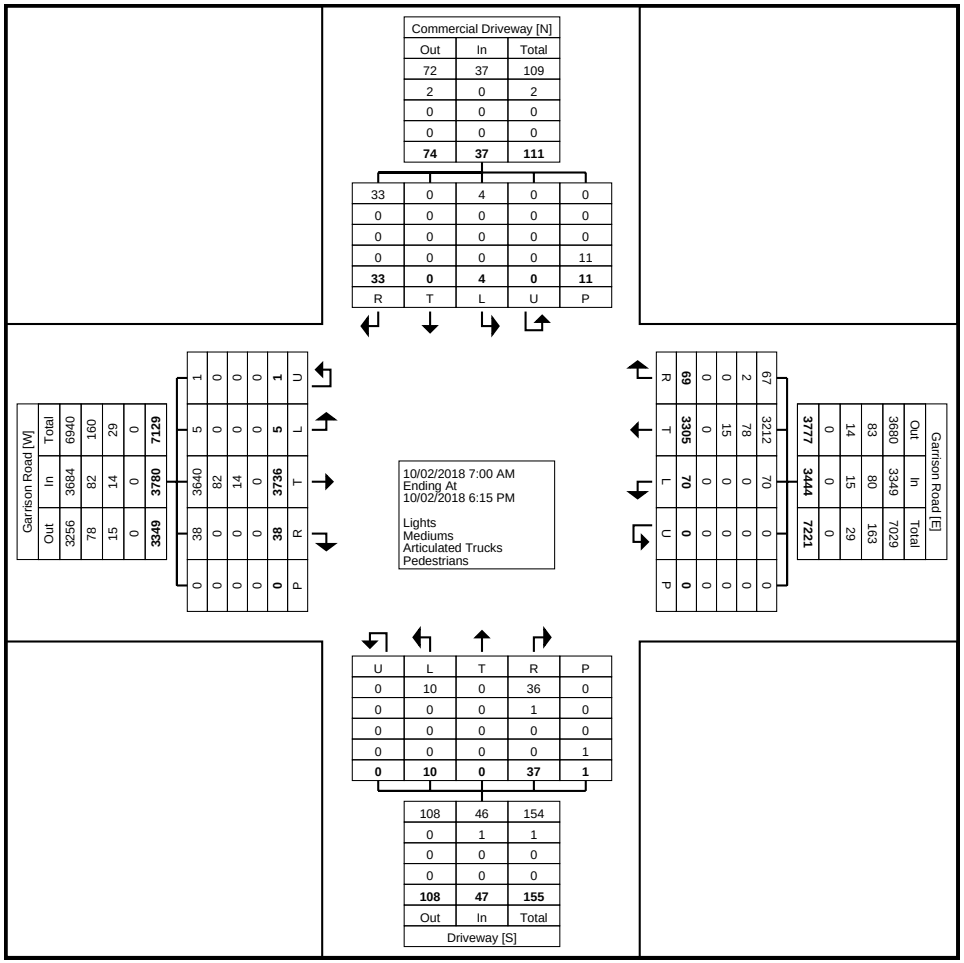
Start Time	Garrison Road Eastbound						Garrison Road Westbound						Driveway Northbound						Commercial Driveway Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	43	0	0	0	43	0	24	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	67
7:15 AM	1	53	0	0	0	54	0	43	0	0	0	43	0	0	0	0	0	0	0	0	0	0	0	0	97
7:30 AM	0	72	1	0	0	73	2	52	0	0	0	54	0	0	1	0	0	1	0	0	0	0	0	0	128
7:45 AM	0	84	0	0	0	84	1	55	0	0	0	56	0	0	0	0	0	0	0	0	1	0	0	1	141
Hourly Total	1	252	1	0	0	254	3	174	0	0	0	177	0	0	1	0	0	1	0	0	1	0	0	1	433
8:00 AM	1	79	0	0	0	80	0	68	1	0	0	69	0	0	0	0	0	0	0	0	3	0	0	3	152
8:15 AM	0	103	0	1	0	104	0	50	1	0	0	51	0	0	0	0	0	0	0	0	0	0	0	0	155
8:30 AM	0	114	1	0	0	115	0	68	1	0	0	69	0	0	0	0	0	0	1	0	2	0	0	3	187
8:45 AM	0	127	0	0	0	127	1	78	6	0	0	85	0	0	0	0	0	0	0	0	0	0	0	0	212
Hourly Total	1	423	1	1	0	426	1	264	9	0	0	274	0	0	0	0	0	0	1	0	5	0	0	6	706
9:00 AM	0	123	0	0	0	123	1	81	1	0	0	83	0	0	1	0	0	1	0	0	1	0	0	1	208
9:15 AM	0	121	0	0	0	121	0	80	1	0	0	81	0	0	0	0	0	0	0	0	1	0	0	1	203
9:30 AM	1	99	1	0	0	101	0	89	1	0	0	90	0	0	0	0	0	0	1	0	3	0	0	4	195
9:45 AM	0	112	1	0	0	113	1	85	4	0	0	90	1	0	1	0	0	2	0	0	1	0	0	1	206
Hourly Total	1	455	2	0	0	458	2	335	7	0	0	344	1	0	2	0	0	3	1	0	6	0	0	7	812
10:00 AM	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
11:00 AM	0	135	1	0	0	136	1	104	3	0	0	108	0	0	1	0	0	1	0	0	1	0	0	1	246
11:15 AM	0	130	3	0	0	133	2	106	4	0	0	112	0	0	3	0	0	3	0	0	0	0	0	0	248
11:30 AM	0	131	4	0	0	135	3	117	2	0	0	122	1	0	0	0	0	1	0	0	2	0	1	2	260
11:45 AM	0	150	2	0	0	152	5	120	5	0	0	130	0	0	2	0	0	2	0	0	2	0	0	2	286
Hourly Total	0	546	10	0	0	556	11	447	14	0	0	472	1	0	6	0	0	7	0	0	5	0	1	5	1040
12:00 PM	0	157	4	0	0	161	4	117	2	0	0	123	0	0	3	0	0	3	0	0	0	0	0	0	287
12:15 PM	0	151	3	0	0	154	7	139	3	0	0	149	0	0	3	0	0	3	0	0	2	0	1	2	308
12:30 PM	1	158	2	0	0	161	7	143	5	0	0	155	0	0	2	0	0	2	0	0	2	0	0	2	320
12:45 PM	0	165	0	0	0	165	2	145	4	0	0	151	0	0	1	0	0	1	0	0	1	0	2	1	318
Hourly Total	1	631	9	0	0	641	20	544	14	0	0	578	0	0	9	0	0	9	0	0	5	0	3	5	1233
1:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	110	1	0	0	111	3	135	3	0	0	141	0	0	0	0	0	0	0	0	0	0	0	0	252
3:15 PM	0	113	1	0	0	114	9	121	3	0	0	133	3	0	9	0	0	12	0	0	1	0	0	1	260
3:30 PM	0	131	3	0	0	134	3	121	3	0	0	127	1	0	2	0	0	3	0	0	4	0	0	4	268
3:45 PM	0	114	1	0	0	115	4	121	2	0	0	127	0	0	1	0	0	1	0	0	1	0	0	1	244
Hourly Total	0	468	6	0	0	474	19	498	11	0	0	528	4	0	12	0	0	16	0	0	6	0	0	6	1024
4:00 PM	0	130	1	0	0	131	0	131	5	0	0	136	0	0	0	0	0	0	0	0	0	0	1	0	267

4:15 PM	0	127	0	0	0	127	2	146	1	0	0	149	0	0	0	0	0	0	0	0	2	0	1	2	278
4:30 PM	0	143	1	0	0	144	0	145	0	0	0	145	1	0	1	0	1	2	0	0	0	0	1	0	291
4:45 PM	0	127	1	0	0	128	1	150	4	0	0	155	2	0	0	0	0	2	2	0	2	0	1	4	289
Hourly Total	0	527	3	0	0	530	3	572	10	0	0	585	3	0	1	0	1	4	2	0	4	0	4	6	1125
5:00 PM	0	125	0	0	0	125	2	134	1	0	0	137	0	0	1	0	0	1	0	0	0	0	1	0	263
5:15 PM	0	100	1	0	0	101	0	131	0	0	0	131	0	0	0	0	0	0	0	0	1	0	2	1	233
5:30 PM	1	96	0	0	0	97	4	119	1	0	0	124	1	0	2	0	0	3	0	0	0	0	0	0	224
5:45 PM	0	109	5	0	0	114	5	84	2	0	0	91	0	0	3	0	0	3	0	0	0	0	0	0	208
Hourly Total	1	430	6	0	0	437	11	468	4	0	0	483	1	0	6	0	0	7	0	0	1	0	3	1	928
6:00 PM	0	2	0	0	0	2	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
Grand Total	5	3736	38	1	0	3780	70	3305	69	0	0	3444	10	0	37	0	1	47	4	0	33	0	11	37	7308
Approach %	0.1	98.8	1.0	0.0	-	-	2.0	96.0	2.0	0.0	-	-	21.3	0.0	78.7	0.0	-	-	10.8	0.0	89.2	0.0	-	-	-
Total %	0.1	51.1	0.5	0.0	-	51.7	1.0	45.2	0.9	0.0	-	47.1	0.1	0.0	0.5	0.0	-	0.6	0.1	0.0	0.5	0.0	-	0.5	-
Lights	5	3640	38	1	-	3684	70	3212	67	0	-	3349	10	0	36	0	-	46	4	0	33	0	-	37	7116
% Lights	100.0	97.4	100.0	100.0	-	97.5	100.0	97.2	97.1	-	-	97.2	100.0	-	97.3	-	-	97.9	100.0	-	100.0	-	-	100.0	97.4
Mediums	0	82	0	0	-	82	0	78	2	0	-	80	0	0	1	0	-	1	0	0	0	0	-	0	163
% Mediums	0.0	2.2	0.0	0.0	-	2.2	0.0	2.4	2.9	-	-	2.3	0.0	-	2.7	-	-	2.1	0.0	-	0.0	-	-	0.0	2.2
Articulated Trucks	0	14	0	0	-	14	0	15	0	0	-	15	0	0	0	0	-	0	0	0	0	0	-	0	29
% Articulated Trucks	0.0	0.4	0.0	0.0	-	0.4	0.0	0.5	0.0	-	-	0.4	0.0	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.4
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	11	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Commercial Driveway on Garrison Road
Site Code:
Start Date: 10/02/2018



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Commercial Driveway on Garrison Road
Site Code:
Start Date: 10/02/2018

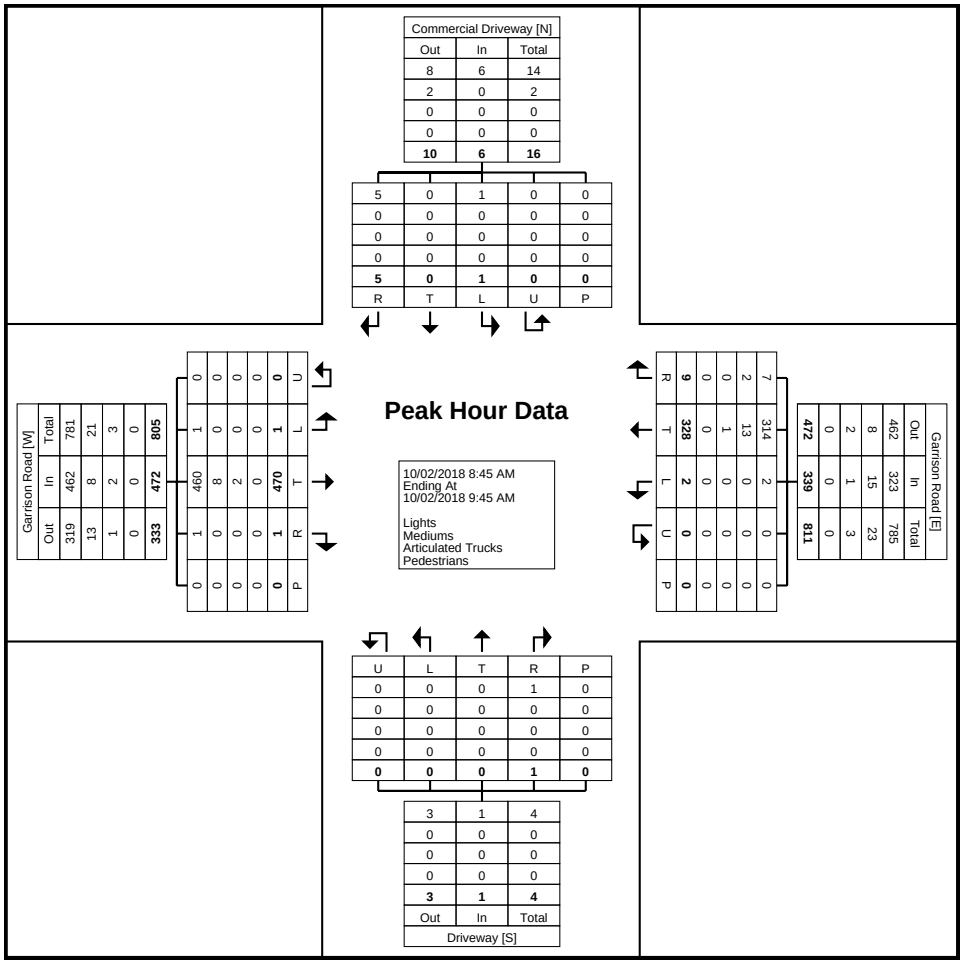
Turning Movement Peak Hour Data (8:45 AM)

Start Time	Garrison Road Eastbound						Garrison Road Westbound						Driveway Northbound						Commercial Driveway 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	
8:45 AM	0	127	0	0	0	127	1	78	6	0	0	85	0	0	0	0	0	0	0	0	0	0	0	0	212
9:00 AM	0	123	0	0	0	123	1	81	1	0	0	83	0	0	1	0	0	1	0	0	1	0	0	1	208
9:15 AM	0	121	0	0	0	121	0	80	1	0	0	81	0	0	0	0	0	0	0	0	1	0	0	1	203
9:30 AM	1	99	1	0	0	101	0	89	1	0	0	90	0	0	0	0	0	0	1	0	3	0	0	4	195
Total	1	470	1	0	0	472	2	328	9	0	0	339	0	0	1	0	0	1	1	0	5	0	0	6	818
Approach %	0.2	99.6	0.2	0.0	-	-	0.6	96.8	2.7	0.0	-	-	0.0	0.0	100.0	0.0	-	-	16.7	0.0	83.3	0.0	-	-	-
Total %	0.1	57.5	0.1	0.0	-	57.7	0.2	40.1	1.1	0.0	-	41.4	0.0	0.0	0.1	0.0	-	0.1	0.1	0.0	0.6	0.0	-	0.7	-
PHF	0.250	0.925	0.250	0.000	-	0.929	0.500	0.921	0.375	0.000	-	0.942	0.000	0.000	0.250	0.000	-	0.250	0.250	0.000	0.417	0.000	-	0.375	0.965
Lights	1	460	1	0	-	462	2	314	7	0	-	323	0	0	1	0	-	1	1	0	5	0	-	6	792
% Lights	100.0	97.9	100.0	-	-	97.9	100.0	95.7	77.8	-	-	95.3	-	-	100.0	-	-	100.0	100.0	-	100.0	-	-	100.0	96.8
Mediums	0	8	0	0	-	8	0	13	2	0	-	15	0	0	0	0	-	0	0	0	0	0	-	0	23
% Mediums	0.0	1.7	0.0	-	-	1.7	0.0	4.0	22.2	-	-	4.4	-	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	2.8
Articulated Trucks	0	2	0	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	3
% Articulated Trucks	0.0	0.4	0.0	-	-	0.4	0.0	0.3	0.0	-	-	0.3	-	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.4
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Commercial Driveway on Garrison Road
Site Code:
Start Date: 10/02/2018



Turning Movement Peak Hour Data Plot (8:45 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Commercial Driveway on Garrison Road
Site Code:
Start Date: 10/02/2018

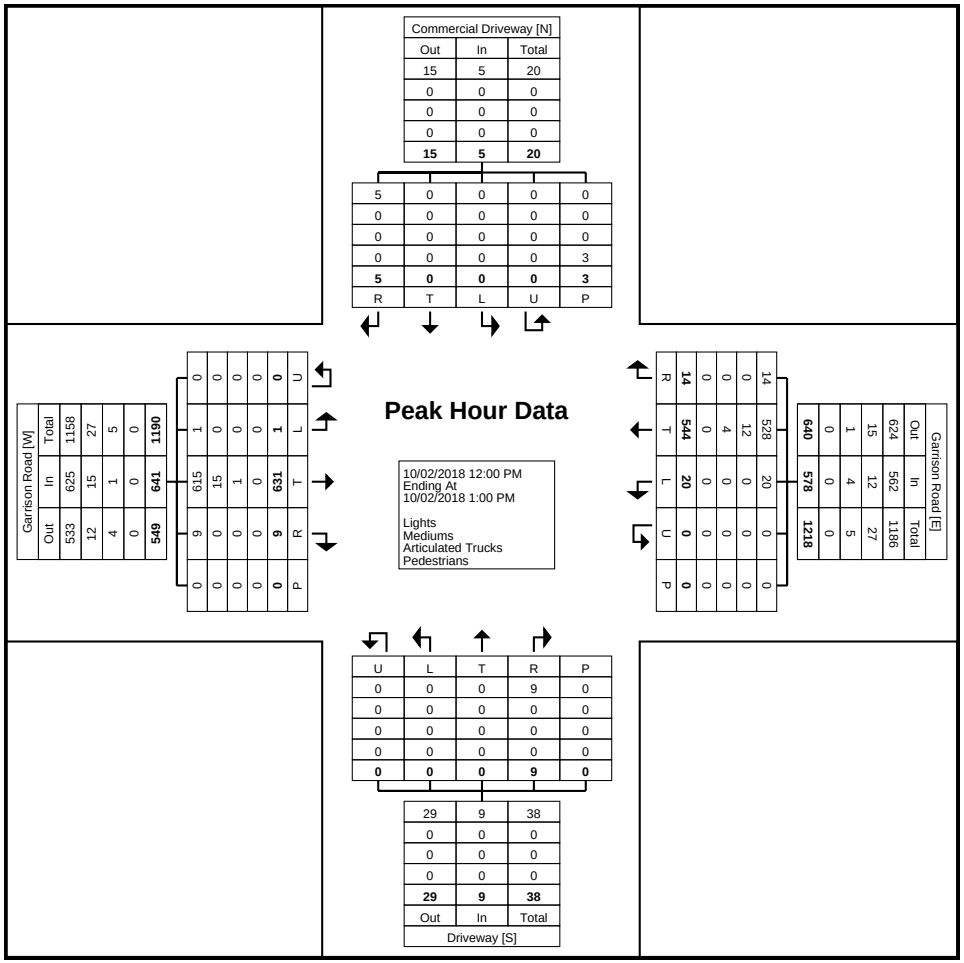
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Garrison Road Eastbound						Garrison Road Westbound						Driveway Northbound						Commercial Driveway 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	157	4	0	0	161	4	117	2	0	0	123	0	0	3	0	0	3	0	0	0	0	0	0	287
12:15 PM	0	151	3	0	0	154	7	139	3	0	0	149	0	0	3	0	0	3	0	0	2	0	1	2	308
12:30 PM	1	158	2	0	0	161	7	143	5	0	0	155	0	0	2	0	0	2	0	0	2	0	0	2	320
12:45 PM	0	165	0	0	0	165	2	145	4	0	0	151	0	0	1	0	0	1	0	0	1	0	2	1	318
Total	1	631	9	0	0	641	20	544	14	0	0	578	0	0	9	0	0	9	0	0	5	0	3	5	1233
Approach %	0.2	98.4	1.4	0.0	-	-	3.5	94.1	2.4	0.0	-	-	0.0	0.0	100.0	0.0	-	-	0.0	0.0	100.0	0.0	-	-	-
Total %	0.1	51.2	0.7	0.0	-	52.0	1.6	44.1	1.1	0.0	-	46.9	0.0	0.0	0.7	0.0	-	0.7	0.0	0.0	0.4	0.0	-	0.4	-
PHF	0.250	0.956	0.563	0.000	-	0.971	0.714	0.938	0.700	0.000	-	0.932	0.000	0.000	0.750	0.000	-	0.750	0.000	0.000	0.625	0.000	-	0.625	0.963
Lights	1	615	9	0	-	625	20	528	14	0	-	562	0	0	9	0	-	9	0	0	5	0	-	5	1201
% Lights	100.0	97.5	100.0	-	-	97.5	100.0	97.1	100.0	-	-	97.2	-	-	100.0	-	-	100.0	-	-	100.0	-	-	100.0	97.4
Mediums	0	15	0	0	-	15	0	12	0	0	-	12	0	0	0	0	-	0	0	0	0	0	-	0	27
% Mediums	0.0	2.4	0.0	-	-	2.3	0.0	2.2	0.0	-	-	2.1	-	-	0.0	-	-	0.0	-	-	0.0	-	-	0.0	2.2
Articulated Trucks	0	1	0	0	-	1	0	4	0	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	5
% Articulated Trucks	0.0	0.2	0.0	-	-	0.2	0.0	0.7	0.0	-	-	0.7	-	-	0.0	-	-	0.0	-	-	0.0	-	-	0.0	0.4
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Commercial Driveway on Garrison Road
Site Code:
Start Date: 10/02/2018



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

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Commercial Driveway on Garrison Road
Site Code:
Start Date: 10/02/2018

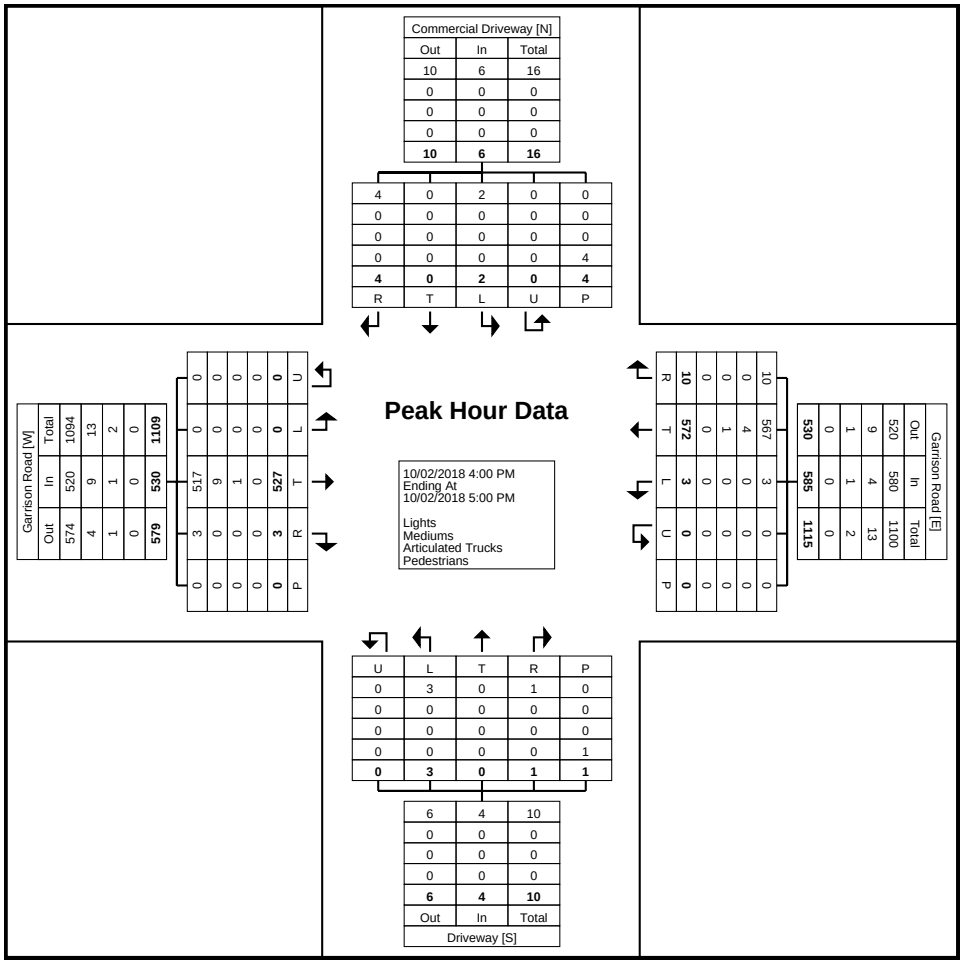
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Garrison Road Eastbound						Garrison Road Westbound						Driveway Northbound						Commercial Driveway 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	
4:00 PM	0	130	1	0	0	131	0	131	5	0	0	136	0	0	0	0	0	0	0	0	0	0	1	0	267
4:15 PM	0	127	0	0	0	127	2	146	1	0	0	149	0	0	0	0	0	0	0	0	2	0	1	2	278
4:30 PM	0	143	1	0	0	144	0	145	0	0	0	145	1	0	1	0	1	2	0	0	0	0	1	0	291
4:45 PM	0	127	1	0	0	128	1	150	4	0	0	155	2	0	0	0	0	2	2	0	2	0	1	4	289
Total	0	527	3	0	0	530	3	572	10	0	0	585	3	0	1	0	1	4	2	0	4	0	4	6	1125
Approach %	0.0	99.4	0.6	0.0	-	-	0.5	97.8	1.7	0.0	-	-	75.0	0.0	25.0	0.0	-	-	33.3	0.0	66.7	0.0	-	-	-
Total %	0.0	46.8	0.3	0.0	-	47.1	0.3	50.8	0.9	0.0	-	52.0	0.3	0.0	0.1	0.0	-	0.4	0.2	0.0	0.4	0.0	-	0.5	-
PHF	0.000	0.921	0.750	0.000	-	0.920	0.375	0.953	0.500	0.000	-	0.944	0.375	0.000	0.250	0.000	-	0.500	0.250	0.000	0.500	0.000	-	0.375	0.966
Lights	0	517	3	0	-	520	3	567	10	0	-	580	3	0	1	0	-	4	2	0	4	0	-	6	1110
% Lights	-	98.1	100.0	-	-	98.1	100.0	99.1	100.0	-	-	99.1	100.0	-	100.0	-	-	100.0	100.0	-	100.0	-	-	100.0	98.7
Mediums	0	9	0	0	-	9	0	4	0	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	13
% Mediums	-	1.7	0.0	-	-	1.7	0.0	0.7	0.0	-	-	0.7	0.0	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	1.2
Articulated Trucks	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	2
% Articulated Trucks	-	0.2	0.0	-	-	0.2	0.0	0.2	0.0	-	-	0.2	0.0	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.2
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Commercial Driveway on Garrison Road
Site Code:
Start Date: 10/02/2018



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

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Commercial Driveway on Garrison Road
Site Code:
Start Date: 10/02/2018

Appendix B

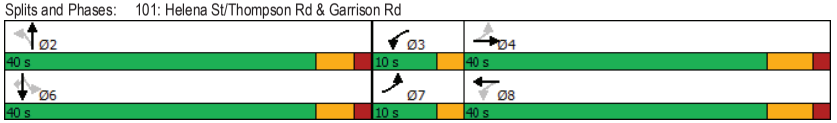
Base Year Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	412	18	10	270	48	35	60	15	88	29	166
Future Volume (vph)	230	412	18	10	270	48	35	60	15	88	29	166
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	35.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	80.0			0.0			50.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.994			0.977			0.970				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3195	0	1662	3079	0	1662	3054	0	1568	2995	1316
Flt Permitted	0.508			0.483			0.735			0.702		
Satd. Flow (perm)	846	3195	0	845	3079	0	1286	3054	0	1159	2995	1316
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			27			16				180
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		211.1			79.7			139.9			83.2	
Travel Time (s)		15.2			5.7			10.1			6.0	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	3%	12%	0%	5%	7%	0%	7%	0%	6%	11%	13%
Adj. Flow (vph)	250	448	20	11	293	52	38	65	16	96	32	180
Shared Lane Traffic (%)												
Lane Group Flow (vph)	250	468	0	11	345	0	38	81	0	96	32	180
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	9.0	39.0		9.0	39.0		38.1	38.1		38.1	38.1	38.1
Total Split (s)	10.0	40.0		10.0	40.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	11.1%	44.4%		11.1%	44.4%		44.4%	44.4%		44.4%	44.4%	44.4%
Maximum Green (s)	7.0	33.0		7.0	33.0		33.9	33.9		33.9	33.9	33.9
Yellow Time (s)	3.0	5.0		3.0	5.0		4.1	4.1		4.1	4.1	4.1
All-Red Time (s)	0.0	2.0		0.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	1.0	-3.0		1.0	-3.0		-2.1	-2.1		-2.1	-2.1	-2.1
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)		12.0			12.0		12.0	12.0		12.0	12.0	12.0
Flash Dont Walk (s)		20.0			20.0		20.0	20.0		20.0	20.0	20.0
Pedestrian Calls (#/hr)		0			0		0	0		0	0	0
Act Effct Green (s)	23.5	17.5		21.6	16.6		13.1	13.1		13.1	13.1	13.1
Actuated g/C Ratio	0.49	0.37		0.45	0.35		0.27	0.27		0.27	0.27	0.27
v/c Ratio	0.49	0.40		0.02	0.32		0.11	0.10		0.30	0.04	0.37
Control Delay	9.8	12.2		5.3	11.4		14.9	12.0		17.7	13.9	5.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	9.8	12.2		5.3	11.4		14.9	12.0		17.7	13.9	5.6
LOS	A	B		A	B		B	B		B	B	A
Approach Delay		11.4			11.2			12.9			10.2	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 47.8			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 101: Helena St/Thompson Rd & Garrison Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	250	468	11	345	38	81	96	32	180
v/c Ratio	0.49	0.40	0.02	0.32	0.11	0.10	0.30	0.04	0.37
Control Delay	9.8	12.2	5.3	11.4	14.9	12.0	17.7	13.9	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	12.2	5.3	11.4	14.9	12.0	17.7	13.9	5.6
Queue Length 50th (m)	9.3	14.6	0.4	10.0	2.5	2.2	6.6	1.0	0.0
Queue Length 95th (m)	22.6	27.1	2.1	19.8	8.7	6.8	18.4	3.8	11.8
Internal Link Dist (m)		187.1		55.7		115.9		59.2	
Turn Bay Length (m)	40.0		50.0		35.0				
Base Capacity (vph)	510	2428	503	2346	976	2324	880	2275	1043
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.19	0.02	0.15	0.04	0.03	0.11	0.01	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	412	18	10	270	48	35	60	15	88	29	166
Future Volume (vph)	230	412	18	10	270	48	35	60	15	88	29	166
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	3194		1662	3080		1662	3055		1568	2995	1316
Flt Permitted	0.51	1.00		0.48	1.00		0.74	1.00		0.70	1.00	1.00
Satd. Flow (perm)	847	3194		846	3080		1287	3055		1158	2995	1316
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	448	20	11	293	52	38	65	16	96	32	180
RTOR Reduction (vph)	0	4	0	0	18	0	0	12	0	0	0	131
Lane Group Flow (vph)	250	464	0	11	327	0	38	69	0	96	32	49
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	5%	3%	12%	0%	5%	7%	0%	7%	0%	6%	11%	13%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	21.5	14.5		19.7	13.6		11.0	11.0		11.0	11.0	11.0
Effective Green, g (s)	19.5	17.5		17.7	16.6		13.1	13.1		13.1	13.1	13.1
Actuated g/C Ratio	0.41	0.37		0.37	0.35		0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	3.0	7.0		3.0	7.0		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	438	1171		401	1071		353	839		318	822	361
v/s Ratio Prot	c0.07	0.15		0.00	0.11			0.02			0.01	
v/s Ratio Perm	c0.16			0.01			0.03			c0.08		0.04
v/c Ratio	0.57	0.40		0.03	0.31		0.11	0.08		0.30	0.04	0.14
Uniform Delay, d1	9.9	11.2		9.5	11.3		12.9	12.8		13.7	12.7	13.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.5		0.0	0.3		0.1	0.0		0.5	0.0	0.2
Delay (s)	11.4	11.7		9.5	11.7		13.1	12.9		14.2	12.7	13.2
Level of Service	B	B		A	B		B	B		B	B	B
Approach Delay (s)		11.6			11.6			12.9			13.5	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	47.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	46.1%	ICU Level of Service	A	
Analysis Period (min)	15			

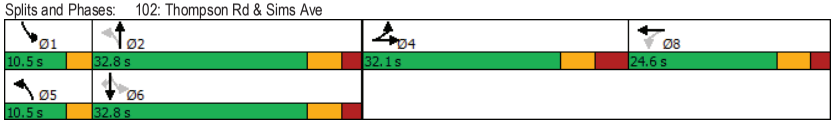
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	0	16	2	1	2	12	348	1	0	233	35
Future Volume (vph)	32	0	16	2	1	2	12	348	1	0	233	35
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			20.0			40.0			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Frt		0.898			0.900							0.850
Flt Protected	0.950	0.984		0.950			0.950					
Satd. Flow (prot)	1476	1218	0	1662	1575	0	1525	3079	0	1750	4343	1403
Flt Permitted	0.950	0.984		0.740			0.589					
Satd. Flow (perm)	1476	1218	0	1295	1575	0	946	3079	0	1750	4343	1403
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		145			2							160
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		170.4			237.8			108.3			142.5	
Travel Time (s)		12.3			17.1			7.8			10.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	27%	0%	0%	0%	9%	8%	0%	0%	10%	6%
Adj. Flow (vph)	35	0	17	2	1	2	13	378	1	0	253	38
Shared Lane Traffic (%)	23%											
Lane Group Flow (vph)	27	25	0	2	3	0	13	379	0	0	253	38
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			6.0			6.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8			2			6		6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	32.1	32.1		24.6	24.6		9.0	32.7		9.0	32.7	32.7
Total Split (s)	32.1	32.1		24.6	24.6		10.5	32.8		10.5	32.8	32.8
Total Split (%)	32.1%	32.1%		24.6%	24.6%		10.5%	32.8%		10.5%	32.8%	32.8%
Maximum Green (s)	24.0	24.0		18.0	18.0		7.5	26.1		7.5	26.1	26.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.0	4.1		3.0	4.1	4.1
All-Red Time (s)	4.0	4.0		2.5	2.5		0.0	2.6		0.0	2.6	2.6
Lost Time Adjust (s)	-4.1	-4.1		-2.6	-2.6		1.0	-2.7		3.0	-2.7	-2.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		6.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3		2.5	2.3	2.3
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)	11.0	11.0						8.0			8.0	8.0
Flash Dont Walk (s)	13.0	13.0						18.0			18.0	18.0
Pedestrian Calls (#/hr)	0	0						0			0	0
Act Effct Green (s)	12.4	12.4		10.6	10.6		19.8	14.7			14.7	14.7
Actuated g/C Ratio	0.21	0.21		0.18	0.18		0.34	0.25			0.25	0.25
v/c Ratio	0.09	0.07		0.01	0.01		0.04	0.49			0.23	0.08
Control Delay	20.3	0.3		21.5	17.7		10.8	21.2			18.1	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	20.3	0.3		21.5	17.7		10.8	21.2			18.1	0.3
LOS	C	A		C	B		B	C			B	A
Approach Delay		10.7			19.2			20.9			15.8	
Approach LOS		B			B			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 58.8			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 30.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 102: Thompson Rd & Sims Ave



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	27	25	2	3	13	379	253	38
v/c Ratio	0.09	0.07	0.01	0.01	0.04	0.49	0.23	0.08
Control Delay	20.3	0.3	21.5	17.7	10.8	21.2	18.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	0.3	21.5	17.7	10.8	21.2	18.1	0.3
Queue Length 50th (m)	2.5	0.0	0.2	0.1	0.9	19.1	8.2	0.0
Queue Length 95th (m)	9.0	0.0	1.9	2.2	3.6	31.2	14.2	0.0
Internal Link Dist (m)		146.4		213.8		84.3	118.5	
Turn Bay Length (m)			20.0		40.0			
Base Capacity (vph)	706	658	454	553	405	1510	2130	769
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.04	0.00	0.01	0.03	0.25	0.12	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	0	16	2	1	2	12	348	1	0	233	35
Future Volume (vph)	32	0	16	2	1	2	12	348	1	0	233	35
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95			0.91	1.00
Frt	1.00	0.90		1.00	0.90		1.00	1.00			1.00	0.85
Flt Protected	0.95	0.98		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1476	1218		1662	1575		1525	3078			4343	1403
Flt Permitted	0.95	0.98		0.74	1.00		0.59	1.00			1.00	1.00
Satd. Flow (perm)	1476	1218		1295	1575		945	3078			4343	1403
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	0	17	2	1	2	13	378	1	0	253	38
RTOR Reduction (vph)	0	20	0	0	2	0	0	0	0	0	0	28
Lane Group Flow (vph)	27	5	0	2	1	0	13	379	0	0	253	10
Heavy Vehicles (%)	7%	0%	27%	0%	0%	0%	9%	8%	0%	0%	10%	6%
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	8.3	8.3		8.0	8.0		18.0	12.0			12.0	12.0
Effective Green, g (s)	12.4	12.4		10.6	10.6		16.0	14.7			14.7	14.7
Actuated g/C Ratio	0.21	0.21		0.18	0.18		0.27	0.25			0.25	0.25
Clearance Time (s)	8.1	8.1		6.6	6.6		3.0	6.7			6.7	6.7
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3			2.3	2.3
Lane Grp Cap (vph)	311	257		233	284		306	770			1087	351
v/s Ratio Prot	c0.02	0.00			0.00		c0.00	c0.12			0.06	
v/s Ratio Perm				c0.00			0.01					0.01
v/c Ratio	0.09	0.02		0.01	0.00		0.04	0.49			0.23	0.03
Uniform Delay, d1	18.6	18.3		19.7	19.7		15.7	18.8			17.5	16.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.2	0.0		0.0	0.0		0.0	0.3			0.1	0.0
Delay (s)	18.8	18.4		19.7	19.7		15.7	19.1			17.6	16.6
Level of Service	B	B		B	B		B	B			B	B
Approach Delay (s)		18.6			19.7			19.0			17.5	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.21			
Actuated Cycle Length (s)	58.7	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	30.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	8	317	21	10	242
Future Volume (vph)	11	8	317	21	10	242
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	0.95	0.95	0.86	0.86
Frt	0.942		0.991			
Flt Protected	0.972					0.998
Satd. Flow (prot)	1571	0	3230	0	0	5890
Flt Permitted	0.972					0.998
Satd. Flow (perm)	1571	0	3230	0	0	5890
Link Speed (k/h)	50		50			50
Link Distance (m)	51.6		83.2			50.4
Travel Time (s)	3.7		6.0			3.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	9	345	23	11	263
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	368	0	0	274
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	8	317	21	10	242
Future Volume (Veh/h)	11	8	317	21	10	242
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)	12	9	345	23	11	263
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			83			159
pX, platoon unblocked						
vC, conflicting volume	444	184			368	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	444	184			368	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	537	827			1187	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	21	230	138	49	75	75	75
Volume Left	12	0	0	11	0	0	0
Volume Right	9	0	23	0	0	0	0
cSH	632	1700	1700	1187	1700	1700	1700
Volume to Capacity	0.03	0.14	0.08	0.01	0.04	0.04	0.04
Queue Length 95th (m)	0.8	0.0	0.0	0.2	0.0	0.0	0.0
Control Delay (s)	10.9	0.0	0.0	1.9	0.0	0.0	0.0
Lane LOS	B			A			
Approach Delay (s)	10.9	0.0		0.3			
Approach LOS	B						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	21.8%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	514	1	2	322	10	0	0	1	0	0	5
Future Volume (vph)	0	514	1	2	322	10	0	0	1	0	0	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	10.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	1		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.995				0.850			0.865
Flt Protected				0.950								
Satd. Flow (prot)	0	3197	0	1662	3164	0	1750	0	1488	0	0	1514
Flt Permitted				0.950								
Satd. Flow (perm)	0	3197	0	1662	3164	0	1750	0	1488	0	0	1514
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		79.7			288.4			53.1			60.2	
Travel Time (s)		5.7			20.8			3.8			4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	0%	4%	22%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	559	1	2	350	11	0	0	1	0	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	560	0	2	361	0	0	0	1	0	0	5
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			5.0			10.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.5%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	514	1	2	322	10	0	0	1	0	0	5
Future Volume (Veh/h)	0	514	1	2	322	10	0	0	1	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	559	1	2	350	11	0	0	1	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		80										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	361			560			744	924	280	640	920	180
vC1, stage 1 conf vol							560	560		360	360	
vC2, stage 2 conf vol							184	365		280	560	
vCu, unblocked vol	361			338			538	736	33	426	730	180
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1209			1130			556	499	953	605	500	837

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	373	187	2	233	128	0	1	5
Volume Left	0	0	2	0	0	0	0	0
Volume Right	0	1	0	0	11	0	1	5
cSH	1700	1700	1130	1700	1700	1700	953	837
Volume to Capacity	0.22	0.11	0.00	0.14	0.08	0.00	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	8.2	0.0	0.0	0.0	8.8	9.3
Lane LOS			A			A	A	A
Approach Delay (s)	0.0		0.0			8.8		9.3
Approach LOS						A		A

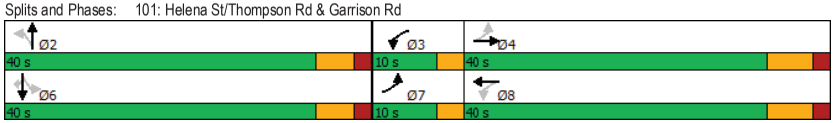
Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		25.5%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	414	39	30	502	87	40	46	12	138	84	277
Future Volume (vph)	145	414	39	30	502	87	40	46	12	138	84	277
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	35.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	80.0			0.0			50.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.987			0.978			0.969				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1554	3219	0	1599	3217	0	1614	3052	0	1646	3197	1458
Flt Permitted	0.315			0.448			0.695			0.714		
Satd. Flow (perm)	515	3219	0	754	3217	0	1181	3052	0	1237	3197	1458
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			26			13				301
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		211.1			79.7			139.9			83.2	
Travel Time (s)		15.2			5.7			10.1			6.0	
Confl. Peds. (#/hr)	3		1	1		3						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	0%	4%	1%	0%	3%	7%	0%	1%	4%	2%
Adj. Flow (vph)	158	450	42	33	546	95	43	50	13	150	91	301
Shared Lane Traffic (%)												
Lane Group Flow (vph)	158	492	0	33	641	0	43	63	0	150	91	301
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	9.0	39.0		9.0	39.0		38.1	38.1		38.1	38.1	38.1
Total Split (s)	10.0	40.0		10.0	40.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	11.1%	44.4%		11.1%	44.4%		44.4%	44.4%		44.4%	44.4%	44.4%
Maximum Green (s)	7.0	33.0		7.0	33.0		33.9	33.9		33.9	33.9	33.9
Yellow Time (s)	3.0	5.0		3.0	5.0		4.1	4.1		4.1	4.1	4.1
All-Red Time (s)	0.0	2.0		0.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	1.0	-3.0		1.0	-3.0		-2.1	-2.1		-2.1	-2.1	-2.1
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)		12.0			12.0		12.0	12.0		12.0	12.0	12.0
Flash Dont Walk (s)		20.0			20.0		20.0	20.0		20.0	20.0	20.0
Pedestrian Calls (#/hr)		0			0		0	0		0	0	0
Act Effct Green (s)	29.0	23.1		27.7	22.4		15.7	15.7		15.7	15.7	15.7
Actuated g/C Ratio	0.51	0.41		0.49	0.40		0.28	0.28		0.28	0.28	0.28
v/c Ratio	0.42	0.37		0.07	0.49		0.13	0.07		0.43	0.10	0.48
Control Delay	10.2	12.5		6.6	14.0		17.5	13.7		22.3	16.4	5.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	10.2	12.5		6.6	14.0		17.5	13.7		22.3	16.4	5.5
LOS	B	B		A	B		B	B		C	B	A
Approach Delay		11.9			13.6			15.2			12.0	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 56.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 12.7		Intersection LOS: B	
Intersection Capacity Utilization 55.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: Helena St/Thompson Rd & Garrison Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	158	492	33	641	43	63	150	91	301
v/c Ratio	0.42	0.37	0.07	0.49	0.13	0.07	0.43	0.10	0.48
Control Delay	10.2	12.5	6.6	14.0	17.5	13.7	22.3	16.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	12.5	6.6	14.0	17.5	13.7	22.3	16.4	5.5
Queue Length 50th (m)	6.4	16.7	1.2	23.4	3.4	2.0	12.8	3.6	0.0
Queue Length 95th (m)	18.7	34.0	5.3	45.2	11.1	6.5	31.8	9.6	16.1
Internal Link Dist (m)		187.1		55.7		115.9		59.2	
Turn Bay Length (m)	40.0		50.0		35.0				
Base Capacity (vph)	380	2113	474	2116	773	2003	810	2094	1058
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.23	0.07	0.30	0.06	0.03	0.19	0.04	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	414	39	30	502	87	40	46	12	138	84	277
Future Volume (vph)	145	414	39	30	502	87	40	46	12	138	84	277
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1553	3220		1598	3217		1614	3052		1646	3197	1458
Flt Permitted	0.31	1.00		0.45	1.00		0.69	1.00		0.71	1.00	1.00
Satd. Flow (perm)	515	3220		754	3217		1181	3052		1237	3197	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	450	42	33	546	95	43	50	13	150	91	301
RTOR Reduction (vph)	0	8	0	0	16	0	0	9	0	0	0	217
Lane Group Flow (vph)	158	484	0	33	625	0	43	54	0	150	91	84
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	7%	2%	0%	4%	1%	0%	3%	7%	0%	1%	4%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	26.9	20.0		25.7	19.4		13.6	13.6		13.6	13.6	13.6
Effective Green, g (s)	24.9	23.0		23.7	22.4		15.7	15.7		15.7	15.7	15.7
Actuated g/C Ratio	0.44	0.41		0.42	0.40		0.28	0.28		0.28	0.28	0.28
Clearance Time (s)	3.0	7.0		3.0	7.0		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	338	1322		398	1286		331	855		346	896	408
v/s Ratio Prot	c0.05	0.15		0.01	c0.19			0.02			0.03	
v/s Ratio Perm	0.16			0.03			0.04			c0.12		0.06
v/c Ratio	0.47	0.37		0.08	0.49		0.13	0.06		0.43	0.10	0.21
Uniform Delay, d1	9.8	11.4		9.5	12.5		15.0	14.8		16.5	14.9	15.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.4		0.1	0.6		0.2	0.0		0.9	0.0	0.3
Delay (s)	10.6	11.8		9.6	13.1		15.2	14.8		17.4	15.0	15.6
Level of Service	B	B		A	B		B	B		B	B	B
Approach Delay (s)		11.5			12.9			15.0			16.0	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	56.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	55.9%	ICU Level of Service	B	
Analysis Period (min)	15			

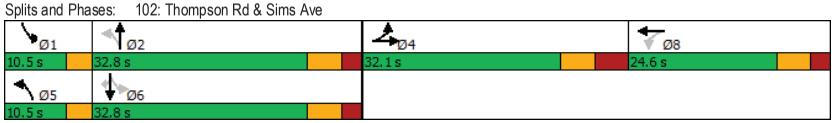
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	2	38	5	1	1	51	230	5	2	398	169
Future Volume (vph)	127	2	38	5	1	1	51	230	5	2	398	169
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			20.0			40.0			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Ped Bike Factor	1.00	1.00			0.99		1.00	1.00		1.00		0.99
Frt		0.931			0.925			0.997				0.850
Flt Protected	0.950	0.975		0.950			0.950			0.950		
Satd. Flow (prot)	1504	1432	0	1662	1608	0	1568	3159	0	1662	4638	1444
Flt Permitted	0.950	0.975		0.696			0.436			0.594		
Satd. Flow (perm)	1502	1432	0	1218	1608	0	719	3159	0	1037	4638	1425
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41			1			2				184
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		170.4			237.8			108.3			142.5	
Travel Time (s)		12.3			17.1			7.8			10.3	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	0%	6%	0%	0%	0%	6%	5%	0%	0%	3%	3%
Adj. Flow (vph)	138	2	41	5	1	1	55	250	5	2	433	184
Shared Lane Traffic (%)	33%											
Lane Group Flow (vph)	92	89	0	5	2	0	55	255	0	2	433	184
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			6.0			6.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8			2			6		6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	32.1	32.1		24.6	24.6		9.0	32.7		9.0	32.7	32.7
Total Split (s)	32.1	32.1		24.6	24.6		10.5	32.8		10.5	32.8	32.8
Total Split (%)	32.1%	32.1%		24.6%	24.6%		10.5%	32.8%		10.5%	32.8%	32.8%
Maximum Green (s)	24.0	24.0		18.0	18.0		7.5	26.1		7.5	26.1	26.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.0	4.1		3.0	4.1	4.1
All-Red Time (s)	4.0	4.0		2.5	2.5		0.0	2.6		0.0	2.6	2.6
Lost Time Adjust (s)	-4.1	-4.1		-2.6	-2.6		1.0	-2.7		3.0	-2.7	-2.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		6.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3		2.5	2.3	2.3
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)	11.0	11.0						8.0			8.0	8.0
Flash Dont Walk (s)	13.0	13.0						18.0			18.0	18.0
Pedestrian Calls (#/hr)	0	0						0			0	0
Act Effct Green (s)	14.4	14.4		10.7	10.7		20.2	14.5		14.9	13.9	13.9
Actuated g/C Ratio	0.24	0.24		0.18	0.18		0.33	0.24		0.25	0.23	0.23
v/c Ratio	0.26	0.24		0.02	0.01		0.17	0.34		0.01	0.41	0.39
Control Delay	21.3	13.7		23.6	20.5		13.7	20.6		13.5	21.5	6.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	21.3	13.7		23.6	20.5		13.7	20.6		13.5	21.5	6.6
LOS	C	B		C	C		B	C		B	C	A
Approach Delay		17.6			22.7			19.3			17.1	
Approach LOS		B			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 60.7			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 17.8		Intersection LOS: B	
Intersection Capacity Utilization 37.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 102: Thompson Rd & Sims Ave



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	92	89	5	2	55	255	2	433	184
v/c Ratio	0.26	0.24	0.02	0.01	0.17	0.34	0.01	0.41	0.39
Control Delay	21.3	13.7	23.6	20.5	13.7	20.6	13.5	21.5	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	13.7	23.6	20.5	13.7	20.6	13.5	21.5	6.6
Queue Length 50th (m)	8.9	4.5	0.5	0.1	3.9	12.7	0.2	15.6	0.0
Queue Length 95th (m)	21.8	16.1	3.4	1.9	10.9	23.2	1.4	25.9	14.0
Internal Link Dist (m)		146.4		213.8		84.3		118.5	
Turn Bay Length (m)			20.0		40.0				
Base Capacity (vph)	700	688	415	549	340	1508	326	2212	775
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.13	0.01	0.00	0.16	0.17	0.01	0.20	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	2	38	5	1	1	51	230	5	2	398	169
Future Volume (vph)	127	2	38	5	1	1	51	230	5	2	398	169
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		6.0	4.0	4.0
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.97		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1504	1432		1662	1608		1568	3159		1661	4638	1426
Flt Permitted	0.95	0.97		0.70	1.00		0.44	1.00		0.59	1.00	1.00
Satd. Flow (perm)	1504	1432		1219	1608		720	3159		1038	4638	1426
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	2	41	5	1	1	55	250	5	2	433	184
RTOR Reduction (vph)	0	31	0	0	1	0	0	2	0	0	0	142
Lane Group Flow (vph)	92	58	0	5	1	0	55	253	0	2	433	42
Confl. Peds. (#/hr)	1					1	1		2	2		1
Heavy Vehicles (%)	5%	0%	6%	0%	0%	0%	6%	5%	0%	0%	3%	3%
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	10.3	10.3		8.0	8.0		18.6	11.9		17.2	11.2	11.2
Effective Green, g (s)	14.4	14.4		10.6	10.6		16.6	14.6		11.2	13.9	13.9
Actuated g/C Ratio	0.24	0.24		0.17	0.17		0.27	0.24		0.18	0.23	0.23
Clearance Time (s)	8.1	8.1		6.6	6.6		3.0	6.7		3.0	6.7	6.7
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3		2.5	2.3	2.3
Lane Grp Cap (vph)	357	340		213	281		276	761		222	1063	327
v/s Ratio Prot	c0.06	0.04			0.00		c0.02	0.08		0.00	c0.09	
v/s Ratio Perm				c0.00			0.04			0.00		0.03
v/c Ratio	0.26	0.17		0.02	0.00		0.20	0.33		0.01	0.41	0.13
Uniform Delay, d1	18.8	18.4		20.7	20.6		16.6	19.0		20.2	19.8	18.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3		0.0	0.0		0.3	0.2		0.0	0.1	0.1
Delay (s)	19.3	18.7		20.7	20.6		16.8	19.1		20.2	20.0	18.6
Level of Service	B	B		C	C		B	B		C	B	B
Approach Delay (s)		19.0			20.7			18.7			19.6	
Approach LOS		B			C			B			B	

Intersection Summary					
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.25				
Actuated Cycle Length (s)	60.6	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	37.7%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	45	12	271	7	17	426
Future Volume (vph)	45	12	271	7	17	426
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	0.95	0.95	0.86	0.86
Frt	0.972		0.996			
Flt Protected	0.962					0.998
Satd. Flow (prot)	1636	0	3248	0	0	5894
Flt Permitted	0.962					0.998
Satd. Flow (perm)	1636	0	3248	0	0	5894
Link Speed (k/h)	50		50			50
Link Distance (m)	51.6		83.2			50.4
Travel Time (s)	3.7		6.0			3.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	49	13	295	8	18	463
Shared Lane Traffic (%)						
Lane Group Flow (vph)	62	0	303	0	0	481
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	28.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	45	12	271	7	17	426
Future Volume (Veh/h)	45	12	271	7	17	426
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)	49	13	295	8	18	463
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			83			159
pX, platoon unblocked						
vC, conflicting volume	451	152			303	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	451	152			303	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	99			99	
cM capacity (veh/h)	535	874			1269	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	62	197	106	84	132	132	132
Volume Left	49	0	0	18	0	0	0
Volume Right	13	0	8	0	0	0	0
cSH	582	1700	1700	1269	1700	1700	1700
Volume to Capacity	0.11	0.12	0.06	0.01	0.08	0.08	0.08
Queue Length 95th (m)	2.8	0.0	0.0	0.3	0.0	0.0	0.0
Control Delay (s)	11.9	0.0	0.0	1.8	0.0	0.0	0.0
Lane LOS	B			A			
Approach Delay (s)	11.9	0.0		0.3			
Approach LOS	B						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	28.9%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	560	3	3	611	11	3	0	1	0	0	4
Future Volume (vph)	0	560	3	3	611	11	3	0	1	0	0	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	10.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	1		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.997				0.850			0.865
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	3257	0	1662	3283	0	1662	0	1488	0	0	1514
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	3257	0	1662	3283	0	1662	0	1488	0	0	1514
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		79.7			288.4			53.1			60.2	
Travel Time (s)		5.7			20.8			3.8			4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	609	3	3	664	12	3	0	1	0	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	612	0	3	676	0	3	0	1	0	0	4
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			5.0			10.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.4%		ICU Level of Service A	
Analysis Period (min) 15			

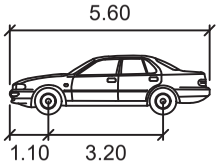
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	560	3	3	611	11	3	0	1	0	0	4
Future Volume (Veh/h)	0	560	3	3	611	11	3	0	1	0	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	609	3	3	664	12	3	0	1	0	0	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		80										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	676			612			952	1292	306	982	1288	338
vC1, stage 1 conf vol							610	610		676	676	
vC2, stage 2 conf vol							342	682		306	612	
vCu, unblocked vol	676			401			771	1141	67	803	1136	338
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	99
cM capacity (veh/h)	925			1074			472	381	908	395	382	664

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	406	206	3	443	233	3	1	4
Volume Left	0	0	3	0	0	3	0	0
Volume Right	0	3	0	0	12	0	1	4
cSH	1700	1700	1074	1700	1700	472	908	664
Volume to Capacity	0.24	0.12	0.00	0.26	0.14	0.01	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1
Control Delay (s)	0.0	0.0	8.4	0.0	0.0	12.7	9.0	10.5
Lane LOS			A			B	A	B
Approach Delay (s)	0.0		0.0			11.7		10.5
Approach LOS						B		B

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		35.4%	ICU Level of Service	A
Analysis Period (min)		15		

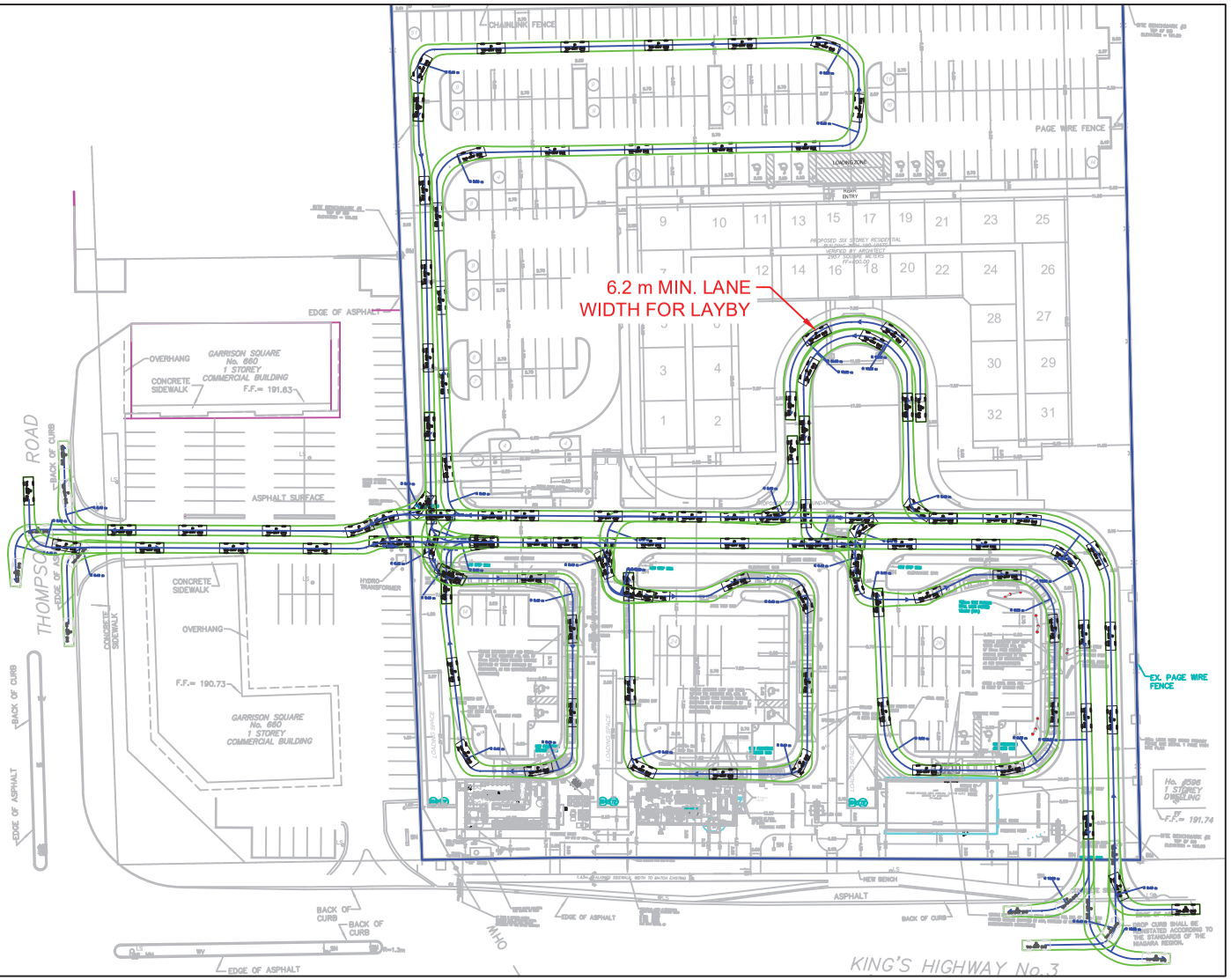
Appendix C

AutoTURN Swept Path Analysis



P

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



Appendix D

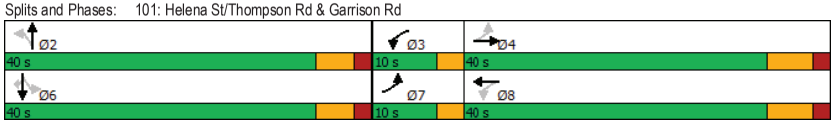
Background Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	473	21	11	310	55	40	69	17	101	33	190
Future Volume (vph)	265	473	21	11	310	55	40	69	17	101	33	190
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	35.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	80.0			0.0			50.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.994			0.977			0.971				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3195	0	1662	3079	0	1662	3056	0	1568	2995	1316
Flt Permitted	0.478			0.428			0.732			0.694		
Satd. Flow (perm)	796	3195	0	749	3079	0	1281	3056	0	1146	2995	1316
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			27			18				207
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		211.1			79.7			139.9			83.2	
Travel Time (s)		15.2			5.7			10.1			6.0	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	3%	12%	0%	5%	7%	0%	7%	0%	6%	11%	13%
Adj. Flow (vph)	288	514	23	12	337	60	43	75	18	110	36	207
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	537	0	12	397	0	43	93	0	110	36	207
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	9.0	39.0		9.0	39.0		38.1	38.1		38.1	38.1	38.1
Total Split (s)	10.0	40.0		10.0	40.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	11.1%	44.4%		11.1%	44.4%		44.4%	44.4%		44.4%	44.4%	44.4%
Maximum Green (s)	7.0	33.0		7.0	33.0		33.9	33.9		33.9	33.9	33.9
Yellow Time (s)	3.0	5.0		3.0	5.0		4.1	4.1		4.1	4.1	4.1
All-Red Time (s)	0.0	2.0		0.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	1.0	-3.0		1.0	-3.0		-2.1	-2.1		-2.1	-2.1	-2.1
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)		12.0			12.0		12.0	12.0		12.0	12.0	12.0
Flash Dont Walk (s)		20.0			20.0		20.0	20.0		20.0	20.0	20.0
Pedestrian Calls (#/hr)		0			0		0	0		0	0	0
Act Effct Green (s)	25.5	19.4		23.4	18.4		13.8	13.8		13.8	13.8	13.8
Actuated g/C Ratio	0.51	0.38		0.46	0.37		0.27	0.27		0.27	0.27	0.27
v/c Ratio	0.58	0.44		0.03	0.35		0.12	0.11		0.35	0.04	0.41
Control Delay	12.2	12.7		5.6	11.8		15.9	12.7		19.5	14.7	5.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	12.2	12.7		5.6	11.8		15.9	12.7		19.5	14.7	5.7
LOS	B	B		A	B		B	B		B	B	A
Approach Delay		12.5			11.6			13.7			10.9	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 50.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 50.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 101: Helena St/Thompson Rd & Garrison Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	288	537	12	397	43	93	110	36	207
v/c Ratio	0.58	0.44	0.03	0.35	0.12	0.11	0.35	0.04	0.41
Control Delay	12.2	12.7	5.6	11.8	15.9	12.7	19.5	14.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	12.7	5.6	11.8	15.9	12.7	19.5	14.7	5.7
Queue Length 50th (m)	11.2	17.3	0.4	12.0	2.9	2.6	8.0	1.2	0.0
Queue Length 95th (m)	28.6	33.1	2.3	24.1	10.1	8.0	22.1	4.4	13.1
Internal Link Dist (m)		187.1		55.7		115.9		59.2	
Turn Bay Length (m)	40.0		50.0		35.0				
Base Capacity (vph)	497	2315	473	2237	927	2217	830	2168	1010
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.23	0.03	0.18	0.05	0.04	0.13	0.02	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	473	21	11	310	55	40	69	17	101	33	190
Future Volume (vph)	265	473	21	11	310	55	40	69	17	101	33	190
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	3194		1662	3080		1662	3056		1568	2995	1316
Flt Permitted	0.48	1.00		0.43	1.00		0.73	1.00		0.69	1.00	1.00
Satd. Flow (perm)	796	3194		749	3080		1282	3056		1145	2995	1316
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	288	514	23	12	337	60	43	75	18	110	36	207
RTOR Reduction (vph)	0	4	0	0	17	0	0	13	0	0	0	150
Lane Group Flow (vph)	288	533	0	12	380	0	43	80	0	110	36	57
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	5%	3%	12%	0%	5%	7%	0%	7%	0%	6%	11%	13%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	23.4	16.3		21.4	15.3		11.7	11.7		11.7	11.7	11.7
Effective Green, g (s)	21.4	19.3		19.4	18.3		13.8	13.8		13.8	13.8	13.8
Actuated g/C Ratio	0.43	0.38		0.39	0.36		0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	3.0	7.0		3.0	7.0		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	434	1227		382	1122		352	840		314	823	361
v/s Ratio Prot	c0.08	0.17		0.00	0.12			0.03			0.01	
v/s Ratio Perm	c0.20			0.01			0.03			c0.10		0.04
v/c Ratio	0.66	0.43		0.03	0.34		0.12	0.10		0.35	0.04	0.16
Uniform Delay, d1	10.2	11.4		9.5	11.6		13.7	13.6		14.6	13.4	13.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.4	0.5		0.0	0.4		0.2	0.0		0.7	0.0	0.2
Delay (s)	13.6	11.9		9.5	11.9		13.8	13.6		15.3	13.4	14.0
Level of Service	B	B		A	B		B	B		B	B	B
Approach Delay (s)		12.5			11.9			13.7			14.3	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	50.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

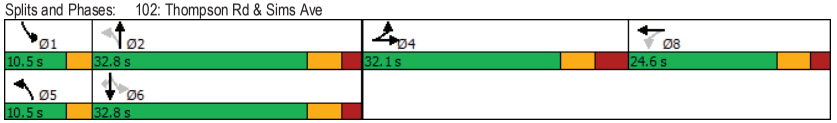
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	0	18	2	1	2	13	400	1	0	268	40
Future Volume (vph)	37	0	18	2	1	2	13	400	1	0	268	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			20.0			40.0			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Frt		0.897			0.900							0.850
Flt Protected	0.950	0.985		0.950			0.950					
Satd. Flow (prot)	1476	1216	0	1662	1575	0	1525	3079	0	1750	4343	1403
Flt Permitted	0.950	0.985		0.737			0.562					
Satd. Flow (perm)	1476	1216	0	1290	1575	0	902	3079	0	1750	4343	1403
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		145			2							160
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		170.4			237.8			108.3			142.5	
Travel Time (s)		12.3			17.1			7.8			10.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	27%	0%	0%	0%	9%	8%	0%	0%	10%	6%
Adj. Flow (vph)	40	0	20	2	1	2	14	435	1	0	291	43
Shared Lane Traffic (%)	22%											
Lane Group Flow (vph)	31	29	0	2	3	0	14	436	0	0	291	43
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			6.0			6.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8			2			6		6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	32.1	32.1		24.6	24.6		9.0	32.7		9.0	32.7	32.7
Total Split (s)	32.1	32.1		24.6	24.6		10.5	32.8		10.5	32.8	32.8
Total Split (%)	32.1%	32.1%		24.6%	24.6%		10.5%	32.8%		10.5%	32.8%	32.8%
Maximum Green (s)	24.0	24.0		18.0	18.0		7.5	26.1		7.5	26.1	26.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.0	4.1		3.0	4.1	4.1
All-Red Time (s)	4.0	4.0		2.5	2.5		0.0	2.6		0.0	2.6	2.6
Lost Time Adjust (s)	-4.1	-4.1		-2.6	-2.6		1.0	-2.7		3.0	-2.7	-2.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		6.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3		2.5	2.3	2.3
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)	11.0	11.0						8.0			8.0	8.0
Flash Dont Walk (s)	13.0	13.0						18.0			18.0	18.0
Pedestrian Calls (#/hr)	0	0						0			0	0
Act Effct Green (s)	12.6	12.6		10.6	10.6		20.8	15.8			15.7	15.7
Actuated g/C Ratio	0.21	0.21		0.18	0.18		0.35	0.26			0.26	0.26
v/c Ratio	0.10	0.08		0.01	0.01		0.04	0.54			0.26	0.09
Control Delay	21.1	0.4		22.5	18.3		10.7	21.7			18.0	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	21.1	0.4		22.5	18.3		10.7	21.7			18.0	0.3
LOS	C	A		C	B		B	C			B	A
Approach Delay		11.1			20.0			21.3			15.8	
Approach LOS		B			B			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 60
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 18.4 — Intersection LOS: B
Intersection Capacity Utilization 30.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 102: Thompson Rd & Sims Ave



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	31	29	2	3	14	436	291	43
v/c Ratio	0.10	0.08	0.01	0.01	0.04	0.54	0.26	0.09
Control Delay	21.1	0.4	22.5	18.3	10.7	21.7	18.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	0.4	22.5	18.3	10.7	21.7	18.0	0.3
Queue Length 50th (m)	3.0	0.0	0.2	0.1	0.9	22.4	9.5	0.0
Queue Length 95th (m)	10.1	0.0	1.9	2.2	3.8	36.0	16.1	0.0
Internal Link Dist (m)		146.4		213.8		84.3	118.5	
Turn Bay Length (m)			20.0		40.0			
Base Capacity (vph)	692	647	443	543	402	1481	2089	758
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.04	0.00	0.01	0.03	0.29	0.14	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	0	18	2	1	2	13	400	1	0	268	40
Future Volume (vph)	37	0	18	2	1	2	13	400	1	0	268	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95			0.91	1.00
Frt	1.00	0.90		1.00	0.90		1.00	1.00			1.00	0.85
Flt Protected	0.95	0.98		0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1476	1215		1662	1575		1525	3078			4343	1403
Flt Permitted	0.95	0.98		0.74	1.00		0.56	1.00			1.00	1.00
Satd. Flow (perm)	1476	1215		1290	1575		902	3078			4343	1403
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	0	20	2	1	2	14	435	1	0	291	43
RTOR Reduction (vph)	0	23	0	0	2	0	0	0	0	0	0	32
Lane Group Flow (vph)	31	6	0	2	1	0	14	436	0	0	291	11
Heavy Vehicles (%)	7%	0%	27%	0%	0%	0%	9%	8%	0%	0%	10%	6%
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	8.4	8.4		8.0	8.0		19.2	13.1			13.0	13.0
Effective Green, g (s)	12.5	12.5		10.6	10.6		17.2	15.8			15.7	15.7
Actuated g/C Ratio	0.21	0.21		0.18	0.18		0.29	0.26			0.26	0.26
Clearance Time (s)	8.1	8.1		6.6	6.6		3.0	6.7			6.7	6.7
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3			2.3	2.3
Lane Grp Cap (vph)	308	253		228	278		312	811			1138	367
v/s Ratio Prot	c0.02	0.00			0.00		c0.00	c0.14			0.07	
v/s Ratio Perm				c0.00			0.01					0.01
v/c Ratio	0.10	0.02		0.01	0.00		0.04	0.54			0.26	0.03
Uniform Delay, d1	19.2	18.8		20.3	20.3		15.4	18.9			17.5	16.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	0.2	0.1		0.0	0.0		0.0	0.5			0.1	0.0
Delay (s)	19.4	18.9		20.3	20.3		15.4	19.4			17.5	16.5
Level of Service	B	B		C	C		B	B			B	B
Approach Delay (s)		19.1			20.3			19.3			17.4	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.24			
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	30.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	12	10	364	24	11	278
Future Volume (vph)	12	10	364	24	11	278
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	0.95	0.95	0.86	0.86
Frt	0.938		0.991			
Flt Protected	0.974					0.998
Satd. Flow (prot)	1567	0	3230	0	0	5890
Flt Permitted	0.974					0.998
Satd. Flow (perm)	1567	0	3230	0	0	5890
Link Speed (k/h)	50		50			50
Link Distance (m)	51.6		83.2			50.4
Travel Time (s)	3.7		6.0			3.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	11	396	26	12	302
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	422	0	0	314
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	10	364	24	11	278
Future Volume (Veh/h)	12	10	364	24	11	278
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)	13	11	396	26	12	302
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			83			159
pX, platoon unblocked						
vC, conflicting volume	508	211			422	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	508	211			422	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			99	
cM capacity (veh/h)	489	794			1134	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	24	264	158	55	86	86	86
Volume Left	13	0	0	12	0	0	0
Volume Right	11	0	26	0	0	0	0
cSH	593	1700	1700	1134	1700	1700	1700
Volume to Capacity	0.04	0.16	0.09	0.01	0.05	0.05	0.05
Queue Length 95th (m)	1.0	0.0	0.0	0.3	0.0	0.0	0.0
Control Delay (s)	11.3	0.0	0.0	1.9	0.0	0.0	0.0
Lane LOS	B			A			
Approach Delay (s)	11.3	0.0		0.3			
Approach LOS	B						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	23.2%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	590	1	2	369	11	0	0	1	0	0	6
Future Volume (vph)	0	590	1	2	369	11	0	0	1	0	0	6
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	10.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	1		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.996				0.850			0.865
Flt Protected				0.950								
Satd. Flow (prot)	0	3197	0	1662	3168	0	1750	0	1488	0	0	1514
Flt Permitted				0.950								
Satd. Flow (perm)	0	3197	0	1662	3168	0	1750	0	1488	0	0	1514
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		79.7			288.4			53.1			60.2	
Travel Time (s)		5.7			20.8			3.8			4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	0%	4%	22%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	641	1	2	401	12	0	0	1	0	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	642	0	2	413	0	0	0	1	0	0	7
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			5.0			10.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	590	1	2	369	11	0	0	1	0	0	6
Future Volume (Veh/h)	0	590	1	2	369	11	0	0	1	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	641	1	2	401	12	0	0	1	0	0	7
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		80										
pX, platoon unblocked				0.90			0.90	0.90	0.90	0.90	0.90	
vC, conflicting volume	413			642			853	1058	321	732	1053	206
vC1, stage 1 conf vol							642	642		411	411	
vC2, stage 2 conf vol							212	417		322	642	
vCu, unblocked vol	413			373			608	837	16	474	831	206
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1157			1074			516	463	957	566	464	806

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	427	215	2	267	146	0	1	7
Volume Left	0	0	2	0	0	0	0	0
Volume Right	0	1	0	0	12	0	1	7
cSH	1700	1700	1074	1700	1700	1700	957	806
Volume to Capacity	0.25	0.13	0.00	0.16	0.09	0.00	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	8.4	0.0	0.0	0.0	8.8	9.5
Lane LOS			A			A	A	A
Approach Delay (s)	0.0		0.0			8.8		9.5
Approach LOS						A		A

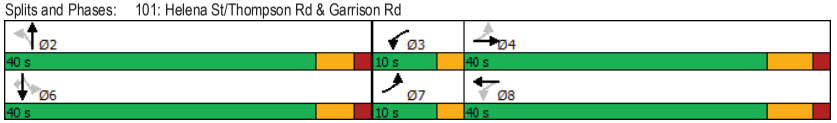
Intersection Summary					
Average Delay	0.1				
Intersection Capacity Utilization	27.7%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	475	45	34	577	100	46	52	13	158	96	318
Future Volume (vph)	167	475	45	34	577	100	46	52	13	158	96	318
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	35.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	80.0			0.0			50.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.987			0.978			0.970				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1554	3219	0	1599	3217	0	1614	3054	0	1646	3197	1458
Flt Permitted	0.261			0.400			0.686			0.708		
Satd. Flow (perm)	427	3219	0	673	3217	0	1166	3054	0	1227	3197	1458
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			26			14				302
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		211.1			79.7			139.9			83.2	
Travel Time (s)		15.2			5.7			10.1			6.0	
Confl. Peds. (#/hr)	3		1	1		3						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	0%	4%	1%	0%	3%	7%	0%	1%	4%	2%
Adj. Flow (vph)	182	516	49	37	627	109	50	57	14	172	104	346
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	565	0	37	736	0	50	71	0	172	104	346
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	9.0	39.0		9.0	39.0		38.1	38.1		38.1	38.1	38.1
Total Split (s)	10.0	40.0		10.0	40.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	11.1%	44.4%		11.1%	44.4%		44.4%	44.4%		44.4%	44.4%	44.4%
Maximum Green (s)	7.0	33.0		7.0	33.0		33.9	33.9		33.9	33.9	33.9
Yellow Time (s)	3.0	5.0		3.0	5.0		4.1	4.1		4.1	4.1	4.1
All-Red Time (s)	0.0	2.0		0.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	1.0	-3.0		1.0	-3.0		-2.1	-2.1		-2.1	-2.1	-2.1
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)		12.0			12.0		12.0	12.0		12.0	12.0	12.0
Flash Dont Walk (s)		20.0			20.0		20.0	20.0		20.0	20.0	20.0
Pedestrian Calls (#/hr)		0			0		0	0		0	0	0
Act Effct Green (s)	32.5	26.4		30.8	25.5		17.4	17.4		17.4	17.4	17.4
Actuated g/C Ratio	0.53	0.43		0.50	0.41		0.28	0.28		0.28	0.28	0.28
v/c Ratio	0.54	0.41		0.09	0.55		0.15	0.08		0.50	0.11	0.55
Control Delay	14.2	13.3		7.3	15.1		19.0	14.7		25.0	17.6	7.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	14.2	13.3		7.3	15.1		19.0	14.7		25.0	17.6	7.8
LOS	B	B		A	B		B	B		C	B	A
Approach Delay		13.5			14.7			16.5			14.2	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 61.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 14.3		Intersection LOS: B	
Intersection Capacity Utilization 61.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: Helena St/Thompson Rd & Garrison Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	182	565	37	736	50	71	172	104	346
v/c Ratio	0.54	0.41	0.09	0.55	0.15	0.08	0.50	0.11	0.55
Control Delay	14.2	13.3	7.3	15.1	19.0	14.7	25.0	17.6	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	13.3	7.3	15.1	19.0	14.7	25.0	17.6	7.8
Queue Length 50th (m)	8.4	21.2	1.5	30.1	4.3	2.5	16.5	4.6	3.8
Queue Length 95th (m)	23.5	42.7	6.4	57.3	13.6	7.8	39.4	11.5	25.2
Internal Link Dist (m)		187.1		55.7		115.9		59.2	
Turn Bay Length (m)	40.0		50.0		35.0				
Base Capacity (vph)	339	1955	441	1958	706	1855	743	1936	1002
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.29	0.08	0.38	0.07	0.04	0.23	0.05	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	475	45	34	577	100	46	52	13	158	96	318
Future Volume (vph)	167	475	45	34	577	100	46	52	13	158	96	318
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1554	3219		1598	3217		1614	3055		1646	3197	1458
Flt Permitted	0.26	1.00		0.40	1.00		0.69	1.00		0.71	1.00	1.00
Satd. Flow (perm)	427	3219		673	3217		1166	3055		1227	3197	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	516	49	37	627	109	50	57	14	172	104	346
RTOR Reduction (vph)	0	7	0	0	15	0	0	10	0	0	0	216
Lane Group Flow (vph)	182	558	0	37	721	0	50	61	0	172	104	130
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	7%	2%	0%	4%	1%	0%	3%	7%	0%	1%	4%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	30.5	23.3		28.7	22.4		15.2	15.2		15.2	15.2	15.2
Effective Green, g (s)	28.5	26.3		26.7	25.4		17.3	17.3		17.3	17.3	17.3
Actuated g/C Ratio	0.47	0.43		0.44	0.42		0.28	0.28		0.28	0.28	0.28
Clearance Time (s)	3.0	7.0		3.0	7.0		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	314	1390		375	1341		331	867		348	908	414
v/s Ratio Prot	c0.06	0.17		0.01	c0.22			0.02			0.03	
v/s Ratio Perm	0.21			0.03			0.04			c0.14		0.09
v/c Ratio	0.58	0.40		0.10	0.54		0.15	0.07		0.49	0.11	0.31
Uniform Delay, d1	10.3	11.9		9.9	13.3		16.3	15.9		18.2	16.1	17.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.1	0.4		0.1	0.8		0.2	0.0		1.1	0.1	0.4
Delay (s)	12.4	12.3		9.9	14.1		16.5	16.0		19.3	16.2	17.6
Level of Service	B	B		A	B		B	B		B	B	B
Approach Delay (s)		12.3			13.9			16.2			17.8	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			

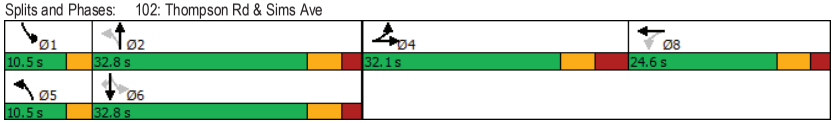
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	2	44	6	1	1	59	265	6	2	457	194
Future Volume (vph)	146	2	44	6	1	1	59	265	6	2	457	194
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			20.0			40.0			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Ped Bike Factor	1.00	1.00			0.99		1.00	1.00		1.00		0.99
Frt		0.929			0.925			0.996				0.850
Flt Protected	0.950	0.975		0.950			0.950			0.950		
Satd. Flow (prot)	1504	1429	0	1662	1608	0	1568	3156	0	1662	4638	1444
Flt Permitted	0.950	0.975		0.688			0.375			0.572		
Satd. Flow (perm)	1502	1428	0	1204	1608	0	619	3156	0	999	4638	1425
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			1			2				211
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		170.4			237.8			108.3			142.5	
Travel Time (s)		12.3			17.1			7.8			10.3	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	0%	6%	0%	0%	0%	6%	5%	0%	0%	3%	3%
Adj. Flow (vph)	159	2	48	7	1	1	64	288	7	2	497	211
Shared Lane Traffic (%)	32%											
Lane Group Flow (vph)	108	101	0	7	2	0	64	295	0	2	497	211
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			6.0			6.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8			2			6		6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	32.1	32.1		24.6	24.6		9.0	32.7		9.0	32.7	32.7
Total Split (s)	32.1	32.1		24.6	24.6		10.5	32.8		10.5	32.8	32.8
Total Split (%)	32.1%	32.1%		24.6%	24.6%		10.5%	32.8%		10.5%	32.8%	32.8%
Maximum Green (s)	24.0	24.0		18.0	18.0		7.5	26.1		7.5	26.1	26.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.0	4.1		3.0	4.1	4.1
All-Red Time (s)	4.0	4.0		2.5	2.5		0.0	2.6		0.0	2.6	2.6
Lost Time Adjust (s)	-4.1	-4.1		-2.6	-2.6		1.0	-2.7		3.0	-2.7	-2.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		6.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3		2.5	2.3	2.3
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)	11.0	11.0						8.0			8.0	8.0
Flash Dont Walk (s)	13.0	13.0						18.0			18.0	18.0
Pedestrian Calls (#/hr)	0	0						0			0	0
Act Effct Green (s)	15.1	15.1		10.7	10.7		21.1	15.3		15.6	14.6	14.6
Actuated g/C Ratio	0.24	0.24		0.17	0.17		0.34	0.25		0.25	0.23	0.23
v/c Ratio	0.30	0.27		0.03	0.01		0.22	0.38		0.01	0.46	0.43
Control Delay	22.2	14.3		25.0	22.0		14.5	21.2		14.0	22.3	6.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	22.2	14.3		25.0	22.0		14.5	21.2		14.0	22.3	6.5
LOS	C	B		C	C		B	C		B	C	A
Approach Delay		18.4			24.3			20.0			17.6	
Approach LOS		B			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 62.3			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.46			
Intersection Signal Delay: 18.4		Intersection LOS: B	
Intersection Capacity Utilization 38.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 102: Thompson Rd & Sims Ave



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	108	101	7	2	64	295	2	497	211
v/c Ratio	0.30	0.27	0.03	0.01	0.22	0.38	0.01	0.46	0.43
Control Delay	22.2	14.3	25.0	22.0	14.5	21.2	14.0	22.3	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	14.3	25.0	22.0	14.5	21.2	14.0	22.3	6.5
Queue Length 50th (m)	11.0	5.4	0.7	0.1	4.7	15.3	0.2	18.7	0.0
Queue Length 95th (m)	25.6	18.2	4.2	2.0	12.5	27.1	1.4	30.2	15.0
Internal Link Dist (m)		146.4		213.8		84.3		118.5	
Turn Bay Length (m)			20.0		40.0				
Base Capacity (vph)	683	673	400	536	316	1470	322	2159	776
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.15	0.02	0.00	0.20	0.20	0.01	0.23	0.27

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	2	44	6	1	1	59	265	6	2	457	194
Future Volume (vph)	146	2	44	6	1	1	59	265	6	2	457	194
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		6.0	4.0	4.0
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1504	1429		1662	1608		1568	3157		1661	4638	1426
Flt Permitted	0.95	0.98		0.69	1.00		0.38	1.00		0.57	1.00	1.00
Satd. Flow (perm)	1504	1429		1205	1608		620	3157		999	4638	1426
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	2	48	7	1	1	64	288	7	2	497	211
RTOR Reduction (vph)	0	34	0	0	1	0	0	2	0	0	0	161
Lane Group Flow (vph)	108	67	0	7	1	0	64	293	0	2	497	50
Confl. Peds. (#/hr)	1					1	1		2	2		1
Heavy Vehicles (%)	5%	0%	6%	0%	0%	0%	6%	5%	0%	0%	3%	3%
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	11.0	11.0		8.1	8.1		19.5	12.7		17.9	11.9	11.9
Effective Green, g (s)	15.1	15.1		10.7	10.7		17.5	15.4		11.9	14.6	14.6
Actuated g/C Ratio	0.24	0.24		0.17	0.17		0.28	0.25		0.19	0.23	0.23
Clearance Time (s)	8.1	8.1		6.6	6.6		3.0	6.7		3.0	6.7	6.7
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3		2.5	2.3	2.3
Lane Grp Cap (vph)	365	346		207	276		262	781		223	1088	334
v/s Ratio Prot	c0.07	0.05			0.00		c0.02	0.09		0.00	c0.11	
v/s Ratio Perm				c0.01			0.05			0.00		0.03
v/c Ratio	0.30	0.19		0.03	0.00		0.24	0.38		0.01	0.46	0.15
Uniform Delay, d1	19.2	18.7		21.4	21.3		16.8	19.4		20.4	20.4	18.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.4		0.0	0.0		0.4	0.2		0.0	0.2	0.1
Delay (s)	19.8	19.1		21.5	21.3		17.1	19.6		20.4	20.6	19.0
Level of Service	B	B		C	C		B	B		C	C	B
Approach Delay (s)		19.5			21.5			19.2			20.1	
Approach LOS		B			C			B			C	

Intersection Summary					
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.29				
Actuated Cycle Length (s)	62.2	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	38.4%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	51	13	311	9	20	489
Future Volume (vph)	51	13	311	9	20	489
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	0.95	0.95	0.86	0.86
Frt	0.973		0.996			
Flt Protected	0.962					0.998
Satd. Flow (prot)	1638	0	3249	0	0	5895
Flt Permitted	0.962					0.998
Satd. Flow (perm)	1638	0	3249	0	0	5895
Link Speed (k/h)	50		50			50
Link Distance (m)	51.6		83.2			50.4
Travel Time (s)	3.7		6.0			3.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	55	14	338	10	22	532
Shared Lane Traffic (%)						
Lane Group Flow (vph)	69	0	348	0	0	554
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	51	13	311	9	20	489
Future Volume (Veh/h)	51	13	311	9	20	489
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)	55	14	338	10	22	532
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			83			159
pX, platoon unblocked						
vC, conflicting volume	520	174			348	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	520	174			348	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	98			98	
cM capacity (veh/h)	482	846			1222	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	69	225	123	98	152	152	152
Volume Left	55	0	0	22	0	0	0
Volume Right	14	0	10	0	0	0	0
cSH	528	1700	1700	1222	1700	1700	1700
Volume to Capacity	0.13	0.13	0.07	0.02	0.09	0.09	0.09
Queue Length 95th (m)	3.6	0.0	0.0	0.4	0.0	0.0	0.0
Control Delay (s)	12.8	0.0	0.0	1.9	0.0	0.0	0.0
Lane LOS	B			A			
Approach Delay (s)	12.8	0.0		0.3			
Approach LOS	B						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	31.6%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	644	4	4	702	12	4	0	1	0	0	5
Future Volume (vph)	0	644	4	4	702	12	4	0	1	0	0	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	10.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	1		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.997				0.850			0.865
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	3257	0	1662	3283	0	1662	0	1488	0	0	1514
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	3257	0	1662	3283	0	1662	0	1488	0	0	1514
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		79.7			288.4			53.1			60.2	
Travel Time (s)		5.7			20.8			3.8			4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	700	4	4	763	13	4	0	1	0	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	704	0	4	776	0	4	0	1	0	0	5
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			5.0			10.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	644	4	4	702	12	4	0	1	0	0	5
Future Volume (Veh/h)	0	644	4	4	702	12	4	0	1	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	700	4	4	763	13	4	0	1	0	0	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		80										
pX, platoon unblocked				0.90			0.90	0.90	0.90	0.90	0.90	
vC, conflicting volume	776			704			1096	1486	352	1128	1482	388
vC1, stage 1 conf vol							702	702		778	778	
vC2, stage 2 conf vol							394	784		351	704	
vCu, unblocked vol	776			450			886	1319	60	922	1314	388
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	99
cM capacity (veh/h)	849			1009			426	338	901	344	339	616

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	467	237	4	509	267	4	1	5
Volume Left	0	0	4	0	0	4	0	0
Volume Right	0	4	0	0	13	0	1	5
cSH	1700	1700	1009	1700	1700	426	901	616
Volume to Capacity	0.27	0.14	0.00	0.30	0.16	0.01	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.2
Control Delay (s)	0.0	0.0	8.6	0.0	0.0	13.5	9.0	10.9
Lane LOS			A			B	A	B
Approach Delay (s)	0.0		0.0			12.6		10.9
Approach LOS						B		B

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		38.1%	ICU Level of Service	A
Analysis Period (min)		15		

Appendix E

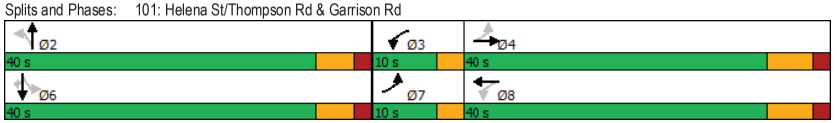
Total Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	516	21	17	358	55	40	69	25	101	33	190
Future Volume (vph)	265	516	21	17	358	55	40	69	25	101	33	190
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	35.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	80.0			0.0			50.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.994			0.980			0.960				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3196	0	1662	3090	0	1662	3036	0	1568	2995	1316
Flt Permitted	0.437			0.393			0.732			0.688		
Satd. Flow (perm)	728	3196	0	688	3090	0	1281	3036	0	1136	2995	1316
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			23			27				207
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		211.1			79.7			139.9			83.2	
Travel Time (s)		15.2			5.7			10.1			6.0	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	3%	12%	0%	5%	7%	0%	7%	0%	6%	11%	13%
Adj. Flow (vph)	288	561	23	18	389	60	43	75	27	110	36	207
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	584	0	18	449	0	43	102	0	110	36	207
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	9.0	39.0		9.0	39.0		38.1	38.1		38.1	38.1	38.1
Total Split (s)	10.0	40.0		10.0	40.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	11.1%	44.4%		11.1%	44.4%		44.4%	44.4%		44.4%	44.4%	44.4%
Maximum Green (s)	7.0	33.0		7.0	33.0		33.9	33.9		33.9	33.9	33.9
Yellow Time (s)	3.0	5.0		3.0	5.0		4.1	4.1		4.1	4.1	4.1
All-Red Time (s)	0.0	2.0		0.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	1.0	-3.0		1.0	-3.0		-2.1	-2.1		-2.1	-2.1	-2.1
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)		12.0			12.0		12.0	12.0		12.0	12.0	12.0
Flash Dont Walk (s)		20.0			20.0		20.0	20.0		20.0	20.0	20.0
Pedestrian Calls (#/hr)		0			0		0	0		0	0	0
Act Effct Green (s)	26.3	20.3		24.3	19.2		14.0	14.0		14.0	14.0	14.0
Actuated g/C Ratio	0.51	0.39		0.47	0.37		0.27	0.27		0.27	0.27	0.27
v/c Ratio	0.61	0.46		0.04	0.38		0.12	0.12		0.36	0.04	0.41
Control Delay	13.2	12.9		5.8	12.3		16.4	12.2		20.1	15.1	5.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	13.2	12.9		5.8	12.3		16.4	12.2		20.1	15.1	5.8
LOS	B	B		A	B		B	B		C	B	A
Approach Delay		13.0			12.0			13.5			11.2	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 51.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 12.5		Intersection LOS: B	
Intersection Capacity Utilization 51.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 101: Helena St/Thompson Rd & Garrison Rd



Queues
101: Helena St/Thompson Rd & Garrison Rd

Total (2028)
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	288	584	18	449	43	102	110	36	207
v/c Ratio	0.61	0.46	0.04	0.38	0.12	0.12	0.36	0.04	0.41
Control Delay	13.2	12.9	5.8	12.3	16.4	12.2	20.1	15.1	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	12.9	5.8	12.3	16.4	12.2	20.1	15.1	5.8
Queue Length 50th (m)	11.4	19.4	0.6	14.1	3.0	2.7	8.3	1.3	0.0
Queue Length 95th (m)	29.1	36.7	3.1	27.9	10.5	8.4	22.7	4.6	13.3
Internal Link Dist (m)		187.1		55.7		115.9		59.2	
Turn Bay Length (m)	40.0		50.0		35.0				
Base Capacity (vph)	473	2270	453	2200	909	2162	806	2126	994
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.26	0.04	0.20	0.05	0.05	0.14	0.02	0.21

Intersection Summary

HCM Signalized Intersection Capacity Analysis
101: Helena St/Thompson Rd & Garrison Rd

Total (2028)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	516	21	17	358	55	40	69	25	101	33	190
Future Volume (vph)	265	516	21	17	358	55	40	69	25	101	33	190
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1583	3197		1662	3090		1662	3037		1568	2995	1316
Flt Permitted	0.44	1.00		0.39	1.00		0.73	1.00		0.69	1.00	1.00
Satd. Flow (perm)	728	3197		687	3090		1282	3037		1135	2995	1316
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	288	561	23	18	389	60	43	75	27	110	36	207
RTOR Reduction (vph)	0	3	0	0	14	0	0	20	0	0	0	151
Lane Group Flow (vph)	288	581	0	18	435	0	43	82	0	110	36	56
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	5%	3%	12%	0%	5%	7%	0%	7%	0%	6%	11%	13%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	24.3	17.2		22.3	16.2		11.8	11.8		11.8	11.8	11.8
Effective Green, g (s)	22.3	20.2		20.3	19.2		13.9	13.9		13.9	13.9	13.9
Actuated g/C Ratio	0.44	0.39		0.40	0.37		0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	3.0	7.0		3.0	7.0		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	418	1261		369	1158		348	824		308	813	357
v/s Ratio Prot	c0.08	0.18		0.00	0.14			0.03			0.01	
v/s Ratio Perm	c0.22			0.01			0.03			c0.10		0.04
v/c Ratio	0.69	0.46		0.05	0.38		0.12	0.10		0.36	0.04	0.16
Uniform Delay, d1	10.1	11.5		9.4	11.6		14.1	14.0		15.0	13.8	14.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.3	0.6		0.0	0.4		0.2	0.1		0.7	0.0	0.2
Delay (s)	14.4	12.0		9.5	12.1		14.2	14.0		15.8	13.8	14.4
Level of Service	B	B		A	B		B	B		B	B	B
Approach Delay (s)		12.8			12.0			14.1			14.8	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	51.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.8%	ICU Level of Service	A	
Analysis Period (min)	15			

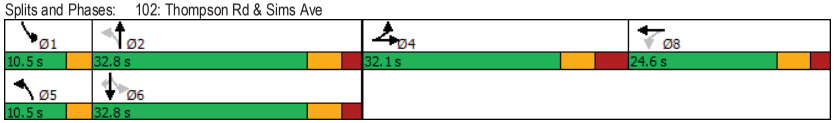
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	1	20	2	5	14	15	427	1	3	283	40
Future Volume (vph)	37	1	20	2	5	14	15	427	1	3	283	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			20.0			40.0			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Frt		0.890			0.887							0.850
Flt Protected	0.950	0.988		0.950			0.950			0.950		
Satd. Flow (prot)	1476	1204	0	1662	1552	0	1525	3079	0	1662	4343	1403
Flt Permitted	0.950	0.988		0.737			0.553			0.377		
Satd. Flow (perm)	1476	1204	0	1290	1552	0	888	3079	0	660	4343	1403
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			15							160
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		170.4			172.1			108.3			142.5	
Travel Time (s)		12.3			12.4			7.8			10.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	0%	27%	0%	0%	0%	9%	8%	0%	0%	10%	6%
Adj. Flow (vph)	40	1	22	2	5	15	16	464	1	3	308	43
Shared Lane Traffic (%)	18%											
Lane Group Flow (vph)	33	30	0	2	20	0	16	465	0	3	308	43
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			6.0			6.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8			2			6		6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	32.1	32.1		24.6	24.6		9.0	32.7		9.0	32.7	32.7
Total Split (s)	32.1	32.1		24.6	24.6		10.5	32.8		10.5	32.8	32.8
Total Split (%)	32.1%	32.1%		24.6%	24.6%		10.5%	32.8%		10.5%	32.8%	32.8%
Maximum Green (s)	24.0	24.0		18.0	18.0		7.5	26.1		7.5	26.1	26.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.0	4.1		3.0	4.1	4.1
All-Red Time (s)	4.0	4.0		2.5	2.5		0.0	2.6		0.0	2.6	2.6
Lost Time Adjust (s)	-4.1	-4.1		-2.6	-2.6		1.0	-2.7		3.0	-2.7	-2.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		6.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3		2.5	2.3	2.3
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)	11.0	11.0						8.0			8.0	8.0
Flash Dont Walk (s)	13.0	13.0						18.0			18.0	18.0
Pedestrian Calls (#/hr)	0	0						0			0	0
Act Effct Green (s)	12.6	12.6		10.6	10.6		21.4	16.4		17.3	16.3	16.3
Actuated g/C Ratio	0.21	0.21		0.17	0.17		0.35	0.27		0.29	0.27	0.27
v/c Ratio	0.11	0.11		0.01	0.07		0.04	0.56		0.01	0.26	0.09
Control Delay	21.6	12.9		23.0	14.8		10.7	21.9		11.7	18.0	0.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	21.6	12.9		23.0	14.8		10.7	21.9		11.7	18.0	0.3
LOS	C	B		C	B		B	C		B	B	A
Approach Delay		17.5			15.5			21.5			15.8	
Approach LOS		B			B			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 60.7			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 18.9		Intersection LOS: B	
Intersection Capacity Utilization 30.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 102: Thompson Rd & Sims Ave



Queues
102: Thompson Rd & Sims Ave

Total (2028)
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	33	30	2	20	16	465	3	308	43
v/c Ratio	0.11	0.11	0.01	0.07	0.04	0.56	0.01	0.26	0.09
Control Delay	21.6	12.9	23.0	14.8	10.7	21.9	11.7	18.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	12.9	23.0	14.8	10.7	21.9	11.7	18.0	0.3
Queue Length 50th (m)	3.3	0.8	0.2	0.5	1.0	24.1	0.2	10.1	0.0
Queue Length 95th (m)	10.7	7.3	1.9	6.0	4.1	38.5	1.6	17.0	0.0
Internal Link Dist (m)		146.4		148.1		84.3		118.5	
Turn Bay Length (m)			20.0		40.0				
Base Capacity (vph)	685	570	439	538	403	1465	279	2066	751
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.05	0.00	0.04	0.04	0.32	0.01	0.15	0.06

Intersection Summary

HCM Signalized Intersection Capacity Analysis
102: Thompson Rd & Sims Ave

Total (2028)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	1	20	2	5	14	15	427	1	3	283	40
Future Volume (vph)	37	1	20	2	5	14	15	427	1	3	283	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		6.0	4.0	4.0
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95		1.00	0.91	1.00
Frt	1.00	0.89		1.00	0.89		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1476	1204		1662	1553		1525	3078		1662	4343	1403
Flt Permitted	0.95	0.99		0.74	1.00		0.55	1.00		0.38	1.00	1.00
Satd. Flow (perm)	1476	1204		1289	1553		887	3078		660	4343	1403
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	1	22	2	5	15	16	464	1	3	308	43
RTOR Reduction (vph)	0	17	0	0	12	0	0	0	0	0	0	31
Lane Group Flow (vph)	33	13	0	2	8	0	16	465	0	3	308	12
Heavy Vehicles (%)	7%	0%	27%	0%	0%	0%	9%	8%	0%	0%	10%	6%
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	8.5	8.5		8.0	8.0		19.8	13.7		19.6	13.6	13.6
Effective Green, g (s)	12.6	12.6		10.6	10.6		17.8	16.4		13.6	16.3	16.3
Actuated g/C Ratio	0.21	0.21		0.17	0.17		0.29	0.27		0.22	0.27	0.27
Clearance Time (s)	8.1	8.1		6.6	6.6		3.0	6.7		3.0	6.7	6.7
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3		2.5	2.3	2.3
Lane Grp Cap (vph)	306	250		225	271		314	832		197	1168	377
v/s Ratio Prot	c0.02	0.01			c0.00		c0.00	c0.15		0.00	0.07	
v/s Ratio Perm				0.00			0.01			0.00		0.01
v/c Ratio	0.11	0.05		0.01	0.03		0.05	0.56		0.02	0.26	0.03
Uniform Delay, d1	19.4	19.2		20.7	20.7		15.3	19.0		18.3	17.4	16.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		0.0	0.0		0.0	0.6		0.0	0.1	0.0
Delay (s)	19.7	19.3		20.7	20.8		15.3	19.6		18.3	17.5	16.3
Level of Service	B	B		C	C		B	B		B	B	B
Approach Delay (s)		19.5			20.8			19.4			17.4	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	30.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	23	43	360	28	39	267
Future Volume (vph)	23	43	360	28	39	267
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	0.95	0.95	0.86	0.86
Frt	0.912		0.989			
Flt Protected	0.983					0.994
Satd. Flow (prot)	1538	0	3224	0	0	5867
Flt Permitted	0.983					0.994
Satd. Flow (perm)	1538	0	3224	0	0	5867
Link Speed (k/h)	50		50			50
Link Distance (m)	51.6		83.2			50.4
Travel Time (s)	3.7		6.0			3.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	47	391	30	42	290
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	0	421	0	0	332
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	23	43	360	28	39	267
Future Volume (Veh/h)	23	43	360	28	39	267
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)	25	47	391	30	42	290
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			83			159
pX, platoon unblocked						
vC, conflicting volume	562	210			421	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	562	210			421	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	94			96	
cM capacity (veh/h)	440	795			1135	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	72	261	160	83	83	83	83
Volume Left	25	0	0	42	0	0	0
Volume Right	47	0	30	0	0	0	0
cSH	621	1700	1700	1135	1700	1700	1700
Volume to Capacity	0.12	0.15	0.09	0.04	0.05	0.05	0.05
Queue Length 95th (m)	3.1	0.0	0.0	0.9	0.0	0.0	0.0
Control Delay (s)	11.6	0.0	0.0	4.3	0.0	0.0	0.0
Lane LOS	B			A			
Approach Delay (s)	11.6	0.0		1.1			
Approach LOS	B						

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	30.9%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	641	1	2	399	11	0	0	1	0	0	30
Future Volume (vph)	0	641	1	2	399	11	0	0	1	0	0	30
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	10.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	1		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.996				0.850			0.865
Flt Protected				0.950								
Satd. Flow (prot)	0	3197	0	1662	3170	0	1750	0	1488	0	0	1514
Flt Permitted				0.950								
Satd. Flow (perm)	0	3197	0	1662	3170	0	1750	0	1488	0	0	1514
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		79.7			123.8			53.1			60.2	
Travel Time (s)		5.7			8.9			3.8			4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	0%	4%	22%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	697	1	2	434	12	0	0	1	0	0	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	698	0	2	446	0	0	0	1	0	0	33
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			5.0			10.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	641	1	2	399	11	0	0	1	0	0	30
Future Volume (Veh/h)	0	641	1	2	399	11	0	0	1	0	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	697	1	2	434	12	0	0	1	0	0	33
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		80										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	446			698			952	1148	349	794	1142	223
vC1, stage 1 conf vol							698	698		444	444	
vC2, stage 2 conf vol							254	450		350	698	
vCu, unblocked vol	446			398			685	906	4	506	900	223
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	96
cM capacity (veh/h)	1125			1036			478	440	960	541	441	787

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	465	233	2	289	157	0	1	33
Volume Left	0	0	2	0	0	0	0	0
Volume Right	0	1	0	0	12	0	1	33
cSH	1700	1700	1036	1700	1700	1700	960	787
Volume to Capacity	0.27	0.14	0.00	0.17	0.09	0.00	0.00	0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	8.5	0.0	0.0	0.0	8.8	9.8
Lane LOS			A			A	A	A
Approach Delay (s)	0.0		0.0			8.8		9.8
Approach LOS						A		A

Intersection Summary					
Average Delay		0.3			
Intersection Capacity Utilization		29.3%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	78	565	367	37	79	45
Future Volume (vph)	78	565	367	37	79	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	10.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.986		0.951	
Flt Protected	0.950				0.969	
Satd. Flow (prot)	1630	3260	3214	0	1581	0
Flt Permitted	0.950				0.969	
Satd. Flow (perm)	1630	3260	3214	0	1581	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		123.8	164.6		47.9	
Travel Time (s)		8.9	11.9		3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	614	399	40	86	49
Shared Lane Traffic (%)						
Lane Group Flow (vph)	85	614	439	0	135	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane		Yes	Yes			
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	78	565	367	37	79	45
Future Volume (Veh/h)	78	565	367	37	79	45
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)	85	614	399	40	86	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		204				
pX, platoon unblocked					0.97	
vC, conflicting volume	439				896	220
vC1, stage 1 conf vol					419	
vC2, stage 2 conf vol					477	
vCu, unblocked vol	439				829	220
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	92				82	94
cM capacity (veh/h)	1117				483	785

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	85	307	307	266	173	135
Volume Left	85	0	0	0	0	86
Volume Right	0	0	0	0	40	49
cSH	1117	1700	1700	1700	1700	561
Volume to Capacity	0.08	0.18	0.18	0.16	0.10	0.24
Queue Length 95th (m)	2.0	0.0	0.0	0.0	0.0	7.5
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	13.4
Lane LOS	A					B
Approach Delay (s)	1.0			0.0		13.4
Approach LOS						B

Intersection Summary					
Average Delay		2.0			
Intersection Capacity Utilization		34.7%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1	4	0	5	16	0
Future Volume (vph)	1	4	0	5	16	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.892					
Flt Protected					0.950	
Satd. Flow (prot)	1530	0	0	1716	1630	0
Flt Permitted					0.950	
Satd. Flow (perm)	1530	0	0	1716	1630	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	172.1			146.2	55.6	
Travel Time (s)	12.4			10.5	4.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	4	0	5	17	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	0	0	5	17	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1	4	0	5	16	0
Future Volume (Veh/h)	1	4	0	5	16	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)	1	4	0	5	17	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)	172					
pX, platoon unblocked						
vC, conflicting volume			5		8	3
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			5		8	3
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1616		1013	1081

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	5	5	17
Volume Left	0	0	17
Volume Right	4	0	0
cSH	1700	1616	1013
Volume to Capacity	0.00	0.00	0.02
Queue Length 95th (m)	0.0	0.0	0.4
Control Delay (s)	0.0	0.0	8.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.6
Approach LOS			A

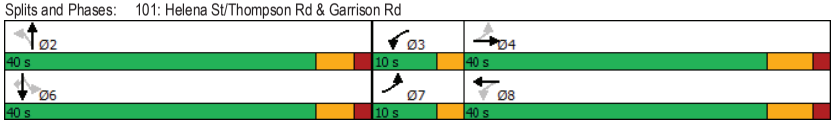
Intersection Summary				
Average Delay		5.4		
Intersection Capacity Utilization		13.3%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	505	45	40	605	100	46	52	19	158	96	318
Future Volume (vph)	167	505	45	40	605	100	46	52	19	158	96	318
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	40.0		0.0	50.0		0.0	35.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	80.0			0.0			50.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.988			0.979			0.960				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1554	3222	0	1599	3221	0	1614	3037	0	1646	3197	1458
Flt Permitted	0.249			0.376			0.686			0.704		
Satd. Flow (perm)	407	3222	0	632	3221	0	1166	3037	0	1220	3197	1458
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			25			21				291
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		211.1			79.7			139.9			83.2	
Travel Time (s)		15.2			5.7			10.1			6.0	
Confl. Peds. (#/hr)	3		1	1		3						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	0%	4%	1%	0%	3%	7%	0%	1%	4%	2%
Adj. Flow (vph)	182	549	49	43	658	109	50	57	21	172	104	346
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	598	0	43	767	0	50	78	0	172	104	346
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	7	4		3	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	9.0	39.0		9.0	39.0		38.1	38.1		38.1	38.1	38.1
Total Split (s)	10.0	40.0		10.0	40.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	11.1%	44.4%		11.1%	44.4%		44.4%	44.4%		44.4%	44.4%	44.4%
Maximum Green (s)	7.0	33.0		7.0	33.0		33.9	33.9		33.9	33.9	33.9
Yellow Time (s)	3.0	5.0		3.0	5.0		4.1	4.1		4.1	4.1	4.1
All-Red Time (s)	0.0	2.0		0.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	1.0	-3.0		1.0	-3.0		-2.1	-2.1		-2.1	-2.1	-2.1
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)		12.0			12.0		12.0	12.0		12.0	12.0	12.0
Flash Dont Walk (s)		20.0			20.0		20.0	20.0		20.0	20.0	20.0
Pedestrian Calls (#/hr)		0			0		0	0		0	0	0
Act Effct Green (s)	33.2	27.0		31.6	26.2		17.6	17.6		17.6	17.6	17.6
Actuated g/C Ratio	0.53	0.43		0.51	0.42		0.28	0.28		0.28	0.28	0.28
v/c Ratio	0.55	0.43		0.11	0.56		0.15	0.09		0.50	0.12	0.56
Control Delay	14.9	13.6		7.4	15.4		19.3	14.0		25.5	17.9	8.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	14.9	13.6		7.4	15.4		19.3	14.0		25.5	17.9	8.4
LOS	B	B		A	B		B	B		C	B	A
Approach Delay		13.9			15.0			16.1			14.7	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 62.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 61.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 101: Helena St/Thompson Rd & Garrison Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	182	598	43	767	50	78	172	104	346
v/c Ratio	0.55	0.43	0.11	0.56	0.15	0.09	0.50	0.12	0.56
Control Delay	14.9	13.6	7.4	15.4	19.3	14.0	25.5	17.9	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	13.6	7.4	15.4	19.3	14.0	25.5	17.9	8.4
Queue Length 50th (m)	8.4	23.0	1.8	32.1	4.4	2.5	16.8	4.7	4.8
Queue Length 95th (m)	#23.6	45.8	7.1	60.6	13.6	8.0	39.5	11.5	27.2
Internal Link Dist (m)		187.1		55.7		115.9		59.2	
Turn Bay Length (m)	40.0		50.0		35.0				
Base Capacity (vph)	331	1927	424	1932	695	1820	727	1907	987
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.31	0.10	0.40	0.07	0.04	0.24	0.05	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	505	45	40	605	100	46	52	19	158	96	318
Future Volume (vph)	167	505	45	40	605	100	46	52	19	158	96	318
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1554	3222		1598	3220		1614	3035		1646	3197	1458
Flt Permitted	0.25	1.00		0.38	1.00		0.69	1.00		0.70	1.00	1.00
Satd. Flow (perm)	407	3222		633	3220		1166	3035		1219	3197	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	549	49	43	658	109	50	57	21	172	104	346
RTOR Reduction (vph)	0	7	0	0	14	0	0	15	0	0	0	209
Lane Group Flow (vph)	182	591	0	43	753	0	50	63	0	172	104	137
Confl. Peds. (#/hr)	3		1	1		3						
Heavy Vehicles (%)	7%	2%	0%	4%	1%	0%	3%	7%	0%	1%	4%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	31.1	23.9		29.5	23.1		15.4	15.4		15.4	15.4	15.4
Effective Green, g (s)	29.1	26.9		27.5	26.1		17.5	17.5		17.5	17.5	17.5
Actuated g/C Ratio	0.47	0.44		0.44	0.42		0.28	0.28		0.28	0.28	0.28
Clearance Time (s)	3.0	7.0		3.0	7.0		6.1	6.1		6.1	6.1	6.1
Vehicle Extension (s)	2.5	5.0		2.5	5.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	306	1402		365	1359		330	859		345	905	412
v/s Ratio Prot	c0.06	0.18		0.01	c0.23			0.02			0.03	
v/s Ratio Perm	0.22			0.04			0.04			c0.14		0.09
v/c Ratio	0.59	0.42		0.12	0.55		0.15	0.07		0.50	0.11	0.33
Uniform Delay, d1	10.4	12.1		9.8	13.5		16.6	16.2		18.5	16.4	17.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	0.4		0.1	0.8		0.2	0.0		1.1	0.1	0.5
Delay (s)	13.0	12.5		9.9	14.3		16.8	16.3		19.6	16.5	18.0
Level of Service	B	B		A	B		B	B		B	B	B
Approach Delay (s)		12.6			14.1			16.5			18.2	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.54				
Actuated Cycle Length (s)	61.8	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	61.9%	ICU Level of Service		B	
Analysis Period (min)	15				

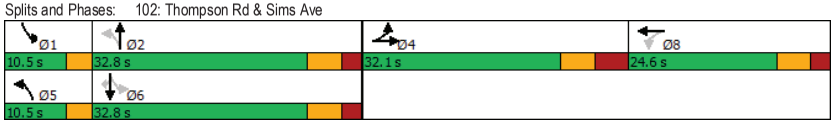
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	6	48	6	4	4	63	275	6	9	478	194
Future Volume (vph)	146	6	48	6	4	4	63	275	6	9	478	194
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	7.5			20.0			40.0			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.91	1.00
Ped Bike Factor	1.00	1.00			0.99		1.00	1.00		1.00		0.99
Frt		0.927			0.925			0.997				0.850
Flt Protected	0.950	0.978		0.950			0.950			0.950		
Satd. Flow (prot)	1504	1433	0	1662	1608	0	1568	3159	0	1662	4638	1444
Flt Permitted	0.950	0.978		0.684			0.359			0.565		
Satd. Flow (perm)	1502	1432	0	1197	1608	0	592	3159	0	986	4638	1425
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		47			4			2				211
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		170.4			173.1			108.3			142.5	
Travel Time (s)		12.3			12.5			7.8			10.3	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	0%	6%	0%	0%	0%	6%	5%	0%	0%	3%	3%
Adj. Flow (vph)	159	7	52	7	4	4	68	299	7	10	520	211
Shared Lane Traffic (%)	30%											
Lane Group Flow (vph)	111	107	0	7	8	0	68	306	0	10	520	211
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			6.0			6.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8			2			6		6
Detector Phase	4	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		6.0	10.0		6.0	10.0	10.0
Minimum Split (s)	32.1	32.1		24.6	24.6		9.0	32.7		9.0	32.7	32.7
Total Split (s)	32.1	32.1		24.6	24.6		10.5	32.8		10.5	32.8	32.8
Total Split (%)	32.1%	32.1%		24.6%	24.6%		10.5%	32.8%		10.5%	32.8%	32.8%
Maximum Green (s)	24.0	24.0		18.0	18.0		7.5	26.1		7.5	26.1	26.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.0	4.1		3.0	4.1	4.1
All-Red Time (s)	4.0	4.0		2.5	2.5		0.0	2.6		0.0	2.6	2.6
Lost Time Adjust (s)	-4.1	-4.1		-2.6	-2.6		1.0	-2.7		3.0	-2.7	-2.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		6.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3		2.5	2.3	2.3
Recall Mode	Min	Min		Min	Min		Min	Min		Min	Min	Min
Walk Time (s)	11.0	11.0						8.0			8.0	8.0
Flash Dont Walk (s)	13.0	13.0						18.0			18.0	18.0
Pedestrian Calls (#/hr)	0	0						0			0	0
Act Effct Green (s)	15.3	15.3		10.7	10.7		21.7	15.9		16.1	15.1	15.1
Actuated g/C Ratio	0.24	0.24		0.17	0.17		0.34	0.25		0.26	0.24	0.24
v/c Ratio	0.30	0.28		0.03	0.03		0.23	0.38		0.04	0.47	0.42
Control Delay	22.7	14.7		25.5	20.6		14.7	21.2		14.1	22.4	6.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	22.7	14.7		25.5	20.6		14.7	21.2		14.1	22.4	6.4
LOS	C	B		C	C		B	C		B	C	A
Approach Delay		18.8			22.9			20.0			17.7	
Approach LOS		B			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 63			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 18.6		Intersection LOS: B	
Intersection Capacity Utilization 38.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 102: Thompson Rd & Sims Ave



Queues
102: Thompson Rd & Sims Ave

Total (2028)
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	111	107	7	8	68	306	10	520	211
v/c Ratio	0.30	0.28	0.03	0.03	0.23	0.38	0.04	0.47	0.42
Control Delay	22.7	14.7	25.5	20.6	14.7	21.2	14.1	22.4	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	14.7	25.5	20.6	14.7	21.2	14.1	22.4	6.4
Queue Length 50th (m)	11.4	6.0	0.7	0.4	5.0	16.0	0.8	19.8	0.0
Queue Length 95th (m)	26.5	19.0	4.3	4.1	13.2	28.2	3.7	31.6	15.0
Internal Link Dist (m)		146.4		149.1		84.3		118.5	
Turn Bay Length (m)			20.0		40.0				
Base Capacity (vph)	675	669	394	532	312	1455	324	2135	769
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.16	0.02	0.02	0.22	0.21	0.03	0.24	0.27

Intersection Summary

HCM Signalized Intersection Capacity Analysis
102: Thompson Rd & Sims Ave

Total (2028)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	6	48	6	4	4	63	275	6	9	478	194
Future Volume (vph)	146	6	48	6	4	4	63	275	6	9	478	194
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		6.0	4.0	4.0
Lane Util. Factor	0.95	0.95		1.00	1.00		1.00	0.95		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.98		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1504	1434		1662	1608		1568	3158		1661	4638	1426
Flt Permitted	0.95	0.98		0.68	1.00		0.36	1.00		0.57	1.00	1.00
Satd. Flow (perm)	1504	1434		1198	1608		593	3158		989	4638	1426
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	7	52	7	4	4	68	299	7	10	520	211
RTOR Reduction (vph)	0	36	0	0	3	0	0	1	0	0	0	160
Lane Group Flow (vph)	111	71	0	7	5	0	68	305	0	10	520	51
Confl. Peds. (#/hr)	1					1	1		2	2		1
Heavy Vehicles (%)	5%	0%	6%	0%	0%	0%	6%	5%	0%	0%	3%	3%
Turn Type	Split	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4			8		5	2		1	6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	11.2	11.2		8.1	8.1		20.0	13.2		18.4	12.4	12.4
Effective Green, g (s)	15.3	15.3		10.7	10.7		18.0	15.9		12.4	15.1	15.1
Actuated g/C Ratio	0.24	0.24		0.17	0.17		0.29	0.25		0.20	0.24	0.24
Clearance Time (s)	8.1	8.1		6.6	6.6		3.0	6.7		3.0	6.7	6.7
Vehicle Extension (s)	4.0	4.0		2.5	2.5		2.5	2.3		2.5	2.3	2.3
Lane Grp Cap (vph)	365	348		203	273		259	798		227	1113	342
v/s Ratio Prot	c0.07	0.05			0.00		c0.02	0.10		0.00	c0.11	
v/s Ratio Perm				c0.01			0.05			0.01		0.04
v/c Ratio	0.30	0.21		0.03	0.02		0.26	0.38		0.04	0.47	0.15
Uniform Delay, d1	19.4	19.0		21.8	21.7		16.8	19.4		20.4	20.5	18.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.4		0.1	0.0		0.4	0.2		0.1	0.2	0.1
Delay (s)	20.1	19.4		21.8	21.7		17.2	19.6		20.5	20.6	18.9
Level of Service	C	B		C	C		B	B		C	C	B
Approach Delay (s)		19.7			21.8			19.2			20.2	
Approach LOS		B			C			B			C	

Intersection Summary					
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.30				
Actuated Cycle Length (s)	62.9	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	38.8%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	70	30	308	12	64	470
Future Volume (vph)	70	30	308	12	64	470
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	0.95	0.95	0.86	0.86
Frt	0.959		0.994			
Flt Protected	0.966					0.994
Satd. Flow (prot)	1621	0	3243	0	0	5880
Flt Permitted	0.966					0.994
Satd. Flow (perm)	1621	0	3243	0	0	5880
Link Speed (k/h)	50		50			50
Link Distance (m)	51.6		83.2			50.4
Travel Time (s)	3.7		6.0			3.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	2%
Adj. Flow (vph)	76	33	335	13	70	511
Shared Lane Traffic (%)						
Lane Group Flow (vph)	109	0	348	0	0	581
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	70	30	308	12	64	470
Future Volume (Veh/h)	70	30	308	12	64	470
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)	76	33	335	13	70	511
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			83			159
pX, platoon unblocked						
vC, conflicting volume	609	174			348	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	609	174			348	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	96			94	
cM capacity (veh/h)	407	846			1222	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	109	223	125	143	146	146	146
Volume Left	76	0	0	70	0	0	0
Volume Right	33	0	13	0	0	0	0
cSH	482	1700	1700	1222	1700	1700	1700
Volume to Capacity	0.23	0.13	0.07	0.06	0.09	0.09	0.09
Queue Length 95th (m)	6.9	0.0	0.0	1.5	0.0	0.0	0.0
Control Delay (s)	14.6	0.0	0.0	4.2	0.0	0.0	0.0
Lane LOS	B			A			
Approach Delay (s)	14.6	0.0		1.0			
Approach LOS	B						

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	34.3%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	680	4	4	722	12	4	0	1	0	0	19
Future Volume (vph)	0	680	4	4	722	12	4	0	1	0	0	19
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0		0.0	10.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	1		0	1		1	0		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.998				0.850			0.865
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	3257	0	1662	3286	0	1662	0	1488	0	0	1514
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	0	3257	0	1662	3286	0	1662	0	1488	0	0	1514
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		79.7			128.8			53.1			60.2	
Travel Time (s)		5.7			9.3			3.8			4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	739	4	4	785	13	4	0	1	0	0	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	743	0	4	798	0	4	0	1	0	0	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			5.0			10.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes			Yes							
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	680	4	4	722	12	4	0	1	0	0	19
Future Volume (Veh/h)	0	680	4	4	722	12	4	0	1	0	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	739	4	4	785	13	4	0	1	0	0	21
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		80										
pX, platoon unblocked				0.89			0.89	0.89	0.89	0.89	0.89	
vC, conflicting volume	798			743			1162	1547	372	1170	1542	399
vC1, stage 1 conf vol							741	741		800	800	
vC2, stage 2 conf vol							422	806		370	743	
vCu, unblocked vol	798			468			939	1370	51	947	1365	399
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	97
cM capacity (veh/h)	833			984			402	328	902	333	328	606

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	493	250	4	523	275	4	1	21
Volume Left	0	0	4	0	0	4	0	0
Volume Right	0	4	0	0	13	0	1	21
cSH	1700	1700	984	1700	1700	402	902	606
Volume to Capacity	0.29	0.15	0.00	0.31	0.16	0.01	0.00	0.03
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.9
Control Delay (s)	0.0	0.0	8.7	0.0	0.0	14.0	9.0	11.2
Lane LOS			A			B	A	B
Approach Delay (s)	0.0		0.0			13.0		11.2
Approach LOS						B		B

Intersection Summary					
Average Delay		0.2			
Intersection Capacity Utilization		38.7%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	41	641	697	51	25	41
Future Volume (vph)	41	641	697	51	25	41
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	15.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	10.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.990		0.916	
Flt Protected	0.950				0.982	
Satd. Flow (prot)	1630	3260	3227	0	1543	0
Flt Permitted	0.950				0.982	
Satd. Flow (perm)	1630	3260	3227	0	1543	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		128.8	159.6		55.1	
Travel Time (s)		9.3	11.5		4.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	697	758	55	27	45
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	697	813	0	72	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane		Yes	Yes			
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	41	641	697	51	25	41
Future Volume (Veh/h)	41	641	697	51	25	41
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)	45	697	758	55	27	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		208				
pX, platoon unblocked					0.95	
vC, conflicting volume	813				1224	406
vC1, stage 1 conf vol					786	
vC2, stage 2 conf vol					438	
vCu, unblocked vol	813				1128	406
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	94				93	92
cM capacity (veh/h)	810				368	594

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	45	348	348	505	308	72
Volume Left	45	0	0	0	0	27
Volume Right	0	0	0	0	55	45
cSH	810	1700	1700	1700	1700	483
Volume to Capacity	0.06	0.20	0.20	0.30	0.18	0.15
Queue Length 95th (m)	1.4	0.0	0.0	0.0	0.0	4.2
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	13.8
Lane LOS	A					B
Approach Delay (s)	0.6			0.0		13.8
Approach LOS						B

Intersection Summary					
Average Delay		0.9			
Intersection Capacity Utilization		40.3%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	10	11	0	8	6	0
Future Volume (vph)	10	11	0	8	6	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.930					
Flt Protected					0.950	
Satd. Flow (prot)	1596	0	0	1716	1630	0
Flt Permitted					0.950	
Satd. Flow (perm)	1596	0	0	1716	1630	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	173.1			160.8	63.4	
Travel Time (s)	12.5			11.6	4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	12	0	9	7	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	0	9	7	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	10	11	0	8	6	0
Future Volume (Veh/h)	10	11	0	8	6	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)	11	12	0	9	7	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)	173					
pX, platoon unblocked						
vC, conflicting volume			23		26	17
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			23		26	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)			1592		989	1062

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	23	9	7
Volume Left	0	0	7
Volume Right	12	0	0
cSH	1700	1592	989
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

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		