

Edworthy West Pit Township of North Dumfries Transportation Impact Study

Paradigm Transportation Solutions Limited

January 2023 190439



Project Summary



Project Number 190439

January 2023

Client

Cambridge Aggregates Inc.

c/o MHBC Planning, Urban Design & Landscape Architecture 200-540 Bingemans Centre Drive Kitchener ON N2B 3X9

Client Contact

Caitlin Port MES, MCIP, RPP Associate

Consultant Project Team

Matthew Brouwer, P.Eng. Evan Hong, EIT Jim Mallett, M.A.Sc., P.Eng., PTOE

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

Edworthy West Pit Transportation Impact Study



Matt Brouwer, 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 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

This report is protected by Canadian and International copyright laws. Reproduction and/or distribution of the report without the written permission of Paradigm Transportation Solutions Limited is prohibited.

© 2022 Paradigm Transportation Solutions Limited. All rights reserved

Executive Summary

Content

Cambridge Aggregates Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study (TIS) for proposed Edworthy West aggregate pit located at Part of Lots 16, 17 and 18, Concession 9 (former geographic Township of Dumfries), Township of North Dumfries, Regional Municipality of Waterloo.

Development Concept

Cambridge Aggregates Inc., is proposing to use the lands to permit aggregate extraction operation. The material extracted from the proposed Edworthy West Pit will be hauled, via Spragues Road, to the southern portion of the Cambridge Aggregates Inc. existing North Dumfries Pit Licence (Licence # 607701). A proposed truck crossing across Alps Road will provide access to the north portion of the North Dumfries Pit Licence where the material will be processed and shipped to market via Cedar Creek Road. Pit. The North and South portions of the North Dumfries Pit are already approved.

Conclusions

The main conclusions of this study are:

- Existing Traffic Operations: The analysis indicates that the intersection of Spragues Road and Greenfield Road currently operates at acceptable levels of service, without any problem movements;
- Trip Generation: The aggregate hauling operation is forecast to generate 40 trips during the peak hour;
- Background Traffic Operations: The intersection of Spragues Road and Greenfield Road is forecast to operate at acceptable levels of service, without any problem movements;
- Total Traffic Operations: All intersections in the study area are forecast to operate at acceptable levels of service, without any problem movements; and
- **Remedial Measures:** No remedial measures are justified.

Recommendations

No improvement to the transportation network be required for the approval of the subject development.



Contents

1	Introduction	1
1.1 1.2	Overview Purpose and Scope	1 1
2	Existing Conditions	3
2.1 2.2 2.3 2.4 2.5 2.6	Existing Roads Transit Service Active Transportation Traffic Volumes Traffic Operations Speed Study	3 3 6 8
3	Development Concept	.10
 3.1 3.2 3.3 3.4 3.4.1 	Development Description Trip Generation Trip Distribution and Assignment Sight Distance Assessment Alps Road Accesses	10 12 13 15 15
3.4.1	Spragues Road Accesses	15 21
4.1 4.1.1 4.1.2 4.2 4.2.1 4.2.2	Background Traffic Forecasts	21 21 21 21 21 21 24
5	Remedial Measures	.27
5.1	Left-turn Lane Requirements	.27
6	Conclusions and Recommendations	.29
6.1 6.2	Conclusions Recommendations	29 29

Appendices

Appendix A	Existing Turning Movement Count Data
Appendix B	Existing Traffic Operational Reports
Appendix C	Speed Study Reports
Appendix D	2027 Background Traffic Operations Reports
Appendix E	2027 Total Traffic Operations Reports



Figures

Figure 1.1	Site Location	2
Figure 2.1:	Existing Lane Configuration and Traffic Control	4
Figure 2.2:	Existing Traffic Volumes	5
Figure 2.3:	Locations of Speed Measurements	9
Figure 3.1:	Haul Route	.11
Figure 3.2:	Site Traffic Volumes	.14
Figure 3.3	Acceptable Access Locations	.18
Figure 3.4	Locations with Adequate Sight Distance	.19
Figure 3.5	Site Access on Spragues Road and Hauling Route	.20
Figure 4.1:	2027 Background Traffic Volumes	.22
Figure 4.2:	2027 Total Traffic Volumes	.25
Figure 5.1:	Left turn Nomograph Spragues Road & Spragues	
•	Site Access N	.28

Tables

Table 2.1:	Existing Traffic Operations Summary	7
Table 2.2:	Spot Speed Study Results	8
Table 3.1:	Trip Generation Estimates	.12
Table 3.2:	Intersection Sight Distance REquirments	.15
Table 3.3:	Measured Sight Distances (Passenger Vehicle Eye	
	Height)	.16
Table 4.1:	2027 Background Traffic Operations	.23
Table 4.2:	2027 Total Traffic Operations	.26



1 Introduction

1.1 Overview

Cambridge Aggregates Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study (TIS) for proposed Edworthy West aggregate pit located at Part of Lots 16, 17 and 18, Concession 9 (former geographic Township of Dumfries), Township of North Dumfries, Regional Municipality of Waterloo.

Figure 1.1 illustrates the location of the development.

1.2 Purpose and Scope

The purpose of this report is to identify and assess the potential traffic impacts resulting from the proposed development. The scope of the study, developed in consultation with North Dumfries and Region of Waterloo staff via e-mail in June 2022, includes:

- documenting current traffic conditions near the development site;
- forecasting background traffic growth to 2027;
- forecasting site-generated traffic;
- assigning site-generated traffic to the study area road network (Alps Road, Spragues Road and Greenfield Road); and
- identifying any operational or safety concerns and required mitigation measures at the study area intersections.







Edworthy Aggregate Pits - TIS 190439

Site Location Figure 1.1

2 Existing Conditions

This section documents current traffic conditions, operational deficiencies and constraints experienced by the public travelling at the intersections within the study area. The operational deficiencies and constraints identified at this stage will be fundamental to the process of defining the required remedial measures.

2.1 Existing Roads

The main roadways within the study area are described as follows:

- Spragues Road is a north-south two-lane Region of Waterloo Road with posted speed limit of 80 km/h;
- Alps Road is an east-west two-lane Township Road with posted speed limit of 60 km/h; and
- Greenfield Road is an east-west two-lane Township Road with posted speed limit of 60 km/h.

Figure 2.1 illustrates the existing lane configuration and traffic control.

2.2 Transit Service

There is no transit service near the site.

2.3 Active Transportation

No sidewalk or cycling facilities are provided near the site.

2.4 Traffic Volumes

Figure 2.1 displays the existing AM and PM peak hour turning movement traffic volumes collected by Paradigm in April 2022.

Appendix A contains the detailed traffic counts for the study area intersection.







Existing Lane Configuration and Traffic Control

Edworthy Aggregate Pits - TIS 190439

Figure 2.1

AM PEAK HOUR











Existing Traffic Volumes

Edworthy Aggregate Pits - TIS 190439

Figure 2.2

2.5 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles intending to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to 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 intersections in the study area were evaluated with the existing turning movement volumes using Synchro 11.

The intersection analysis considered two separate measures of performance:

- ▶ the volume to capacity ratio for each intersection; and
- the LOS for each turning movement (LOS is based on the average control delay per vehicle).

Table 2.1 summarizes the existing intersection operations. The entries in the table indicating the AM and PM peak hour level of service (LOS), volume to capacity ratios (V/C), and 95th percentile queues experienced.

The observed intersection is forecast to operate well without any problem movements.

Appendix B contains the detailed Synchro 11 reports.



σ									0)irecti	on/Mc	veme	nt/App	oroach	1					
'erio		Control Type			Eastb	ound			Westk	ound			North	oound		Southbound				
Analysis P	Intersection		MOE	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Overall
ak			LOS	<	В	>	В	<	В	>	В	А	А	А	Α	Α	А	Α	Α	
Pe	Spragues Road &	TWSC	Delay	<	12	>	12	<	10	>	10	8	0	0	0	8	0	0	0	
ΜĂ	Greenfield Road	1000	V/C	<	0.05	>		<	0.02	>		0.00	0.00	0.00		0.00	0.00	0.00		
A			Q	<	1	>		<	1	>		0	0	0		0	0	0		
k			LOS	<	В	^	В	<	В	٧	В	Α	Α	А	Α	Α	А	Α	Α	
ea ur	Spragues Road &	TMCC	Delay	<	12	>	12	<	12	>	12	8	0	0	0	8	0	0	0	
M P Hoi	Greenfield Road	d TWSC	V/C	<	0.05	>		<	0.00	>		0.00	0.00	0.00		0.00	0.00	0.00		
٩.			Q	<	2	>		<	0	>		0	0	0		0	0	0		

TABLE 2.1: EXISTING TRAFFIC OPERATIONS SUMMARY

MOE - Measure of Effectiveness

Q - 95th Percentile Queue Length (m)

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds V/C - Volume to Capacity Ratio TWSC - Two-Way Stop Control </> - Shared with through movement



2.6 Speed Study

Speed collected in May 2022 reveal operating conditions on Spragues Road. The posted speed limit on the area of interest is 80 km/h while the design speed limit is 100 km/h (+20 km/h of posted speed limit). **Figure 2.3** illustrates the three spot speed sampling locations.

Table 2.2 summarizes the 85th percentile speeds measured. The results show that generally 85 percent of the traffic is travelling at or below the design speed.

Road	Location	Direction	85 th Percentile Speed (km/h)
Spragues Road	300 metres south of Greenfield Road	northbound	100
Spragues Road	300 m south of Greenfield Road	southbound	109
Spragues Road	250 metres north of Greenfield Road	northbound	105
Spragues Road	250 metres north of Greenfield Road	southbound	97
Spragues Road	450 metres south of Alps Road	northbound	98
Spragues Road	450 metres south of Alps Road	southbound	97

TABLE 2.2: SPOT SPEED STUDY RESULTS

Appendix C contains details of speed study.







Locations of Speed Measurements

Edworthy Aggregate Pits - TIS 190439

Figure 2.3

3 Development Concept

3.1 Development Description

Cambridge Aggregates Inc., is proposing to use the lands to permit aggregate extraction operation. The material extracted from the proposed Edworthy West Pit will be hauled, via Spragues Road, to the southern portion of the Cambridge Aggregates Inc. existing North Dumfries Pit Licence (Licence # 607701). A proposed truck crossing across Alps Road will provide access to the north portion of the North Dumfries Pit Licence where the material will be processed and shipped to market via Cedar Creek Road. Pit. The North and South portions of the North Dumfries Pit are already approved.







Proposed Haul Route

Edworthy Aggregate Pits - TIS 190439

3.2 Trip Generation

The site trip generation is based on the number of trips made by trucks using the proposed crossing. For the purposes of traffic operation analysis, the number of truck trips between sites was forecast from the planned pit operating schedule:

- Licensed Extraction Rate: The maximum amount of tonnage applied for the aggregate licence is 1,000,000 tonnes per year. This rate represents the maximum amount of material that can be extracted from the site on yearly basis.
- Pit Operations: The operational plan for the pit notes that the trucks will be loaded between 7:00 AM and 5:00 PM daily, 5-days per week. Realities of market forces and weather have shown that this activity can be sustained for approximately 50 weeks annually, resulting in 160 operating days per year.
- Vehicle Size: The traffic generated by the site is related to the payload of the vehicles being loaded. As it determines the number of total trucks needed. An average of 35 tonnes per truck was used for the analysis.

Table 3.1 summarizes the estimated average daily and peak hour traffic generation. It is recognized that truck traffic in this operation is not spread uniformly throughout the day. To account for potential variance from the averaged peak hour volume, the calculated volume of 35 trips per hour has been rounded to 40 trips per hour to use in the operational analysis.

Measure	Units	Input	Calculation
Annual Rate of Extraction	tonnes/year	1,000,000	
Operating Days per Year	day/year	160	
Average Extraction per day	tonnes/day		6,250
Average Payload per Truck	tonnes/truck	36	
Average Number of Trucks per Day	trucks/day		174
Operating Hours per Day	hours/day	10	
Average Number of Trucks Load per Hour	truck/hour		17.36
Trip per Truck Load	trips/truck	2	
Peak Hour Truck Volume	trips/hours		35

TABLE 3.1: TRIP GENERATION ESTIMATES



3.3 Trip Distribution and Assignment

The site traffic will travel between the South Property and North Property crossing to Main Pit. All trips are distributed and assigned evenly between the site four site accesses.

Figure 3.2 illustrates the site-generated trip assignment for the AM and PM peak hours.



AM PEAK HOUR

PM PEAK HOUR







Site-Generated Traffic Volumes

Edworthy Aggregate Pits - TIS 190439

3.4 Sight Distance Assessment

3.4.1 Alps Road Accesses

The required sight distance for the proposed driveways has been assessed based on the methodology outlined in the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads*¹ ("TAC Guide").

The sight distance requirements for the proposed driveway locations were determined based on a design speed of 70 km/h, which is 10 km/h above the posted speed limit of 60 km/h on Alps Road.

Table 3.2 indicates the Transportation Association of Canada required sight distance² for a left and right-turn/crossing manoeuvre (cars and trucks) from a stop-controlled intersection (site driveway).

Vahiala	For	Sight Distance (m) 70 km/h Design Speed
venicie	Left-Turn	Right-Turn/ Crossing Maneuver
Cars	150	130
Trucks	225	205

TABLE 3.2: INTERSECTION SIGHT DISTANCE REQUIRMENTS

Paradigm staff completed a site visit in August 2021 to measure the sight distance at planned driveway along Alps Road. Using the TAC-specified standard driver eye and object height³, it was confirmed that over 225 metres of sight distance is available. This meets the standard for passenger vehicles and trucks, for all movements.

3.4.1 Spragues Road Accesses

The same methodology has been used to assess the sight distances for the accesses on Spragues Road. Sight distance requirements for the proposed driveway locations were determined based on a design

³ Transportation Association of Canada, *Geometric Design Guide for Canadian Roads*, (Ottawa: TAC, 2017) Table 2.5.1



¹ Transportation Association of Canada, *Geometric Design Guide for Canadian Roads*, (Ottawa: TAC, 2017).

² Transportation Association of Canada, *Geometric Design Guide for Canadian Roads*, (Ottawa: TAC, 2017) Section 9.9.2.3

speed of 100 km/h, which is 20 km/h above the 80 km/h speed limit on Spragues Road.

For a 100 km/h design speed, the TAC-required sight distance requirement from a stop-controlled intersection is 210 metres for a left-turn and 185 metres for a right-turn.

Paradigm staff completed a site visit in February 2020 to measure the sightlines at five locations along Spragues Road and identify viable locations for the proposed accesses. Sightlines were measured using standard driver eye and object heights. **Table 3.3** summarizes the measurements taken during the sight visit.

		Sight Distance (m)						
	Location	To North	To South					
1	Sign for 1119 Spragues Road	200	223					
2	Hydro pole near house building at 1119 Spragues Road	204	196					
3	Southbound "Reverse Curve" sign	246	305					
4	Southbound "School Bus Stop Ahead" sign	355	287					
5	Hydro pole near 1451 Spragues Road	320	355					

TABLE 3.3: MEASURED SIGHT DISTANCES (PASSENGER VEHICLE EYE HEIGHT)

For the north property, sight distance is met near Location 3 for passenger vehicles. For the south property, sight distance is met for all three locations surveyed, but is greatest at Location 5.

A follow-up survey was conducted in December 2021 along the south property frontage to determine how far south an access could be located on Spragues Road before sight-distance would be insufficient due to the curve in the road on the other side of Greenfield Road. The follow-up survey location is referred to as Location 6. It was found that sight distance could be achieved at a location 55 metres north of Greenfield Road. According to the Region of Waterloo Access Policy, a



commercial access should be at least 55 metres from a non-signalized intersection on a high-speed road⁴.

Figure 3.3 shows the results of the sight distance measurements.

Figure 3.4 show the areas in which a location could be constructed to meet sight distance requirements. For the North Property, the access can be located near Location 3, but no further northeast. For the South Property, it is noted that the property owner prefers to locate the access on the southernmost parcel of land, and access could be located along that frontage.

Figure 3.5 illustrates the haul route with the acceptable site access locations.

⁴ Region of Waterloo, *Policies and Procedures for Access Onto Regional Roads*, (Kitchener: RMOW, 1984), Appendix C.







Acceptable Access Locations

Edworthy Aggregate Pits - TIS 190439

North Property



South Property





Locations with Adequate Sight Distance

Edworthy Aggregate Pits - TIS 190439





Site Accesses on Spragues Road And Haul Route

Edworthy Aggregate Pits - TIS 190439

4 Evaluation of Future Traffic Conditions

The assessment of future traffic conditions contained in this section includes estimates of future background and total traffic volumes and analysis for the five-year horizon (2027). The future traffic volumes near the development will consist of increased non-site traffic volumes (background traffic), traffic generated by other developments, and the traffic forecast to be generated by the proposed development.

4.1 Background Traffic Forecasts

4.1.1 Background Growth

The non-site traffic increase is the generalized traffic growth in North Dumfries. In pre-study consultation, the township confirmed a growth rate of 2% per annum, which was applied to the existing traffic volumes to forecast horizon years.

4.1.2 Other Area Development

No other area development was confirmed by the Township staff.

4.2 2027 Horizon

4.2.1 2027 Background Traffic Operations

Figure 4.1 illustrates the 2027 background traffic volumes, including traffic growth, and other area development traffic volumes.

The 2027 background traffic volumes have been analyzed using the same methodology as under existing traffic conditions. **Table 4.1** summarizes the results of the 2027 background traffic operations.

All intersections are forecast to operate well without problem movements.

Appendix D contains the supporting detailed Synchro 11 reports.



AM PEAK HOUR



St Andrews

42

67 → 62

Alps

Road

0 .

0

Site

Site

0

0

0

Spragues

Road

L

_**+** • 1 1

→

16 210

L,

2

1 7

20

29 → 26

Road

Street

4 237

5

_**+** ٩ Î

040

_

203

Spragues Road

Ť

185

Î

85

0

0

3 159 0

Spragues Road

₳ ç

162 ← 211

Greenfield

4 →

Road 1

 \supset

204







2027 Background Traffic Volume

Edworthy Aggregate Pits - TIS 190439

Figure 4.1

σ									0)irecti	on/Mc	veme	nt/App	oroacl	า					
erio		Control Type			Eastb	ound			Westk	ound			Northl	bound	I	Southbound				
Analysis P	Intersection		MOE	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Overall
AM Peak Hour	Spragues Road & Greenfield Road	TWSC	LOS Delay V/C Q	v v v v	B 12 0.05 2	~ ^ ^ ^	B 12	v v v v	B 10 0.02 1	~ ~ ~ ~	B 10	A 8 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	A 8 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	
PM Peak Hour	Spragues Road & Greenfield Road	TWSC	LOS Delay V/C Q	~ ~ ~ ~	B 12 0.06 2	~ ~ ~ ~	B 12	~ ~ ~ ~	B 12 0.00 0	~ ~ ~ ~	B 12	A 8 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	A 8 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	

TABLE 4.1: 2027 BACKGROUND TRAFFIC OPERATIONS

MOE - Measure of Effectiveness

Q - 95th Percentile Queue Length (m)

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds V/C - Volume to Capacity Ratio TWSC - Two-Way Stop Control </> - Shared with through movement



4.2.2 Total 2027 Traffic Volumes

Figure 4.2 illustrates the 2027 total traffic volumes, including trips generated by the background trip.

The total traffic volumes are found by summation of background traffic volumes and site generated traffic volumes.

The 2027 total traffic volumes have been analyzed using the same methodology as under existing traffic conditions. **Table 4.2** summarizes the results of the 2027 total traffic operations.

All intersections are forecast to operate well without any problem movements.

Appendix E contains the supporting detailed Synchro 11 reports.



AM PEAK HOUR











2027 Total Traffic Volumes

Edworthy Aggregate Pits - TIS 190439

Figure 4.2

σ									I	Directi	on/Mo	veme	nt/App	oroach	۱	_	_			
ŝrio					Eastb	ound			West	bound			North	bound	l	;	South	bound	k	
Analysis Pe	Intersection	Control Type	MOE	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Overall
	Spragues Road & Greenfield Road	TWSC	LOS Delay V/C Q	~ ~ ~ ~	B 12 0.05 2	~ ~ ~ ~	B 12	~ ~ ~ ~	B 10 0.02 1	~ ~ ~ ~	В 10	A 8 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	A 8 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	
AM Peak Hour	Alps Site Access S/Alps Site Access N & Alps Road	TWSC	LOS Delay V/C Q	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	~ ~ ~ ~	B 11 0.03 1	~ ~ ~ ~	B 11	<pre></pre>	B 11 0.03 1	> > > > >	B 11	
	Spragues Road & Spragues Site Access N	TWSC	LOS Delay V/C Q	A 9 0.02 1		> > > > >	A 9					A 8 0.01 0	A 0 0.00 0		A 0		A 0 0.00 0	A 0 0.00 0	A 0	
	Spragues Road & Spragues Site Access S	TWSC	LOS Delay V/C Q	B 12 0.04 1		~ ~ ~ ~	B 12					A 0 0.00 0	A 0 0.00 0		A 0		A 0 0.00 0	A 0 0.00 0	A 0	
	Spragues Road & Greenfield Road	TWSC	LOS Delay V/C Q	V V V V	B 12 0.06 2	> > > >	B 12	<pre></pre>	B 12 0.00 0	~ ~ ~ ~	B 12	A 8 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	A 8 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	
ik Hour	Alps Site Access S/Alps Site Access N & Alps Road	TWSC	LOS Delay V/C Q	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	A 0 0.00 0	A 0 0.00 0	A 0 0.00 0	A 0	<pre></pre>	B 11 0.04 1	~ ~ ~ ~	B 11	<pre></pre>	B 11 0.04 1	> > > >	B 11	
PM Pea	Spragues Road & Spragues Site Access N	TWSC	LOS Delay V/C Q	A 10 0.03 1		~ ~ ~ ~	A 10					A 8 0.02 1	A 0 0.00 0		A 1		A 0 0.00 0	A 0 0.00 0	A 0	
	Spragues Road & Spragues Site Access S	TWSC	LOS Delay V/C	B 12 0.04		> > > > >	B 12					A 0 0.00 0	A 0 0.00		A 0		A 0 0.00	A 0 0.00	A 0	

TABLE 4.2: 2027 TOTAL TRAFFIC OPERATIONS

MOE - Measure of Effectiveness

LOS - Level of Service

Q - 95th Percentile Queue Length (m) TWSC - Two-Way Stop Control

Delay - Average Delay per Vehicle in Seconds

</> - Shared with through movement

V/C - Volume to Capacity Ratio



5 Remedial Measures

The level of service conditions outlined in **Chapter 4** has not identified any areas of concern based on delay. The following sections discuss the remedial measures necessary to accommodate the future build-out of the subject site.

5.1 Left-turn Lane Requirements

The need for designated left-turn lanes at the proposed site access on Spragues Road and Alps Road were assessed using MTO procedures detailed in the MTO Supplement to the TAC Geometric Design Guide⁵. Using a design speed of 100 km/h for the accesses on Spragues Road (20 km/h greater than the speed limit) and a design speed of 70 km/h for the site access on Alps Road, the analysis shows that no left-turn lanes are warranted at the 2027 horizon.

Figure 5.1 displays the left-turn lane warrant nomographs for the intersections.

⁵ Ontario Ministry of Transportation, *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads*, (Toronto: Queen's Printer for Ontario, 2020).





Edworthy Aggregate Pits - TIS 190439

Figure 5.1

6 Conclusions and Recommendations

6.1 Conclusions

The main conclusions of this study are as follows:

- Existing Traffic Operations: The analysis indicates that the intersection of Spragues Road and Greenfield Road is operating without any problem movements;
- Trip Generation: The aggregate hauling operation is forecast to generate 40 trips during the peak hour;
- Background Traffic Operations: The intersection is forecast to operate without any problem movements;
- Total Traffic Operations: All intersections in the study area are forecast to operate without any problem movements.
- Remedial Measures: no additional remedial measures are needed.

6.2 Recommendations

No improvement to the transportation network be required for the approval of the subject development.



Appendix A

Existing Turning Movement Count Data





Paradigm Transportation Solutions Limited 5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8 519-896-3163 cbowness@ptsl.com Count Name: Greenfield Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 1

Turning Movement Data

	Greenfield Road Eastbound								Greenfi West	eld Road tbound	Ū		Spragues Road Northbound							Spragues Road Southbound						
Start Time	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	
7:30 AM	2	0	0	0	0	2	0	1	5	0	0	6	1	54	0	0	0	55	1	22	7	0	0	30	93	
7:45 AM	5	0	0	0	0	5	0	0	2	0	0	2	0	65	0	0	0	65	1	32	5	0	0	38	110	
Hourly Total	7	0	0	0	0	7	0	1	7	0	0	8	1	119	0	0	0	120	2	54	12	0	0	68	203	
8:00 AM	11	0	0	0	0	11	0	1	1	0	0	2	0	54	0	0	0	54	2	27	8	0	1	37	104	
8:15 AM	3	1	0	0	0	4	0	0	1	0	0	1	0	37	0	0	0	37	0	22	3	0	0	25	67	
8:30 AM	5	0	0	0	0	5	0	0	0	0	0	0	0	41	0	0	0	41	0	31	4	0	0	35	81	
8:45 AM	3	0	0	0	0	3	0	0	0	0	0	0	0	36	0	0	0	36	0	22	6	0	0	28	67	
Hourly Total	22	1	0	0	0	23	0	1	2	0	0	3	0	168	0	0	0	168	2	102	21	0	1	125	319	
9:00 AM	4	0	0	0	0	4	0	0	0	0	0	0	1	30	0	0	0	31	0	20	3	0	0	23	58	
9:15 AM	4	0	0	0	0	4	0	1	0	0	0	1	0	32	0	0	0	32	0	25	2	0	0	27	64	
9:30 AM	3	1	0	0	0	4	0	0	0	0	0	0	0	27	1	0	0	28	1	21	4	0	0	26	58	
9:45 AM	1	0	0	0	0	1	0	1	0	0	0	1	0	25	0	0	0	25	0	18	0	0	0	18	45	
Hourly Total	12	1	0	0	0	13	0	2	0	0	0	2	1	114	1	0	0	116	1	84	9	0	0	94	225	
10:00 AM	3	0	0	0	0	3	0	0	0	0	0	0	0	21	0	0	0	21	0	19	1	0	0	20	44	
10:15 AM	4	0	0	0	0	4	0	0	0	0	0	0	0	25	0	0	0	25	0	20	2	0	0	22	51	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Hourly Total	7	0	0	0	0	7	0	0	0	0	0	0	0	46	0	0	0	46	0	39	3	0	0	42	95	
12:00 PM	6	0	0	0	0	6	0	0	0	0	0	0	0	32	0	0	0	32	1	21	0	0	0	22	60	
12:15 PM	3	0	1	0	0	4	1	0	0	0	0	1	0	21	0	0	0	21	0	23	3	0	0	26	52	
12:30 PM	3	0	0	0	0	3	0	0	0	0	0	0	0	29	0	0	0	29	0	23	2	0	0	25	57	
12:45 PM	1	0	0	0	0	1	0	0	1	0	0	1	0	27	0	0	0	27	0	26	7	0	0	33	62	
Hourly Total	13	0	1	0	0	14	1	0	1	0	0	2	0	109	0	0	0	109	1	93	12	0	0	106	231	
1:00 PM	5	0	1	0	0	6	0	1	0	0	0	1	0	29	1	0	0	30	0	29	3	0	0	32	69	
1:15 PM	0	0	0	1	0	1	0	0	2	0	0	2	0	27	0	0	0	27	0	18	3	0	0	21	51	
1:30 PM	5	0	0	0	0	5	0	0	0	0	0	0	0	26	0	0	0	26	1	24	2	0	0	27	58	
1:45 PM	3	0	0	0	0	3	0	1	0	0	0	1	1	31	0	0	0	32	1	36	5	0	0	42	78	
Hourly Total	13	0	1	1	0	15	0	2	2	0	0	4	1	113	1	0	0	115	2	107	13	0	0	122	256	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3:00 PM	3	. 1	1	0	0	5	0	1	1	0	0	2	1	22	0	0	0	23	1	35	3	0	2	39	69	
3:15 PM	5	0	0	0	0	5	0	0	1	0	0	1	0	31	0	0	0	31	0	41	4	0	0	45	82	
3:30 PM	4	0	0	0	0	4	0	0	0	0	0	0	1	38	0	0	0	39	0	39	2	0	0	41	84	
3:45 PM	6	0	0	0	0	6	0	0	0	0	0	0	1	24	0	0	0	25	1	42	2	0	0	45	76	
Hourly Total	18	1	1	0	0	20	0	1	2	0	0	3	3	115	0	0	0	118	2	157	11	0	2	170	311	
4:00 PM	8	0	0	0	0	8	0	1	0	0	0	1	0	28	0	0	0	28	0	34	11	1	0	46	83	
4:15 PM	5	1	0	0	0	6	0	0	0	0	0	0	1	42	0	0	0	43	1	55	5	0	0	61	110	
4:30 PM	6	0	0	0	0	6	0	1	0	0	0	1	1	39	0	0	0	40	0	46	5	0	0	51	98	
----------------------------	------	-------	-------	-------	---	------	-------	------	------	-----	---	------	-------	------	------	-----	---	------	------	------	------	-------	---------	------	------	
4:45 PM	6	1	1	0	0	8	0	0	0	0	0	0	0	33	0	0	0	33	0	45	2	0	0	47	88	
Hourly Total	25	2	1	0	0	28	0	2	0	0	0	2	2	142	0	0	0	144	1	180	23	1	0	205	379	
5:00 PM	7	0	0	0	0	7	0	0	0	0	0	0	1	34	0	0	0	35	1	49	3	0	0	53	95	
5:15 PM	3	0	1	0	0	4	0	0	0	0	0	0	0	43	0	0	0	43	1	53	6	0	0	60	107	
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	0	24	0	39	7	0	0	46	70	
5:45 PM	7	1	0	0	0	8	1	0	1	0	0	2	0	25	0	0	0	25	2	29	2	0	0	33	68	
Hourly Total	17	1	1	0	0	19	1	0	1	0	0	2	1	126	0	0	0	127	4	170	18	0	0	192	340	
Grand Total	134	6	5	1	0	146	2	9	15	0	0	26	9	1052	2	0	0	1063	15	986	122	1	3	1124	2359	
Approach %	91.8	4.1	3.4	0.7	-	-	7.7	34.6	57.7	0.0	-	-	0.8	99.0	0.2	0.0	-	-	1.3	87.7	10.9	0.1	-	-	-	
Total %	5.7	0.3	0.2	0.0	-	6.2	0.1	0.4	0.6	0.0	-	1.1	0.4	44.6	0.1	0.0	-	45.1	0.6	41.8	5.2	0.0	-	47.6	-	
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	4	0	0	-	4	5	
% Motorcycles	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	-	0.1	0.0	0.4	0.0	0.0	-	0.4	0.2	
Cars & Light Goods	128	6	5	1	-	140	2	8	13	0	-	23	9	1000	1	0	-	1010	14	930	119	1	-	1064	2237	
% Cars & Light Goods	95.5	100.0	100.0	100.0	-	95.9	100.0	88.9	86.7	-	-	88.5	100.0	95.1	50.0	-	-	95.0	93.3	94.3	97.5	100.0	-	94.7	94.8	
Buses	2	0	0	0	-	2	0	0	0	0	-	0	0	8	0	0	-	8	0	5	1	0	-	6	16	
% Buses	1.5	0.0	0.0	0.0	-	1.4	0.0	0.0	0.0	-	-	0.0	0.0	0.8	0.0	-	-	0.8	0.0	0.5	0.8	0.0	-	0.5	0.7	
Single-Unit Trucks	2	0	0	0	-	2	0	1	2	0	-	3	0	42	1	0	-	43	1	44	2	0	-	47	95	
% Single-Unit Trucks	1.5	0.0	0.0	0.0	-	1.4	0.0	11.1	13.3	-	-	11.5	0.0	4.0	50.0	-	-	4.0	6.7	4.5	1.6	0.0	-	4.2	4.0	
Articulated Trucks	2	0	0	0	-	2	0	0	0	0	-	0	0	1	0	0	-	1	0	3	0	0	-	3	6	
% Articulated Trucks	1.5	0.0	0.0	0.0	-	1.4	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	-	0.1	0.0	0.3	0.0	0.0	-	0.3	0.3	
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		100.0	-	-	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3 100.0	-		



Count Name: Greenfield Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 3



Turning Movement Data Plot



Cambridge, Ontario, Canada N1R 8J8 519-896-3163 cbowness@ptsl.com Count Name: Greenfield Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 4

Turning Movement Peak Hour Data (7:30 AM)

								i uni	in ig i	10101		oun	10 di	Duiu	(1.00	,									
			Greenfi East	eld Road bound					Greenfi Wes	ield Road tbound					Spragu North	es Road Ibound					Spragu South	es Road bound			
Start Time	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
7:30 AM	2	0	0	0	0	2	0	1	5	0	0	6	1	54	0	0	0	55	1	22	7	0	0	30	93
7:45 AM	5	0	0	0	0	5	0	0	2	0	0	2	0	65	0	0	0	65	1	32	5	0	0	38	110
8:00 AM	11	0	0	0	0	11	0	1	1	0	0	2	0	54	0	0	0	54	2	27	8	0	1	37	104
8:15 AM	3	1	0	0	0	4	0	0	1	0	0	1	0	37	0	0	0	37	0	22	3	0	0	25	67
Total	21	1	0	0	0	22	0	2	9	0	0	11	1	210	0	0	0	211	4	103	23	0	1	130	374
Approach %	95.5	4.5	0.0	0.0	-	-	0.0	18.2	81.8	0.0	-	-	0.5	99.5	0.0	0.0	-	-	3.1	79.2	17.7	0.0	-	-	-
Total %	5.6	0.3	0.0	0.0	-	5.9	0.0	0.5	2.4	0.0	-	2.9	0.3	56.1	0.0	0.0	-	56.4	1.1	27.5	6.1	0.0	-	34.8	-
PHF	0.477	0.250	0.000	0.000	-	0.500	0.000	0.500	0.450	0.000	-	0.458	0.250	0.808	0.000	0.000	-	0.812	0.500	0.805	0.719	0.000	-	0.855	0.850
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	21	1	0	0	-	22	0	2	7	0	-	9	1	205	0	0	-	206	3	94	22	0	-	119	356
% Cars & Light Goods	100.0	100.0	-	-	-	100.0	-	100.0	77.8	-	-	81.8	100.0	97.6	-	-	-	97.6	75.0	91.3	95.7	-	-	91.5	95.2
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	0	2	1	0	-	3	5
% Buses	0.0	0.0	-	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0	1.0	-	-	-	0.9	0.0	1.9	4.3	-	-	2.3	1.3
Single-Unit Trucks	0	0	0	0	-	0	0	0	2	0	-	2	0	3	0	0	-	3	1	6	0	0	-	7	12
% Single-Unit Trucks	0.0	0.0	-	-	-	0.0	-	0.0	22.2	-	-	18.2	0.0	1.4	-	-	-	1.4	25.0	5.8	0.0	-	-	5.4	3.2
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Articulated Trucks	0.0	0.0	-	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	1.0	0.0	-	-	0.8	0.3
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	I	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	100.0	-	-



Count Name: Greenfield Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 5



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



Cambridge, Ontario, Canada N1R 8J8 519-896-3163 cbowness@ptsl.com Count Name: Greenfield Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 6

Turning Movement Peak Hour Data (1:00 PM)

Shaff Shaff <th< th=""><th></th><th></th><th></th><th>Greenfie Eastl</th><th>eld Road bound</th><th></th><th></th><th></th><th></th><th>Greenfi West</th><th>eld Road bound</th><th></th><th></th><th></th><th></th><th>Spragu North</th><th>es Road bound</th><th></th><th></th><th></th><th></th><th>Sprague South</th><th>es Road bound</th><th></th><th></th><th></th></th<>				Greenfie Eastl	eld Road bound					Greenfi West	eld Road bound					Spragu North	es Road bound					Sprague South	es Road bound			
https://htttps://https://https://https://https://https://https:	Start Time	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
11.30 M 0 0 0 0 0 2 0 0 0 0 2 0 0 0 0 <td>1:00 PM</td> <td>5</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>6</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>29</td> <td>1</td> <td>0</td> <td>0</td> <td>30</td> <td>0</td> <td>29</td> <td>3</td> <td>0</td> <td>0</td> <td>32</td> <td>69</td>	1:00 PM	5	0	1	0	0	6	0	1	0	0	0	1	0	29	1	0	0	30	0	29	3	0	0	32	69
hisp 1 0 0 0 0 0 2 0	1:15 PM	0	0	0	1	0	1	0	0	2	0	0	2	0	27	0	0	0	27	0	18	3	0	0	21	51
14.8PM 3 0 0 3 0 1 0 1 1 1 1 1 1 3 0 1 38 0 1 38 0 1 38 0 1 38 0 0 12 13 0 0 13 0 16 13 0 0 13 0 0 13 0 0 13 0 0 0 13 0 0 0 13 0 0 0 13 0	1:30 PM	5	0	0	0	0	5	0	0	0	0	0	0	0	26	0	0	0	26	1	24	2	0	0	27	58
Indial 1 1 1 1 1 1 1 1 1 0 1 1 1 1 0 1 1 1 1 1 0 1 <td>1:45 PM</td> <td>3</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>3</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>31</td> <td>0</td> <td>0</td> <td>0</td> <td>32</td> <td>1</td> <td>36</td> <td>5</td> <td>0</td> <td>0</td> <td>42</td> <td>78</td>	1:45 PM	3	0	0	0	0	3	0	1	0	0	0	1	1	31	0	0	0	32	1	36	5	0	0	42	78
Appreach % 8.7 0.0 6.7 6.7 <	Total	13	0	1	1	0	15	0	2	2	0	0	4	1	113	1	0	0	115	2	107	13	0	0	122	256
https: https: <thtp:< th=""> https:<td>Approach %</td><td>86.7</td><td>0.0</td><td>6.7</td><td>6.7</td><td>-</td><td>-</td><td>0.0</td><td>50.0</td><td>50.0</td><td>0.0</td><td>-</td><td>-</td><td>0.9</td><td>98.3</td><td>0.9</td><td>0.0</td><td>-</td><td>-</td><td>1.6</td><td>87.7</td><td>10.7</td><td>0.0</td><td>-</td><td>-</td><td>-</td></thtp:<>	Approach %	86.7	0.0	6.7	6.7	-	-	0.0	50.0	50.0	0.0	-	-	0.9	98.3	0.9	0.0	-	-	1.6	87.7	10.7	0.0	-	-	-
PHF 0.00 0.20 <th0< td=""><td>Total %</td><td>5.1</td><td>0.0</td><td>0.4</td><td>0.4</td><td>-</td><td>5.9</td><td>0.0</td><td>0.8</td><td>0.8</td><td>0.0</td><td>-</td><td>1.6</td><td>0.4</td><td>44.1</td><td>0.4</td><td>0.0</td><td>-</td><td>44.9</td><td>0.8</td><td>41.8</td><td>5.1</td><td>0.0</td><td>-</td><td>47.7</td><td>-</td></th0<>	Total %	5.1	0.0	0.4	0.4	-	5.9	0.0	0.8	0.8	0.0	-	1.6	0.4	44.1	0.4	0.0	-	44.9	0.8	41.8	5.1	0.0	-	47.7	-
Moderycycles 0 <t< td=""><td>PHF</td><td>0.650</td><td>0.000</td><td>0.250</td><td>0.250</td><td>-</td><td>0.625</td><td>0.000</td><td>0.500</td><td>0.250</td><td>0.000</td><td>-</td><td>0.500</td><td>0.250</td><td>0.911</td><td>0.250</td><td>0.000</td><td>-</td><td>0.898</td><td>0.500</td><td>0.743</td><td>0.650</td><td>0.000</td><td>-</td><td>0.726</td><td>0.821</td></t<>	PHF	0.650	0.000	0.250	0.250	-	0.625	0.000	0.500	0.250	0.000	-	0.500	0.250	0.911	0.250	0.000	-	0.898	0.500	0.743	0.650	0.000	-	0.726	0.821
% Modercycles 0.0	Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
Cars & Liph Good 1 0 1 <	% Motorcycles	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.9	0.0	-	-	0.8	0.4
************************************	Cars & Light Goods	11	0	1	1	-	13	0	2	2	0	-	4	1	107	1	0	-	109	2	100	12	0	-	114	240
Buses 0 <td>% Cars & Light Goods</td> <td>84.6</td> <td>-</td> <td>100.0</td> <td>100.0</td> <td>-</td> <td>86.7</td> <td>-</td> <td>100.0</td> <td>100.0</td> <td>-</td> <td>-</td> <td>100.0</td> <td>100.0</td> <td>94.7</td> <td>100.0</td> <td>-</td> <td>-</td> <td>94.8</td> <td>100.0</td> <td>93.5</td> <td>92.3</td> <td>-</td> <td>-</td> <td>93.4</td> <td>93.8</td>	% Cars & Light Goods	84.6	-	100.0	100.0	-	86.7	-	100.0	100.0	-	-	100.0	100.0	94.7	100.0	-	-	94.8	100.0	93.5	92.3	-	-	93.4	93.8
98 Uses 0.0 - 0.0 <th< td=""><td>Buses</td><td>0</td><td>0</td><td>0</td><td>0</td><td>-</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>-</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>-</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>-</td><td>0</td><td>0</td></th<>	Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Single-Unit Trucks 1 0	% Buses	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Main Single-Unit Trucks 7.7 9. 0.0 0.0 0.0 0.0 5.3 0.0 5.0 5.2 0.0 5.6 7.7 5	Single-Unit Trucks	1	0	0	0	-	1	0	0	0	0	-	0	0	6	0	0	-	6	0	6	1	0	-	7	14
Articulated Trucks 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0	% Single-Unit Trucks	7.7	-	0.0	0.0	-	6.7	-	0.0	0.0	-	-	0.0	0.0	5.3	0.0	-	-	5.2	0.0	5.6	7.7	-	-	5.7	5.5
$^{\text{M}}$ Articulated 7.7 \cdot 0.0 0.0 \cdot 6.7 \cdot 0.0 <td>Articulated Trucks</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>-</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>-</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>-</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>-</td> <td>0</td> <td>1</td>	Articulated Trucks	1	0	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
Bicycles on Road 0	% Articulated Trucks	7.7	-	0.0	0.0	-	6.7	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.4
M Bicycles on Road 0.0 </td <td>Bicycles on Road</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>-</td> <td>0</td> <td>0</td>	Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Bicycles on Crosswalk I	% Bicycles on Road	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
M Bicycles on Crosswalk I <td>Bicycles on Crosswalk</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>0</td> <td>-</td> <td>-</td>	Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Pedestrians - 0 - <th< td=""><td>% Bicycles on Crosswalk</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></th<>	% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Pedestrians	Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
	% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: Greenfield Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 7



Turning Movement Peak Hour Data Plot (1:00 PM)



Cambridge, Ontario, Canada N1R 8J8 519-896-3163 cbowness@ptsl.com Count Name: Greenfield Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 8

Turning Movement Peak Hour Data (4:15 PM)

Shart model Shart west Shart				Greenfie	eld Road					Greenfi	eld Road					Spragu	es Road					Sprague	es Road			
SetTime Let Tru Rept U-u Rept Let Tru Rep Let Tru <				East	bound					West	bound					North	bound					South	bound			
4.5PM 5 1 0 <td>Start Time</td> <td>Left</td> <td>Thru</td> <td>Right</td> <td>U-Turn</td> <td>Peds</td> <td>App. Total</td> <td>Int. Total</td>	Start Time	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
Her H	4:15 PM	5	1	0	0	0	6	0	0	0	0	0	0	1	42	0	0	0	43	1	55	5	0	0	61	110
head PM 6 1 0 </td <td>4:30 PM</td> <td>6</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>6</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>39</td> <td>0</td> <td>0</td> <td>0</td> <td>40</td> <td>0</td> <td>46</td> <td>5</td> <td>0</td> <td>0</td> <td>51</td> <td>98</td>	4:30 PM	6	0	0	0	0	6	0	1	0	0	0	1	1	39	0	0	0	40	0	46	5	0	0	51	98
SOPM 7 0 0 7 0 0 7 0 0 7 0 0 7 0 1 34 0 0 0 35 1 49 35 0 0 53 93 Approach % 88 7.4 3.7 0.0 - 0.0 10.0 0.0 0.0 1 33 188 0.0 0.0 15.0 15.0 0.0 1.0 0.0 0.0 0.0 0.0 0.0 1.0 0.0 <td>4:45 PM</td> <td>6</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>8</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>33</td> <td>0</td> <td>0</td> <td>0</td> <td>33</td> <td>0</td> <td>45</td> <td>2</td> <td>0</td> <td>0</td> <td>47</td> <td>88</td>	4:45 PM	6	1	1	0	0	8	0	0	0	0	0	0	0	33	0	0	0	33	0	45	2	0	0	47	88
Total 2 1 0 0 1 0 0 1 3 148 0 0 15 15 0 0 12 31 Approach 889 7.4 3.7 0.0 10.0 10.0 0.0	5:00 PM	7	0	0	0	0	7	0	0	0	0	0	0	1	34	0	0	0	35	1	49	3	0	0	53	95
Approach % 88 7.4 3.7 0.0 - 0.0 0.0 - 2.0 98.0 0.0 - - 0.0 0.0 - - 0.0 0.0 - - 0.0 0.0 - - 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.00 0.00	Total	24	2	1	0	0	27	0	1	0	0	0	1	3	148	0	0	0	151	2	195	15	0	0	212	391
here	Approach %	88.9	7.4	3.7	0.0	-	-	0.0	100.0	0.0	0.0	-	-	2.0	98.0	0.0	0.0	-	-	0.9	92.0	7.1	0.0	-	-	-
PHF 0.50 0.25 0.000 - 0.80 0.000 - 0.87 0.807 0.886 0.757 0.878 0.000 - 0.886 0.757 0.878 0.000 - 0.886 0.757 0.878 0.000 - 0.00 0	Total %	6.1	0.5	0.3	0.0	-	6.9	0.0	0.3	0.0	0.0	-	0.3	0.8	37.9	0.0	0.0	-	38.6	0.5	49.9	3.8	0.0	-	54.2	-
Motorcycle 0	PHF	0.857	0.500	0.250	0.000	-	0.844	0.000	0.250	0.000	0.000	-	0.250	0.750	0.881	0.000	0.000	-	0.878	0.500	0.886	0.750	0.000	-	0.869	0.889
% Motorcycles 0.0	Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
Cars & Light Goods 23 2 1 0 - 26 0 1 0 0 - 1 3 143 0 0 - 16 2 190 15 0 - 207 380 % Cars & Light Goods 96.8 10.0 10.0 - 96.8 10.0 96.7 100.0 97.4 100.0 - 97.6	% Motorcycles	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.5	0.0	-	-	0.5	0.3
% 2 in 20 in 3 in	Cars & Light Goods	23	2	1	0	-	26	0	1	0	0	-	1	3	143	0	0	-	146	2	190	15	0	-	207	380
Buses 1 0 0 1 0 0 1 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 0 1 0 1 0 0 1 0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 <td>% Cars & Light Goods</td> <td>95.8</td> <td>100.0</td> <td>100.0</td> <td>-</td> <td>-</td> <td>96.3</td> <td>-</td> <td>100.0</td> <td>-</td> <td>-</td> <td>-</td> <td>100.0</td> <td>100.0</td> <td>96.6</td> <td>-</td> <td>-</td> <td>-</td> <td>96.7</td> <td>100.0</td> <td>97.4</td> <td>100.0</td> <td>-</td> <td>-</td> <td>97.6</td> <td>97.2</td>	% Cars & Light Goods	95.8	100.0	100.0	-	-	96.3	-	100.0	-	-	-	100.0	100.0	96.6	-	-	-	96.7	100.0	97.4	100.0	-	-	97.6	97.2
% Buses 4.2 0.0 0.0 0.0 0.7 0.0 0.7 0.0 <	Buses	1	0	0	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	3
Single-Unit Trucks 0	% Buses	4.2	0.0	0.0	-	-	3.7	-	0.0	-	-	-	0.0	0.0	0.7	-	-	-	0.7	0.0	0.5	0.0	-	-	0.5	0.8
M Single-Unit 0.0 0.0 0.0 - 0.0 - 0.0 0.0 2.7 - 0.0 - 0.0 - 1.4 1.8 Arriculated Trucks 0 0 0 0 0 0 0 0 0.	Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	4	0	0	-	4	0	3	0	0	-	3	7
Articulated Trucks 0	% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	-	0.0	0.0	2.7	-	-	-	2.6	0.0	1.5	0.0	-	-	1.4	1.8
% Articulated Trucks 0.0	Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Bicycles on Road 0	% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
% Bicycles on Road 0.0 </td <td>Bicycles on Road</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>-</td> <td>0</td> <td>0</td>	Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Bicycles on Crosswalk 0 -0 - 0 </td <td>% Bicycles on Road</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>-</td> <td>-</td> <td>0.0</td> <td>-</td> <td>0.0</td> <td>-</td> <td>-</td> <td>-</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>-</td> <td>-</td> <td>-</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>-</td> <td>-</td> <td>0.0</td> <td>0.0</td>	% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
M Bicycles on Crosswalk Image: Crosswalk	Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Pedestrians - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - 1 0 - 0 <th< td=""><td>% Bicycles on Crosswalk</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></th<>	% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Pedestrians	Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
	% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: Greenfield Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 9



Turning Movement Peak Hour Data Plot (4:15 PM)



Cambridge, Ontario, Canada N1R 8J8 519-896-3163 cbowness@ptsl.com Count Name: Alps Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 1

Turning Movement Data

			Alps Road				-	Spragues Road					Spragues Road			
Start Time			Eastbound					Northbound					Southbound			
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:30 AM	2	1	0	0	3	2	61	0	0	63	28	12	0	0	40	106
7:45 AM	4	1	0	0	5	2	80	0	0	82	36	18	0	0	54	141
Hourly Total	6	2	0	0	8	4	141	0	0	145	64	30	0	0	94	247
8:00 AM	9	0	0	0	9	0	67	0	0	67	36	12	0	0	48	124
8:15 AM	7	1	0	1	8	0	42	0	0	42	31	10	0	0	41	91
8:30 AM	4	1	0	0	5	1	50	0	0	51	32	7	0	0	39	95
8:45 AM	3	0	0	0	3	1	35	0	0	36	27	5	0	0	32	71
Hourly Total	23	2	0	1	25	2	194	0	0	196	126	34	0	0	160	381
9:00 AM	4	1	0	1	5	1	38	0	0	39	25	6	0	0	31	75
9:15 AM	7	1	0	0	8	0	37	0	0	37	29	4	0	0	33	78
9:30 AM	5	0	0	0	5	0	36	0	0	36	24	6	0	0	30	71
9:45 AM	7	1	0	0	8	0	25	0	0	25	19	10	1	0	30	63
Hourly Total	23	3	0	1	26	1	136	0	0	137	97	26	1	0	124	287
10:00 AM	4	1	0	0	5	1	25	0	0	26	22	4	0	0	26	57
10:15 AM	3	1	0	0	4	0	27	0	0	27	28	5	0	0	33	64
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	7	2	0	0	9	1	52	0	0	53	50	9	0	0	59	121
12:00 PM	3	1	0	0	4	1	37	0	0	38	22	10	0	0	32	74
12:15 PM	4	0	0	0	4	0	22	0	0	22	23	5	0	0	28	54
12:30 PM	2	1	0	0	3	0	31	0	0	31	26	3	0	0	29	63
12:45 PM	9	2	0	0	11	0	28	0	0	28	33	7	1	0	41	80
Hourly Total	18	4	0	0	22	1	118	0	0	119	104	25	1	0	130	271
1:00 PM	5	0	0	0	5	0	38	0	0	38	34	3	0	0	37	80
1:15 PM	8	1	0	0	9	0	34	0	0	34	23	5	0	0	28	71
1:30 PM	4	0	0	0	4	0	31	0	0	31	32	4	0	0	36	71
1:45 PM	3	3	0	0	6	1	35	0	0	36	33	2	0	0	35	77
Hourly Total	20	4	0	0	24	1	138	0	0	139	122	14	0	0	136	299
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	10	1	0	0	11	0	25	0	0	25	46	1	0	0	47	83
3:15 PM	8	2	0	1	10	0	39	0	0	39	43	11	0	1	54	103
3:30 PM	6	1	0	0	7	0	41	0	0	41	44	7	0	0	51	99
3:45 PM	8	4	0	0	12	0	32	0	0	32	43	15	0	0	58	102
Hourly Total	32	8	0	1	40	0	137	0	0	137	176	34	0	1	210	387
4:00 PM	11	1	0	0	12	2	31	0	0	33	51	15	0	0	66	111
4:15 PM	18	2	0	0	20	1	48	0	0	49	61	13	0	0	74	143
4:30 PM	11	0	0	0	11	0	51	0	0	51	59	11	0	0	70	132

4:45 PM	16	1	0	0	17	0	43	0	0	43	46	7	0	0	53	113
Hourly Total	56	4	0	0	60	3	173	0	0	176	217	46	0	0	263	499
5:00 PM	13	2	0	0	15	0	46	0	0	46	54	7	0	0	61	122
5:15 PM	14	0	0	0	14	0	45	0	0	45	61	3	0	0	64	123
5:30 PM	15	1	0	0	16	0	27	0	0	27	41	10	0	0	51	94
5:45 PM	4	0	0	0	4	0	31	0	0	31	33	8	0	0	41	76
Hourly Total	46	3	0	0	49	0	149	0	0	149	189	28	0	0	217	415
Grand Total	231	32	0	3	263	13	1238	0	0	1251	1145	246	2	1	1393	2907
Approach %	87.8	12.2	0.0	-	-	1.0	99.0	0.0	-	-	82.2	17.7	0.1	-	-	-
Total %	7.9	1.1	0.0	-	9.0	0.4	42.6	0.0	-	43.0	39.4	8.5	0.1	-	47.9	-
Motorcycles	0	0	0	-	0	0	1	0	-	1	3	1	0	-	4	5
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.1	0.3	0.4	0.0	-	0.3	0.2
Cars & Light Goods	227	23	0	-	250	11	1179	0	-	1190	1084	243	2	-	1329	2769
% Cars & Light Goods	98.3	71.9	-	-	95.1	84.6	95.2	-	-	95.1	94.7	98.8	100.0	-	95.4	95.3
Buses	2	6	0	-	8	2	13	0	-	15	19	1	0	-	20	43
% Buses	0.9	18.8	-	-	3.0	15.4	1.1	-	-	1.2	1.7	0.4	0.0	-	1.4	1.5
Single-Unit Trucks	1	2	0	-	3	0	41	0	-	41	36	1	0	-	37	81
% Single-Unit Trucks	0.4	6.3	-	-	1.1	0.0	3.3	-	-	3.3	3.1	0.4	0.0	-	2.7	2.8
Articulated Trucks	0	1	0	-	1	0	4	0	-	4	3	0	0	-	3	8
% Articulated Trucks	0.0	3.1	-	-	0.4	0.0	0.3	-	-	0.3	0.3	0.0	0.0	-	0.2	0.3
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.4	0.0	-	-	0.4	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	3	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-



Count Name: Alps Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 3



Turning Movement Data Plot



Cambridge, Ontario, Canada N1R 8J8 519-896-3163 cbowness@ptsl.com Count Name: Alps Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 4

Turning Movement Peak Hour Data (7:30 AM)

					- Mining	, 1110 001			Juiu (I							
			Alps Road					Spragues Road					Spragues Road			
Ctart Time			Eastbound					Northbound					Southbound			
Start Time	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:30 AM	2	1	0	0	3	2	61	0	0	63	28	12	0	0	40	106
7:45 AM	4	1	0	0	5	2	80	0	0	82	36	18	0	0	54	141
8:00 AM	9	0	0	0	9	0	67	0	0	67	36	12	0	0	48	124
8:15 AM	7	1	0	1	8	0	42	0	0	42	31	10	0	0	41	91
Total	22	3	0	1	25	4	250	0	0	254	131	52	0	0	183	462
Approach %	88.0	12.0	0.0	-	-	1.6	98.4	0.0	-	-	71.6	28.4	0.0	-	-	-
Total %	4.8	0.6	0.0	-	5.4	0.9	54.1	0.0	-	55.0	28.4	11.3	0.0	-	39.6	-
PHF	0.611	0.750	0.000	-	0.694	0.500	0.781	0.000	-	0.774	0.910	0.722	0.000	-	0.847	0.819
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	22	2	0	-	24	3	240	0	-	243	121	50	0	-	171	438
% Cars & Light Goods	100.0	66.7	-	-	96.0	75.0	96.0	-	-	95.7	92.4	96.2	-	-	93.4	94.8
Buses	0	0	0	-	0	1	3	0	-	4	4	1	0	-	5	9
% Buses	0.0	0.0	-	-	0.0	25.0	1.2	-	-	1.6	3.1	1.9	-	-	2.7	1.9
Single-Unit Trucks	0	1	0	-	1	0	7	0	-	7	5	1	0	-	6	14
% Single-Unit Trucks	0.0	33.3	-	-	4.0	0.0	2.8	-	-	2.8	3.8	1.9	-	-	3.3	3.0
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.8	0.0	-	-	0.5	0.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: Alps Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 5



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



Cambridge, Ontario, Canada N1R 8J8 519-896-3163 cbowness@ptsl.com Count Name: Alps Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 6

Turning Movement Peak Hour Data (12:45 PM)

					i anning	1010 0011										
			Alps Road					Spragues Road					Spragues Road			
Start Time			Eastbound					Northbound					Southbound			
Start Time	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:45 PM	9	2	0	0	11	0	28	0	0	28	33	7	1	0	41	80
1:00 PM	5	0	0	0	5	0	38	0	0	38	34	3	0	0	37	80
1:15 PM	8	1	0	0	9	0	34	0	0	34	23	5	0	0	28	71
1:30 PM	4	0	0	0	4	0	31	0	0	31	32	4	0	0	36	71
Total	26	3	0	0	29	0	131	0	0	131	122	19	1	0	142	302
Approach %	89.7	10.3	0.0	-	-	0.0	100.0	0.0	-	-	85.9	13.4	0.7	-	-	-
Total %	8.6	1.0	0.0	-	9.6	0.0	43.4	0.0	-	43.4	40.4	6.3	0.3	-	47.0	-
PHF	0.722	0.375	0.000	-	0.659	0.000	0.862	0.000	-	0.862	0.897	0.679	0.250	-	0.866	0.944
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	24	3	0	-	27	0	117	0	-	117	116	19	1	-	136	280
% Cars & Light Goods	92.3	100.0	-	-	93.1	-	89.3	-	-	89.3	95.1	100.0	100.0	-	95.8	92.7
Buses	1	0	0	-	1	0	6	0	-	6	0	0	0	-	0	7
% Buses	3.8	0.0	-	-	3.4	-	4.6	-	-	4.6	0.0	0.0	0.0	-	0.0	2.3
Single-Unit Trucks	1	0	0	-	1	0	7	0	-	7	6	0	0	-	6	14
% Single-Unit Trucks	3.8	0.0	-	-	3.4	-	5.3	-	-	5.3	4.9	0.0	0.0	-	4.2	4.6
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	-	0.8	-	-	0.8	0.0	0.0	0.0	-	0.0	0.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: Alps Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 7



Turning Movement Peak Hour Data Plot (12:45 PM)



Cambridge, Ontario, Canada N1R 8J8 519-896-3163 cbowness@ptsl.com Count Name: Alps Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 8

Turning Movement Peak Hour Data (4:15 PM)

					1 011111	3 1010 1011			Juiu							
			Alps Road					Spragues Road					Spragues Road			
Stort Time			Eastbound					Northbound					Southbound			
Start Time	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:15 PM	18	2	0	0	20	1	48	0	0	49	61	13	0	0	74	143
4:30 PM	11	0	0	0	11	0	51	0	0	51	59	11	0	0	70	132
4:45 PM	16	1	0	0	17	0	43	0	0	43	46	7	0	0	53	113
5:00 PM	13	2	0	0	15	0	46	0	0	46	54	7	0	0	61	122
Total	58	5	0	0	63	1	188	0	0	189	220	38	0	0	258	510
Approach %	92.1	7.9	0.0	-	-	0.5	99.5	0.0	-	-	85.3	14.7	0.0	-	-	-
Total %	11.4	1.0	0.0	-	12.4	0.2	36.9	0.0	-	37.1	43.1	7.5	0.0	-	50.6	-
PHF	0.806	0.625	0.000	-	0.788	0.250	0.922	0.000	-	0.926	0.902	0.731	0.000	-	0.872	0.892
Motorcycles	0	0	0	-	0	0	0	0	-	0	1	1	0	-	2	2
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.5	2.6	-	-	0.8	0.4
Cars & Light Goods	56	2	0	-	58	1	183	0	-	184	211	37	0	-	248	490
% Cars & Light Goods	96.6	40.0	-	-	92.1	100.0	97.3	-	-	97.4	95.9	97.4	-	-	96.1	96.1
Buses	1	3	0	-	4	0	1	0	-	1	5	0	0	-	5	10
% Buses	1.7	60.0	-	-	6.3	0.0	0.5	-	-	0.5	2.3	0.0	-	-	1.9	2.0
Single-Unit Trucks	0	0	0	-	0	0	4	0	-	4	3	0	0	-	3	7
% Single-Unit Trucks	0.0	0.0	-	-	0.0	0.0	2.1	-	-	2.1	1.4	0.0	-	-	1.2	1.4
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	1.7	0.0	-	-	1.6	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Count Name: Alps Road & Spragues Road Site Code: 190439 Start Date: 04/26/2022 Page No: 9



Turning Movement Peak Hour Data Plot (4:15 PM)

Appendix B

Existing Traffic Operations Report



	≯	-	\mathbf{r}	1	-	*	•	1	1	1	Ļ	~
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations		\$			\$			\$			\$	
Traffic Volume (vph)	21	1	0	0	2	9	1	210	0	4	103	23
Future Volume (vph)	21	1	0	0	2	9	1	210	0	4	103	23
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
ane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		(
Storage Lanes	0		0	0		0	0		0	0		(
Taper Length (ft)	25			25			25			25		
ane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.886						0.976	
Fit Protected		0.954									0.998	
Satd. Flow (prot)	0	1813	0	0	1419	0	0	1881	0	0	1740	(
Flt Permitted		0.954									0.998	
Satd. Flow (perm)	0	1813	0	0	1419	0	0	1881	0	0	1740	(
ink Speed (mph)		30			30			30			30	
ink Distance (ft)		1815			1890			1980			668	
Travel Time (s)		41.3			43.0			45.0			15.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	22%	0%	1%	0%	25%	7%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	(
Parking (#/hr)												
Vid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	25	1	0	0	2	11	1	247	0	5	121	27
Shared Lane Traffic (%)												
ane Group Flow (vph)	0	26	0	0	13	0	0	248	0	0	153	(
Sign Control		Stop			Stop			Free			Free	
ntersection Summary												

HCM 6th TWSC 1: Spragues Road & Greenfield Road (190439) Edworthy Pits TIS Existing AM

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4			4	
Traffic Vol, veh/h	21	1	0	0	2	9	1	210	0	4	103	23
Future Vol, veh/h	21	1	0	0	2	9	1	210	0	4	103	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-		-	-	-
Veh in Median Storage,	,# -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0		-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	22	0	1	0	25	7	0
Mvmt Flow	25	1	0	0	2	11	1	247	0	5	121	27
Major/Minor M	/linor2		1	Vinor1			Maior1			Maior2		
Conflicting Flow All	401	394	135	394	407	247	148	0	0	247	0	0
Stage 1	145	145	-	249	249		-	-	-		-	-
Stage 2	256	249		145	158					-		
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.42	4.1	-	-	4.35	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-			-		
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-		-	-	-
Follow-up Hdwv	3.5	4	3.3	3.5	4	3.498	2.2			2.425		-
Pot Cap-1 Maneuver	563	546	919	569	537	745	1446	-	-	1196	-	
Stage 1	863	781	-	759	704	-	-	-		-	-	-
Stage 2	753	704	-	863	771	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	551	543	919	566	534	745	1446	-	-	1196	-	-
Mov Cap-2 Maneuver	551	543	-	566	534	-	-	-	-	-	-	-
Stage 1	862	777	-	758	703	-	-	-	-	-	-	-
Stage 2	739	703	-	857	767	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay	11.9			10.3			0			0.2		
HCM LOS	B			R			Ū			0.2		
	5			5								
Minnellen (Marine Marine		ND	NDT	NDD			0.01	0.0.7	000			
winor Lane/Major Mvm	t	NBL	NRI	NRK	EBLN1	VBLn1	SBL	SBI	SBK			
Capacity (veh/h)		1446		-	551	695	1196					
HCM Lane V/C Ratio	_	0.001	-	-	0.047	0.019	0.004	-		_	_	_
HCM Control Delay (s)		7.5	0	-	11.9	10.3	8	0				
HCM Lane LOS		A	A	-	B	B	A	A				
HCM 95th %tile Q(veh)		0	-	-	0.1	0.1	0	-	-			

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 1

Paradigm Transportation Solutions Limited

	≯	-	\mathbf{r}	1	+	•	•	1	1	1	÷.	~
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations		4			4			\$			\$	
Traffic Volume (vph)	24	2	1	0	1	0	3	148	0	2	195	15
uture Volume (vph)	24	2	1	0	1	0	3	148	0	2	195	15
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
ane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		C
Storage Lanes	0		0	0		0	0		0	0		C
aper Length (ft)	25			25			25			25		
ane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995									0.990	
It Protected		0.957						0.999				
Satd. Flow (prot)	0	1809	0	0	1900	0	0	1844	0	0	1847	C
It Permitted		0.957						0.999				
Satd. Flow (perm)	0	1809	0	0	1900	0	0	1844	0	0	1847	C
ink Speed (mph)		30			30			30			30	
ink Distance (ft)		1815			1890			1980			668	
Travel Time (s)		41.3			43.0			45.0			15.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
leavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	C
Parking (#/hr)												
/lid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	27	2	1	0	1	0	3	166	0	2	219	17
Shared Lane Traffic (%)												
ane Group Flow (vph)	0	30	0	0	1	0	0	169	0	0	238	C
Sign Control		Stop			Stop			Free			Free	
ntersection Summary												

HCM 6th TWSC 1: Spragues Road & Greenfield Road (190439) Edworthy Pits TIS Existing PM

Intersection	
Int Delay, s/veh 1	
Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT	SBR
Lane Configurations A A A	
Traffic Vol. veh/h 24 2 1 0 1 0 3 148 0 2 195	15
Future Vol. veh/h 24 2 1 0 1 0 3 148 0 2 195	15
Conflicting Peds. #/hr 0 0 0 0 0 0 0 0 0 0 0 0	0
Sign Control Stop Stop Stop Stop Stop Stop Free Free Free Free Free	Free
RT Channelized None None None	None
Storage Length	-
Veh in Median Storage, # - 0 0 0 0	-
Grade, % - 0 0 0	-
Peak Hour Factor 89 89 89 89 89 89 89 89 89 89 89 89 89	89
Heavy Vehicles, % 0 0 0 0 0 0 0 0 3 0 0 2	0
Mvmt Flow 27 2 1 0 1 0 3 166 0 2 219	17
Maior/Minor Minor? Minor1 Maior1 Maior2	
Conflicting Flow All 405 404 228 405 412 166 236 0 0 166 0	0
Stane 1 232 232 - 172 172	-
Stage 2 173 172 - 233 240	
Critical Hdwy 7.1 6.5 6.2 7.1 6.5 6.2 4.1 4.1 -	-
Critical Hdwy Stg 1 6.1 5.5 - 6.1 5.5	
Critical Hdwy Stg 2 6.1 5.5 - 6.1 5.5	-
Follow-up Hdwy 3.5 4 3.3 3.5 4 3.3 2.2 2.2 -	
Pot Cap-1 Maneuver 560 539 816 560 533 884 1343 - 1424 -	-
Stage 1 775 716 - 835 760	
Stage 2 834 760 - 775 711	-
Platoon blocked, %	-
Mov Cap-1 Maneuver 557 537 816 556 531 884 1343 1424 -	-
Mov Cap-2 Maneuver 557 537 - 556 531	-
Stage 1 773 715 - 833 758	-
Stage 2 831 758 - 770 710	-
Approach EB WB NB SB	
HCM Control Delay, s 11.8 11.8 0.2 0.1	
HCM LOS B B	
Minor Lane/Major Mymt NBL NBT NBR FBL n1WBL n1 SBL SBT SBR	
Canacity (yeh/h) 1343 562 531 1424	
HCM Lane V/C Ratio 0.003 - 0.054 0.002 0.002 -	
HCM Control Delay (s) 77 0 - 118 118 75 0 -	

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 1

Paradigm Transportation Solutions Limited

Appendix C

Speed Study Reports



MH Corbin Traffic Analyzer Study Computer Generated Summary Report City: North Dumfries Street: Spragues Rd - NB Location: 2

A study of vehicle traffic was conducted with the device having serial number 405269. The study was done in the NB lane at Spragues Rd - NB in North Dumfries, ON in 300m south of Greenfield Rd county. The study began on 2022-04-28 at 12:00 AM and concluded on 2022-04-29 at 12:00 AM, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 2,025 vehicles passed through the location with a peak volume of 58 on 2022-04-28 at [07:45 AM-08:00 AM] and a minimum volume of 0 on 2022-04-28 at [12:30 AM-12:45 AM]. The AADT count for this study was 2,025.

<u>SPEED</u>

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 90 - 100 KM/H range or lower. The average speed for all classifed vehicles was 89 KM/H with 79.73% vehicles exceeding the posted speed of 80 KM/H. 79.73% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 90KM/H and the 85th percentile was 99.76 KM/H.

<	10	20	30	40	50	60	70	80	90	100	110	120	130	140
to	to	to	to	to	to	to	to							
9	19	29	39	49	59	69	79	89	99	109	119	129	139	>
0	0	0	4	5	21	80	297	573	744	232	36	12	4	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin. Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 1939 which represents 97 percent of the total classified vehicles. The number of Small Trucks in the study was 22 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 30 which represents 1 percent of the total classified vehicles. The number of Tractor Trailers in the study was 17 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 8.4	8.5 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 22.4	22.5 to >				
878	1061	22	30	7	5	5	0				

CHART 2

HEADWAY

During the peak traffic period, on 2022-04-28 at [07:45 AM-08:00 AM] the average headway between vehicles was 15.254 seconds. During the slowest traffic period, on 2022-04-28 at [12:30 AM-12:45 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 0.00 and 31.00 degrees C.

MH Corbin Traffic Analyzer Study Computer Generated Summary Report City: North Dumfries Street: Spragues Rd - SB Location: 2

A study of vehicle traffic was conducted with the device having serial number 405075. The study was done in the SB lane at Spragues Rd - SB in North Dumfries, ON in 300m south of Greenfield Rd county. The study began on 2022-04-28 at 12:00 AM and concluded on 2022-04-29 at 12:00 AM, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 1,880 vehicles passed through the location with a peak volume of 62 on 2022-04-28 at [04:30 PM-04:45 PM] and a minimum volume of 0 on 2022-04-28 at [01:45 AM-02:00 AM]. The AADT count for this study was 1,880.

<u>SPEED</u>

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 80 - 90 KM/H range or lower. The average speed for all classifed vehicles was 95 KM/H with 89.41% vehicles exceeding the posted speed of 80 KM/H. 89.41% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 80KM/H and the 85th percentile was 109.13 KM/H.

<	10	20	30	40	50	60	70	80	90	100	110	120	130	140
to	to	to	to	to	to	to	to							
9	19	29	39	49	59	69	79	89	99	109	119	129	139	>
2	0	3	7	5	9	33	137	491	475	449	165	47	27	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin. Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 1731 which represents 94 percent of the total classified vehicles. The number of Small Trucks in the study was 45 which represents 2 percent of the total classified vehicles. The number of Trucks/Buses in the study was 34 which represents 2 percent of the total classified vehicles. The number of Tractor Trailers in the study was 40 which represents 2 percent of the total classified vehicles.

< to 4.9	5.0 to 8.4	8.5 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 22.4	22.5 to >				
298	1433	45	34	25	9	0	6				

CHART 2

HEADWAY

During the peak traffic period, on 2022-04-28 at [04:30 PM-04:45 PM] the average headway between vehicles was 14.286 seconds. During the slowest traffic period, on 2022-04-28 at [01:45 AM-02:00 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 0.00 and 30.00 degrees C.

MH Corbin Traffic Analyzer Study Computer Generated Summary Report City: North Dumfries Street: Spragues Rd - NB Location: 3

A study of vehicle traffic was conducted with the device having serial number 405259. The study was done in the NB lane at Spragues Rd - NB in North Dumfries, ON in 250m north of Greenfield Rd county. The study began on 2022-04-28 at 12:00 AM and concluded on 2022-04-29 at 12:00 AM, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 2,278 vehicles passed through the location with a peak volume of 66 on 2022-04-28 at [07:45 AM-08:00 AM] and a minimum volume of 0 on 2022-04-28 at [12:00 AM-12:15 AM]. The AADT count for this study was 2,278.

<u>SPEED</u>

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 90 - 100 KM/H range or lower. The average speed for all classifed vehicles was 92 KM/H with 86.94% vehicles exceeding the posted speed of 80 KM/H. 86.94% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 90KM/H and the 85th percentile was 104.95 KM/H.

<	10	20	30	40	50	60	70	80	90	100	110	120	130	140
to	to	to	to	to	to	to	to							
9	19	29	39	49	59	69	79	89	99	109	119	129	139	>
0	0	0	0	6	15	55	221	631	822	368	123	26	7	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin. Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 2184 which represents 96 percent of the total classified vehicles. The number of Small Trucks in the study was 29 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 33 which represents 1 percent of the total classified vehicles. The number of Tractor Trailers in the study was 28 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 8.4	8.5 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 22.4	22.5 to >				
623	1561	29	33	17	5	4	2				

CHART 2

HEADWAY

During the peak traffic period, on 2022-04-28 at [07:45 AM-08:00 AM] the average headway between vehicles was 13.433 seconds. During the slowest traffic period, on 2022-04-28 at [12:00 AM-12:15 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 0.00 and 34.00 degrees C.

MH Corbin Traffic Analyzer Study Computer Generated Summary Report City: North Dumfries Street: Spragues Rd - SB Location: 3

A study of vehicle traffic was conducted with the device having serial number 406305. The study was done in the SB lane at Spragues Rd - SB in North Dumfries, ON in 250m north of Greenfield Rd county. The study began on 2022-04-28 at 12:00 AM and concluded on 2022-04-29 at 12:00 AM, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 2,151 vehicles passed through the location with a peak volume of 68 on 2022-04-28 at [04:30 PM-04:45 PM] and a minimum volume of 0 on 2022-04-28 at [03:00 AM-03:15 AM]. The AADT count for this study was 2,151.

<u>SPEED</u>

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 80 - 90 KM/H range or lower. The average speed for all classifed vehicles was 84 KM/H with 60.02% vehicles exceeding the posted speed of 80 KM/H. 60.02% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 80KM/H and the 85th percentile was 97.38 KM/H.

<	10	20	30	40	50	60	70	80	90	100	110	120	130	140
to	to	to	to	to	to	to	to	to						
9	19	29	39	49	59	69	79	89	99	109	119	129	139	>
0	1	2	3	16	54	190	572	596	470	122	51	10	9	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin. Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 2001 which represents 95 percent of the total classified vehicles. The number of Small Trucks in the study was 38 which represents 2 percent of the total classified vehicles. The number of Trucks/Buses in the study was 36 which represents 2 percent of the total classified vehicles. The number of Tractor Trailers in the study was 21 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 8.4	8.5 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 22.4	22.5 to >				
1077	924	38	36	12	1	4	4				

CHART 2

HEADWAY

During the peak traffic period, on 2022-04-28 at [04:30 PM-04:45 PM] the average headway between vehicles was 13.043 seconds. During the slowest traffic period, on 2022-04-28 at [03:00 AM-03:15 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 0.00 and 36.00 degrees C.

MH Corbin Traffic Analyzer Study Computer Generated Summary Report City: North Dumfries Street: Spragues Rd - NB Location: 4

A study of vehicle traffic was conducted with the device having serial number 405285. The study was done in the NB lane at Spragues Rd - NB in North Dumfries, ON in 450m south of Alps Rd county. The study began on 2022-04-28 at 12:00 AM and concluded on 2022-04-29 at 12:00 AM, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 2,300 vehicles passed through the location with a peak volume of 67 on 2022-04-28 at [08:00 AM-08:15 AM] and a minimum volume of 0 on 2022-04-28 at [12:00 AM-12:15 AM]. The AADT count for this study was 2,300.

<u>SPEED</u>

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 80 - 90 KM/H range or lower. The average speed for all classifed vehicles was 87 KM/H with 74.25% vehicles exceeding the posted speed of 80 KM/H. 74.25% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 80KM/H and the 85th percentile was 98.25 KM/H.

<	10	20	30	40	50	60	70	80	90	100	110	120	130	140
to	to	to	to	to	to	to	to							
9	19	29	39	49	59	69	79	89	99	109	119	129	139	>
0	2	3	5	7	23	86	465	817	657	196	21	13	0	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin. Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 2211 which represents 96 percent of the total classified vehicles. The number of Small Trucks in the study was 24 which represents 1 percent of the total classified vehicles. The number of Trucks/Buses in the study was 39 which represents 2 percent of the total classified vehicles. The number of Tractor Trailers in the study was 21 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 8.4	8.5 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 22.4	22.5 to >				
880	1331	24	39	9	5	5	2				

CHART 2

HEADWAY

During the peak traffic period, on 2022-04-28 at [08:00 AM-08:15 AM] the average headway between vehicles was 13.235 seconds. During the slowest traffic period, on 2022-04-28 at [12:00 AM-12:15 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 0.00 and 26.00 degrees C.

MH Corbin Traffic Analyzer Study Computer Generated Summary Report City: North Dumfries Street: Spragues Rd - SB Location: 4

A study of vehicle traffic was conducted with the device having serial number 406307. The study was done in the SB lane at Spragues Rd - SB in North Dumfries, ON in 450m south of Alps Rd county. The study began on 2022-04-28 at 12:00 AM and concluded on 2022-04-29 at 12:00 AM, lasting a total of 24.00 hours. Traffic statistics were recorded in 15 minute time periods. The total recorded volume showed 2,169 vehicles passed through the location with a peak volume of 66 on 2022-04-28 at [04:30 PM-04:45 PM] and a minimum volume of 0 on 2022-04-28 at [01:45 AM-02:00 AM]. The AADT count for this study was 2,169.

<u>SPEED</u>

Chart 1 lists the values of the speed bins and the total traffic volume for each bin. At least half the vehicles were traveling in the 70 - 80 KM/H range or lower. The average speed for all classifed vehicles was 83 KM/H with 55.81% vehicles exceeding the posted speed of 80 KM/H. 55.81% percent of the total vehicles were traveling in excess of 89 KM/H. The mode speed for this traffic study was 70KM/H and the 85th percentile was 96.80 KM/H.

<	10	20	30	40	50	60	70	80	90	100	110	120	130	140
to	to	to	to	to	to	to	to	to						
9	19	29	39	49	59	69	79	89	99	109	119	129	139	>
0	6	2	0	13	62	238	615	566	438	100	46	17	15	0

CHART 1

CLASSIFICATION

Chart 2 lists the values of the classification bins and the total traffic volume accumulated for each bin. Most of the vehicles classified during the study were Passenger Vehicles. The number of Passenger Vehicles in the study was 2030 which represents 96 percent of the total classified vehicles. The number of Small Trucks in the study was 32 which represents 2 percent of the total classified vehicles. The number of Trucks/Buses in the study was 35 which represents 2 percent of the total classified vehicles. The number of Tractor Trailers in the study was 21 which represents 1 percent of the total classified vehicles.

< to 4.9	5.0 to 8.4	8.5 to 9.9	10.0 to 12.9	13.0 to 15.9	16.0 to 18.9	19.0 to 22.4	22.5 to >				
1121	909	32	35	11	1	5	4				

CHART 2

HEADWAY

During the peak traffic period, on 2022-04-28 at [04:30 PM-04:45 PM] the average headway between vehicles was 13.433 seconds. During the slowest traffic period, on 2022-04-28 at [01:45 AM-02:00 AM] the average headway between vehicles was 900 seconds.

WEATHER

The roadway surface temperature over the period of the study varied between 0.00 and 28.00 degrees C.

Appendix D

2027 Background Traffic Operations Reports



ane Group ane Configurations raffic Volume (vph) uture Volume (vph) deal Elow (vphp)	EBL			•					1		•	
ane Configurations raffic Volume (vph) uture Volume (vph)		EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
raffic Volume (vph) uture Volume (vph)		\$			\$			\$			\$	
uture Volume (vph)	23	1	0	0	2	10	1	226	0	4	111	25
loal Flow (uphpl)	23	1	0	0	2	10	1	226	0	4	111	25
	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
ane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
torage Length (ft)	0		0	0		0	0		0	0		0
torage Lanes	0		0	0		0	0		0	0		0
aper Length (ft)	25			25			25			25		
ane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ed Bike Factor												
rt					0.884						0.976	
It Protected		0.954									0.998	
atd. Flow (prot)	0	1813	0	0	1413	0	0	1881	0	0	1741	0
It Permitted		0.954									0.998	
atd. Flow (perm)	0	1813	0	0	1413	0	0	1881	0	0	1741	0
ink Speed (mph)		30			30			30			30	
ink Distance (ft)		1815			1890			1980			668	
ravel Time (s)		41.3			43.0			45.0			15.2	
onfl. Peds. (#/hr)												
onfl. Bikes (#/hr)												
eak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Frowth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
leavy Vehicles (%)	0%	0%	0%	0%	0%	22%	0%	1%	0%	25%	7%	0%
us Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
arking (#/hr)												
lid-Block Traffic (%)		0%			0%			0%			0%	
.dj. Flow (vph)	27	1	0	0	2	12	1	266	0	5	131	29
hared Lane Traffic (%)												
ane Group Flow (vph)	0	28	0	0	14	0	0	267	0	0	165	0
ign Control		Stop			Stop			Free			Free	
ntersection Summary												

HCM 6th TWSC 1: Spragues Road & Greenfield Road

(190439) Edworthy Pits TIS 2027 Background AM

Int Delay, s/veh 1.1 Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBL SBT SBR Lane Configurations 0 0 1 0 226 0 4 111 25 Traffic Vol, veh/h 23 1 0 0 2 10 1 226 0 4 111 25 Configurations Stop Stop <th>Intersection</th> <th></th>	Intersection												
Movement EBL EBT EBR WBL WBT NBL NBT NBT SBL SBT SBR Lane Configurations	Int Delay, s/veh	1.1											
Lane Configurations 4 4 4 4 4 4 Traffic Vol, veh/h 23 1 0 0 2 10 1 226 0 4 111 25 Future Vol, veh/h 23 1 0 0 2 10 1 226 0 4 111 25 Conflicting Peds, #/hr 0 25 7 0 0 0 25 7 0 0 10 25 7 0 0 10 25 7 0 0 10 11	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, velv/h 23 1 0 0 2 10 1 226 0 4 111 25 Future Vol, velv/h 23 1 0 0 2 10 1 226 0 4 111 25 Future Vol, velv/h 23 1 0 0 2 10 1 226 0 4 111 25 Conflicting Peds, #/hr 0 - - - - - - - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - - 0 - 1 0 1 0 1 0 0 - 0	Lane Configurations		4			\$			\$			4	
Future Vol, veh/h 23 1 0 0 2 10 1 226 0 4 111 25 Conflicting Peds, #/hr 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 0 2 0 1 0 0 2 0 1 0 2 7 0 0 2 0 1 0 0 2 0 1 0 0 2 13 13 19 14 14 14 14 14	Traffic Vol, veh/h	23	1	0	0	2	10	1	226	0	4	111	25
Conflicting Peds, #/hr 0	Future Vol, veh/h	23	1	0	0	2	10	1	226	0	4	111	25
Sign Control Stop Stop Stop Stop Stop Stop Stop Stop Stop Free Free <td>Conflicting Peds, #/hr</td> <td>0</td>	Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
RT Channelized - None Personand Rediable None - None - None None Personand None None <tht< td=""><td>Sign Control</td><td>Stop</td><td>Stop</td><td>Stop</td><td>Stop</td><td>Stop</td><td>Stop</td><td>Free</td><td>Free</td><td>Free</td><td>Free</td><td>Free</td><td>Free</td></tht<>	Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Storage Length - - - - - - - - - - - - - - - 0 0 0 0 2 13 29 0 0 1 0 1 0 13 29 0 131 29 131 29 131 29 131 133 135 136 136	RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Veh in Median Storage, # 0 - 0 0 0 2 0 0 0 0 2 0 1 0 0 25 7 0 Major/Minor Minor Minor Minor Major Major Major Major Major Major Major Major 25 7 0 0 266 0 0 266 0 0 266 0 0 266 0 0 266 0 0 266 162 1 1 1 1 1 1 1 1 1 1 <th< td=""><td>Storage Length</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></th<>	Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Grade, % - 0 0 - 0 0 - 0 0 1 0 0 225 7 0 0 227 1 0 0 2 12 1 0 0 25 7 0 0 25 7 0 0 25 7 0 0 25 7 0 0 25 7 0 0 25 7 0 0 25 7 0 0 25 7 0 0 26 10 10 11 10 11 10 11 10 <	Veh in Median Storage	,# -	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor 85	Grade, %	-	0	-	-	0	-	-	0		-	0	-
Heavy Vehicles, % 0 0 0 0 22 0 1 0 25 7 0 Mmrt Flow 27 1 0 0 2 12 1 266 0 5 131 29 Major/Minor Minor1 Major/ Major/ Major Major/ Major/ Major/ Major/ Conflicting Flow All 431 424 146 424 438 266 160 0 0 266 0 0 Stage 1 156 156 -	Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Mvmt Flow 27 1 0 0 2 12 1 266 0 5 131 29 Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 431 424 146 424 438 266 160 0 0 266 0 0 Stage 1 156 156 268 268 -	Heavy Vehicles, %	0	0	0	0	0	22	0	1	0	25	7	0
Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 431 424 146 424 438 266 160 0 0 266 0 0 Stage 1 156 156 - 268 268 - <td>Mvmt Flow</td> <td>27</td> <td>1</td> <td>0</td> <td>0</td> <td>2</td> <td>12</td> <td>1</td> <td>266</td> <td>0</td> <td>5</td> <td>131</td> <td>29</td>	Mvmt Flow	27	1	0	0	2	12	1	266	0	5	131	29
Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 431 424 446 424 438 266 160 0 0 266 0 0 Stage 1 156 156 - 268 268 -													
Conflicting Flow All 431 424 146 424 438 266 160 0 0 266 0 0 Stage 1 156 156 268 268 - <t< td=""><td>Major/Minor M</td><td>Minor2</td><td></td><td>1</td><td>Minor1</td><td></td><td></td><td>Major1</td><td></td><td></td><td>Major2</td><td></td><td></td></t<>	Major/Minor M	Minor2		1	Minor1			Major1			Major2		
Stage 1 156 156 268 268 -	Conflicting Flow All	431	424	146	424	438	266	160	0	0	266	0	0
Stage 2 275 268 156 170 -	Stage 1	156	156	-	268	268	-	-	-	-	-	-	-
Critical Howy 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.1 5.5 -	Stage 2	275	268	-	156	170	-	-	-		-	-	-
Critical Hdwy Stg 1 6.1 5.5 6.1 5.5 -<	Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.42	4.1	-	-	4.35	-	-
Critical Hdwy Stg 2 6.1 5.5 - 6.1 5.5 -<	Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-		-	-	-
Follow-up Hdwy 3.5 4 3.3 3.5 4 3.498 2.2 - 2.425 - <th< td=""><td>Critical Hdwy Stg 2</td><td>6.1</td><td>5.5</td><td>-</td><td>6.1</td><td>5.5</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></th<>	Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Pot Cap-1 Maneuver 538 525 906 544 515 727 1432 - - 1176 -	Follow-up Hdwy	3.5	4	3.3	3.5	4	3.498	2.2	-		2.425	-	-
Stage 1 851 772 742 691 -	Pot Cap-1 Maneuver	538	525	906	544	515	727	1432	-	-	1176	-	-
Stage 2 736 691 851 762 -	Stage 1	851	772	-	742	691	-	-	-	-	-	-	-
Platoon blocked, % -	Stage 2	736	691	-	851	762	-	-	-	-	-	-	-
Mov Cap-1 Maneuver 525 522 906 541 512 727 1432 - - 1176 -	Platoon blocked, %								-			-	-
Mov Cap-2 Maneuver 525 522 - 541 512 - </td <td>Mov Cap-1 Maneuver</td> <td>525</td> <td>522</td> <td>906</td> <td>541</td> <td>512</td> <td>727</td> <td>1432</td> <td>-</td> <td>-</td> <td>1176</td> <td>-</td> <td>-</td>	Mov Cap-1 Maneuver	525	522	906	541	512	727	1432	-	-	1176	-	-
Stage 1 850 768 - 741 690 -	Mov Cap-2 Maneuver	525	522	-	541	512	-	-	-	-	-	-	-
Stage 2 721 690 - 845 758 -	Stage 1	850	768	-	741	690	-	-	-	-	-	-	-
Approach EB WB NB SB HCM Control Delay, s 12.2 10.4 0 0.2 HCM LOS B B B B B Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1432 - - 525 679 1176 - - HCM Lane V/C Ratio 0.001 - 0.054 0.021 0.004 - - HCM Control Delay (s) 7.5 0 - 12.2 10.4 8.1 0 - HCM Lane LOS A A B B A - -	Stage 2	721	690	-	845	758	-	-	-	-	-	-	-
Approach EB WB NB SB HCM Control Delay, s 12.2 10.4 0 0.2 HCM LOS B B B B B Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1432 - - 525 679 1176 - HCM Lane V/C Ratio 0.001 - 0.054 0.021 0.004 - HCM Lane LOS A A B B A -													
HCM Control Delay, s 12.2 10.4 0 0.2 HCM LOS B A A HCM Lane LOS A A B B A A A B B A A A A A B B A A A A A A B B A A A A A B B A A A A A A A A A A A A A A A A A </td <td>Approach</td> <td>EB</td> <td></td> <td></td> <td>WB</td> <td>_</td> <td></td> <td>NB</td> <td></td> <td></td> <td>SB</td> <td>_</td> <td></td>	Approach	EB			WB	_		NB			SB	_	
HCM LOS B B Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1432 - 525 679 1176 - HCM Lane V/C Ratio 0.001 - 0.054 0.021 0.004 - HCM Control Delay (s) 7.5 0 12.2 10.4 8.1 0 - HCM Lane LOS A A B B A - -	HCM Control Delay, s	12.2			10.4			0			0.2		
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1432 - 525 679 1176 - HCM Lane V/C Ratio 0.001 - 0.054 0.021 0.004 - - HCM Control Delay (s) 7.5 0 12.2 10.4 8.1 0 - HCM Lane LOS A A B B A - -	HCM LOS	В			В								
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1432 - 525 679 1176 - - HCM Lane V/C Ratio 0.001 - 0.054 0.021 0.004 - - HCM Control Delay (s) 7.5 0 - 12.2 10.4 8.1 0 - HCM Lane LOS A A - B B A -													
Capacity (veh/h) 1432 - 525 679 1176 - - HCM Lane V/C Ratio 0.001 - - 0.054 0.021 0.004 - - HCM Control Delay (s) 7.5 0 - 12.2 10.4 8.1 0 - HCM Lane LOS A A - B B A -	Minor Lane/Maior Mvm	it	NBL	NBT	NBR	EBLn1\	WBLn1	SBL	SBT	SBR			
Control Policy Control Control	Capacity (veh/h)	-	1432	-		525	679	1176	-				
HCM Control Delay (s) 7.5 0 - 12.2 10.4 8.1 0 - HCM Lane LOS A A - B B A A -	HCM Lane V/C Ratio		0.001			0.054	0.021	0.004					
HCM Lane LOS A A - B B A A -	HCM Control Delay (s)		7.5	0	-	12.2	10.4	8.1	0	-			
	HCM Lane LOS		A	A		B	B	A	A				
HCM 95th %tile Q(veh) 0 0.2 0.1 0	HCM 95th %tile Q(veh)		0	-		0.2	0.1	0	-	-			

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 1

Paradigm Transportation Solutions Limited

Lane Group EBL Lane Configurations Traffic Volume (vph) 26 Future Volume (vph) 26 100 Uture Volume (vph) 26 100 Ideal Flow (vphpl) 1900 1900 Lane Width (ft) 12 1900 Grade (%) 5 5 Storage Length (ft) 02 100 Zorage Length (ft) 25 100 Ped Bike Factor Frt 100 Fit Protected Satd. Flow (prot) 02 Satd. Flow (prot) 02 111 Link Distance (ft) 111 111 Travel Time (s) 0 0 Confl. Peds. (#/hr) 0 0	L EBT 4 6 2 6 2 0 1900 2 12 0% 0 0 5 0 1.00 0.996 0.957 0 1811 0.957 0 1811 0.957 0 1811 0.1	EBR 1 1900 12 0 0 1.00 0 0 0	WBL 0 1900 12 0 0 25 1.00	WBT 1 1 1900 12 0% 1.00 1900 1900	WBR 0 1900 12 0 0 1.00	NBL 3 1900 12 0 025 1.00	NBT 159 159 1900 12 0% 1.00 0.999 1844 0.999	NBR 0 1900 12 0 0 1.00	SBL 2 1900 12 0 0 25 1.00	SBT 210 210 1900 12 0% 1.00 0.991 1849	SBF 16 1900 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Lane Configurations Traffic Volume (vph) 26 Future Volume (vph) 26 Ideal Flow (vphpl) 1900 Lane Width (ft) 12 Grade (%) 5 Storage Length (ft) 00 Storage Length (ft) 25 Lane Util. Factor 1.00 Ped Bike Factor Frt Fit Protected 5 Satd. Flow (prot) 00 Link Speed (mph) 1 Link Speed (mph) 1 Confl. Peds. (#/hr) 0 Confl. Bikse (#/hr) 0	6 2 6 2 6 2 0 1900 2 12 0% 0 5 0 1.00 0.957 0 1811 0.957 0 1811 30 1815	1 1900 12 0 0 1.00	0 0 1900 12 0 0 25 1.00	♣ 1 1 1900 12 0% 1.00 1.00 1900	0 0 1900 12 0 0 1.00	3 3 1900 12 0 0 25 1.00	 ♣ 159 159 1900 12 0% 1.00 0.999 1844 0.999 	0 0 1900 12 0 0 1.00	2 1900 12 0 0 25 1.00	 210 210 1900 12 0% 1.00 0.991 1849 	16 1900 12 0 0 0 0
Traffic Volume (vph) 26 Future Volume (vph) 26 deal Flow (vphpl) 1900 Lane Width (ft) 12 Grade (%) 0 Storage Length (ft) 00 Storage Length (ft) 25 Lane Width (ft) 25 Storage Length (ft) 26 Lane Util, Factor 1.00 Ped Bike Factor 6 Fit Fit Fit Protected 5 Satd. Flow (port) 00 Link Speed (mph) 1 Link Speed (mph) 1 Travel Time (s) 0 Confl. Peds. (#/hr) 0	6 2 6 2 0 1900 2 12 0% 0 0 0 0 0 0 0 0 0 0 0 0 0	1 1900 12 0 0 1.00	0 0 1900 12 0 0 25 1.00 0 0	1 1900 12 0% 1.00 1900	0 0 1900 12 0 0 1.00	3 3 1900 12 0 0 25 1.00	159 159 1900 12 0% 1.00 0.999 1844 0.999	0 0 1900 12 0 0 1.00	2 1900 12 0 0 25 1.00	210 210 1900 12 0% 1.00 0.991 1849	16 16 1900 12 0 0 0 0 1.00
Future Volume (vph) 26 Ideal Flow (vphpl) 1900 Lane Width (ft) 12 Grade (%) Storage Length (ft) CC Storage Lanes CC Taper Length (ft) CC Taper Length (ft) 25 C Storage Lanes CC Taper Length (ft) 25 Lane Util. Factor 1.00 Ped Bike Factor Ft Fit Fritected Satd. Flow (prot) CC C Satd. Flow (prot) CC Satd. Flow (perm) CC Link Speed (mph) Cinik Speed (mph) Confi. Peds. (#/hr) Confi. Peds. (#/hr) Confi. Bikes (#/hr) Confi. Bikes (#/hr) COnfi. Peds. COnfi	6 2 0 1900 2 12 0% 0 5 0 1.00 0.996 0.957 0 1811 30 1815 1815	1 1900 12 0 0 1.00	0 1900 12 0 0 25 1.00	1 1900 12 0% 1.00 1900 1900	0 1900 12 0 0 1.00	3 1900 12 0 0 25 1.00	159 1900 12 0% 1.00 0.999 1844 0.999	0 1900 12 0 0 1.00	2 1900 12 0 0 25 1.00	210 1900 12 0% 1.00 0.991 1849	16 1900 12 0 0 0 1.00
Ideal Flow (vphpl) 1900 Lane Width (ft) 12 Storage Length (ft) 00 Storage Lanes 00 Taper Length (ft) 25 Lane Util, Factor 1.00 Ped Bike Factor 1.00 Fit Protected Stat. Flow (prot) 00 Satd. Flow (prot) 00 Link Speed (mph) Link Speed (mph) 00 Link Speed (mph) Confl. Peds. (#hr) Confl. Bikes (#hr) 00	0 1900 2 12 0% 0 5 0 1.00 0.996 0.957 0 1811 30 1815	1900 12 0 0 1.00	1900 12 0 0 25 1.00	1900 12 0% 1.00 1900	1900 12 0 0 1.00	1900 12 0 0 25 1.00	1900 12 0% 1.00 0.999 1844 0.999	1900 12 0 0 1.00	1900 12 0 0 25 1.00	1900 12 0% 1.00 0.991 1849	1900 12 0 0 1.00
Lane Width (ft) 12 Grade (%) 5 Storage Length (ft) CC Storage Lanes CC Grade (#) 25 Jorage Lanes CC Faper Length (ft) 25 Jorage Lanes CC Faper Length (ft) 25 Jorage Lanes CC Faper Length (ft) 25 Jorage Lanes CC Fit Protected Satd. Flow (prot) Satd. Flow (perm) CC Jink Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr)	2 12 0% 0 5 0 1.00 0.996 0.957 0 1811 0.957 0 1811 30 1815	12 0 0 1.00	12 0 25 1.00 0 0	12 0% 1.00 1900	12 0 1.00	12 0 25 1.00	12 0% 1.00 0.999 1844 0.999	12 0 0 1.00	12 0 25 1.00	12 0% 1.00 0.991 1849	12 C 0 1.00
Grade (%) Constant Storage Length (ft) CC Storage Lanes CC Taper Length (ft) 25 .ane Util. Factor 1.00 Ped Bike Factor	0% 0 5 0 1.00 0.996 0.957 0 1811 0.957 0 1811 30 1815 1815	0 0 1.00 0	0 0 25 1.00 0	0% 1.00 1900 1900	0 0 1.00	0 0 25 1.00	0% 1.00 0.999 1844 0.999	0 0 1.00	0 0 25 1.00	0% 1.00 0.991 1849	C 0 1.00
Storage Length (ft) C Storage Lanes C Taper Length (ft) 22 ane Util. Factor 1.00 Ped Bike Factor Fit "It Protected Satd. Flow (prot) C Satd. Flow (prot) C C Jatd Flow (perm) C Link Speed (mph)	0 0 5 0 1.00 0.996 0.957 0 1811 0.957 0 1811 30 1815 1815	0 0 1.00 0 0	0 0 25 1.00 0	1.00 1900 1900	0 0 1.00	0 0 25 1.00	1.00 0.999 1844 0.999	0 0 1.00	0 0 25 1.00	1.00 0.991 1849	C C 1.00
Storage Lanes C Taper Length (tt) 25 Lane Util. Factor 1.00 Ped Bike Factor 5 Fit Petoted 5 Satd. Flow (prot) C0 "It Protected 5 Satd. Flow (prot) C0 "It Permitted 5 Satd. Flow (perm) C0 _ink Distance (tt) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr)	0 5 0 1.00 0.996 0.957 0 1811 0.957 0 1811 30 1815	0 1.00 0 0	0 25 1.00 0	1.00 1900 1900	0 1.00 0 0	0 25 1.00 0	1.00 0.999 1844 0.999	0 1.00 0	0 25 1.00	1.00 0.991 1849	0 1.00
Taper Length (ft) 25 Lane Util, Factor 1.00 Ped Bike Factor Frt Fit Fit Protected Satd. Flow (prot) 00 Satd. Flow (perm) 00 Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr)	5 0 1.00 0.996 0.957 0 1811 0.957 0 1811 30 1815	1.00 0 0	25 1.00 0 0	1.00 1900 1900	1.00 0 0	25 1.00 0	1.00 0.999 1844 0.999	1.00	25 1.00 0	1.00 0.991 1849	1.00
Lane Util. Factor 1.00 Ped Bike Factor Frt Fit Satd. Flow (prot) 00 Satd. Flow (prot) 00 Link Speed (mph) Link Speed (mph) 01 Link Speed (mph) Link Speed (mph) 00 Link Speed (mph) Confi. Peds. (#/hr) Confi. Bikes (#/hr) Confi. Bikes (#/hr)	0 1.00 0.996 0.957 0 1811 0.957 0 1811 30 1815	1.00 0 0	1.00 0 0	1.00 1900 1900	1.00 0	1.00	1.00 0.999 1844 0.999	1.00	1.00 0	1.00 0.991 1849	1.00
Ped Bike Factor Fit Fit Protected Satd. Flow (port) C0 Fit Permitted Satd. Flow (perm) C0 _ink Speed (mph)	0.996 0.957 0 1811 0.957 0 1811 30 1815	0	0 0	1900 1900	0	0	0.999 1844 0.999	0	0	0.991 1849	0
Fit Protected 'It Protected Contract Satd. Flow (prot) CO 'It Permitted Contract Satd. Flow (perm) CO .ink Distance (ft) Iravel Time (s) .confl. Peds. (#/hr) Confl. Bikes (#/hr)	0.996 0.957 0 1811 0.957 0 1811 30 1815	0	0	1900 1900	0	0	0.999 1844 0.999	0	0	0.991 1849	0
Fit Protected Classifier Satd. Flow (prot) Classifier Fit Permitted Satd. Flow (perm) Classifier Satd. Flow (perm) Classifier Classifier Jink Distance (tt) Travel Time (s) Confil. Pds. (#/hr) Confil. Bikes (#/hr) Confil. Bikes (#/hr) Classifier	0.957 0 1811 0.957 0 1811 30 1815	0 0	0 0	1900 1900	0	0	0.999 1844 0.999	0	0	1849	0
Satd. Flow (prot) C "It Permitted Satd. Flow (perm) C Jatd. Flow (perm) C Link Speed (mph)	0 1811 0.957 0 1811 30 1815	0 0	0	1900 1900	0	0	1844 0.999	0	0	1849	G
Fit Permitted Control Satd. Flow (perm) Control Link Speed (mph) Link Distance (ft) Iravel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr) Confl. Bikes (#/hr)	0.957 0 1811 30 1815	0	0	1900	0	0	0.999				
Satd. Flow (perm) C .ink Speed (mph) . .ink Distance (ft) . Travel Time (s) . Confl. Peds. (#/hr) . Confl. Bikes (#/hr) .	0 1811 30 1815	0	0	1900	0	0					
Link Speed (mph) Link Distance (ft) Fravel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr)	30 1815					0	1844	0	0	1849	0
Link Distance (ft) Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr)	1815			30			30			30	
Travel Time (s) Confl. Peds. (#/hr) Confl. Bikes (#/hr)	44.0			1890			1980			668	
Confl. Peds. (#/hr) Confl. Bikes (#/hr)	41.3			43.0			45.0			15.2	
Confl. Bikes (#/hr)											
Peak Hour Factor 0.85	9 0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor 100%	6 100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%) 0%	% 0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Bus Blockages (#/hr) C	0 0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)											
Mid-Block Traffic (%)	0%			0%			0%			0%	
Adj. Flow (vph) 29	92	1	0	1	0	3	179	0	2	236	18
Shared Lane Traffic (%)											
_ane Group Flow (vph) 0	0 32	0	0	1	0	0	182	0	0	256	0
Sign Control	Stop			Stop			Free			Free	
Intersection Summary											

HCM 6th TWSC 1: Spragues Road & Greenfield Road

(190439) Edworthy Pits TIS 2027 Background PM

Int Delay, s/veh 1 Movement EBL EBT EBR WBL WBR NBL NBT NBR SBL SBL SBR SBR SBR Lane Configurations -0 -0 1 0 3 159 0 2 210 16 Future Vol, veh/h 26 2 1 0 1 0 3 159 0 2 210 16 Conflicting Peds, #hr 0 - 0 - - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - - 0 - - 0 0 <th>Intersection</th> <th></th>	Intersection												
Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR Lane Configurations	Int Delay, s/veh	1											
Lane Configurations Image: Configurations <	Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h 26 2 1 0 1 0 3 159 0 2 210 16 Future Vol, veh/h 26 2 1 0 1 0 3 159 0 2 210 16 Future Vol, veh/h 26 2 1 0 1 0 3 159 0 2 210 16 Conflicting Peds, #/hr 0	Lane Configurations		4			4			4			4	
Future Vol, veh/h 26 2 1 0 1 0 3 159 0 2 210 16 Conflicting Peds, #/hr 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 0 - 0 0 0 0 0 16.5 6.2 16.5 6.5 16.5 16.5 16.5 16.5 16.5	Traffic Vol, veh/h	26	2	1	0	1	0	3	159	0	2	210	16
Conflicting Peds, #/hr 0	Future Vol, veh/h	26	2	1	0	1	0	3	159	0	2	210	16
Sign Control Stop Free Free <td>Conflicting Peds, #/hr</td> <td>0</td>	Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
RT Channelized - None Personand None Personand None Personand None No	Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Storage Length - - - - - - - - - - - - - - - - - - - 0 - - 0 - - 0 - - 0 0 0 0 2 0 0 2 0	RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Veh in Median Storage, # - 0 - - 0 - - 0 - - 0 - - 0 - - 0 - - 0 0 </td <td>Storage Length</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td>-</td> <td>-</td> <td>-</td>	Storage Length	-	-	-	-	-	-	-	-		-	-	-
Grade, % - 0 0<	Veh in Median Storage	,# -	0	-	-	0	-	-	0		-	0	-
Peak Hour Factor 89	Grade, %	-	0	-	-	0	-	-	0		-	0	-
Heavy Vehicles, % 0 0 0 0 0 0 0 0 3 0 0 2 0 Mymt Flow 29 2 1 0 1 0 3 179 0 2 236 18 Major/Minor Minor1 Major/ Major/ Major/ Major/ Conflicting Flow All 435 434 245 436 443 179 254 0 0 179 0 0 Stage 1 249 249 - 185 185 -	Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Mvmt Flow 29 2 1 0 1 0 3 179 0 2 236 18 Major/Minor Minor2 Minor1 Major1 Major2 Major2 Conflicting Flow All 435 434 245 436 443 179 254 0 0 179 0 0 0 Stage 1 249 249 249 185 185 - <td>Heavy Vehicles, %</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>3</td> <td>0</td> <td>0</td> <td>2</td> <td>0</td>	Heavy Vehicles, %	0	0	0	0	0	0	0	3	0	0	2	0
Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 435 434 245 436 443 179 254 0 0 179 0 0 Stage 1 249 249 - 185 185 -	Mvmt Flow	29	2	1	0	1	0	3	179	0	2	236	18
Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 435 434 245 436 443 179 254 0 0 179 0 0 Stage 1 249 249 - 185 185 -													
Conflicting Flow All 435 434 245 436 443 179 254 0 0 179 0 0 Stage 1 249 249 - 185 185 - <t< td=""><td>Major/Minor M</td><td>Minor2</td><td></td><td>1</td><td>Minor1</td><td></td><td></td><td>Major1</td><td></td><td>1</td><td>Major2</td><td></td><td></td></t<>	Major/Minor M	Minor2		1	Minor1			Major1		1	Major2		
Stage 1 249 249 - 185 185 -	Conflicting Flow All	435	434	245	436	443	179	254	0	0	179	0	0
Stage 2 186 185 251 258 -	Stage 1	249	249	-	185	185	-	-	-	-	-	-	-
Critical Hdwy 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.1 5.5 -	Stage 2	186	185	-	251	258	-	-	-	-	-	-	-
Critical Hdwy Stg 1 6.1 5.5 - 6.1 5.5 -	Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-		4.1	-	-
Critical Hdwy Stg 2 6.1 5.5 - 6.1 5.5 -<	Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy 3.5 4 3.3 3.5 4 3.3 2.2 - 2.2 - Pot Cap-1 Maneuver 535 518 799 534 512 869 1323 - 1409 - - Stage 1 759 704 821 751 - - - - - - Stage 2 820 751 - 758 698 - - - - - Mov Cap-2 Maneuver 532 515 799 529 509 691 1323 - 1409 - Mov Cap-2 Maneuver 532 515 529 509 - - - - - Stage 1 757 703 - 819 749 - - - - - Stage 2 816 749 - 753 697 - - - - - Approach EB WB NB SB B B B B HCM Control Delay, s 12.1 12.1 12.1 0.1 0.1 0.1 HCM Los B B B - - -<	Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Pot Cap-1 Maneuver 535 518 799 534 512 869 1323 - - 1409 -	Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-		2.2	-	-
Stage 1 759 704 821 751 -	Pot Cap-1 Maneuver	535	518	799	534	512	869	1323	-		1409	-	-
Stage 2 820 751 758 698 -	Stage 1	759	704	-	821	751	-	-	-	-	-	-	-
Platoon blocked, % - - - - - Mov Cap-1 Maneuver 532 515 799 529 509 1323 - - 1409 - Mov Cap-2 Maneuver 532 515 529 509 - - - - - - Stage 1 757 703 - 819 749 - - - - - Aproach EB WB NB SB HCM Control Delay, s 12.1 12.1 0.1 0.1 HCM LOS B B B Minor Lane/Major Mivmt NBL NBT NBR EBLn1WBLn1 SBL SBR Capacity (veh/h) 1323 - - 537 509 1409 HCM Lane V/C Ratio 0.003 - 0.061 0.002 0.002 - HCM Control Delay (s) 7.7 0 - 12.1 12.1 7.6 0 HCM Lane LOS A A - B A - -	Stage 2	820	751	-	758	698	-	-	-		-	-	-
Mov Cap-1 Maneuver 532 515 799 529 509 869 1323 - - 1409 -	Platoon blocked, %								-			-	-
Mov Cap-2 Maneuver 532 515 529 509 - </td <td>Mov Cap-1 Maneuver</td> <td>532</td> <td>515</td> <td>799</td> <td>529</td> <td>509</td> <td>869</td> <td>1323</td> <td>-</td> <td>-</td> <td>1409</td> <td>-</td> <td>-</td>	Mov Cap-1 Maneuver	532	515	799	529	509	869	1323	-	-	1409	-	-
Stage 1 757 703 819 749 -	Mov Cap-2 Maneuver	532	515	-	529	509	-	-	-	-	-	-	-
Stage 2 816 749 - 753 697 -	Stage 1	757	703	-	819	749	-	-	-		-	-	-
Approach EB WB NB SB HCM Control Delay, s 12.1 12.1 0.1 0.1 HCM LOS B B B B B Minor Lane//Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1323 - - 537 509 1409 - - HCM Lane V/C Ratio 0.003 - - 0.061 0.002 0.002 - - HCM Control Delay (s) 7.7 0 - 12.1 7.6 0 - HCM Lane LOS A A - B B A -	Stage 2	816	749	-	753	697	-	-	-	-	-	-	-
Approach EB WB NB SB HCM Control Delay, s 12.1 12.1 0.1 0.1 HCM LOS B B B B B Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1323 - - 537 509 1409 - - HCM Lane V/C Ratio 0.003 - 0.061 0.002 0.002 - - HCM Control Delay (s) 7.7 0 - 12.1 17.6 0 - HCM Lane LOS A A - B B A -													
HCM Control Delay, s 12.1 12.1 0.1 0.1 HCM LOS B	Approach	EB	_		WB	_		NB		_	SB	_	_
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1323 - 537 509 1409 - - HCM Lane V/C Ratio 0.003 - - 0.061 0.002 0.002 - - HCM Lane V/C Ratio 0.003 - - 0.061 0.002 - - HCM Lane LOS A A - B B A - HCM Stin Wile Queh) 0 - - 0.2 0 0 -	HCM Control Delay s	12.1			12.1			0.1			0.1		
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1323 - 537 509 1409 - - HCM Lane V/C Ratio 0.003 - - 0.061 0.002 0.002 - - HCM Control Delay (s) 7.7 0 - 12.1 12.6 0 - HCM Lane LOS A A - B A - HCM Lane LOS - -	HCM LOS	B			B			0.1			0.1		
Minor Lane/Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR Capacity (veh/h) 1323 - - 537 509 1409 - - HCM Lane V/C Ratio 0.003 - - 0.061 0.002 0.002 - - HCM Control Delay (s) 7.7 0 - 12.1 12.1 7.6 0 - HCM Lane LOS A A - B B A - HCM Stin Wille Q(veh) 0 - - 0.2 0 0 -	1000 200	5											
Capacity (veh/h) 1323 - - 537 509 1409 - HCM Lane V/C Ratio 0.003 - - 0.061 0.002 - - HCM Lane V/C Ratio 0.003 - - 0.061 0.002 - - HCM Control Delay (s) 7.7 0 - 12.1 12.6 0 - HCM Lane LOS A A - B A - HCM Stink Økilie Q(veh) 0 - - 0.2 0 -	Minor Lane/Maior Mym	t	NBI	NBT	NBR	FBI n1\	NBI n1	SBI	SBT	SBR			
Control Delay (s) 0.003 - 0.061 0.002 - - HCM Lane V/C Ratio 0.003 - 0.061 0.002 0.002 - - HCM Control Delay (s) 7.7 0 - 12.1 12.1 7.6 0 - HCM Lane LOS A A - B A - HCM Lane LOS A -	Canacity (veh/h)		1323	-	-	537	509	1409		-			
HCM Control Delay (s) 7.7 0 - 12.1 12.1 7.6 0 - HCM Lane LOS A A - B B A A - HCM 95th %tile Q(yeb) 0 - 0 2 0 0 -	HCM Lane V/C Ratio		0.003			0.061	0.002	0.002	_				
HCM Lane LOS A A - B B A A - HCM Stih (%tile Q/yeh) 0 - 02 0 0	HCM Control Delay (s)		77	0	-	12 1	12 1	7.6	0	-			
HCM 95th %tile Q(veh) 0 02 0 0	HCM Lane LOS		A	A		B	B	Α	A				
······································	HCM 95th %tile Q(veh)	1	0	-	-	0.2	0	0	-				

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 1

Paradigm Transportation Solutions Limited

Appendix E

2027 Total Traffic Operations Reports



	≯	-	\mathbf{r}	1	-	*	1	1	1	1	÷.	~
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations		4			4			4			ф,	
raffic Volume (vph)	23	1	0	0	2	10	1	226	0	4	111	25
uture Volume (vph)	23	1	0	0	2	10	1	226	0	4	111	25
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
ane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
ane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.884						0.976	
It Protected		0.954									0.998	
Satd. Flow (prot)	0	1813	0	0	1413	0	0	1881	0	0	1741	0
It Permitted		0.954									0.998	
Satd. Flow (perm)	0	1813	0	0	1413	0	0	1881	0	0	1741	0
ink Speed (mph)		30			30			30			30	
ink Distance (ft)		1815			1890			1980			668	
ravel Time (s)		41.3			43.0			45.0			15.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
leavy Vehicles (%)	0%	0%	0%	0%	0%	22%	0%	1%	0%	25%	7%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
/lid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	27	1	0	0	2	12	1	266	0	5	131	29
Shared Lane Traffic (%)												
ane Group Flow (vph)	0	28	0	0	14	0	0	267	0	0	165	0
Sign Control		Stop			Stop			Free			Free	
ntersection Summary												

HCM 6th TWSC 1: Spragues Road & Greenfield Road (190439) Edworthy Pits TIS 2027 Total AM

Int Delay, s/veh 1.1 Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR Lane Configurations - 0 - - 0 - - 0 - - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -
Movement EBL EBT EBR WBL WBT WBR NBL NBT NBT SBL SBT SBR Lane Configurations
Lane Configurations 4 4 4 4 4 4 4 4 Traffic Vol, veh/h 23 1 0 0 2 10 1 226 0 4 111 25 Conflicting Peds, #hr 0 2 12 1 266 0 0 0 0 0 0 0
Iraffic Vol, veh/h 23 1 0 0 2 10 1 226 0 4 111 25 Future Vol, veh/h 23 1 0 0 2 10 1 226 0 4 111 25 Future Vol, veh/h 23 1 0 0 2 10 1 226 0 4 111 25 Future Vol, veh/h 23 1 0 0 2 10 1 226 0 4 111 25 Conflicting Peds, #/hr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 25 7 0 Veh in Median Storage, # 0 0 0 2 12 1 266 0
Future Vol, veh/h 23 1 0 0 2 10 1 226 0 4 111 25 Conflicting Peds, #/hr 0 </td
Conflicting Peds, #/hr 0
Sign Control Stop Free Free
RT Channelized - None Non
Storage Length - - - - - - - - - - - - - - - - - - 0 - 1 1 1 1 1 1 1 1 1
Veh in Median Storage, # 0 - 0 0 0 0 2 0 1 0 25 7 0 Median Storage, % 0 0 0 2 12 1 266 0 0 25 7 0 0 25 7 0 0 25 7 0 131 29 0 331 29 131 29 131 29 131
Grade, % - 0 0 - 0 0 0 0 0 0 0 0 0 0 0 0 2 0 1 0 0 2 1 0 0 2 1 0 0 2 1 1 0 2 1 1 0 2 1 1 0 0 2 1 1 0 0 2 1 1 0 0 2 1 1 0 0 2 1 1 0 0 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1<
Peak Hour Factor 85
Heavy Vehicles, % 0 0 0 0 22 0 1 0 25 7 0 Mvmt Flow 27 1 0 0 2 12 1 266 0 5 131 29 Major/Minor Minor/2 Minor/1 Major/1 Major/1 Major/2 Conflicting Flow All 431 424 146 424 438 266 160 0 0 266 0 0 Stage 1 156 156 - 268 268 - <t< td=""></t<>
Mvmt Flow 27 1 0 0 2 12 1 266 0 5 131 29 Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 431 424 146 424 438 266 160 0 266 0 0 Stage 1 156 156 - 268 268 -
Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 431 424 146 424 438 266 160 0 0 266 0 0 Stage 1 156 156 - 268 268 -
Major/Minor Minor2 Minor1 Major1 Major2 Conflicting Flow All 431 424 146 424 438 266 160 0 0 266 0 0 Stage 1 156 156 - 268 268 -
Conflicting Flow All 431 424 146 424 438 266 160 0 0 266 0 0 Stage 1 156 156 - 268 -
Stage 1 156 156 - 268 268 -
Stage 2 275 268 - 156 170 -
Critical Hdwy 7.1 6.5 6.2 7.1 6.5 6.42 4.1 - - 4.35 - 2 1176 - - - - - - - - - - - - -
Critical Hdwy Stg 1 6.1 5.5 -
Critical Hdwy Stg 2 6.1 5.5 6.1 5.5 -<
Follow-up Hdwy 3.5 4 3.3 3.5 4 3.498 2.2 - 2.425 - Pot Cap-1 Maneuver 538 525 906 544 515 772 1432 - - 1176 - Stage 1 851 772 - 742 691 - - - - - Stage 2 736 691 - 742 691 - - - - - Platoon blocked, % - - - - - - - - - Mov Cap-1 Maneuver 525 522 906 541 512 727 1432 - 1176 - Mov Cap-2 Maneuver 525 522 906 541 512 - - - - Stage 1 850 768 - 741 690 - - - - Stage 2 721 690 - 845 758 - - - - Approach EB WB NB SB HCM LOS B B B
Pot Cap-1 Maneuver 538 525 906 544 515 727 1432 - - 1176 -
Stage 1 851 772 742 691 - - - - - - Stage 2 736 691 - 851 762 - - - - - - Platon blocked, % - - - - - - - - - Mov Cap-1 Maneuver 525 522 906 541 512 727 1432 - - 1176 - Mov Cap-2 Maneuver 525 522 - 541 512 - - - - - - Stage 1 850 768 - 741 690 - - - - - - Stage 2 721 690 - 845 758 - - - - - - Approach EB WB NB SB HCM Control Delay, s 12.2 10.4 0 0.2 HCM LOS B B B - - - -
Stage 2 736 691 - 851 762 -
Platon blocked, % - - - - - Mov Cap-1 Maneuver 525 522 906 541 512 727 1432 - - 1176 - Mov Cap-2 Maneuver 525 522 - 541 512 - - - - - Stage 1 850 768 - 741 690 - - - - - Stage 2 721 690 - 845 758 - - - - Approach EB WB NB SB HCM Control Delay, s 12.2 10.4 0 0.2 HCM LOS B B
Mov Cap-1 Maneuver 525 522 906 541 512 727 1432 - - 1176 -
Mov Cap-2 Maneuver 525 522 - 541 512 - </td
Stage 1 850 768 - 741 690 -
Stage 2 721 690 - 845 758 - 1 1
Approach EB WB NB SB HCM Control Delay, s 12.2 10.4 0 0.2 HCM LOS B B B B B
Approach EB WB NB SB HCM Control Delay, s 12.2 10.4 0 0.2 HCM LOS B B B B B
HCM Control Delay, s 12.2 10.4 0 0.2 HCM LOS B B
HCM LOS B B
Minor Lane/Maior Mymt NBL NBT NBR FBL n1WBL n1 SBL SBT SBR
Canacity (veb/b) 1432 525 679 1176
HCM Lane V/C Ratio 0.001 0.054 0.021 0.004
HCM Control Delay (s) 7.5 0 - 12.2 10.4 8.1 0 -
HCM Lane LOS A A - B B A A -

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 1

Paradigm Transportation Solutions Limited

	≯	-	\mathbf{r}	1	-	•	1	1	1	- \	÷.	~
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations		\$			\$			\$			\$	
raffic Volume (vph)	0	27	0	0	60	0	0	20	0	0	20	(
uture Volume (vph)	0	27	0	0	60	0	0	20	0	0	20	(
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
ane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		(
Storage Lanes	0		0	0		0	0		0	0		(
aper Length (ft)	25			25			25			25		
ane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
irt												
It Protected												
Satd. Flow (prot)	0	1863	0	0	1863	0	0	950	0	0	950	(
It Permitted												
Satd. Flow (perm)	0	1863	0	0	1863	0	0	950	0	0	950	(
ink Speed (mph)		30			30			30			30	
ink Distance (ft)		755			2769			220			208	
ravel Time (s)		17.2			62.9			5.0			4.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Browth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
leavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	100%	2%	2%	100%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	(
Parking (#/hr)												
/lid-Block Traffic (%)		0%			0%			0%			0%	
dj. Flow (vph)	0	29	0	0	65	0	0	22	0	0	22	(
Shared Lane Traffic (%)												
ane Group Flow (vph)	0	29	0	0	65	0	0	22	0	0	22	(
Sign Control		Free			Free			Stop			Stop	
ntersection Summary												

HCM 6th TWSC 2: Alps Site Access S/Alps Site Access N & Alps Road (190439) Edworthy Pits TIS 2027 Total AM

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4			4	
Traffic Vol, veh/h	0	27	0	0	60	0	0	20	0	0	20	0
Future Vol, veh/h	0	27	0	0	60	0	0	20	0	0	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-		None			None	-		None	-		None
Storage Length			-				-	-	-	-		
Veh in Median Storage	e,# -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	100	2	2	100	2
Mvmt Flow	0	29	0	0	65	0	0	22	0	0	22	0
Major/Minor	Major1			Major2		1	Minor1			Minor2		
Conflicting Flow All	65	0	0	29	0	0	105	94	29	105	94	65
Stage 1	-	-	-	-	-	-	29	29	-	65	65	-
Stage 2	-		-	-		-	76	65	-	40	29	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	7.5	6.22	7.12	7.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	6.5	-	6.12	6.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	6.5	-	6.12	6.5	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.9	3.318	3.518	4.9	3.318
Pot Cap-1 Maneuver	1537	-	-	1584	-	-	875	643	1046	875	643	999
Stage 1	-	-	-	-	-	-	988	711	-	946	683	-
Stage 2	-	-	-		-	-	933	683	-	975	711	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1537	-	-	1584	-	-	852	643	1046	852	643	999
Mov Cap-2 Maneuver	-	-	-	-	-	-	852	643	-	852	643	-
Stage 1	-	-	-	-		-	988	711	-	946	683	-
Stage 2	-	-	-	-	-	-	903	683	-	945	711	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			10.8			10.8		
HCM LOS							B			B		
Miner Lene/Meier Mar			EDI	EDT	EDD	W/D/	WDT	MDD				
Minor Lane/Major MVn	iit I		EBL	ERI	EBK	WBL	WBI	WBR	SBLUJ	_	_	_
Capacity (veh/h)		643	1537			1584	-		643			
HCM Lane V/C Ratio		0.034	-	-		-	-	-	0.034			
HCIVI Control Delay (s))	10.8	0	-	-	0	-	-	10.8			
HCM Lane LOS	,	B	A		-	A	-	-	B	_	_	_
HCIVI 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1			

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 3

Paradigm Transportation Solutions Limited

3: Spragues Road	& Sprag	gues S	ite Aco	cess N			(190439) Edwortity Fits The 2027 Total AM
	•	7	1	Ť	Ŧ	1	
ane Group	EBL	EBR	NBL	NBT	SBT	SBR	
ane Configurations	Υ			ર્સ	eî		
Fraffic Volume (vph)	0	20	20	259	144	0	
uture Volume (vph)	0	20	20	259	144	0	
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
ane Width (ft).	12	12	12	12	12	12	
Grade (%)	0%			0%	0%		
Storage Length (ft)	0	0	0			0	
Storage Lanes	1	0	0			0	
Taper Length (ft)	25		25				
ane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt	0.865						
It Protected				0.996			
Satd. Flow (prot)	1611	0	0	1855	1863	0	
It Permitted				0.996			
Satd. Flow (perm)	1611	0	0	1855	1863	0	
ink Speed (mph)	30			30	30		
ink Distance (ft).	640			453	2080		
ravel Time (s)	14.5			10.3	47.3		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Growth Factor	100%	100%	100%	100%	100%	100%	
leavy Vehicles (%)	2%	2%	2%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Aid-Block Traffic (%)	0%			0%	0%		
Adj. Flow (vph)	0	22	22	282	157	0	
Shared Lane Traffic (%)	00	0	0	004	457	0	
ane Group Flow (vph)	22	0	0	304	157	0	
sign Control	Stop			Free	Free		
ntersection Summary							
Area Type:	Other						
Control Type: Unsignalized							

HCM 6th TWSC 3: Spragues Road & Spragues Site Access N (190439) Edworthy Pits TIS 2027 Total AM

Intersection						
Int Delay, s/veh	0.7					
Movement	FBI	FRR	NBI	NRT	SBT	SBP
Lane Configurations	M	LDIK		12	1	0.DIT
Traffic Vol. veh/b	0	20	20	259	144	٥
Future Vol. veh/h	0	20	20	259	144	0
Conflicting Peds #/hr	0	0	20	200	0	0
Sign Control	Ston	Ston	Free	Free	Free	Free
RT Channelized	otop	None	1100	None	1100	None
Storage Length	-	NULLE		NULLE		NULLE
Voh in Median Storage	o # 0			-	0	
Crode %	5 ,# 0	-	-	0	0	-
Grade, %	00	- 02	- 02	00	00	- 00
Peak nour Factor	92	92	92	92	92	92
Heavy venicles, %	2	2	2	2	457	2
Mvmt Flow	0	22	22	282	157	0
Major/Minor	Minor2		Major1	1	Major2	
Conflicting Flow All	483	157	157	0		0
Stage 1	157	-	-	-	-	-
Stage 2	326	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	
Critical Hdwy Stg 2	5.42		-	-	-	
Follow-up Hdwy	3 518	3 318	2 218			
Pot Can-1 Maneuver	5/12	889	1/23	-	_	-
Stane 1	871	005	1420	_	_	-
Stage 2	731					
Diateon blocked %	731	-	-	-	-	-
Platoon blocked, %	500	000	4400	-	-	-
Mov Cap-1 Maneuver	532	889	1423	-		
Mov Cap-2 Maneuver	532	-	-	-	-	-
Stage 1	855			-		
Stage 2	731	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay s	9.2		0.5		0	
HCMLOS	A				-	
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1423	-	889	-	-
HCM Lane V/C Ratio		0.015	-	0.024	-	-
HCM Control Delay (s))	7.6	0	9.2	-	-
HCM Lane LOS		A	A	А	-	-
HCM 95th %tile Q(veh	ı)	0	-	0.1	-	-

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 5

Paradigm Transportation Solutions Limited

+. Opragues Road	a opra	jues o		00000			2021 1000174
	≯	\rightarrow	1	†	Ŧ	-	
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	- Y			<u>स</u> ्	eî 👘		
Traffic Volume (vph)	20	0	0	259	144	20	
Future Volume (vph)	20	0	0	259	144	20	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	12	12	12	12	
Grade (%)	0%			0%	0%		
Storage Length (ft)	0	0	0			0	
Storage Lanes	1	0	0			0	
Taper Length (ft)	25		25				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt					0.983		
Fit Protected	0.950						
Satd. Flow (prot)	1770	0	0	1863	1831	0	
Flt Permitted	0.950						
Satd. Flow (perm)	1770	0	0	1863	1831	0	
ink Speed (mph)	30			30	30		
ink Distance (ft)	792			668	869		
Travel Time (s)	18.0			15.2	19.8		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Vid-Block Traffic (%)	0%			0%	0%		
Adj. Flow (vph)	22	0	0	282	157	22	
Shared Lane Traffic (%)							
ane Group Flow (vph)	22	0	0	282	179	0	
Sign Control	Stop			Free	Free		
ntersection Summary							
Area Type:	Other						
Control Type: Unsignalized							

HCM 6th TWSC 4: Spragues Road & Spragues Site Access S (190439) Edworthy Pits TIS 2027 Total AM

Intersection						
Int Delay, s/veh	0.5					
Movement	EBI	EBR	NBI	NBT	SBT	SBR
Lane Configurations	M	LDIX	HDL	1	1	CDIT
Traffic Vol. veh/h	20	0	0	259	144	20
Future Vol. veh/h	20	0	0	259	144	20
Conflicting Peds #/hr	20	0	0	200	0	20
Sign Control	Ston	Ston	Free	Free	Free	Free
DT Channelized	Stop	Nono	1166	Nono	1166	None
Storage Length	-	NUNE		NUTIC		NULLE
Veh in Median Storage	o # 0	-		-	0	
Crode %	e,# U	-	-	0	0	-
Grade, %	02	-	-	00	00	- 00
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	0	0	282	157	- 22
Major/Minor	Minor2		Major1	1	Major2	
Conflicting Flow All	450	168	179	0	-	0
Stage 1	168	-	-	-	-	-
Stage 2	282					
Critical Hdwy	6.42	6.22	1 12	-	-	_
Critical Hdwy Sta 1	5.42	0.22	7.12	-	-	-
Critical Hdury Stg 1	5.42	-		-	-	-
Follow up Edun	2 510	2 210	2 210	-	-	-
Pollow-up Huwy	5.510	3.310	1207	-	-	-
Pot Cap-1 ivianeuver	100	0/0	1397	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	766	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	567	876	1397	-	-	-
Mov Cap-2 Maneuver	567	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	766	-	-	-	-	-
Annroach	FB		NR		SB	
HCM Control Delay	11.6		0		00	
LCM LOS	D		0		0	
	D					
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1397	-	567	-	-
HCM Lane V/C Ratio		-	-	0.038	-	-
HCM Control Delay (s))	0	-	11.6	-	-
HCM Lane LOS	/	A		B		
HCM 95th %tile O(veh	n)	0	-	0.1	-	-
		0		v. I		

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 7

Paradigm Transportation Solutions Limited

		\rightarrow	\mathbf{r}	-	-		1	- †	1	- >	÷.	-
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
ane Configurations		\$			\$			\$			\$	
raffic Volume (vph)	26	2	1	0	1	0	3	159	0	2	210	16
uture Volume (vph)	26	2	1	0	1	0	3	159	0	2	210	16
leal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
ane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
irade (%)		0%			0%			0%			0%	
torage Length (ft)	0		0	0		0	0		0	0		0
torage Lanes	0		0	0		0	0		0	0		0
aper Length (ft)	25			25			25			25		
ane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ed Bike Factor												
rt		0.996									0.991	
It Protected		0.957						0.999				
atd. Flow (prot)	0	1811	0	0	1900	0	0	1844	0	0	1849	0
It Permitted		0.957						0.999				
atd. Flow (perm)	0	1811	0	0	1900	0	0	1844	0	0	1849	0
ink Speed (mph)		30			30			30			30	
ink Distance (ft)		1815			1890			1980			668	
ravel Time (s)		41.3			43.0			45.0			15.2	
onfl. Peds. (#/hr)												
onfl. Bikes (#/hr)												
eak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
rowth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
eavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
us Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
arking (#/hr)												
lid-Block Traffic (%)		0%			0%			0%			0%	
dj. Flow (vph)	29	2	1	0	1	0	3	179	0	2	236	18
hared Lane Traffic (%)												
ane Group Flow (vph)	0	32	0	0	1	0	0	182	0	0	256	0
ign Control		Stop			Stop			Free			Free	
tersection Summary												

HCM 6th TWSC 1: Spragues Road & Greenfield Road (190439) Edworthy Pits TIS 2027 Total PM

Intersection											
Int Delay, s/veh 1											
Movement EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	\$			4			4			4	
Traffic Vol, veh/h 26	2	1	0	1	0	3	159	0	2	210	16
Future Vol, veh/h 26	2	1	0	1	0	3	159	0	2	210	16
Conflicting Peds, #/hr 0	0	0	0	0	0	0	0	0	0	0	0
Sign Control Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized -	-	None	-	-	None	-	-	None	-	-	None
Storage Length -	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, # -	0	-	-	0	-	-	0	-	-	0	-
Grade, % -	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor 89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, % 0	0	0	0	0	0	0	3	0	0	2	0
Mvmt Flow 29	2	1	0	1	0	3	179	0	2	236	18
Major/Minor Minor2	Minor1		Ма		Major1	or1		Major2		_	
Conflicting Flow All 435	434	245	436	443	179	254	0	0	179	0	0
Stage 1 249	249	-	185	185	-	-	-	-	-	-	-
Stage 2 186	185	-	251	258	-	-	-	-	-	-	-
Critical Hdwy 7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1 6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2 6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy 3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver 535	518	799	534	512	869	1323	-	-	1409	-	-
Stage 1 759	704	-	821	751	-	-	-	-	-	-	-
Stage 2 820	751	-	758	698	-	-	-	-	-	-	-
Platoon blocked, %							-	-		-	-
Mov Cap-1 Maneuver 532	515	799	529	509	869	1323	-	-	1409	-	-
Mov Cap-2 Maneuver 532	515	-	529	509	-	-	-	-	-	-	-
Stage 1 757	703	-	819	749							-
Stage 2 816	749	-	753	697		-	-	-	-	-	-
Approach EB	_	_	WB	_		NB			SB	_	
HCM Control Delay, s 12.1			12.1			0.1			0.1		
HCM LOS B			В								
Minor Lane/Major Mymt	NBI	NBT	NRR	EBI n1\	VRI n1	SBL	SBT	SBR			
Capacity (yeb/b)	1323	-	-	537	509	1/109		-			
HCM Lane V/C Ratio	003			0.061	0.002	0.002					
HCM Control Delay (s)	77	0	-	12 1	12 1	7.6	0	-			
HCM Lane LOS	A	A		B	B	A	A				
HCM 05th % tile O(yeb)	0			0.2	0	0	-	-			

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 1

Paradigm Transportation Solutions Limited
	≯	-	\mathbf{r}	1	-		1	1	1	- \	÷.	-
ane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
ane Configurations		÷			\$			\$			\$	
Fraffic Volume (vph)	0	68	0	0	42	0	0	20	0	0	20	(
uture Volume (vph)	0	68	0	0	42	0	0	20	0	0	20	(
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
ane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		(
Storage Lanes	0		0	0		0	0		0	0		(
aper Length (ft)	25			25			25			25		
ane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
irt												
It Protected												
Satd. Flow (prot)	0	1863	0	0	1863	0	0	950	0	0	950	(
It Permitted												
Satd. Flow (perm)	0	1863	0	0	1863	0	0	950	0	0	950	(
ink Speed (mph)		30			30			30			30	
ink Distance (ft)		755			2769			220			208	
Travel Time (s)		17.2			62.9			5.0			4.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
leavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	100%	2%	2%	100%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	(
Parking (#/hr)												
/lid-Block Traffic (%)		0%			0%			0%			0%	
dj. Flow (vph)	0	74	0	0	46	0	0	22	0	0	22	(
Shared Lane Traffic (%)												
ane Group Flow (vph)	0	74	0	0	46	0	0	22	0	0	22	(
Sign Control		Free			Free			Stop			Stop	
ntersection Summary												

HCM 6th TWSC 2: Alps Site Access S/Alps Site Access N & Alps Road (190439) Edworthy Pits TIS 2027 Total PM

Intersection	_	_	_	_	_	_	_	_	_	_	_	_
Intersection	2.0											
init Delay, s/ven	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4			4	
Traffic Vol, veh/h	0	68	0	0	42	0	0	20	0	0	20	0
Future Vol, veh/h	0	68	0	0	42	0	0	20	0	0	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-		None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage	e,# -	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-		0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	100	2	2	100	2
Mymt Flow	0	74	0	0	46	0	0	22	0	0	22	0
Major/Minor	Major		_	Maiaro			liner	_		Minor	_	
	wajor'i			iviajor2				400	74		400	40
Conflicting Flow All	46	0	0	/4	0	0	131	120	/4	131	120	46
Stage 1	-		-	-			/4	/4	-	46	46	
Stage 2	-	-	-	-		-	5/	46	-	85	/4	-
Critical Hdwy	4.12		-	4.12			7.12	1.5	6.22	7.12	7.5	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	6.5	-	6.12	6.5	-
Critical Hdwy Stg 2	-			-	1.1	-	6.12	6.5	-	6.12	6.5	-
Follow-up Hdwy	2.218	-	-	2.218		-	3.518	4.9	3.318	3.518	4.9	3.318
Pot Cap-1 Maneuver	1562			1526	-		841	620	988	841	620	1023
Stage 1		-	-				935	676	-	968	698	-
Stage 2		-	-			-	955	698		923	676	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1562	-	-	1526	-	-	818	620	988	818	620	1023
Mov Cap-2 Maneuver	-	-	-	-	-	-	818	620	-	818	620	-
Stage 1			-	-		-	935	676	-	968	698	-
Stage 2			-				925	698	-	893	676	-
Approach	EB			WB			NB			SB		
HCM Control Delay s	0			0			11			11		
HCM LOS	0			. 0			B			B		
				_			0					
					-		11/0					
Minor Lane/Major Mvn	nt l	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1			
Capacity (veh/h)		620	1562	-	-	1526		-	620			
HCM Lane V/C Ratio		0.035	-	-		-		-	0.035			
HCM Control Delay (s))	11	0	-	-	0		-	11			
HCM Lane LOS		В	A	-	-	A	-	-	В			
HCM 95th %tile Q(veh	1)	0.1	0	-	-	0	-	-	0.1			

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 3

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 4

3: Spragues Road	& Spra	gues S	ite Aco	cess N			2027 Total PN
	≯	$\mathbf{\hat{z}}$	1	1	Ļ	-	
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	Y			ર્સ	4Î		
Traffic Volume (vph)	0	20	20	185	242	0	
Future Volume (vph)	0	20	20	185	242	0	
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
ane Width (ft)	12	12	12	12	12	12	
Grade (%)	0%			0%	0%		
Storage Length (ft)	0	0	0			0	
Storage Lanes	1	0	0			0	
Taper Length (ft)	25		25				
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt	0.865						
Fit Protected				0.995			
Satd. Flow (prot)	1611	0	0	1853	1863	0	
Flt Permitted				0.995			
Satd. Flow (perm)	1611	0	0	1853	1863	0	
Link Speed (mph)	30			30	30		
_ink Distance (ft)	640			453	2080		
Travel Time (s)	14.5			10.3	47.3		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Vid-Block Traffic (%)	0%			0%	0%		
Adj. Flow (vph)	0	22	22	201	263	0	
Shared Lane Traffic (%)							
ane Group Flow (vph)	22	0	0	223	263	0	
Sign Control	Stop			Free	Free		
ntersection Summary							
Area Type:	Other						
Control Type: Unsignalized							

HCM 6th TWSC 3: Spragues Road & Spragues Site Access N (190439) Edworthy Pits TIS 2027 Total PM

Intersection			_			
Int Delay, s/veh	0.8					
Mayamant	EDI		NDI	NDT	CDT	000
Novement	EBL	ERK	NBL	INBI	5B1	SBK
Lane Configurations	۳.	00	00	405	•	0
Traπic vol, ven/n	0	20	20	105	242	0
Future Vol, ven/n	0	20	20	185	242	0
Conflicting Peds, #/nr	0	0	- 0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None		None		None
Storage Length	0	-	-	-	-	-
Veh in Median Storage	e,#0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	22	22	201	263	0
Major/Minor	Minor?		Major1		Major?	
	E00	060	062	0	viajuiz	0
Conflicting Flow All	000	203	203	0	-	0
Stage 1	203	-		-		-
Stage 2	245	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12			
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	
Pot Cap-1 Maneuver	525	776	1301	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	796	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	515	776	1301	-	-	-
Mov Cap-2 Maneuver	515	-	-	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	796					
Oldge 2	150	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	9.8		0.8		0	
HCM LOS	A					
Minor Long/Major Mum	nt	NDI	NDT	EDI n1	CDT	CDD
	III	INDL	INDI	EDLIII	SDI	SDR
Capacity (veh/h)		1301		//6		
HCM Lane V/C Ratio		0.017	-	0.028	-	-
HCM Control Delay (s))	7.8	0	9.8	-	-
HCM Lane LOS		A	A	A	-	-
	N	0.1		0.1		

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 5

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 6

4: Spragues Road	& Sprac	ues S	ite Aco	cess S			2027 Total PM
U	•	\mathbf{r}	-	Ť	Ļ	1	
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	
ane Configurations	Y			4	4Î		
Traffic Volume (vph)	20	0	0	185	242	20	
Future Volume (vph)	20	0	0	185	242	20	
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
ane Width (ft)	12	12	12	12	12	12	
Grade (%)	0%			0%	0%		
Storage Length (ft)	0	0	0			0	
Storage Lanes	1	0	0			0	
Гaper Length (ft)	25		25				
ane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt					0.990		
It Protected	0.950						
Satd. Flow (prot)	1770	0	0	1863	1844	0	
It Permitted	0.950						
Satd. Flow (perm)	1770	0	0	1863	1844	0	
ink Speed (mph)	30			30	30		
ink Distance (ft)	792			668	869		
Fravel Time (s)	18.0			15.2	19.8		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Vid-Block Traffic (%)	0%			0%	0%		
Adj. Flow (vph)	22	0	0	201	263	22	
Shared Lane Traffic (%)						-	
ane Group Flow (vph)	22	0	0	201	285	0	
Sign Control	Stop			Free	Free		
ntersection Summary							
Area Type:	Other						
ontrol Type: Unsignalized							
ntersection Capacity Utiliza	ation 23.9%			IC	CU Level	of Service A	
Analysis Period (min) 15							

HCM 6th TWSC 4: Spragues Road & Spragues Site Access S

(190439) Edworthy Pits TIS 2027 Total PM

Intersection						
Int Delay, s/veh	0.5					
Movement	ERI	ERD	MRI	NRT	CBT	CRD
		LDN	TIDL		100	-ODIX
	"f	٥	٥	105	242	20
Trainic Vol, ven/n	20	0	0	105	242	20
Future Vol, veh/h	20	0	0	185	242	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage	e,# 0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mymt Flow	22	0	0	201	263	22
		Ū	Ū			
Major/Minor	Minor2		Major1	I	Major2	
Conflicting Flow All	475	274	285	0	-	0
Stage 1	274	-	-	-	-	-
Stage 2	201	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	548	765	1277	-	-	-
Stage 1	772	-	-		-	
Stage 2	833	-	-	-	-	-
Platoon blocked %	000				-	
May Cap 1 Manauwar	E10	765	1077	-	-	-
Mov Cap-1 Waneuver	040 540	105	1211	-	-	-
wov Cap-2 waneuver	548	-	-	-		-
Stage 1	//2	-	-	-		-
Stage 2	833	-	-	-	-	-
Approach	FB		NB		SB	
HCM Control Delay	11.8	_	0	_	0	
HCM LOS	R R		0		0	
	D					
Minor Lane/Major Mvn	nt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)		1277	-	548	-	-
HCM Lane V/C Ratio			-	0.04		
HCM Control Delay (s))	0	-	11.8	-	-
HCM Lane LOS	,	A		B		
HCM 95th %tile O(veh	1)	0	-	01		-
Now Sour Joure Q(Ver	/	0	-	0.1	_	-

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 7

Paradigm Transportation Solutions Limited

Synchro 11 Report Page 8