251 Stone Church Road West
City of Hamilton
Transportation Impact Study

Paradigm Transportation Solutions Limited

March 2022
210669

ptsl.com

Project Summary

Project Number
210669

March 2022

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251 Stone Church Road West
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Executive Summary

Content

Royal Living Development Group retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study for a proposed mid-rise multi family housing building located at 251 Stone Church Road West in the City of Hamilton.

This study determines the impacts of the development traffic on the surrounding road network and identifies the recommended improvements to accommodate the site generated traffic.

Development Concept

The site concept plan includes a 4-storey mid-rise building containing approximately 161 units. Build-out is anticipated to occur by Year 2024; timing subject to market conditions.

Vehicle access to the site is proposed by a private driveway to Stone Church Road West located approximately 410 metres east of Matthews Street (centreline to centreline).

Conclusions

The main findings and conclusions of this study are as follows:

- **Base Year Traffic**: The Stone Church Road West intersections with Garth Street and West 5th Street are operating with acceptable levels of service during the weekday AM and PM peak hours. Localized congestion is occurring at the Garth Street intersection during the AM Peak hour.
- **Site Concept**: The development concept includes 161 residential units in a four-storey high-rise building. Build-out is anticipated to occur by Year 2024. Vehicle access is proposed by a private driveway to Stone Church Road West
- **Trip Generation**: The subject site is forecast to generate approximately 59 and 63 new vehicle trips during the AM and PM peak hours, respectively.
- **Background Traffic**: The study area intersections are forecast to operate with increased congestion. The Stone Church Road West intersection with Garth Street is forecast to have an overall v/c ratio greater than 0.90. The Stone Church Road West intersection West 5th Street is forecast to have an overall v/c ratio greater than 1.00 during the PM peak hour.

- **Total Traffic**: The study area intersections are forecast to operate with similar levels of service as the background traffic conditions with the inclusion of site generated traffic. No additional critical movements are noted at the study area intersections over background conditions.
- **Remedial Measures**: Traffic control signals are not warranted at the study area intersections.

  Optimization of signal timings can help manage delays at the study area intersections. Signal timing changes are not expected to fully resolve the forecast capacity issues.
- **TDM Measures**: To help manage the site's transportation impacts, the site's TDM program should included measures related to walking, cycling, transit, parking, wayfinding, and travel planning.

Recommendations

Based on the findings of this study, the following is recommended:

- The road authority should continue to monitor and adjust signal timings along the Stone Church Road West corridor to address changes in traffic volumes or travel patters that may occur over time.
- The TDM measures outlined in **Section 5.4** will help support the City's goal in encouraging sustainable travel choices by supporting alternative transportation options over the convention of frequently driving alone. The detailed TDM program can be confirmed at the site plan approval stage of development.

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1 Introduction

1.1 Overview

Royal Living Development Group retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study for a proposed mid-rise multi family housing building located at 251 Stone Church Road West in the City of Hamilton.

Figure 1.1 illustrates the site location.

The scope of the study includes:

- An assessment of the current traffic and site conditions within the study area;
- Estimates of background traffic growth;
- Estimates of additional traffic generated by the subject site;
- Analyses of the impact of the future traffic on the surrounding road network; and
- Recommend remedial measures to mitigate the additional traffic on the study area road network, if required.

Appendix A contains the pre-study consultation material and responses from the City of Hamilton. The study has been conducted in general accordance with the City of Hamilton's Traffic Impact Study Guidelines[1].

The study area intersections assessed include:

- Stone Church Road West at Garth Street (signalized);
- Stone Church Road West at Matthews Street (unsignalized);
- Stone Church Road West at West 5th Street (signalized); and
- The proposed site driveway to Stone Church Road West.

[1] Traffic Impact Study Guidelines, City of Hamilton, July 2009.

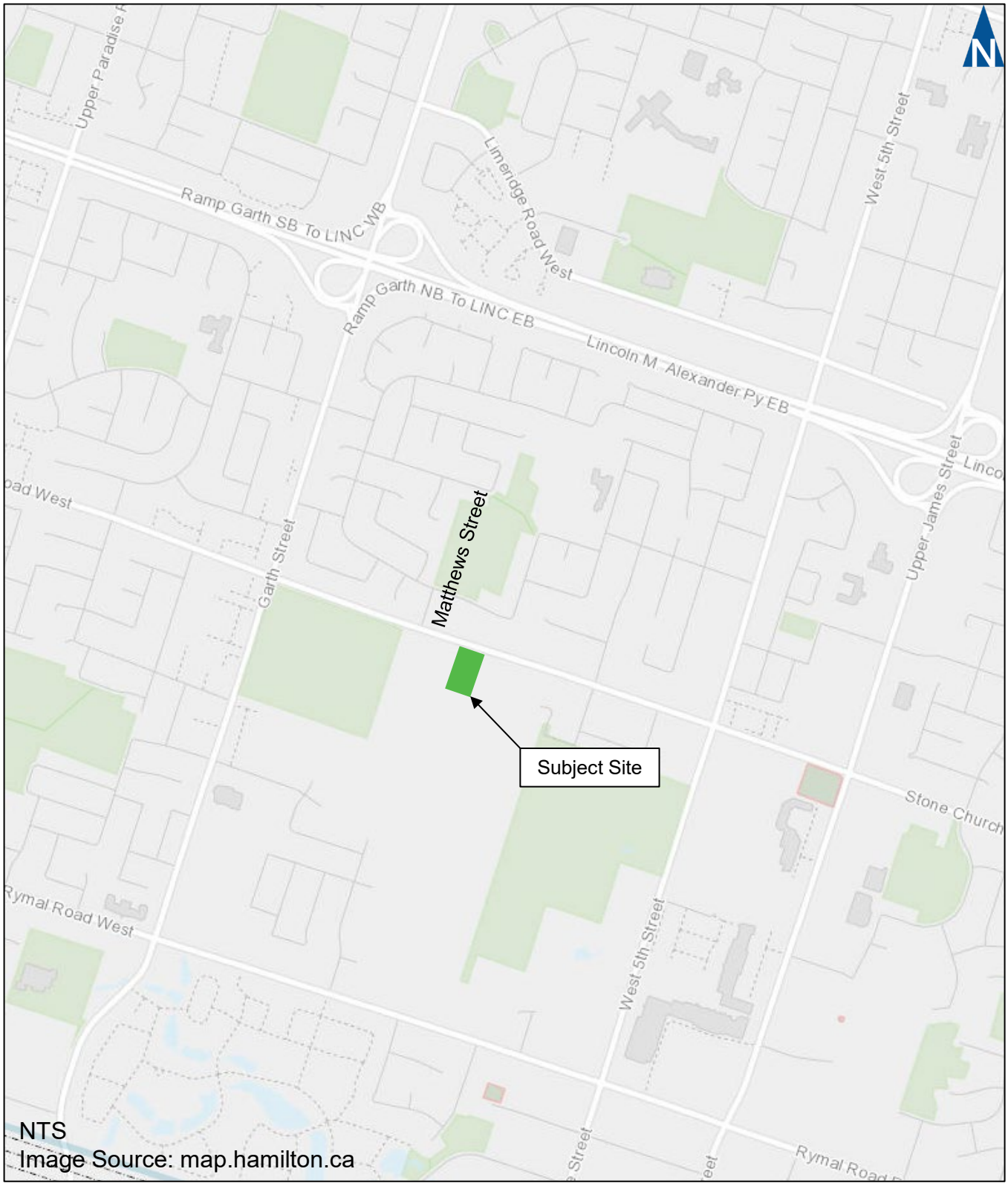

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Image Source: map.hamilton.ca

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Site Location

251 Stone Church Road West, Hamilton TIS
210669

Figure 1.1

2 Existing Conditions

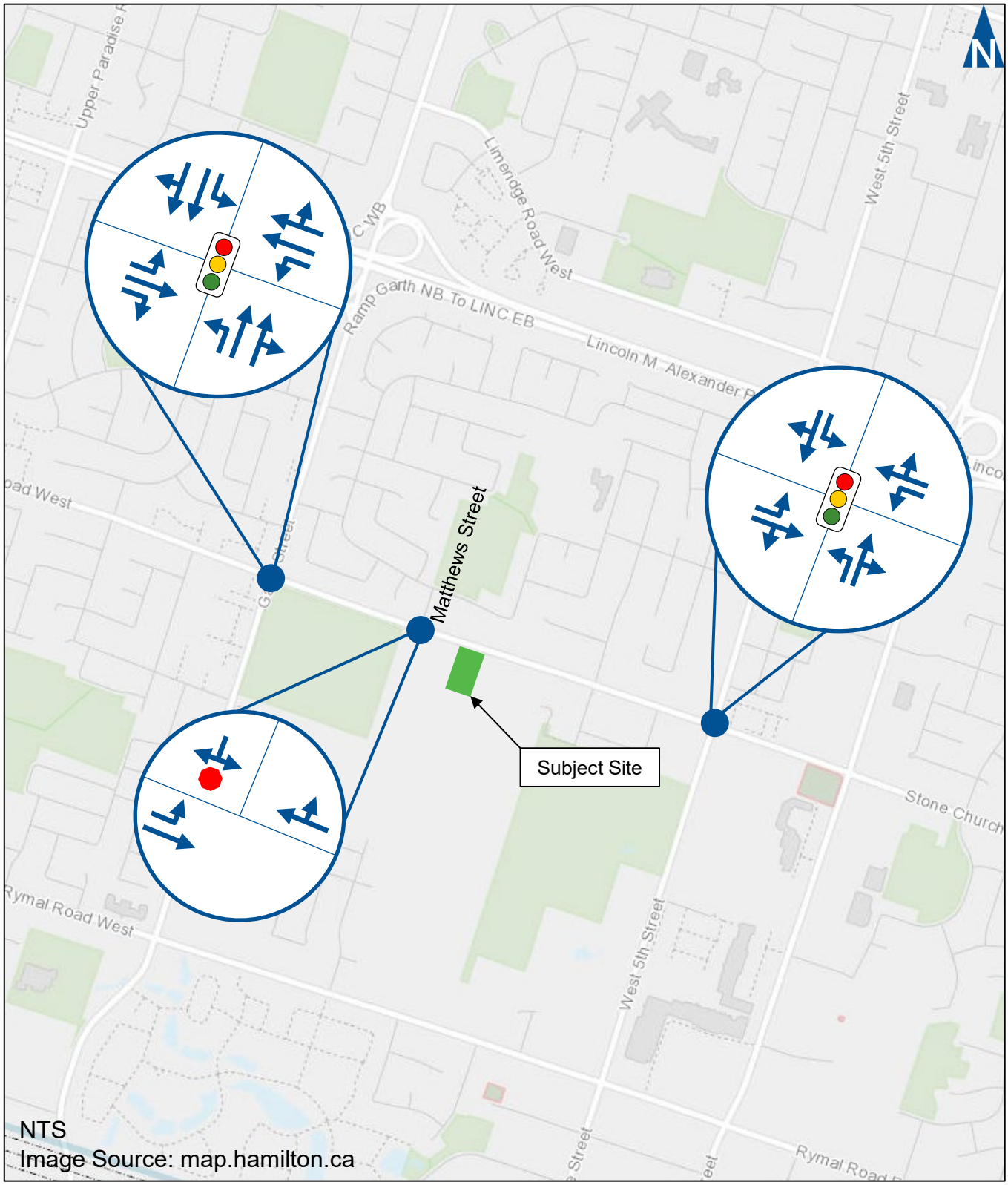
2.1 Road Network

The characteristics of the roadways within the study area are generally described as:

- **Stone Church Road West** is an east/west minor arterial[2] roadway with a speed limit of 50 km/h. The roadway has a two-way left-turn lane (TWLTL) and one travel lane per direction within the study area. Between Garth Street and Matthews Street, there is a raised center median. Sidewalks are present on both sides of the roadway within the study area. The intersections with Garth Street and West 5th Street are signalized.
- **Garth Street** is a north/south minor arterial roadway with two travel lanes per direction and speed limit of 50 km/h. North of Stone Church Road West there is a center median and south of Stone Church Road West there is a TWLTL. Sidewalks are present on both sides of the roadway within the study area.
- **West 5th Street** is a north/south minor arterial roadway with one travel lane per direction and speed limit of 50 km/h. North of Stone Church Road West there is a TWLTL and sidewalks on both sides. South of Stone Church Road West the sidewalk network is discontinuous.
- **Matthews Street** is a local roadway with one travel lane per direction. The speed limit is 40 km/h and sidewalks are present on both sides of the roadway within the study area. The speed limit was reduced in 2021 as part of the City's Neighbourhood Speed Limit Reductions program.

Figure 2.1 illustrates the existing lane configuration and traffic control at the study area intersections. All roadways within the study area operate under the jurisdiction of the City of Hamilton.

[2] *Urban Hamilton Official Plan – Schedule C – Functional Road Classification*, City of Hamilton, July 2009.



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Existing Lane Configuration & Traffic Control

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Figure 2.1

2.2 Pedestrian Network

Sidewalks are provided on both sides of Stone Church Road West, Garth Street, West 5th Street and Matthews Street. **Figure 2.2** illustrates the existing pedestrian facilities near the subject site.

Pedestrian push buttons are provided at the signalized intersections of Stone Church Road West at Garth Street and West 5th Street. Ladder crosswalks are provided at the intersection of Stone Church Road West at Garth Street.

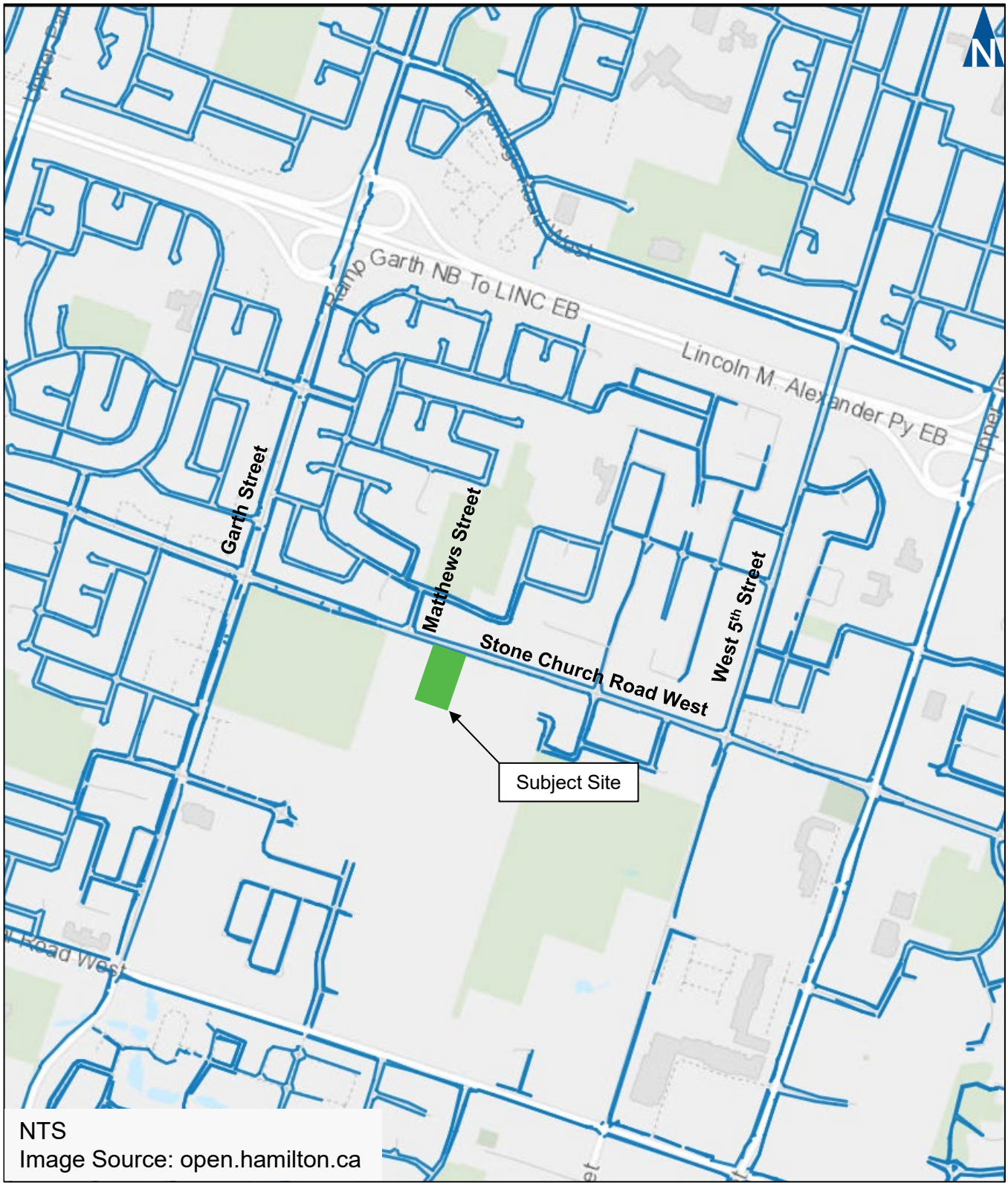

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Image Source: open.hamilton.ca

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Existing Pedestrian Network

251 Stone Church Road West, Hamilton TIS
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Figure 2.2

2.3 Cycling Network

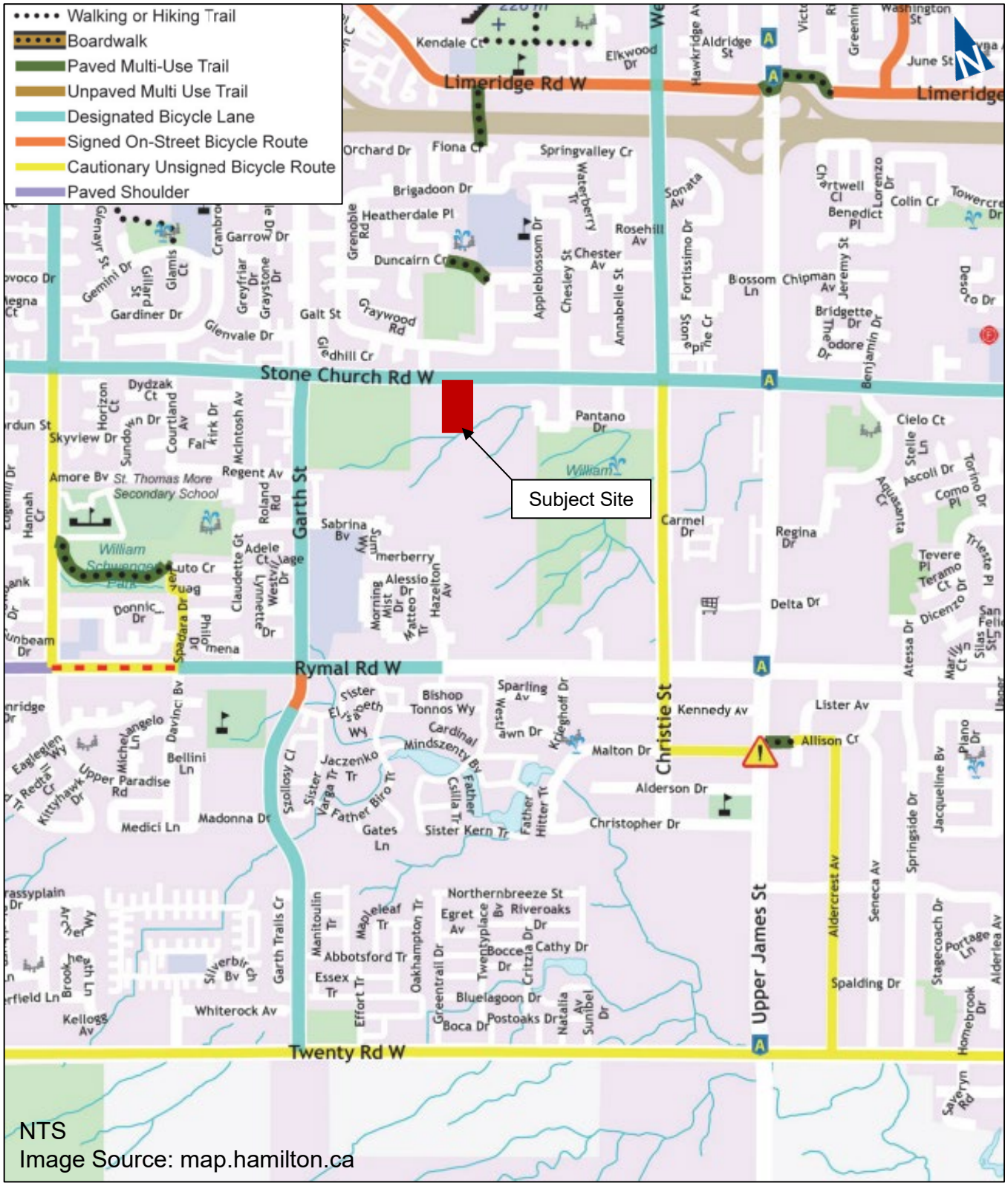
The City's cycling infrastructure consists of on-street and off-street facilities. On-street facilities comprise of cycling lanes, signed cycling routes, and paved shoulders. Off-street facilities are in the form of multi-use or informal trails.

Figure 2.3 illustrates the existing cycling network.

There are bike lanes on Stone Church Road West, on Garth Street south of Stone Church Road West and on West 5th Street north of Stone Church Road West. A multi-use path is present on both sides of Garth Street South of Stone Church Road West.

The City of Hamilton's Transportation Master Plan[3] identifies the planned cycling network for the city. The City intends to have a transportation system that offers a choice of integrated travel modes, emphasizing active transportation (walking and cycling), public transit and carpooling. The Master Plan identifies planned bike lanes on West 5th Street south of Stone Church Road West. **Figure 2.4** illustrates the future cycling network.

[3] 2018 Planned Cycling Network – Map 2 - Cycling Master Plan Review and Update, City of Hamilton.



Existing Cycling Network

251 Stone Church Road West, Hamilton TIS
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Figure 2.3

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Image Source: Hamilton's Cycling Master Plan 2018

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Future Cycling Network

2.4 Transit Service

Hamilton Street Railway (HSR) operates the public transit system in the City of Hamilton. **Figure 2.5** illustrates the existing transit network. The area is currently serviced by the following bus routes[4]:

- **Route 35 – College** travels north - south from downtown Hamilton at the MacNab Terminal Platform #6 to St. Elizabeth Village. Service runs 7 days a week from the early morning until after midnight. Weekday and weekend headways are approximately 20 to 40 minutes.
- **Route 43 – Stone Church** travels east - west from Highland at Saltfleet School to the Meadowlands Terminal. Service runs 7 days a week from the early morning until after midnight. Weekday and weekend headways are approximately 30 to 60 minutes.

All HSR buses have accessible low floors with ramps that provide entry and exit without steps. This allows users with wheelchairs, scooters, and walkers to enter and exit the vehicles more easily. The HSR provides accessible transportation services in addition to the regular transit routes.

Figure 2.6 illustrates the existing transit stops within 500 metres (5-minute walk) of the subject site[5]. The closest bus stops near the subject site are located to the west and east on Stone Church Road West and to the northwest on Chester Avenue.

[4] Route descriptions are copied from HSR's website
[5] https://www.triplinx.ca/

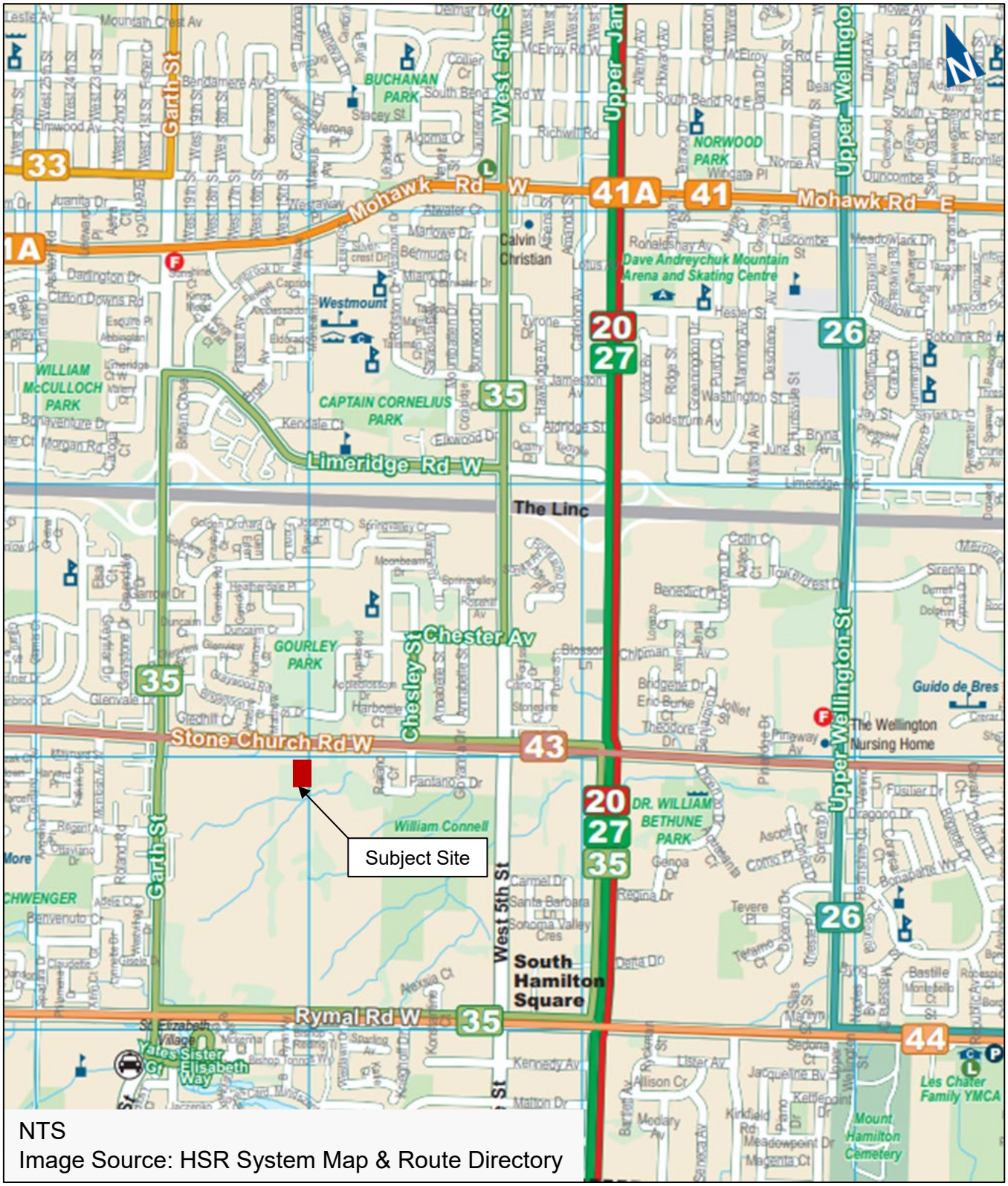

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Image Source: HSR System Map & Route Directory

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Existing Transit Network

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Existing Transit Stops

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Figure 2.6

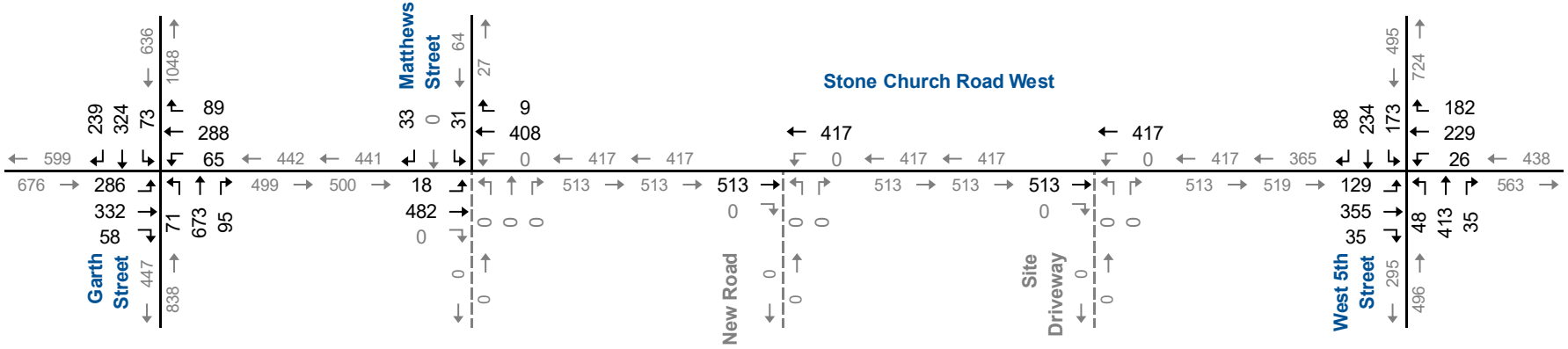
2.5 Traffic Volumes

Paradigm collected weekday AM and PM peak Hour Turning Movement Count (TMC) data at the study area intersections in November 2021. The TMC data was compared to historical TMC data collected by the City of Hamilton in September 2019 to develop an adjustment factor to normalize the 2021 traffic volumes.

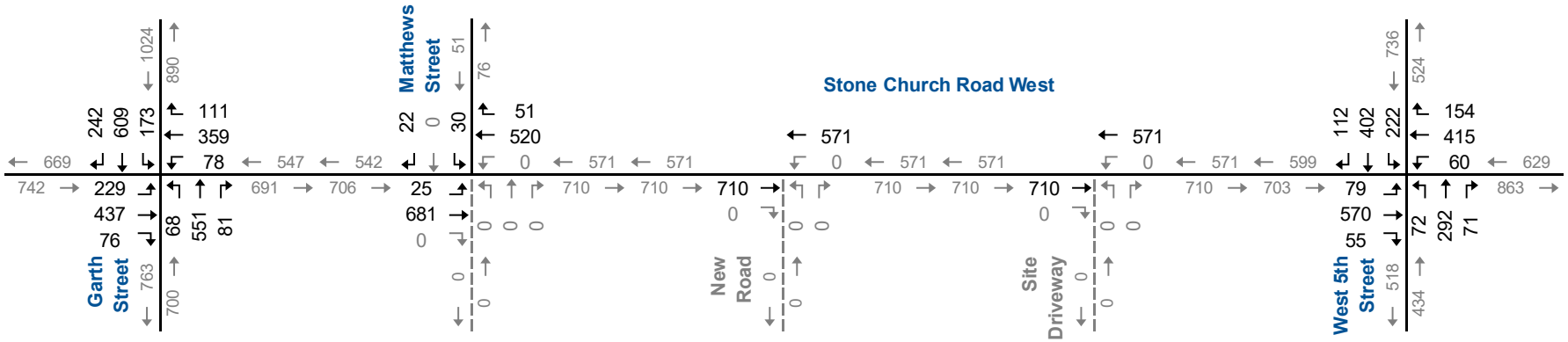
An adjustment factor of 1.10 was calculated based on the 8-hour entering volume at the Stone Church Road West intersection with Garth Street.

Figure 2.7 illustrates the base year weekday AM and PM peak hour volumes. **Appendix B** contains the TMC data and existing signal timing data.

AM Peak Hour



PM Peak Hour



Base Year Traffic Volumes

251 Stone Church Road West, Hamilton TIS
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Figure 2.7

2.6 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the efficiency of traffic flow at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles wanting to make a movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to the opposing traffic flows. The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds at signalized intersections (50 seconds at unsignalized), the movement is considered to have a LOS F and remedial measures are usually implemented if they are feasible.

The operations of the intersections in the study area were evaluated under existing conditions using Synchro 10 and HCM 2000 procedures. The intersection analysis considered three separate measures of performance:

- The LOS for each turning movement. LOS is based on the average control delay per vehicle;
- The volume to capacity ratio for each intersection; and
- 95th percentile queue length (metres), which is estimated using Synchro 10.

Under the City's TIS Guidelines, the operational analysis must include identification of signalized and unsignalized intersections where:

- Volume to Capacity ratios (v/c) for through or shared through/turning movements that exceed 0.85 at a signalized intersection;
- v/c ratios for exclusive turning movements that exceed 0.90 at a signalized intersection;
- The 95th percentile queues for an individual movement are projected to exceed available turning lane storage; and
- LOS, based on average delay per vehicle on individual movements, operate at LOS E or LOS F for unsignalized intersections.

Table 2.1 summarizes the level of service conditions.

The following critical movements are noted:

- Eastbound left-turn for Stone Church Road West and Garth Street operates at LOS F (v/c > 1.00) during the AM peak hour and is also estimated to exceed the current available storage length by approximately 69 metres and 9 meters (45 metres total) during the AM and PM peak hours, respectively.

  The additional storage needed for the eastbound left-turn movement can be accommodated by the existing TWLTL on Stone Church Road West.

Appendix C contains the detailed Synchro 10 reports.

TABLE 2.1: BASE YEAR TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Garth Street & Stone Church Road West	TCS	LOS	F	D	C	**F**	D	D	>	**D**	B	B	>	**B**	B	B	>	**B**	**D**
			Delay	179	38	28	**97**	39	40	>	**40**	12	13	>	**13**	13	12	>	**12**	**39**
			V/C	1.25	0.70	0.04		0.46	0.62	>		0.19	0.43	>		0.28	0.29	>		**0.72**
			Q	114	95	9		27	58	>		17	69	>		20	34	>		
			Stor.	45	-	45		45	-	>		80	-	>		55	-	>		
			Avail.	-69	-	36		18	-	>		63	-	>		35	-	>		
	Stone Church Road West & Matthews Street	TWSC	LOS	A	A		**A**		A	>	**A**					B		>	**B**	
			Delay	8	0		**0**		0	>	**0**					13		>	**13**	
			V/C	0.02	0.30				0.26	>						0.13		>		
			Q	1	0				0	>						4		>		
			Stor.	40	-				-	>						-		>		
			Avail.	-	-				-	>						-		>		
	West 5th Street & Stone Church Road West	TCS	LOS	B	B	>	**B**	B	C	>	**C**	C	D	>	**D**	D	C	>	**C**	**C**
			Delay	12	16	>	**15**	19	31	>	**30**	28	45	>	**44**	44	25	>	**32**	**30**
			V/C	0.34	0.51	>		0.08	0.62	>		0.15	0.83	>		0.80	0.46	>		**0.69**
			Q	17	71	>		8	113	>		15	114	>		36	62	>		
			Stor.	55	-	>		60	-	>		35	-	>		90	-	>		
			Avail.	38	-	>		52	-	>		20	-	>		54	-	>		
PM Peak Hour	Garth Street & Stone Church Road West	TCS	LOS	D	D	C	**D**	D	D	>	**D**	B	B	>	**B**	B	B	>	**B**	**C**
			Delay	53	38	26	**42**	44	40	>	**41**	15	14	>	**14**	19	16	>	**16**	**26**
			V/C	0.86	0.75	0.05		0.58	0.66	>		0.27	0.34	>		0.48	0.46	>		**0.64**
			Q	54	110	9		18	46	>		21	59	>		51	82	>		
			Stor.	45	-	45		45	-	>		80	-	>		55	-	>		
			Avail.	-9	-	36		27	-	>		59	-	>		4	-	>		
	Stone Church Road West & Matthews Street	TWSC	LOS	A	A		**A**		A	>	**A**					B		>	**B**	
			Delay	9	0		**0**		0	>	**0**					15		>	**15**	
			V/C	0.03	0.42				0.35	>						0.13		>		
			Q	1	0				0	>						4		>		
			Stor.	40	-				-	>						-		>		
			Avail.	-	-				-	>						-		>		
	West 5th Street & Stone Church Road West	TCS	LOS	C	D	>	**D**	B	C	>	**C**	D	D	>	**D**	E	D	>	**D**	**D**
			Delay	27	44	>	**42**	18	30	>	**29**	41	49	>	**48**	67	38	>	**47**	**41**
			V/C	0.27	0.78	>		0.25	0.72	>		0.56	0.81	>		0.92	0.79	>		**0.83**
			Q	22	215	>		14	182	>		27	97	>		59	122	>		
			Stor.	55	-	>		60	-	>		35	-	>		90	-	>		
			Avail.	33	-	>		46	-	>		8	-	>		31	-	>		

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

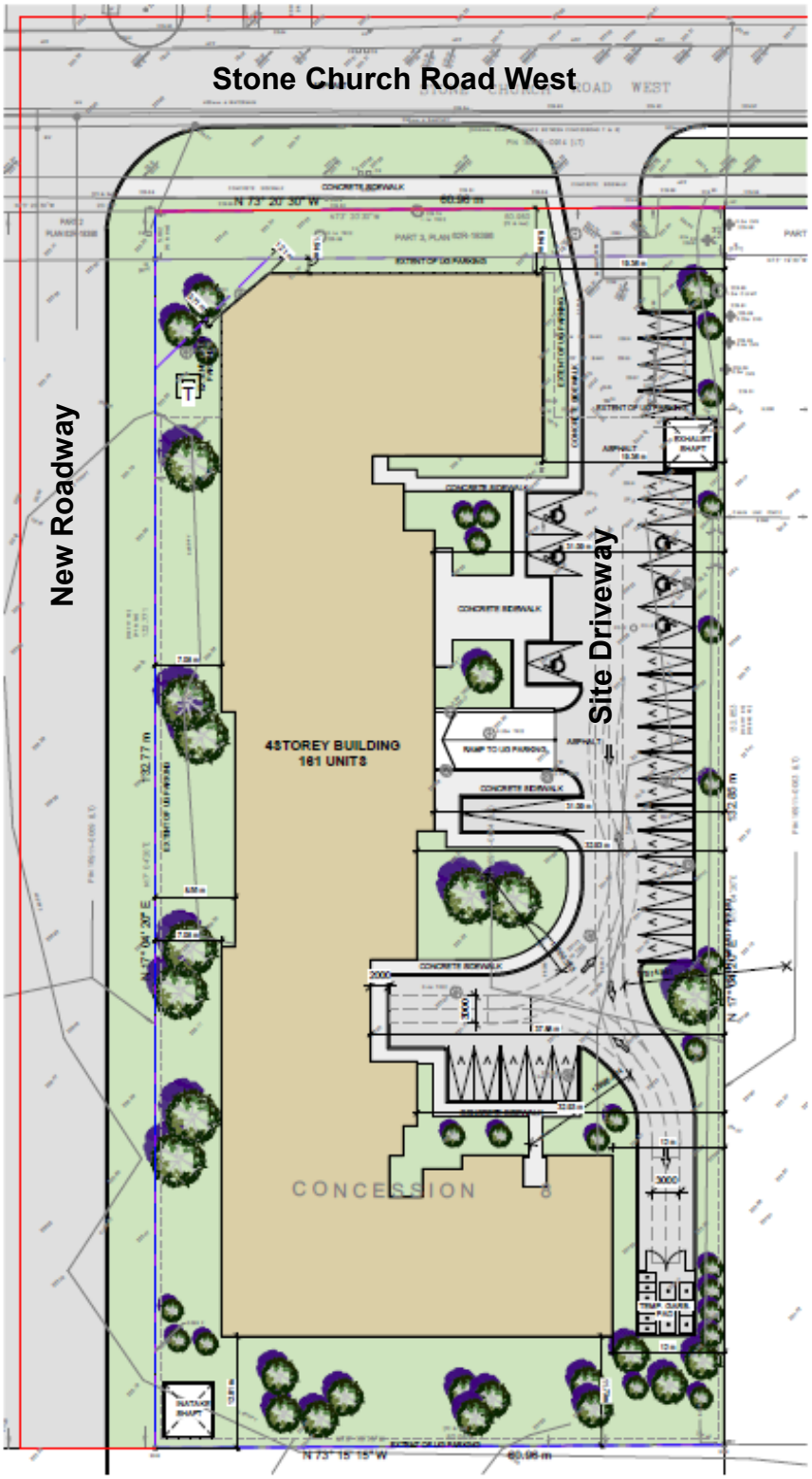
3 Development Concept

3.1 Description

The site concept plan includes a 4-storey mid-rise building containing approximately 161 units. Build-out is anticipated to occur by Year 2024; timing subject to market conditions.

Vehicle access to the site is proposed by a private driveway to Stone Church Road west located approximately 410 metres east of Matthews Street (centreline to centreline). The driveway has a width of 7.0 metres at the property line and clear throat length of approximately 13 metres. Visibility triangles measuring 5 metres by 5 metres are provided on the driveway approach.

Figure 3.1 illustrates the site concept plan.



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Site Concept Plan

3.2 Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation[6] methods are used to estimate the site trip generation. **LUC** 221 - Multifamily Housing (Mid-Rise) was used to estimate the site's trip generation, specifically the regression equations.

As requested by the City, no modal split adjustments have been applied to the trip generation estimate to account for active transportation or transit-oriented trips.

Table 3.1 summarizes the estimated trip generation. The subject site is forecast to generate approximately 59 and 63 new vehicle trips during the AM and PM peak hours, respectively.

TABLE 3.1: SITE GENERATED TRAFFIC

Land Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
LUC 221 – 161 Units	13	46	**59**	38	25	**63**
Total Generation	**13**	**46**	**59**	**38**	**25**	**63**

AM | T = 0.44(X) + 11.61, PM | T = 0.39(X) + 0.34

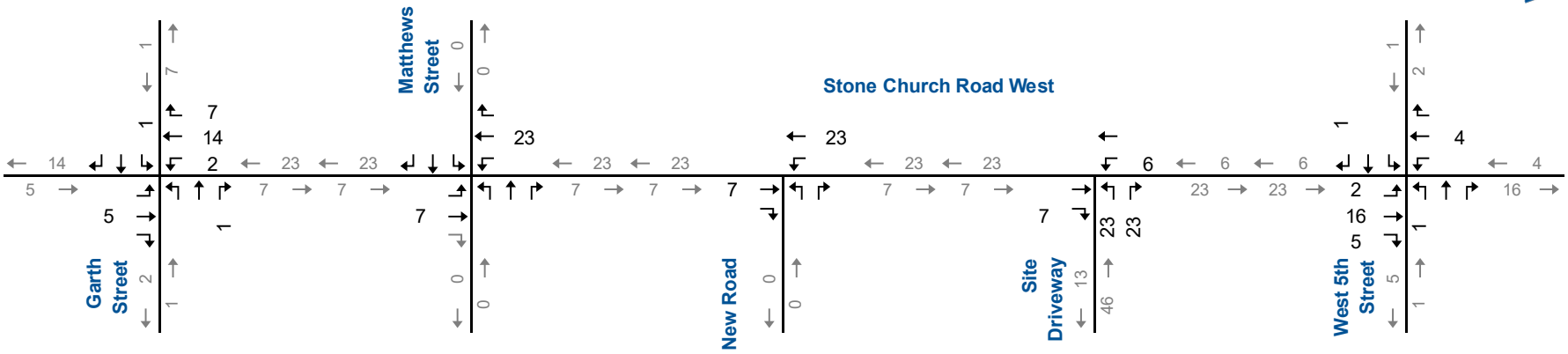
Table 3.2 summarizes the estimated trip distribution. The estimated distribution is based on existing conditions as the surrounding area is primarily residential. **Figure 3.2** illustrates the site generated traffic assignment.

[6] *Trip Generation Eleventh Edition*, Institute of Transportation Engineers, Washington D.C., 2021.

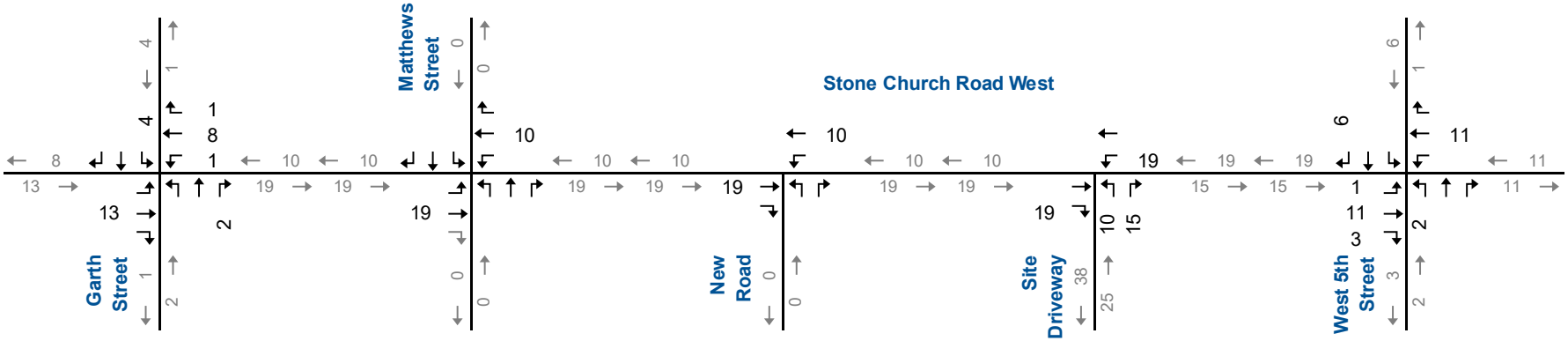
TABLE 3.2: ESTIMATED TRIP DISTRIBUTION

Distribution	AM Peak Hour		PM Peak Hour	
	In	Out	AM	PM
North via Garth Street	10%	15%	10%	5%
North via West 5th Street	10%	5%	15%	5%
South via Garth Street	5%	5%	5%	5%
South via West 5th Street	10%	10%	5%	10%
East via Stone Church Road	30%	35%	30%	45%
West via Stone Church Road	35%	30%	35%	30%
Total	**100%**	**100%**	**100%**	**100%**

AM Peak Hour



PM Peak Hour



Site Generated Traffic Volumes

251 Stone Church Road West, Hamilton TIS
210669

Figure 3.2

4 Future Traffic Conditions

The assessment of future conditions in this section includes the following components:

- Future background traffic estimates;
- Level of service analysis for background traffic (pre-development);
- Future total traffic estimates; and
- Level of service analysis for total traffic (post-development).

4.1 Forecast Traffic

A five-year horizon (Year 2029) following the expected build-out of the site has been assessed. The likely future traffic volumes near the subject site are estimated to consist of:

- Increased non-site traffic (generalized background traffic growth). A 2% growth rate was confirmed with City staff during pre-study consultation.
- Traffic generated by the Sheldon neighbourhood. The Sheldon neighbourhood is located south of the subject site. To date no transportation study for the Sheldon neighbourhood has been completed. As part of the development, two new municipal roadways are proposed to connect to Stone Church Road West. A new connection will form the fourth leg to the Matthews Street intersection and a “New Road” will be formed west of the subject site, which is visible on **Figure 3.1**.

  City Transportation Planning staff provided land use assumptions for the Sheldon neighbourhood as a traffic study is not available. The Sheldon neighbourhood is assumed to consist of:

  - 54 single detached dwellings;
  - 73 street townhouse dwellings; and
  - 169 Condominium block townhouses.

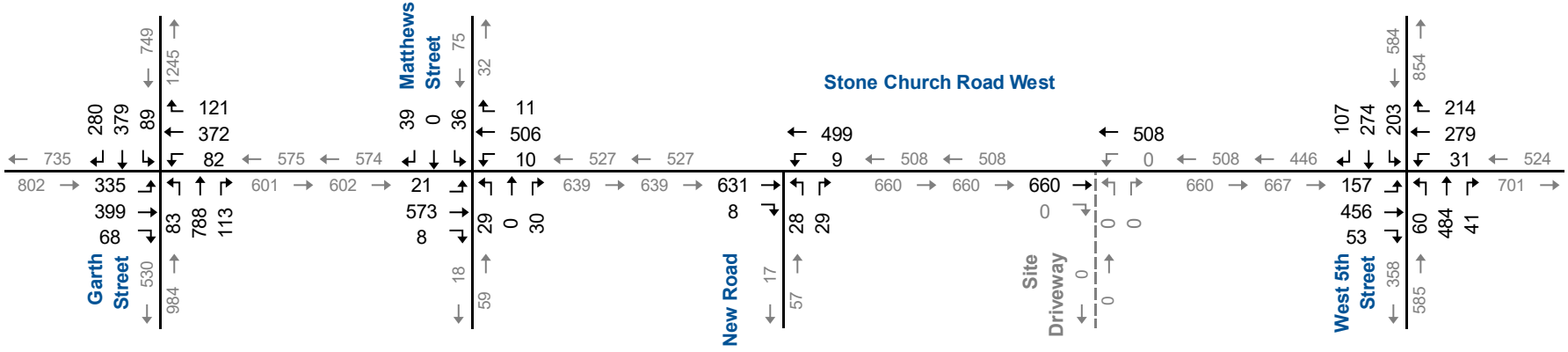
  The trip generation for the Sheldon neighbourhood was estimated using ITE data and trips are assigned to the study area intersections using the estimated distribution summarized in **Table 3.2**.

  Appendix D contains the forecast trip generation and traffic volumes figures for the Sheldon neighbourhood; and

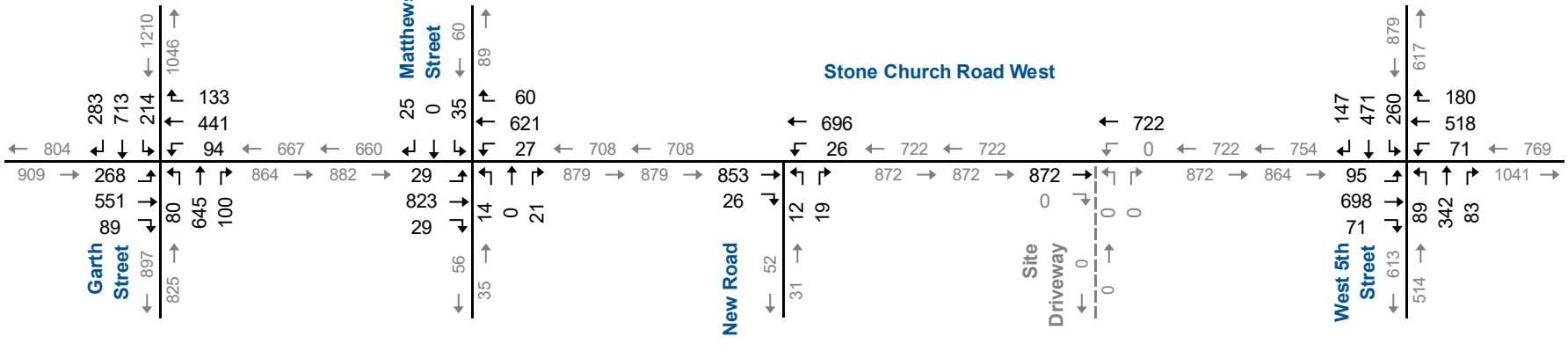
- Traffic generated by the proposed development.

Figure 4.1 illustrates the forecast background traffic volumes for the AM and PM peak hours, which is the combination of generalized growth and traffic generated by nearby developments. **Figure 4.2** illustrates the forecast total traffic volumes for the AM and PM peak hours, which includes the addition of the site-generated traffic volumes.

AM Peak Hour



PM Peak Hour

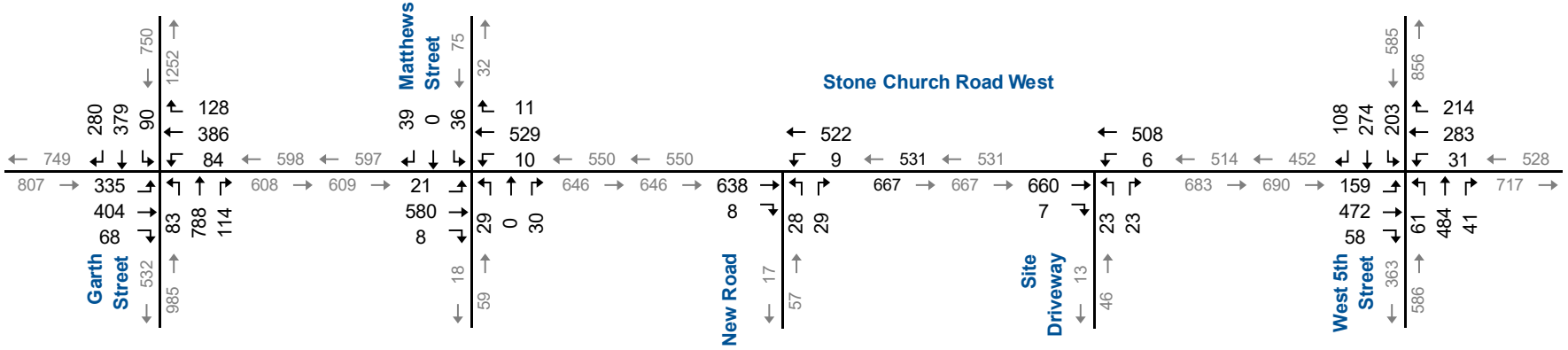


Forecast Background Traffic Volumes

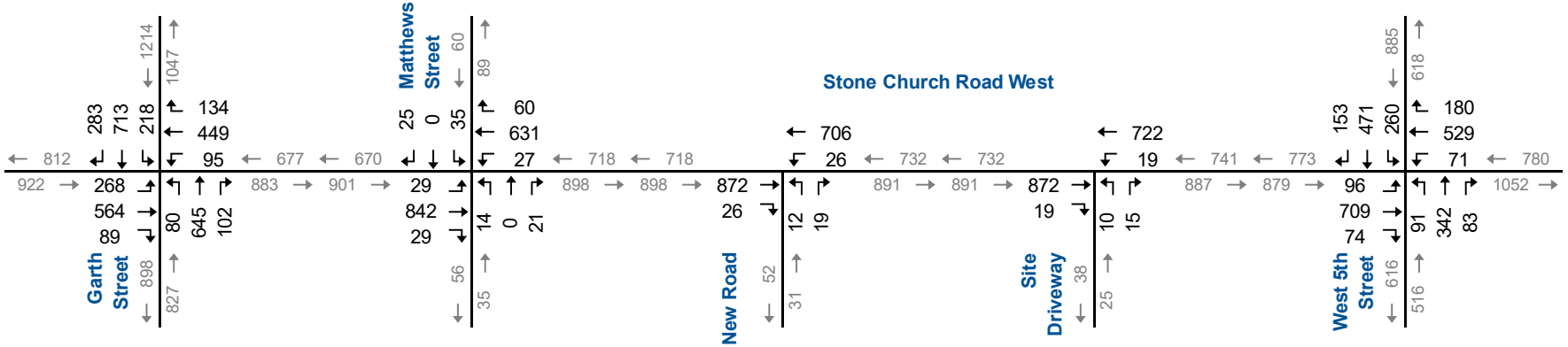
251 Stone Church Road West, Hamilton TIS
210669

Figure 4.1

AM Peak Hour



PM Peak Hour



Forecast Total Traffic Volumes

251 Stone Church Road West, Hamilton TIS
210669

Figure 4.2

4.2 Forecast Traffic Operations

4.2.1 Background Traffic Operations

The study area intersection operations analyses followed the same methodology used for existing conditions. No changes to the existing lane configurations or signal timings are assumed.

Table 4.1 summarizes the level of service conditions.

The following critical movements are noted:

Stone Church Road West and Garth Street

- Eastbound left-turn operates with delays in the LOS F with a v/c ratio greater than 1.00 during the AM peak hour and a v/c greater than 0.90 during the PM peak hour.

  The queue length is also estimated to continue to exceed the current available storage length during the AM and PM peak hours.

  The additional storage needed for the eastbound left-turn movement can be accommodated by the existing TWLTL on Stone Church Road West.

Stone Church Road West and West 5th

- Eastbound through movement is forecast to operate with delay in the LOS E range with a v/c ratio greater than 1.00 during the PM peak hour.
- Westbound through movement is forecast to operate with a v/c ratio greater than 0.85 during the PM peak hour.
- Northbound left-turn is forecast to operate with delay in the LOS F range with a v/c ratio greater than 1.00 during the PM peak hour.

  The queue length is also estimated to exceed the current available storage length during the PM peak hours by approximately 13 metres.
- Southbound left-turn movement is forecast to operate with delay in the LOS F range with a v/c ratio greater than 1.00 during the AM and PM peak hours.
- Southbound through movement is forecast to operate with a v/c ratio greater than 0.85 during the PM peak hour.

The above noted capacity issues are expected to occur without the development of the subject site.

Appendix E contains the detailed Synchro 10 reports.

TABLE 4.1: BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Garth Street & Stone Church Road West	TCS	LOS	F	D	C	**F**	D	D	>	**D**	B	B	>	**B**	C	B	>	**B**	**E**
			Delay	330	39	26	**160**	49	41	>	**42**	15	16	>	**16**	21	14	>	**15**	**58**
			V/C	1.61	0.76	0.06		0.67	0.72	>		0.28	0.53	>		0.46	0.37	>		**0.95**
			Q	145	107	9		30	71	>		24	98	>		32	50	>		
			Stor.	45	-	45		45	-	>		80	-	>		55	-	>		
			Avail.	-100	-	36		15	-	>		56	-	>		23	-	>		
	Matthews Street & Stone Church Road West	TWSC	LOS	A	A	>	**A**	A	A	>	**A**	<	C	>	**C**	<	C	>	**C**	
			Delay	9	0	>	**0**	9	0	>	**0**	<	16	>	**16**	<	16	>	**16**	
			V/C	0.02	0.36	>		0.01	0.32	>		<	0.16	>		<	0.19	>		
			Q	1	0	>		1	0	>		<	5	>		<	6	>		
			Stor.	40	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	-	-	>		-	-	>		<	-	>		<	-	>		
	West 5th Street & Stone Church Road West	TCS	LOS	B	C	>	**C**	C	D	>	**D**	C	D	>	**D**	F	C	>	**D**	**D**
			Delay	20	24	>	**23**	22	45	>	**44**	26	46	>	**44**	90	23	>	**47**	**39**
			V/C	0.58	0.73	>		0.14	0.83	>		0.19	0.87	>		1.00	0.50	>		**0.91**
			Q	32	165	>		10	161	>		18	137	>		57	73	>		
			Stor.	55	-	>		60	-	>		35	-	>		90	-	>		
			Avail.	23	-	>		50	-	>		17	-	>		33	-	>		
	New Roadway & Stone Church Road West	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	0		**0**	15		>	**15**					
			V/C		0.41	>		<	0.01			0.15		>						
			Q		0	>		<	1			4		>						
PM Peak Hour	Garth Street & Stone Church Road West	TCS	LOS	E	D	C	**D**	E	C	>	**D**	C	B	>	**B**	D	C	>	**C**	**C**
			Delay	75	38	22	**48**	63	35	>	**38**	28	18	>	**19**	46	21	>	**25**	**32**
			V/C	0.97	0.82	0.08		0.85	0.66	>		0.49	0.44	>		0.82	0.60	>		**0.90**
			Q	66	131	11		14	40	>		37	82	>		96	117	>		
			Stor.	45	-	45		45	-	>		80	-	>		55	-	>		
			Avail.	-21	-	34		31	-	>		43	-	>		-41	-	>		
	Matthews Street & Stone Church Road West	TWSC	LOS	A	A	>	**A**	A	A	>	**A**	<	C	>	**C**	<	C	>	**C**	
			Delay	9	0	>	**0**	10	0	>	**0**	<	19	>	**19**	<	22	>	**22**	
			V/C	0.03	0.52	>		0.04	0.42	>		<	0.13	>		<	0.22	>		
			Q	1	0	>		1	0	>		<	4	>		<	7	>		
			Stor.	40	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	-	-	>		-	-	>		<	-	>		<	-	>		
	West 5th Street & Stone Church Road West	TCS	LOS	C	E	>	**E**	C	E	>	**E**	F	D	>	**E**	F	D	>	**E**	**E**
			Delay	33	78	>	**73**	27	60	>	**57**	133	49	>	**63**	121	42	>	**66**	**65**
			V/C	0.53	1.02	>		0.47	0.98	>		1.00	0.84	>		1.11	0.88	>		**1.07**
			Q	22	284	>		17	247	>		48	114	>		82	154	>		
			Stor.	55	-	>		60	-	>		35	-	>		90	-	>		
			Avail.	33	-	>		43	-	>		-13	-	>		8	-	>		
	New Roadway & Stone Church Road West	TWSC	LOS		A	>	**A**	<	A		**A**	C		>	**C**					
			Delay		0	>	**0**	<	1		**1**	18		>	**18**					
			V/C		0.56	>		<	0.04			0.11		>						
			Q		0	>		<	1			3		>						

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

4.2.2 Total Traffic Operations

The study area intersection operations analyses followed the same methodology used for existing conditions. No changes to the existing lane configurations or signal timings are assumed.

Table 4.2 summarizes the level of service conditions.

Similar to background traffic conditions, the study area intersections are forecast to operate with congestion. The following critical movements are noted:

Stone Church Road West and Garth Street

- Eastbound left-turn operates with delays in the LOS F with a v/c ratio greater than 1.00 during the AM peak hour and a v/c greater than 0.95 during the PM peak hour.

  The queue length is also estimated to continue to exceed the current available storage length during the AM and PM peak hours.

  The additional storage needed for the eastbound left-turn movement can be accommodated by the existing TWLTL on Stone Church Road West.

Stone Church Road West and West 5th

- Eastbound through movement is forecast to operate with delay in the LOS F range with a v/c ratio greater than 1.00 during the PM peak hour.
- Westbound through movement is forecast to operate with delay in the LOS E range with a v/c ratio approaching 1.00 during the PM peak hour
- Northbound left-turn is forecast to operate with delay in the LOS F range with a v/c ratio greater than 1.00 during the PM peak hour.

  The queue length is also estimated to exceed the current available storage length during the PM peak hours by approximately 16 metres.
- Southbound left-turn movement is forecast to operate with delay in the LOS F range with a v/c ratio greater than 1.00 during the AM and PM peak hours.
- Southbound through movement is forecast to operate with a v/c ratio greater than 0.85 during the PM peak hour.

The site driveway approach to Stone Church Road West is forecast to operate with delays in the LOS A to C range with a v/c of less than 0.60. Queuing on the driveway approach is forecast to be less than 5 metres. The proposed clear throat length can accommodate the anticipated queuing.

Appendix F contains the detailed Synchro 10 reports.

TABLE 4.2: TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Garth Street & Stone Church Road West	TCS	LOS	F	D	C	F	D	D	>	D	B	B	>	B	C	B	>	B	E
			Delay	339	39	25	162	49	42	>	43	15	17	>	16	22	14	>	15	59
			V/C	1.64	0.76	0.06		0.68	0.74	>		0.28	0.53	>		0.47	0.37	>		0.97
			Q	148	109	10		31	74	>		24	97	>		33	50	>		
			Stor.	45	-	45		45	-	>		80	-	>		55	-	>		
			Avail.	-103	-	35		14	-	>		56	-	>		22	-	>		
	Matthews Street & Stone Church Road West	TWSC	LOS	A	A	>	A	A	A	>	A	<	C	>	C	<	C	>	C	
			Delay	9	0	>	0	9	0	>	0	<	16	>	16	<	16	>	16	
			V/C	0.02	0.37	>		0.01	0.34	>		<	0.16	>		<	0.20	>		
			Q	1	0	>		1	0	>		<	5	>		<	6	>		
			Stor.	40	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	-	-	>		-	-	>		<	-	>		<	-	>		
	West 5th Street & Stone Church Road West	TCS	LOS	C	C	>	C	C	D	>	D	C	D	>	D	F	C	>	D	D
			Delay	20	26	>	25	23	46	>	45	26	46	>	44	90	23	>	46	39
			V/C	0.59	0.76	>		0.15	0.84	>		0.20	0.87	>		1.00	0.50	>		0.92
			Q	34	176	>		10	163	>		18	137	>		57	74	>		
			Stor.	55	-	>		60	-	>		35	-	>		90	-	>		
			Avail.	21	-	>		50	-	>		17	-	>		33	-	>		
	New Roadway & Stone Church Road West	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	0		0	15		>	15					
			V/C		0.41	>		<	0.01			0.15		>						
			Q		0	>		<	1			4		>						
	Site Driveway & Stone Church Road West	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	0		0	15		>	15					
			V/C		0.43	>		<	0.01			0.12		>						
			Q		0	>		<	1			4		>						
PM Peak Hour	Garth Street & Stone Church Road West	TCS	LOS	E	D	C	D	E	C	>	D	C	B	>	B	D	C	>	C	C
			Delay	72	38	22	46	66	33	>	38	29	19	>	20	51	22	>	27	32
			V/C	0.96	0.82	0.09		0.88	0.65	>		0.50	0.45	>		0.85	0.61	>		0.92
			Q	63	133	11		14	39	>		38	84	>		100	119	>		
			Stor.	45	-	45		45	-	>		80	-	>		55	-	>		
			Avail.	-18	-	34		31	-	>		42	-	>		-45	-	>		
	Matthews Street & Stone Church Road West	TWSC	LOS	A	A	>	A	A	A	>	A	<	C	>	C	<	C	>	C	
			Delay	9	0	>	0	10	0	>	0	<	20	>	20	<	22	>	22	
			V/C	0.03	0.53	>		0.04	0.42	>		<	0.13	>		<	0.23	>		
			Q	1	0	>		1	0	>		<	4	>		<	7	>		
			Stor.	40	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	-	-	>		-	-	>		<	-	>		<	-	>		
	West 5th Street & Stone Church Road West	TCS	LOS	C	F	>	E	C	E	>	E	F	D	>	E	F	D	>	E	E
			Delay	33	83	>	77	27	64	>	60	159	49	>	68	121	44	>	66	68
			V/C	0.54	1.04	>		0.47	0.99	>		1.08	0.84	>		1.11	0.89	>		1.08
			Q	22	289	>		17	252	>		51	114	>		82	156	>		
			Stor.	55	-	>		60	-	>		35	-	>		90	-	>		
			Avail.	33	-	>		43	-	>		-16	-	>		8	-	>		
	New Roadway & Stone Church Road West	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	1		1	19		>	19					
			V/C		0.57	>		<	0.04			0.11		>						
			Q		0	>		<	1			3		>						
	Site Driveway & Stone Church Road West	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	1		1	18		>	18					
			V/C		0.57	>		<	0.03			0.09		>						
			Q		0	>		<	1			3		>						

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

5 Remedial Measures

5.1 Traffic Control improvements

The intersections of Stone Church Road West with Matthews Street, the New Road, and the Site Driveway were assessed using the Ontario Traffic Manual (OTM Book 12 – Justification 7) signal warrant[7] procedures.

Traffic control signals are not warranted under the forecast total traffic conditions. The Stone Church Road West intersections with Matthews Street, the New Road, and the Site Driveway should remain or be designed as unsignalized (stop controlled) intersections.

Appendix G contains the warrant analysis.

5.2 Turn Lanes

The existing centre two-way left-turn lane on Stone Church Road West across the site's frontage can accommodate left-turns into the subject site. No changes to the lane configuration is recommended.

5.3 Signal Optimization

Signal timings for the Stone Church Road West corridor were optimized using Synchro 10. Signal optimization has the potential to impact intersections outside the study area.

Table 5.1 summarizes the level of service conditions for the total traffic conditions.

Signal optimization helps reduce delay at the signalized intersections. Optimization does not fully resolve the capacity issues. The following movements remain critical:

<u>Stone Church Road West at Garth Street</u>

- Eastbound left-turn – LOS F, v/c ratio greater than 0.85 and queue exceeds storage during the AM and PM peak hours

<u>Stone Church Road West at West 5th Street</u>

- Eastbound left-turn – LOS F, v/c ratio greater than 0.85 and queue exceeds storage during the PM peak hour

[7] *Ontario Traffic Manual Book 12, Ministry of Transportation of Ontario, July 2001.*

- Eastbound through – v/c ratio greater than 0.85 during the PM peak hour
- Westbound through – v/c ratio greater than 0.85 during the PM peak hour
- Southbound left-turn – LOS F during the AM peak hour and v/c ratio greater than 0.85 during the AM and PM peak hours
- Southbound through – LOS F and v/c ratio greater than 1.00 during the PM peak hour

To address the forecast capacity issues at the Stone Church Road West at West 5th Street geometric improvements may be required. The need for geometric improvements is not related to the development of the subject site. The intersection is forecast to experience capacity constraints under the background traffic conditions (no site traffic).

Geometric improvements to provide additional intersection capacity are not likely to be implemented. The City of Hamilton Transportation Master Plan[8] (TMP) does not identify any planned road network improvements within the study area. The TMP modelling indicates there will still be capacity deficiencies and pinch points along strategic road links (e.g., Stone Church Road West at Garth Street or West 5th Street).

To form a sustainable and balanced transportation system the city is working towards improvements to public transit and active transportation (AT) infrastructure to reduce the use of single-occupant vehicles and create a balanced transportation system.

To support these goals and to help limit the site's impact to the existing municipal road network, a Transportation Demand Management (TDM) program is recommended for the subject site. **Section 5.4** outlines the recommended TDM program for the subject site.

TDM encourages sustainable travel choices by supporting alternative transportation options over the convention of frequently driving alone[9].

By shifting travel to public transit and AT, intersection operations could be expected to maintain the status-quo (capacity constraint during peak hours) or possibly improve if fewer vehicles transverse the intersections during the peak hours of a typical weekday.

[8] City of Hamilton Transportation Master Plan Review and Update, City in Motion
[9] Hamilton Transportation Demand Management (TDM) Guide for Development

It is recommended at that the road authority continue to monitor and adjust signal timings along the Stone Church Road West corridor to address changes in traffic volumes or travel patters that may occur over time.

Appendix H contains the detailed Synchro 10 reports.

TABLE 5.1: OPTIMIZED TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Overall
AM Peak Hour	Garth Street & Stone Church Road West	TCS	LOS	D	C	B	C	D	D	>	D	C	D	>	D	C	C	>	C	C
			Delay	39	22	16	29	35	40	>	39	32	42	>	42	25	22	>	22	33
			V/C	0.88	0.56	0.05		0.47	0.73	>		0.41	0.89	>		0.55	0.47	>		0.88
			Q	82	90	8		32	71	>		32	149	>		23	64	>		
			Stor.	45	-	45		45	-	>		80	-	>		55	-	>		
			Avail.	-37	-	37		13	-	>		48	-	>		32	-	>		
	Matthews Street & Stone Church Road West	TWSC	LOS	A	A	>	A	A	A	>	A	<	C	>	C	<	C	>	C	
			Delay	9	0	>	0	9	0	>	0	<	16	>	16	<	16	>	16	
			V/C	0.02	0.37	>		0.01	0.34	>		<	0.16	>		<	0.20	>		
			Q	1	0	>		1	0	>		<	5	>		<	6	>		
			Stor.	40	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	-	-	>		-	-	>		<	-	>		<	-	>		
	West 5th Street & Stone Church Road West	TCS	LOS	C	C	>	C	C	D	>	D	C	D	>	D	F	C	>	D	D
			Delay	25	35	>	32	22	40	>	39	27	51	>	48	86	24	>	45	41
			V/C	0.60	0.74	>		0.15	0.79	>		0.20	0.89	>		0.99	0.50	>		0.90
			Q	38	182	>		10	169	>		20	151	>		70	81	>		
			Stor.	55	-	>		60	-	>		35	-	>		90	-	>		
			Avail.	17	-	>		50	-	>		15	-	>		20	-	>		
	New Roadway & Stone Church Road West	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	0		0	15		>	15					
			V/C		0.41	>		<	0.01			0.15		>						
			Q		0	>		<	1			4		>						
	Site Driveway & Stone Church Road West	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	0		0	15		>	15					
			V/C		0.43	>		<	0.01			0.12		>						
			Q		0	>		<	1			4		>						
PM Peak Hour	Garth Street & Stone Church Road West	TCS	LOS	E	D	C	D	C	C	>	C	D	C	>	C	D	C	>	C	C
			Delay	62	43	21	46	31	26	>	27	51	32	>	34	41	25	>	28	34
			V/C	0.93	0.88	0.06		0.64	0.50	>		0.65	0.67	>		0.85	0.68	>		0.93
			Q	68	165	9		20	61	>		40	94	>		64	111	>		
			Stor.	45	-	45		45	-	>		80	-	>		55	-	>		
			Avail.	-23	-	36		25	-	>		40	-	>		-9	-	>		
	Matthews Street & Stone Church Road West	TWSC	LOS	A	A	>	A	A	A	>	A	<	C	>	C	<	C	>	C	
			Delay	9	0	>	0	10	0	>	0	<	20	>	20	<	22	>	22	
			V/C	0.03	0.53	>		0.04	0.42	>		<	0.13	>		<	0.23	>		
			Q	1	0	>		1	0	>		<	4	>		<	7	>		
			Stor.	40	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	-	-	>		-	-	>		<	-	>		<	-	>		
	West 5th Street & Stone Church Road West	TCS	LOS	D	E	>	E	D	D	>	D	D	E	>	E	E	F	>	F	E
			Delay	40	70	>	66	41	55	>	53	54	70	>	67	77	87	>	84	68
			V/C	0.66	0.99	>		0.60	0.91	>		0.69	0.90	>		0.95	1.01	>		1.00
			Q	26	315	>		24	270	>		34	181	>		108	266	>		
			Stor.	55	-	>		60	-	>		35	-	>		90	-	>		
			Avail.	29	-	>		36	-	>		1	-	>		-18	-	>		
	New Roadway & Stone Church Road West	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	1		1	19		>	19					
			V/C		0.57	>		<	0.04			0.11		>						
			Q		0	>		<	1			3		>						
	Site Driveway & Stone Church Road West	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	1		1	18		>	18					
			V/C		0.57	>		<	0.03			0.09		>						
			Q		0	>		<	1			3		>						

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

5.4 Transportation Demand Management

Transportation Demand Management (TDM) can help improve transportation efficiency, encourage use of alternative modes of transportation, reduce reliance on single occupant vehicles, and encourage a change in behaviour.

The following summarizes the TDM Measures that could be incorporated through the Site Plan Approval stage or following construction.

Cycling

To encourage cycling as a viable option for commuting and shopping the following cycling TDM measures are recommended:

- Locate bicycle parking in a convenient, secure locations such as:
  - Locating visitor parking near the building entrances;
  - Locating resident parking near elevators/stairs; and
  - Locate parking at ground level or in first level of parking structure.
- Provide bicycle parking at the following rates:
  - Long-term: 0.50 to 1.25 spaces per unit; and
  - Short-term: 0.05 to 0.20 spaces per unit.
- Negotiate a reduction in vehicle parking spaces in exchange for additional bicycle parking spaces.

Walking

To encourage walking trips the following TDM measures are recommended to provide an attractive on-site pedestrian realm:

- Include well-lit sidewalks and walkways throughout the site to avoid dark alleys, hallways, and stairwells.
- Provide continuous sidewalks through the site driveway connections to Stone Church Road West; and
- Weather protection by main entrances and on adjacent sidewalks.

Transit

To prioritize connections and access to transit and to encourage transit as a desirable mode choice the following TDM measures are recommended:

- Incorporate displays or kiosks in communal areas or near entrances to display transit information such as schedules of nearby routes;
- Provide presto cards to occupants who do not purchase a parking space.

Parking

To help reduce single occupant vehicle travel and to support alternative modes of travel the following TDM measures are recommended:

- Supply no more than the minimum number of vehicle parking spaces outlined in the zoning bylaw.
- Unbundle the parking space from the rental/sale of residential units and avoid sale of multiple spaces to a single buyer.

Education/Promotion and Travel Planning

To increase awareness of sustainable transportation opportunities for occupants the following TDM measures are recommended:

- Install kiosks with information and schedules of nearby transit routes.
- Install wayfinding signage directing residents and visitors to active transportation facilities, bike networks, trails, or parks.
- Provide transit and active transportation maps to new residents as part of a “welcome package.”
- Support the development of an individualized marking program to address resident concerns about available travel options.
- Brand or highlight TDM element in sale and rental marking materials of the development.

6 Conclusions and Recommendations

6.1 Conclusions

The main findings and conclusions of this study are as follows:

- **Base Year Traffic**: The Stone Church Road West intersections with Garth Street and West 5th Street are operating with acceptable levels of service during the weekday AM and PM peak hours. Localized congestion is occurring at the Garth Street intersection during the AM Peak hour.
- **Site Concept**: The development concept includes 161 residential units in a four-storey high-rise building. Build-out is anticipated to occur by Year 2024. Vehicle access is proposed by a private driveway to Stone Church Road West
- **Trip Generation**: The subject site is forecast to generate approximately 59 and 63 new vehicle trips during the AM and PM peak hours, respectively.
- **Background Traffic**: The study area intersections are forecast to operate with increased congestion. The Stone Church Road West intersection with Garth Street is forecast to have an overall v/c ratio greater than 0.90. The Stone Church Road West intersection West 5th Street is forecast to have an overall v/c ratio greater than 1.00 during the PM peak hour.
- **Total Traffic**: The study area intersections are forecast to operate with similar levels of service as the background traffic conditions with the inclusion of site generated traffic. No additional critical movements are noted at the study area intersections over background conditions.
- **Remedial Measures**: Traffic control signals are not warranted at the study area intersections.

  Optimization of signal timings can help manage delays at the study area intersections. Signal timing changes are not expected to fully resolve the forecast capacity issues.
- **TDM Measures**: To help manage the site's transportation impacts, the site's TDM program should included measures related to walking, cycling, transit, parking, wayfinding, and travel planning.

6.2 Recommendations

Based on the findings of this study, the following is recommended:

- The road authority should continue to monitor and adjust signal timings along the Stone Church Road West corridor to address changes in traffic volumes or travel patters that may occur over time.
- The TDM measures outlined in **Section 5.4** will help support the City's goal in encouraging sustainable travel choices by supporting alternative transportation options over the convention of frequently driving alone. The detailed TDM program can be confirmed at the site plan approval stage of development.

Appendix A

Pre-Study Consultation

Scott Catton

From: Brosseau, Bart <Bart.Brosseau@hamilton.ca>
Sent: 8-Mar-22 10:03
To: Scott Catton
Cc: Andrew Orr; Cornwell, Jeff; Transportation Planning
Subject: FW: 210669 - FC-21-06 (251 Stone Church Rd W) TIS Scope of Work

Categories: Admin

Hi Scott,
I do not have a cell phone. Include Sheldon Neighbourhood Plan as future background traffic. Assumptions are:

- 54 single detached dwellings
- 73 street townhouse dwellings
- 169 Condominium block townhouses

Thanks

Bart Brosseau
Transportation Planning Technologist
Planning and Economic Development Department
Transportation Planning and Parking Division
100 King Street West, 9th Floor, L8P1A2
Phone: 905.546.2424 ex. 4583

Hamilton

The City of Hamilton encourages physical distancing, wearing a mask in an enclosed public space, and increased handwashing. Learn more about the City's response to COVID-19 www.hamilton.ca/coronavirus.

From: Scott Catton <scatton@ptsl.com>
Sent: Monday, March 7, 2022 8:17 AM
To: Brosseau, Bart <Bart.Brosseau@hamilton.ca>; Transportation Planning <Transportation.Planning@hamilton.ca>
Cc: Andrew Orr <aorr@ptsl.com>; Cornwell, Jeff <Jeff.Cornwell@hamilton.ca>
Subject: RE: 210669 - FC-21-06 (251 Stone Church Rd W) TIS Scope of Work

Hi Bart,
Do you have a cell phone I can reach you at, I left a voicemail on your office line.

Following up on my February 24 email below. Does the Sheldon Neighbourhood Plan need to be included as background traffic in our traffic study?

If it does, please provide some assumptions for us to use in developing the traffic forecast for these lands.

Thanks

Scott Catton, C.E.T.
Senior Project Manager

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge, ON N1R 8J8
p: 905.381.2229 x302
e: scatton@ptsl.com
w: www.ptsl.com

From: Scott Catton
Sent: 25-Feb-22 09:56
To: Brosseau, Bart <Bart.Brosseau@hamilton.ca>
Cc: Andrew Orr <aorr@ptsl.com>; Cornwell, Jeff <Jeff.Cornwell@hamilton.ca>
Subject: RE: 210669 - FC-21-06 (251 Stone Church Rd W) TIS Scope of Work

Hi Bart,
Just to clarify, does the Sheldon Neighbourhood Plan need to be included as background traffic in our traffic study?

If it does, please provide some assumptions for us to use in developing the traffic forecast for these lands.

Thanks.

Scott Catton, C.E.T.
Senior Project Manager

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge, ON N1R 8J8
p: 905.381.2229 x302
e: scatton@ptsl.com
w: www.ptsl.com

From: Brosseau, Bart <Bart.Brosseau@hamilton.ca>
Sent: 24-Feb-22 14:14
To: Scott Catton <scatton@ptsl.com>
Cc: Andrew Orr <aorr@ptsl.com>; Cornwell, Jeff <Jeff.Cornwell@hamilton.ca>
Subject: RE: 210669 - FC-21-06 (251 Stone Church Rd W) TIS Scope of Work

Hi Scott,
I do not have a copy, nor am I aware of a traffic study for the Sheldon Neighbourhood Plan. You can estimate the redistributed traffic volumes based on the existing neighbourhood land uses and add the projected site volumes for the proposed development.

Thanks

Bart Brosseau
Transportation Planning Technologist
Planning and Economic Development Department
Transportation Planning and Parking Division
100 King Street West, 9th Floor, L8P1A2
Phone: 905.546.2424 ex. 4583

The City of Hamilton encourages physical distancing, wearing a mask in an enclosed public space, and increased handwashing. Learn more about the City's response to COVID-19 www.hamilton.ca/coronavirus.

From: Scott Catton <scatton@ptsl.com>
Sent: Wednesday, February 23, 2022 4:08 PM
To: Brosseau, Bart <Bart.Brosseau@hamilton.ca>
Cc: Cornwell, Jeff <Jeff.Cornwell@hamilton.ca>; Andrew Orr <aorr@ptsl.com>
Subject: RE: 210669 - FC-21-06 (251 Stone Church Rd W) TIS Scope of Work

Hi Bart,
Following up on this.

Can you provide me with a copy of the traffic study for the Sheldon Neighbourhood Plan?

Thank you.

Scott Catton, C.E.T.
Senior Project Manager

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge, ON N1R 8J8
p: 905.381.2229 x302
e: scatton@ptsl.com
w: www.ptsl.com

From: Scott Catton
Sent: 16-Feb-22 10:05
To: Brosseau, Bart <Bart.Brosseau@hamilton.ca>
Cc: Cornwell, Jeff <Jeff.Cornwell@hamilton.ca>; Andrew Orr <aorr@ptsl.com>
Subject: RE: 210669 - FC-21-06 (251 Stone Church Rd W) TIS Scope of Work

Hi Bart,

Can you provide me with a copy of the traffic study for the Sheldon Neighbourhood Plan?

Looking to get an idea of the volumes for that new north/south roadway to Stone Church Road West.

Thanks again.

Scott Catton, C.E.T.
Senior Project Manager

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge, ON N1R 8J8
p: 905.381.2229 x302
e: scatton@ptsl.com
w: www.ptsl.com

From: Brosseau, Bart <Bart.Brosseau@hamilton.ca>
Sent: 9-Nov-21 08:56
To: Scott Catton <scatton@ptsl.com>
Cc: Cornwell, Jeff <Jeff.Cornwell@hamilton.ca>
Subject: FW: 210669 - FC-21-06 (251 Stone Church Rd W) TIS Scope of Work

Hi Scott,
I want you to be aware that the Sheldon Neighbourhood Plan has a road through the subject property, affecting what can develop. See snip below out of the Sheldon Neighbourhood Plan highlighted in red is the subject property, and the green highlight is the road location through the property.

Sheldon Neighbourhood Plan

The subject property below has the approximate location of the future road highlighted in green as per the Sheldon Neighbourhood Plan, which will significantly affect this development.

Subject Property

See comments below in ***red.*** The new roads will have to be part of the analysis for the study area as stated below.

Thanks

Bart Brosseau
Transportation Planning Technologist
Planning and Economic Development Department
Transportation Planning and Parking Division
Mailing Address: 71 Main Street West, Basement - Mail Room
Phone: 905.546.2424 ex. 4583

Hamilton

The City of Hamilton encourages physical distancing, wearing a mask in an enclosed public space, and increased handwashing. Learn more about the City's response to COVID-19 www.hamilton.ca/coronavirus.

From: Scott Catton <scatton@ptsl.com>
Sent: Thursday, November 4, 2021 2:57 PM
To: Transportation Planning <Transportation.Planning@hamilton.ca>
Subject: 210669 - FC-21-06 (251 Stone Church Rd W) TIS Scope of Work

Hello Transportation Planning,
We've been retained to conduct a Traffic Impact Study for the proposed development of 251 Stone Church Road West.

Kindly review the proposed Terms of Reference outlined below and provide comment.

Site Description.
The concept plan includes a four-storey mid-rise apartment building containing 161 units. The site's parking supply is noted as 205 spaces. Vehicle access is proposed to Stone Church Road West at the site's east limits. Build-out is estimated to occur by Year 2024. The preliminary site plan is attached.

Preliminary ITE trip generation estimates indicate approximately 59 new trips in the AM peak hour and 63 new trips in the PM peak hour.

Proposed Terms of Reference

Study Area Intersections

- Stone Church Road West at Garth Street;
- Stone Church Road West at West 5th Street; and
- The site driveway to Stone Church Road West.

The intersection of the New Road to Stone Church Road West and the New Road to the extension of Raiano Crescent will need to be included in the analysis, including an assessment redistributing the neighbourhood traffic accordingly.

Existing Data

- Please provide comment on the preferred approach used to establish existing conditions.
    - **Approach 1: Historical Count Data.** The 2015 and 2018 TMC data the city has on file for the study area intersections is factored to a year 2021 condition using a growth rate of 2% per annum.
    - **Approach 2: New Counts.** New 2021 TMC data is collected and used. No adjustment factor applied.
    - **Approach 3: New Counts (Factored).** New 2021 TMC data is collected and the Historical TMC for Garth/Stone Church (2015) is obtained. The Historical TMC is increased to a year 2021 condition using a 2% growth rate. The base year volumes are compared to the 2021 TMC data to develop a factor to apply to the 2021 TMC data.

The City would prefer Approach 3: New Counts (Factored)

Horizon Years

- Existing (year 2021); and
- Five-year horizon (Year 2029).

Analysis Periods

- Weekday AM peak hour
- Weekday PM peak hour

Analysis

- Synchro 10 with HCM 2000; and
- Existing signal timings.

Background Traffic

- Generalized growth rate 2% per annum.
- Adjacent development applications to be identified by Planning staff. Please advise if any specific development applications should be considered in the background traffic forecast.

Future Road Improvements

- None unless identified by City Staff.

The Sheldon Neighbourhood Plan has a road through the subject property this shall be taken into consideration as the Owner/Applicant will need to construct a portion of the roadway.

Trip Generation

- ITE Trip Generation Data 11th Edition.
- No modal split reductions
- Preliminary estimate
    - AM Fitted Curve: 59 (Total), 13 (Entry), 46 (Exit)
    - PM Fitted Curve: 63 (Total), 38 (Entry), 25 (Exit)

Site Traffic Distribution

- Existing travel patterns

Report

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

Thanks very much.

Scott Catton, C.E.T.
Senior Project Manager

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge, ON N1R 8J8
p: 905.381.2229 x302
e: scatton@ptsl.com
w: www.ptsl.com

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Appendix B

Existing Data

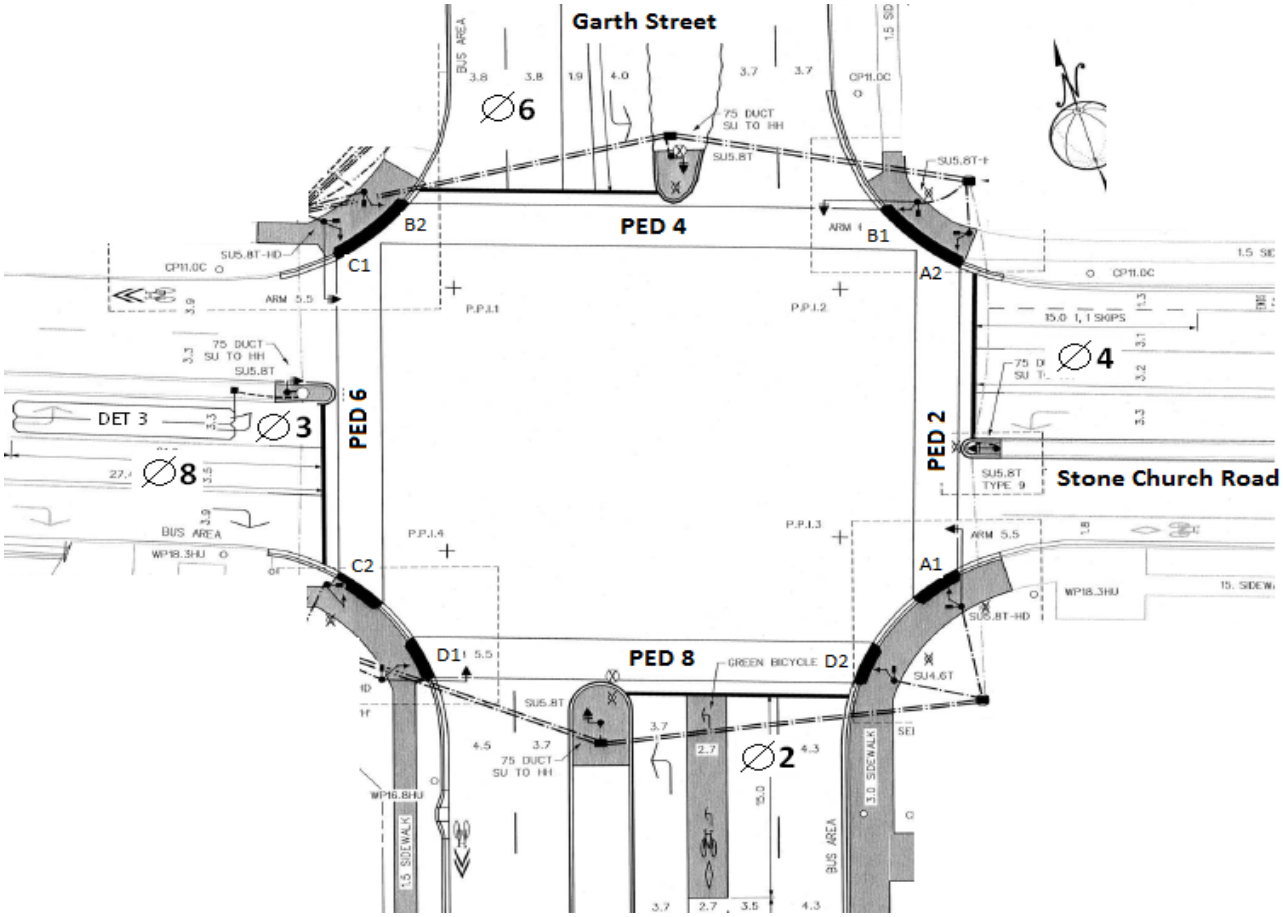
City of Hamilton - Traffic
Traffic Signal Controller Timing Data

Intersection: **Garth & Stone Church**

Controller Type: **3000E** Page **1** of **17**

Programmed By: **DLB** Installed By: **DLB**

Date: **2-Feb-18** Date: **6-Feb-18**



ϕ1:
ϕ2: **Garth - NB, East Xwalk**
ϕ3: **Stone Church - EBLT**
ϕ4: **Stone Church - WB, North Xwalk**
ϕ5:
ϕ6: **Garth - SB, West Xwalk**
ϕ7:
ϕ8: **Stone Church - EB, South Xwalk**

Flash Operation: **Red: Stone Church**
Red: Garth

SEQUENCE/START-UP (MM-3-1-1)

START-UP PHASES/INTERVAL/SEQUENCE

(X = Enable for start-up phases. Must be compatible if more than one)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
START-UP	Phases				X				X								
	Interval	0	(0=Red, 1=Yel, 2= Grn, determines color of selected phases above on start-up)														
	Flash	10	(0-255 seconds start-up flash time)														
	Red	5.0	(0-25.5 secs = length of first red after start-up if start-up in yellow or red)														
	Sequence	3	(2=single ring, 3=dual ring, 4=123/567+48, 5=12/56+3478, 6=1234/56+78, 7=1234/5678, 8=dual quad, 9=12ph														

PHASE RING ASSIGNMENTS

X = Phase assigned to ring (if used). Phases in different rings but same co-phase group can time together.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RING	Ring 1		X	X	X												
	Ring 2						X		X								
	Ring 3																
	Ring 4																

CO-PHASE GRP 1-4 ASSIGNMENTS

X = phase assigned to co-phase group. All ph's assigned to rings must be assigned to co-phase group.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CO-PHASE	CO PH 1		X				X										
	CO PH 2			X	X				X								
	CO PH 3																
	CO PH 4																

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CONTROLLER DATA

PHASE RECALLS/MODES; MIN, MAX, etc. (MM-3-1-2-1-PGDN, etc.) USE 1 TO ALL 4 TIMING PLANS

TP1 PHASE RECALLS

(X = ENABLE)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE RECALLS	MIN RCL																
	MAX RCL																
	PED RCL																
	SOFT REC																
	NON-LOCK			X													
	VEH OMIT																
	PED OMIT																
	WLK REST																
	MAX II																
	RED REST																
	NO SKIP																

TP2 PHASE RECALLS

(X = ENABLE)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE RECALLS	MIN RCL																
	MAX RCL																
	PED RCL																
	SOFT REC																
	NON-LOCK			X													
	VEH OMIT																
	PED OMIT																
	WLK REST																
	MAX II																
	RED REST																
	NO SKIP																

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TP3 PHASE RECALLS

(X = ENABLE)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE RECALLS	MIN RCL																
	MAX RCL																
	PED RCL																
	SOFT REC																
	NON-LOCK			X													
	VEH OMIT																
	PED OMIT																
	WLK REST																
	MAX II																
	RED REST																
	NO SKIP																

TP4 PHASE RECALLS

(X = ENABLE)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE RECALLS	MIN RCL																
	MAX RCL																
	PED RCL																
	SOFT REC																
	NON-LOCK																
	VEH OMIT			X													
	PED OMIT																
	WLK REST																
	MAX II																
	RED REST																
	NO SKIP																

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CONTROLLER DATA

PHASE RECALLS/MODES; CNA, INH MAX, PED OPTIONS, etc. (MM-3-1-2-2) ONLY 1 PLAN PER UNIT

(X = ENABLE)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE RECALLS	CNA 1		X		X		X		X								
	CNA 2																
	CNA 3																
	CNA 4																
	WRM		X		X		X		X								
	INH MAX																
	PED RECY																
	FL WALK																
	FDW->YEL																
	FDW->RED																
	COND PED																

PHASE TIMES (MM-3-1-3-PGDN, etc.) USE 1 TO ALL 4 TIMING PLANS

		TP1															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		20	5	20		20		20								
	Passage			2.0													
	Yellow		3.3	3.0	3.3		3.3		3.3								
	Red		3.0	0.0	3.5		3.0		3.5								
	Walk		12		12		12		12								
	Ped Clr		19		28		19		28								
	Max 1		55	10	40		55		40								
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	AI/Act																
	Max In																

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CONTROLLER DATA

TP2

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		**20**	**5**	**20**		**20**		**20**								
	Passage			**2.0**													
	Yellow		**3.3**	**3.0**	**3.3**		**3.3**		**3.3**								
	Red		**3.0**	**0.0**	**3.5**		**3.0**		**3.5**								
	Walk		**12**		**12**		**12**		**12**								
	Ped Clr		**19**		**28**		**19**		**28**								
	Max 1		**55**	**10**	**40**		**55**		**40**								
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	AI/Act																
	Max In																

TP3

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		**20**	**5**	**20**		**20**		**20**								
	Passage			**2.0**													
	Yellow		**3.3**	**3.0**	**3.3**		**3.3**		**3.3**								
	Red		**3.0**	**0.0**	**3.5**		**3.0**		**3.5**								
	Walk		**12**		**12**		**12**		**15**								
	Ped Clr		**19**		**28**		**19**		**28**								
	Max 1		**55**	**10**	**40**		**55**		**40**								
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	AI/Act																
	Max In																

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CONTROLLER DATA

		TP4															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		**20**		**20**		**20**		**20**								
	Passage																
	Yellow		**3.3**		**3.3**		**3.3**		**3.3**								
	Red		**3.0**		**3.5**		**3.0**		**3.5**								
	Walk		**12**		**12**		**12**		**12**								
	Ped Clr		**19**		**28**		**19**		**28**								
	Max 1		**55**		**40**		**55**		**40**								
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	Al/Act																
	Max In																

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DUAL ENTRY (MM-3-1-6)

DUAL ENTRY ENABLE:	Y	Y/N: Y=Enable Dual Entry. Note this is only one setting even though it appears on each controller screen.

PG1	PH/CALLS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DUAL	1																
ENTRY	2						X										
ASSIGN-	3								X								
MENTS	4								X								
	5																
	6		X														
	7																
	8				X												

VEHICLE DETECTOR ASSIGNMENTS (MM-3-1-4-1, PGDN etc.)

(X = ASSIGN VEH DETECTOR TO THAT PHASE)

	DET/PH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
VEH	1																
DET	2																
ASSIGN-	3			X													
MENTS	4																
	5																
	6																
	7																
	8																
	9																

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PED DETECTOR ASSIGNMENTS (MM-3-1-4-2)

(X = ASSIGN PED DETECTOR TO THAT PHASE)

	DET/PH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PED	1																
DET	2																
ASSIGN-	3																
MENTS	4																
	5																
	6																
	7																
	8																

DETECTOR MODES (MM-3-1-4-3)

	DET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
VEH DET	Mode	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**								
MODES																	

	DET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
VEH DET	**Lock**																
LOCKS																	

DETECTOR TIMES (MM-3-1-4-4)

	DET	1	2	3	4	5	6	7	8
DET	Delay	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TIMES	Str/Stp								

	DET	9	10	11	12	13	14	15	16
DET	Delay	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TIMES	Str/Stp								

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ENHANCED OPTIONS

DYNAMIC OMITS (MM-3-1-9-1-1)

DYNAM OMITS GP1 ENABLE:	**Y**	Y/N: Y=Enable. Note: This is one setting but appears on each screen. No input rquired for GP1.

(X = ENABLE)

GRP1-1	FUNC/PH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DYNAM.	OMIT PHS			**X**													
OMITS	IF PH ON				**X**				**X**								
ASSIGN-	OR O/L	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MENTS	GRN																

Select phases to be dynamically omitted from OMIT PHS row. Select the PH-ONs and/or O/L GRNs that will cause those omits. Phases are omitted when controller state matches IF PH ON row or O/L GRN row.
Note that there are 2 groups of dynamic omits, each with 8 patterns. Group 1 is the default group and group 2 can be selected by input or TOD ckt 96. When a group is active, any one or all of the pattterns within that group may be true depending on the controller state.

DYNAMIC RECALLS (MM-3-1-9-1-2)

DYN. RECALL GP1 ENABLE:	**Y**	Y/N: Y=Enable. Note: This is one setting but appears on each screen. No input rquired for GP1.

(X = ENABLE)

GRP1-1	FUNC/PH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DYNAM.	RCL PHS				**X**				**X**								
RECALLS	IF PH ON			**X**													
ASSIGN-	OR O/L	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MENTS	GRN																

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SELECTION SOURCE (MM-3-2-2)

Entries determine how parameters get selected

Cycle Source:	**1**	0=TOD, 1=CL, 2=INT
Split Source:	**1**	0=TOD, 1=CL, 2=INT
Offset Source:	**1**	0=TOD, 1=CL, 2=INT

Free Source:	**1**	0=TOD, 1=CL, 2=INT
Flash Source:	**0**	0=TOD, 1=CL, 2=INT
Inter-TOD Revert:	**255**	0-255 SECS

TOD = Time of day control by internal clock, CL = Closed loop (comm), INT = Interconnect. Inter-TOD Revert is time allowed after failed interconnect before unit reverts to TOD (Time Base) control.

COORD BASIC OPTIONS (MM-3-2-3)

Reference to End (vs. begin) of Main St.:	**N**	Y/N: Y = Offset references to end of main st. green. N = Beginning of Main st. green.
Use % (vs. secs) for Phase Allocation:	**N**	Y/N: Y = Phase allocations loaded as percent of 100. N = Allocations in seconds.
Use % (vs. secs) for Offset Entry:	**N**	Y/N: Y = Offset loaded as percent of 100. N = Offset loaded in seconds.
Use Fixed (vs. floating) Force Offs:	**Y**	Y/N: Y = Force offs are fixed to cycle. N=Force offs like max times, begin with green.
Permissive Type:	**0**	0-2: 0=Yield, 1= Single, 2= Multiple. See Permissives note below

C/S TO TIMING PLAN (MM-3-2-9-6)

USE THIS CHART WHEN 4 SPLITS/CYCLE = Y

	CYCLE	1	2	3	4	5	6
SPLIT TO TIME PLAN	SPLIT 1	**1**	**2**	**3**	**4**		
	SPLIT 2						
	SPLIT 3						
	SPLIT 4						

(0-4 = TIME PLAN IMPLEMENTED WHEN SPLIT IN EFFECT)

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CYCLES & OFFSETS (MM-3-2-4)

NOTE: FIRST SPECIFY OFSET SEEKING MODE AND 4 SPLITS CYCLE MODE (ENHANCED OPTIONS, OPERATING MODES)

	Cycle #	1/1	2/1	3/1	4/1			
	Length	**100**	**110**	**110**	**90**			
CYCLE	Offset 1	**39**	**80**	**99**	**53**			**Secs**
&	Offset 2							
OFFSETS	Offset 3							
	Offset 4							
	Offset 5							
	Max Dwell	**32**	**32**	**32**	**32**			

COORD PHASES (MM-3-2-5)

	CYCLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1-1		**X**				**X**										
	2-1		**X**				**X**										
COORD	**3-1**		**X**				**X**										
PHASES	**4-1**		**X**				**X**										

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PHASE ALLOCATION (MM-3-2-6)

ENTRY IN:	Secs	% or Secs: Not a controller entry--for reference only. Controller entry is under

	PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE ALLO-CATION	**C1 S1**		**43**	**9**	**48**		**43**		**57**								
	C1 S2																
	C1 S3																
	C1 S4																
	C2 S1		**53**	**11**	**46**		**53**		**57**								
	C2 S2																
	C2 S3																
	C2 S4																
	C3 S1		**49**	**13**	**48**		**49**		**61**								
	C3 S2																
	C3 S3																
	C3 S4																
	C4 S1		**42**		**48**		**42**		**48**								
	C4 S2																
	C4 S3																
	C4 S4																

OFFSET SEEKING MODE (MM-3-2-7)

Offset Seeeling Mode:	0

Mode

0 Add only, cycle times 20% slow only to get in sync

1 Dwell, cycle timer stops at cycle 0 up to max dwell time to get in step

2 Short Route, cycle times 20% fast or slow--whichever gets in step fastest

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ENHANCED OPTIONS

OPERATING OPTIONS (MM-3-2-9-1)

Enhanced Perm:	**Y**	Y/N: See note	Invert Free In:	**N**	Y/N: See note
Central Override:	**N**	Y/N: See note	Split Matrix:	**N**	Y/N: See note
No PCL Offset Adjust:	**N**	Y/N: See note	4 Splits/Cycle:	**Y**	Y/N: See note
			No Early Coord Ped:	**N**	Y/N: See note

Yield Percent	**1**	0-10%: See note
EGB%	**0**	0-100%: See note
RGB%	**0**	0-100%: See note
# Cycles to out of step:	**0**	0-255: 0=Disable

CYCLE SYNC OPTIONS (MM-3-2-9-2)

Sync Source:	**0**	0-2, 0=TOD/CL/Interconnect, 1= City Zero, 2= Absolute

Charts below only For City Zero offfsets or Absolute (0's). These are not daily reference times for Sync Source Option 0 (see TOD).

Cycle 1:	**0**	Cycle 2:	**0**	Cycle 3:	**0**
Cycle 4:	**0**	Cycle 5:	**0**	Cycle 6:	**0**

MANUAL/AUTO FORCE OFFS & PERMS

SET MANUAL MODE (MM-3-2-9-3-1)

Auto Perm and FO:	**Y**	Y/N: Y = Perms & Force offs auto-calculated from phase allocations. N = Manually entered
Ped Perm:	**0**	0-255: 0 = Auto calculated. 1-255 = secs each ped perm, starting with vehicle permissives

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DAY PLANS (MM-3-3-1-#)

	HH	MM	CIRCUIT PLAN	C	O	S	CKT	ON/OFF
1	00	00					11(FRE)	OFF
	00	00		4	1	1		
	08	00		1	1	1		
	18	00		4	1	1		
2	00	00					11(FRE)	OFF
	00	00		4	1	1		
	06	30		2	1	1		
	10	00		1	1	1		
	14	30		3	1	1		
	18	30		1	1	1		
	20	00		4	1	1		

WEEK PLANS (MM-3-3-3)

Plan	SUN	MON	TUE	WED	THU	FRI	SAT
1	1	2	2	2	2	2	1
2							
3							
4							
5							

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CIRCUIT OVERRIDES (MM-3-3-6)

For each ciruit specify TOD (time of day controlled), or manually ON or OFF. Default = TOD

CIRCUIT OVER-RIDES	Circuit	65	66	67	68	69	70	71	72
	Function	LL1	LL2	LL3	LL4	LL5	LL6	LL7	LL8
	State								
	Circuit	**73**	74	75	76	**77**	78	79	80
	Function	**CN1**	CN2	CN3	CN4	**WRM**	MIN	DIM	CVS
	State	**ON**				**ON**			
CIRCUIT OVER-RIDES	Circuit	113	114	115	116	117	118	119	120
	Function	UD1	UD2	UD3	UD4	UD5	UD6	UD7	UD8
	State								
	Circuit	121	122	123	124	**125**	**126**	127	128
	Function	PH2	DP2	DP3	3CD	**EVL**	**EML**	ASC	DCP
	State					**ON**	**ON**		

DAYLIGHT SAVINGS (MM-3-3-7)

DAY LIGHT SAVINGS	Spring		Fall	
	(0-12)	(0-5)	(0-12)	(0-5)
	Month	WOM	Month	WOM
	3	**2**	**11**	**1**

Enter Month and Week of Month for Spring Forward and Fall Back days (typical 4 - 1 and 10 - 5). Unit will adjust at 2AM on Sunday of week specified. Enter zero (or leave blank) if Daylight Savings not used.

SYNC REFERENCE MODE (MM-3-3-8)

Mode:	**0**	0 = Time dependent, 1 = C/O/S Event

	HH	MM	
Time Clock Reset:	**00**	**00**	TOD clock reset to by TBC input
Interrupter:		**N**	Y/N; Y = Interrupter pulses provided
Pulses:		**0**	0-6 = Number of interrupter pulses

TIME DEPENDENT CYCLE REFERENCES		HH	MM		HH	MM		HH	MM
	CYC 1:	**00**	**00**	CYC 2:	**00**	**00**	CYC 3:	**00**	**00**
	CYC 4:	**00**	**00**	CYC 5:	**00**	**00**	CYC 6:	**00**	**00**

When mode = Time dependent, enter reference times of day for each cycle. Default = 00:00 = midnight = most commonly used reference.
When mode = C/O/S Event, cycle restarts on each COS change. Only use this mode for specific reasons. Time dependent most common used mode.

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CLOSED LOOP ID (MM-3-5-1)

CLOSED LOOP ID	Master Type:	**1**	0 = None, 1 = 3000 Series Master, 2 = 3800 EL master
	Intersection ID	**14**	0-255
	Master Identification	**17**	0-255
	Allow Comm Xfer Between Ports 2 & 3		Y/N: Y = Incoming signal on Master port (2 or 3), gets echo'd on other port

COMM SET-UP (MM-3-5-2)

PG1 PORT ASSIGN	Master (CL) Port:		0 = None, 2 = Port 2, 3 = Port 3 (Port to be used to receive Master Comm)
	Monitor Port		0 = None, 2 = Port 2, 3 = Port 3 (Port to be used for Monitor Data Upload)
	Central Port:		0 = None, 2 = Port 2, 3 = Port 3 (Port to be used for Direct Dial-up Modem)

PG2 PORT 2 SETUP	Data Rate:	**9600**	1200, 2400, 4800, 9600, 14400, 19200
	Parity	**0**	0 = None, 1 = Odd, 2=Even
	Data bits	**1**	0 = 7 bits, 1 = 8 bits

PG3 PORT 3 SETUP	Data Rate:	**1200**	1200, 2400, 4800, 9600, 14400, 19200
	Parity	**0**	0 = None, 1 = Odd, 2=Even
	Data bits	**1**	0 = 7 bits, 1 = 8 bits

PG4	Modem Set-up String:		Up to 40 charaters; A-Z, or # @ = , ! ; % \ &

PHONE NUMBERS (MM-3-5-3)

PHONE NUM-BERS	Tone:		Y/N
	Phone 1:		Number & control characters (W , ; # ' / T P) if used
	Phone 2:		Number & control characters (W , ; # ' / T P) if used

LOG DATA (MM-3-5-5)

PG1 SAMPLE	Volume Log Sample period:	**60**	0, 6, 10, 15, 20, 30, 60 minutes, Enabled by TOD Ckt. 125 (EVL)
	MOE Log Sample period:	**60**	0, 6, 10, 15, 20, 30, 60 minutes, Enabled by TOD Ckt. 126 (EML

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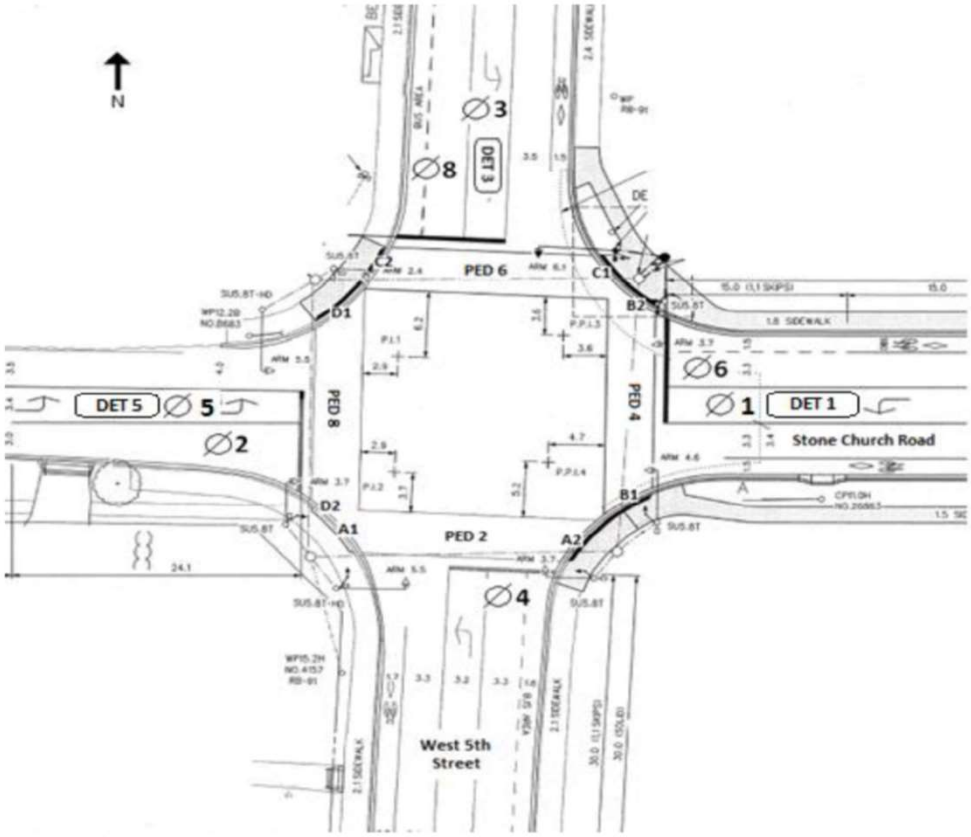
City of Hamilton - Traffic
Traffic Signal Controller Timing Data

Intersection:	**Stone Church & West 5th - Int # 340**		
Controller Type:	**Intelight D4**	Revision:	**10032**
Converted By:	**SC**	Installed By:	
Date:	**30-Jun-20**	Date:	
Reason for Timing Change:	**D4 Controller Swap**		
Communication:	**Radio**	System:	**KITS**
Operation Type:	**LT - Actuated**	UPS:	
APS:		IP Address:	**10.240.115.53**



- ϕ1: **Stone Church - WBL**
- ϕ2: **Stone Church- EB, South Xwalk**
- ϕ3: **West 5th - SBL**
- ϕ4: **West 5th - NB, East Xwalk**
- ϕ5: **Stone Church - EBL**
- ϕ6: **Stone Church - WB, North Xwalk**
- ϕ7:
- ϕ8: **West 5th - SB, West Xwalk**

Flash Operation: Red/Red

West 5th @ Stone Church

Phase Timing

6/30/20 11:56:27 AM

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Green	5	20	5	20	5	20	0	20	0	0	0	0	0	0	0	0
Veh Ext	2.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Green 1	10	60	10	60	10	60	0	60	0	0	0	0	0	0	0	0
Max Green 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Green 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow	3.0	3.3	3.0	3.3	3.0	3.3	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clr	0.0	2.6	0.0	2.5	0.0	2.6	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adv Flash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bike MG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	12	0	12	0	12	0	12	0	0	0	0	0	0	0	0
Ped Clr	0	14	0	14	0	14	0	14	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sol DW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Early Wlk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Wlk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TTReduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Revert	4.0	4.0	4.0	4.0	4.0	4.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neg Ped	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AP Disc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Ped Clr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Return Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West 5th @ Stone Church

Phase Options

6/30/20 11:56:27 AM

Phases	1-8								9-16							
Min Recalls																
Max Recalls																
Ped Recalls		2		4		6		8								
Soft Recall																
Dual Entry		2		4		6		8								
Red Rest																
Walk Rest		2		4		6		8								
Walk Expand																
Ped Recycle		2		4		6		8								
Sim Ped Term																
PC Thru Clr																
Guar Passage																
No Simult Gap																
Yel Lock																
Red Lock																
PhaseNext Lock	1	2	3	4	5	6	7	8								
No Term Call	1	2	3	4	5	6	7	8								
Cond Serv																
CS Enable																
Cond Reserve																
Reserve																
Veh Omit																
Ped Omit																
Perm Phase		2		4		6		8								
Protect Calls																
Protect Calls 2																
Flash Entry																
Flash Exit																
Flash Exit Yel																
Flash Exit Red																
Ped Scramble																
No Min Yel																
No Min Red Rev																
Max Scramble Walk																
Flash Yellow																
Flash FYA																
CNA 1																
CNA 2																

West 5th @ Stone Church

Phase Startup Options

6/30/20 11:56:27 AM

Startup Flash	10	Mode	Yel->Red
Startup All Red	5	Yellow	0.0

Phases	1-8							9-16							
Startup Phases				4			8								
Startup Yellow															
Startup Red				4			8								
Startup No Walk															
Startup Next															
Startup Yel Fls															
Startup FYA															
No Veh Call															
No Ped Call															

Phase Startup Timing

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Unit

Red Revert	0.0	Ped Protect	No	AdvFls in Flash	No

West 5th @ Stone Church

Ring Sequence / Conflicting Phases

6/30/20 11:56:27 AM

Ringgroup 1

Ring 1	1	2	3	4	0	0	0	0	0	0	0	0	0	0	0	0
Ring 2	5	6	0	8	0	0	0	0	0	0	0	0	0	0	0	0

Ringgroup 2

Custom Sequences

Seq 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Conflicting Phases

	1-8							9-16							
Phase 1															
Phase 2															
Phase 3															
Phase 4															
Phase 5															
Phase 6															
Phase 7															
Phase 8															
Phase 9															
Phase 10															
Phase 11															
Phase 12															
Phase 13															
Phase 14															
Phase 15															
Phase 16															

West 5th @ Stone Church

Coordination Pattern 1

6/30/20 11:56:27 AM

Cycle	110	Ringgroup 1 - Offset 1	73	Offset 2	0	Offset 3	0
		Ringgroup 2 - Offset 1	0	Offset 2	0	Offset 3	0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Splits	9	51	10	40	9	51	0	50	0	0	0	0	0	0	0	0
Split Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Float Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perm Min Green	8	12	8	12	8	12	0	12	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Permissive Mode	Sing Band	Max Mode	Max 1	Walk Rest	Opp Call
Ped Permissive	Yield				
Permissive Limit	10	Perm 2 Start	0	Perm 2 End	0
Alt Sequence		TOD Link	0		

Phases/Overlaps	1-8								9-16							
Coord Phases		2				6										
No Extend																
Float Enable																
Veh = Ped Perm																
Walk Rest																
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Serv																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm 1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phases																

Trans Mode	Best 2
Offset Ref	Lag Grn
Adaptive Mode	Disabled

Disable Priority	
Progression Phases	
Priority Alt Seq	
Reserve Extend	

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Priority Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recovery Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West 5th @ Stone Church

Coordination Pattern 2

6/30/20 11:56:27 AM

Cycle	110	Ringgroup 1 - Offset 1	0	Offset 2	0	Offset 3	0
		Ringgroup 2 - Offset 1	0	Offset 2	0	Offset 3	0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Splits	9	41	10	50	9	41	0	60	0	0	0	0	0	0	0	0
Split Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Float Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perm Min Green	8	12	8	12	8	12	0	12	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Permissive Mode	Sing Band	Max Mode	Max 1	Walk Rest	Opp Call
Ped Permissive	Yield				
Permissive Limit	10	Perm 2 Start	0	Perm 2 End	0
Alt Sequence		TOD Link	0		

Phases/Overlaps	1-8								9-16							
Coord Phases		2				6										
No Extend																
Float Enable																
Veh = Ped Perm																
Walk Rest																
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Serv																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm 1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phases																

Trans Mode	Best 2
Offset Ref	Lag Grn
Adaptive Mode	Disabled

Disable Priority	
Progression Phases	
Priority Alt Seq	
Reserve Extend	

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Priority Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recovery Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West 5th @ Stone Church

Coordination Pattern 3

6/30/20 11:56:27 AM

Cycle	110	Ringgroup 1 - Offset 1	81	Offset 2	0	Offset 3	0
		Ringgroup 2 - Offset 1	0	Offset 2	0	Offset 3	0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Splits	9	45	12	44	9	45	0	56	0	0	0	0	0	0	0	0
Split Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Float Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perm Min Green	8	12	8	12	8	12	0	12	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Permissive Mode	Sing Band	Max Mode	Max 1	Walk Rest	Opp Call
Ped Permissive	Yield				
Permissive Limit	10	Perm 2 Start	0	Perm 2 End	0
Alt Sequence		TOD Link	0		

Phases/Overlaps	1-8								9-16							
Coord Phases		2				6										
No Extend																
Float Enable																
Veh = Ped Perm																
Walk Rest																
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Serv																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm 1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phases																

Trans Mode	Best 2
Offset Ref	Lag Grn
Adaptive Mode	Disabled

Disable Priority		
Progression Phases		
Priority Alt Seq		
Reserve Extend		

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Priority Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recovery Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West 5th @ Stone Church

Coordination Pattern 4

6/30/20 11:56:27 AM

Cycle	90	Ringgroup 1 - Offset 1	7	Offset 2	0	Offset 3	0
		Ringgroup 2 - Offset 1	0	Offset 2	0	Offset 3	0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Splits	0	48	0	42	0	48	0	42	0	0	0	0	0	0	0	0
Split Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Float Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perm Min Green	0	12	0	12	0	12	0	12	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Permissive Mode	Sing Band	Max Mode	Max 1	Walk Rest	Opp Call
Ped Permissive	Yield				
Permissive Limit	10	Perm 2 Start	0	Perm 2 End	0
Alt Sequence		TOD Link	0		

Phases/Overlaps	1-8								9-16							
Coord Phases		2				6										
No Extend																
Float Enable																
Veh = Ped Perm																
Walk Rest																
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Serv																
Reservice																
Veh Omit	1		3		5											
Ped Omit																
Olap Omit																
Perm Reserve																
Perm 1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phases																

Trans Mode	Best 2
Offset Ref	Lag Grn
Adaptive Mode	Disabled

Disable Priority		
Progression Phases		
Priority Alt Seq		
Reserve Extend		

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Priority Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recovery Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West 5th @ Stone Church

TOD Pattern Events

6/30/20 11:56:27 AM

	Time	DOW							Holidays								Mode	Pattern	Offset
Event 1	00:00	S						S									Sched	4	1
Event 2	06:00	S						S									Sched	1	1
Event 3	23:00	S						S									Sched	4	1
Event 4	00:00		M	T	W	T	F										Sched	4	1
Event 5	06:00		M	T	W	T	F										Sched	2	1
Event 6	10:00		M	T	W	T	F										Sched	1	1
Event 7	14:30		M	T	W	T	F										Sched	3	1
Event 8	18:30		M	T	W	T	F										Sched	1	1
Event 9	23:00		M	T	W	T	F										Sched	4	1
Event 10	00:00																Sched	0	0
Event 11	00:00																Sched	0	0
Event 12	00:00																Sched	0	0
Event 13	00:00																Sched	0	0
Event 14	00:00																Sched	0	0
Event 15	00:00																Sched	0	0
Event 16	00:00																Sched	0	0
Event 17	00:00																Sched	0	0
Event 18	00:00																Sched	0	0
Event 19	00:00																Sched	0	0
Event 20	00:00																Sched	0	0
Event 21	00:00																Sched	0	0
Event 22	00:00																Sched	0	0
Event 23	00:00																Sched	0	0
Event 24	00:00																Sched	0	0
Event 25	00:00																Sched	0	0
Event 26	00:00																Sched	0	0
Event 27	00:00																Sched	0	0
Event 28	00:00																Sched	0	0
Event 29	00:00																Sched	0	0
Event 30	00:00																Sched	0	0
Event 31	00:00																Sched	0	0
Event 32	00:00																Sched	0	0

West 5th @ Stone Church

Vehicle Detector 1

6/30/20 11:56:27 AM

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						
Delay 2	0.0						

Phases	1-8	9-16
Call Phases	1	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	1	
XSwitch Phases		
Bike Call Phases		

Vehicle Detector 3

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						
Delay 2	0.0						

Phases	1-8	9-16
Call Phases	3	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	3	
XSwitch Phases		
Bike Call Phases		

West 5th @ Stone Church

Vehicle Detector 5

6/30/20 11:56:27 AM

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						
Delay 2	0.0						

Phases	1-8							9-16							
Call Phases				5											
Yellow Lock Phases															
Red Lock Phases															
Extend Phases				5											
XSwitch Phases															
Bike Call Phases															

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Data

Start Time	Stone Church Road W Eastbound						Stone Church Road W Westbound					Garth Street Northbound						Garth Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	26	27	8	0	0	61	5	17	10	0	32	6	77	5	0	0	88	7	29	22	0	1	58	239
7:15 AM	35	31	2	0	0	68	6	17	15	0	38	5	83	7	0	0	95	8	30	24	0	0	62	263
7:30 AM	46	43	6	0	3	95	13	44	16	0	73	13	100	11	0	2	124	7	39	34	0	1	80	372
7:45 AM	52	60	9	0	1	121	15	90	15	0	120	13	145	18	0	4	176	16	56	66	0	0	138	555
Hourly Total	159	161	25	0	4	345	39	168	56	0	263	37	405	41	0	6	483	38	154	146	0	2	338	1429
8:00 AM	78	106	19	0	5	203	15	67	17	0	99	20	157	24	0	1	201	17	60	69	0	1	146	649
8:15 AM	67	78	11	0	4	156	17	50	19	0	86	19	138	20	0	0	177	14	74	34	0	1	122	541
8:30 AM	54	47	12	0	13	113	10	46	27	0	83	10	150	21	0	1	181	17	94	41	0	1	152	529
8:45 AM	48	58	13	0	1	119	17	68	20	0	105	16	123	21	0	2	160	14	109	34	0	0	157	541
Hourly Total	247	289	55	0	23	591	59	231	83	0	373	65	568	86	0	4	719	62	337	178	0	3	577	2260
9:00 AM	48	57	13	0	4	118	15	58	9	0	82	15	119	12	0	0	146	16	91	29	0	1	136	482
9:15 AM	39	63	10	0	2	112	8	42	18	0	68	9	115	22	0	0	146	19	82	42	0	1	143	469
9:30 AM	46	48	12	0	1	106	9	45	16	0	70	12	81	11	0	0	104	7	63	22	0	1	92	372
9:45 AM	37	54	6	0	3	97	9	43	20	0	72	17	77	9	0	1	103	18	59	34	0	0	111	383
Hourly Total	170	222	41	0	10	433	41	188	63	0	292	53	392	54	0	1	499	60	295	127	0	3	482	1706
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	36	58	22	0	2	116	9	44	12	0	65	10	123	16	0	1	149	16	64	36	0	1	116	446
11:15 AM	33	54	15	0	2	102	13	73	16	0	102	13	109	10	0	0	132	26	77	40	0	3	143	479
11:30 AM	27	67	13	0	1	107	7	48	28	0	83	16	82	12	0	0	110	14	67	37	0	2	118	418
11:45 AM	42	62	16	0	0	120	12	58	22	0	92	16	121	11	0	1	148	19	104	36	0	0	159	519
Hourly Total	138	241	66	0	5	445	41	223	78	0	342	55	435	49	0	2	539	75	312	149	0	6	536	1862
12:00 PM	35	61	15	0	2	111	14	57	25	0	96	14	94	12	0	0	120	18	79	41	0	1	138	465
12:15 PM	36	74	9	0	1	119	10	56	16	0	82	17	88	16	0	0	121	19	75	37	0	0	131	453
12:30 PM	42	77	13	0	3	132	18	65	15	0	98	21	88	14	0	1	123	20	71	35	0	0	126	479
12:45 PM	34	65	21	0	1	120	13	72	21	0	106	12	60	8	0	0	80	17	86	34	0	0	137	443
Hourly Total	147	277	58	0	7	482	55	250	77	0	382	64	330	50	0	1	444	74	311	147	0	1	532	1840
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	45	67	22	0	1	134	14	61	30	0	105	17	131	12	0	2	160	23	99	59	0	0	181	580
3:15 PM	51	78	22	0	20	151	25	64	15	0	104	17	113	12	0	0	142	34	133	52	0	1	219	616
3:30 PM	40	67	19	0	5	126	14	77	17	0	108	16	92	14	0	1	122	34	119	59	0	0	212	568
3:45 PM	48	84	13	0	0	145	19	79	26	0	124	15	125	17	0	1	157	35	133	51	0	2	219	645
Hourly Total	184	296	76	0	26	556	72	281	88	0	441	65	461	55	0	4	581	126	484	221	0	3	831	2409
4:00 PM	59	109	19	0	5	187	18	79	30	0	127	16	123	15	0	4	154	39	141	46	0	1	226	694
4:15 PM	45	91	16	0	2	152	19	82	19	0	120	9	126	14	0	0	149	38	126	58	0	1	222	643
4:30 PM	49	99	19	0	2	167	12	75	22	0	109	20	109	25	0	1	154	40	134	57	0	1	231	661

4:45 PM	48	84	11	0	0	143	20	69	24	0	113	5	121	14	0	0	140	46	111	51	0	1	208	604
Hourly Total	201	383	65	0	9	649	69	305	95	0	469	50	479	68	0	5	597	163	512	212	0	4	887	2602
5:00 PM	40	86	14	0	1	140	15	90	20	0	125	11	108	18	0	1	137	34	121	70	0	2	225	627
5:15 PM	55	74	16	0	3	145	22	60	22	0	104	14	120	15	0	0	149	40	131	59	0	1	230	628
5:30 PM	42	74	20	0	4	136	18	70	26	0	114	8	100	18	0	0	126	33	115	55	0	0	203	579
5:45 PM	39	62	20	0	3	121	14	63	19	0	96	4	110	18	0	0	132	29	115	67	0	1	211	560
Hourly Total	176	296	70	0	11	542	69	283	87	0	439	37	438	69	0	1	544	136	482	251	0	4	869	2394
Grand Total	1422	2165	456	0	95	4043	445	1929	627	0	3001	426	3508	472	0	24	4406	734	2887	1431	0	26	5052	16502
Approach %	35.2	53.5	11.3	0.0	-	-	14.8	64.3	20.9	0.0	-	9.7	79.6	10.7	0.0	-	-	14.5	57.1	28.3	0.0	-	-	-
Total %	8.6	13.1	2.8	0.0	-	24.5	2.7	11.7	3.8	0.0	18.2	2.6	21.3	2.9	0.0	-	26.7	4.4	17.5	8.7	0.0	-	30.6	-
Motorcycles	0	0	0	0	-	0	0	0	1	0	1	0	0	0	0	-	0	0	2	0	0	-	2	3
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.2	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	-	0.0	0.0
Cars & Light Goods	1405	2111	445	0	-	3961	433	1868	617	0	2918	418	3433	459	0	-	4310	722	2816	1401	0	-	4939	16128
% Cars & Light Goods	98.8	97.5	97.6	-	-	98.0	97.3	96.8	98.4	-	97.2	98.1	97.9	97.2	-	-	97.8	98.4	97.5	97.9	-	-	97.8	97.7
Buses	6	31	5	0	-	42	7	41	6	0	54	5	50	8	0	-	63	5	45	6	0	-	56	215
% Buses	0.4	1.4	1.1	-	-	1.0	1.6	2.1	1.0	-	1.8	1.2	1.4	1.7	-	-	1.4	0.7	1.6	0.4	-	-	1.1	1.3
Single-Unit Trucks	9	19	5	0	-	33	4	16	2	0	22	3	21	4	0	-	28	6	19	19	0	-	44	127
% Single-Unit Trucks	0.6	0.9	1.1	-	-	0.8	0.9	0.8	0.3	-	0.7	0.7	0.6	0.8	-	-	0.6	0.8	0.7	1.3	-	-	0.9	0.8
Articulated Trucks	2	0	1	0	-	3	1	1	1	0	3	0	3	1	0	-	4	1	5	5	0	-	11	21
% Articulated Trucks	0.1	0.0	0.2	-	-	0.1	0.2	0.1	0.2	-	0.1	0.0	0.1	0.2	-	-	0.1	0.1	0.2	0.3	-	-	0.2	0.1
Bicycles on Road	0	4	0	0	-	4	0	3	0	0	3	0	1	0	0	-	1	0	0	0	0	-	0	8
% Bicycles on Road	0.0	0.2	0.0	-	-	0.1	0.0	0.2	0.0	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	95	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	26	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
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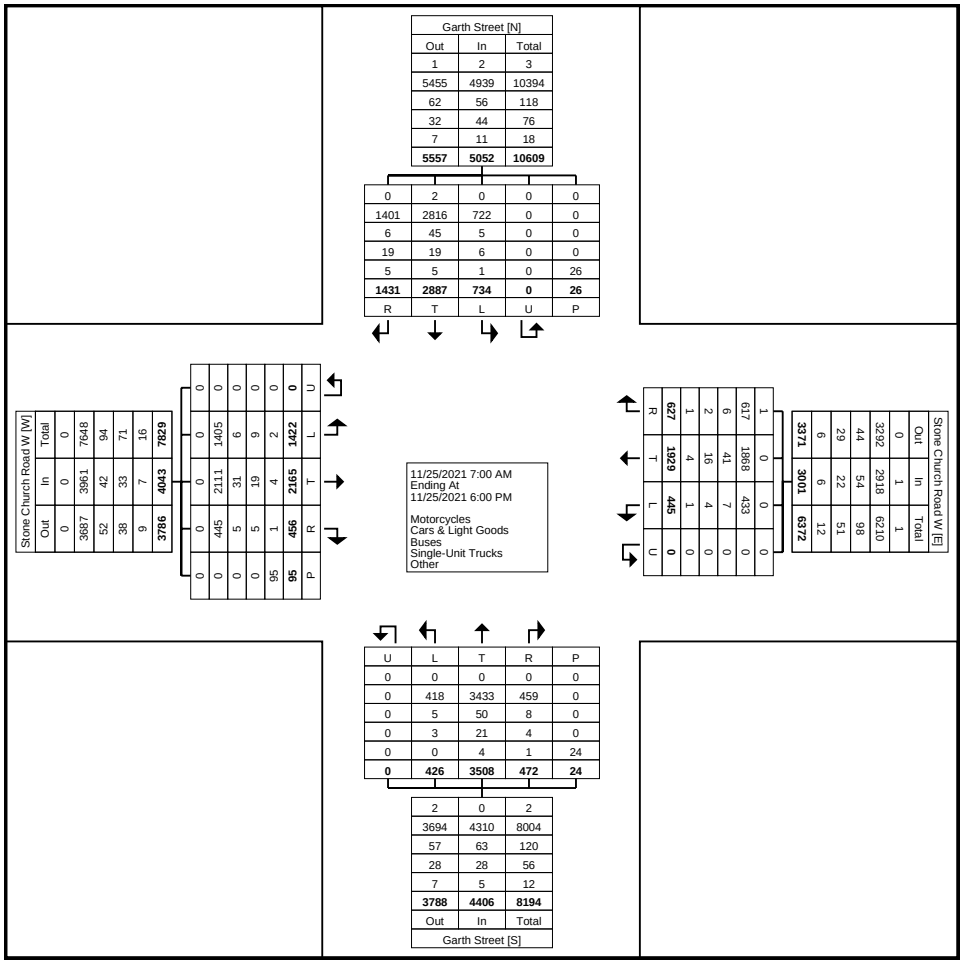
Site Code: 210669
Start Date: 11/25/2021



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021

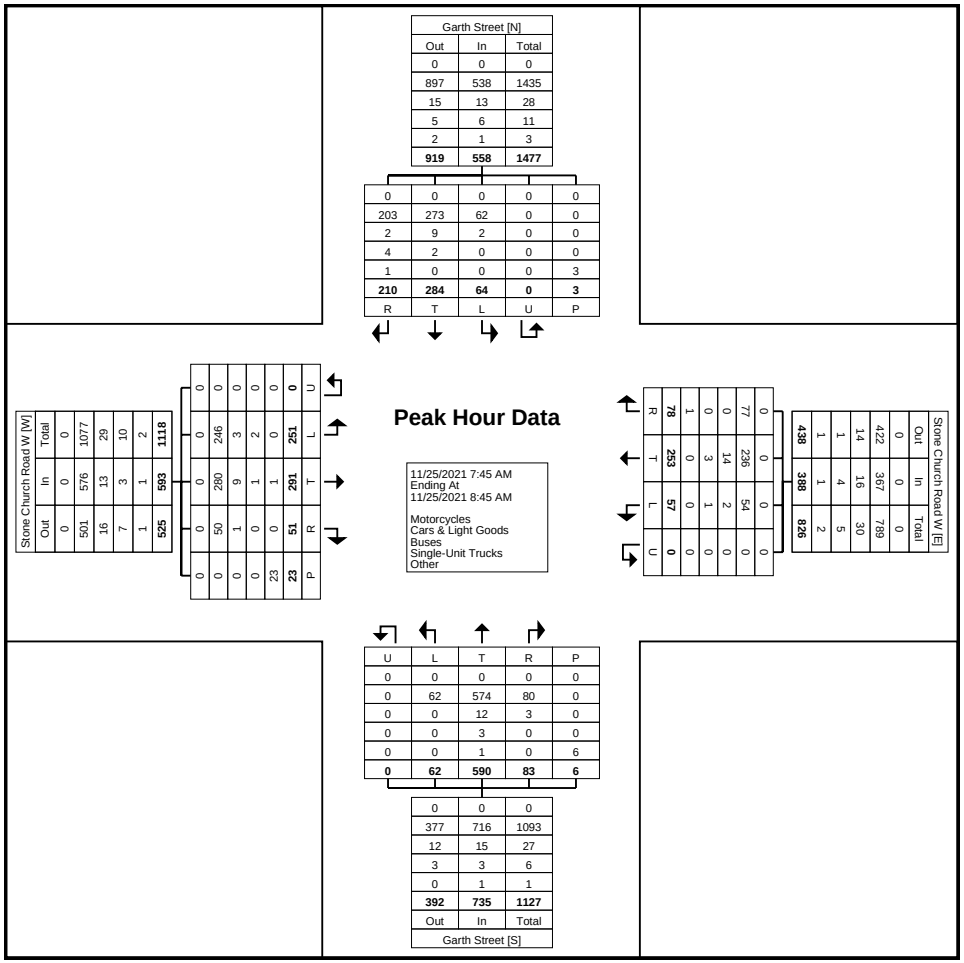
Turning Movement Peak Hour Data (7:45 AM)

Start Time	Stone Church Road W Eastbound						Stone Church Road W Westbound					Garth Street Northbound						Garth Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	52	60	9	0	1	121	15	90	15	0	120	13	145	18	0	4	176	16	56	66	0	0	138	555
8:00 AM	78	106	19	0	5	203	15	67	17	0	99	20	157	24	0	1	201	17	60	69	0	1	146	649
8:15 AM	67	78	11	0	4	156	17	50	19	0	86	19	138	20	0	0	177	14	74	34	0	1	122	541
8:30 AM	54	47	12	0	13	113	10	46	27	0	83	10	150	21	0	1	181	17	94	41	0	1	152	529
Total	251	291	51	0	23	593	57	253	78	0	388	62	590	83	0	6	735	64	284	210	0	3	558	2274
Approach %	42.3	49.1	8.6	0.0	-	-	14.7	65.2	20.1	0.0	-	8.4	80.3	11.3	0.0	-	-	11.5	50.9	37.6	0.0	-	-	-
Total %	11.0	12.8	2.2	0.0	-	26.1	2.5	11.1	3.4	0.0	17.1	2.7	25.9	3.6	0.0	-	32.3	2.8	12.5	9.2	0.0	-	24.5	-
PHF	0.804	0.686	0.671	0.000	-	0.730	0.838	0.703	0.722	0.000	0.808	0.775	0.939	0.865	0.000	-	0.914	0.941	0.755	0.761	0.000	-	0.918	0.876
Motorcycles	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	246	280	50	0	-	576	54	236	77	0	367	62	574	80	0	-	716	62	273	203	0	-	538	2197
% Cars & Light Goods	98.0	96.2	98.0	-	-	97.1	94.7	93.3	98.7	-	94.6	100.0	97.3	96.4	-	-	97.4	96.9	96.1	96.7	-	-	96.4	96.6
Buses	3	9	1	0	-	13	2	14	0	0	16	0	12	3	0	-	15	2	9	2	0	-	13	57
% Buses	1.2	3.1	2.0	-	-	2.2	3.5	5.5	0.0	-	4.1	0.0	2.0	3.6	-	-	2.0	3.1	3.2	1.0	-	-	2.3	2.5
Single-Unit Trucks	2	1	0	0	-	3	1	3	0	0	4	0	3	0	0	-	3	0	2	4	0	-	6	16
% Single-Unit Trucks	0.8	0.3	0.0	-	-	0.5	1.8	1.2	0.0	-	1.0	0.0	0.5	0.0	-	-	0.4	0.0	0.7	1.9	-	-	1.1	0.7
Articulated Trucks	0	0	0	0	-	0	0	0	1	0	1	0	1	0	0	-	1	0	0	1	0	-	1	3
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.3	-	0.3	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.5	-	-	0.2	0.1
Bicycles on Road	0	1	0	0	-	1	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.3	0.0	-	-	0.2	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Peak Hour Data (11:45 AM)

Start Time	Stone Church Road W Eastbound						Stone Church Road W Westbound					Garth Street Northbound						Garth Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:45 AM	42	62	16	0	0	120	12	58	22	0	92	16	121	11	0	1	148	19	104	36	0	0	159	519
12:00 PM	35	61	15	0	2	111	14	57	25	0	96	14	94	12	0	0	120	18	79	41	0	1	138	465
12:15 PM	36	74	9	0	1	119	10	56	16	0	82	17	88	16	0	0	121	19	75	37	0	0	131	453
12:30 PM	42	77	13	0	3	132	18	65	15	0	98	21	88	14	0	1	123	20	71	35	0	0	126	479
Total	155	274	53	0	6	482	54	236	78	0	368	68	391	53	0	2	512	76	329	149	0	1	554	1916
Approach %	32.2	56.8	11.0	0.0	-	-	14.7	64.1	21.2	0.0	-	13.3	76.4	10.4	0.0	-	-	13.7	59.4	26.9	0.0	-	-	-
Total %	8.1	14.3	2.8	0.0	-	25.2	2.8	12.3	4.1	0.0	19.2	3.5	20.4	2.8	0.0	-	26.7	4.0	17.2	7.8	0.0	-	28.9	-
PHF	0.923	0.890	0.828	0.000	-	0.913	0.750	0.908	0.780	0.000	0.939	0.810	0.808	0.828	0.000	-	0.865	0.950	0.791	0.909	0.000	-	0.871	0.923
Motorcycles	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	154	265	51	0	-	470	52	230	77	0	359	67	390	53	0	-	510	76	322	147	0	-	545	1884
% Cars & Light Goods	99.4	96.7	96.2	-	-	97.5	96.3	97.5	98.7	-	97.6	98.5	99.7	100.0	-	-	99.6	100.0	97.9	98.7	-	-	98.4	98.3
Buses	0	3	0	0	-	3	0	2	1	0	3	0	1	0	0	-	1	0	3	0	0	-	3	10
% Buses	0.0	1.1	0.0	-	-	0.6	0.0	0.8	1.3	-	0.8	0.0	0.3	0.0	-	-	0.2	0.0	0.9	0.0	-	-	0.5	0.5
Single-Unit Trucks	0	5	1	0	-	6	2	3	0	0	5	1	0	0	0	-	1	0	4	1	0	-	5	17
% Single-Unit Trucks	0.0	1.8	1.9	-	-	1.2	3.7	1.3	0.0	-	1.4	1.5	0.0	0.0	-	-	0.2	0.0	1.2	0.7	-	-	0.9	0.9
Articulated Trucks	1	0	1	0	-	2	0	0	0	0	0	0	0	0	0	-	0	0	0	1	0	-	1	3
% Articulated Trucks	0.6	0.0	1.9	-	-	0.4	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.7	-	-	0.2	0.2
Bicycles on Road	0	1	0	0	-	1	0	1	0	0	1	0	0	0	0	-	0	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.4	0.0	-	-	0.2	0.0	0.4	0.0	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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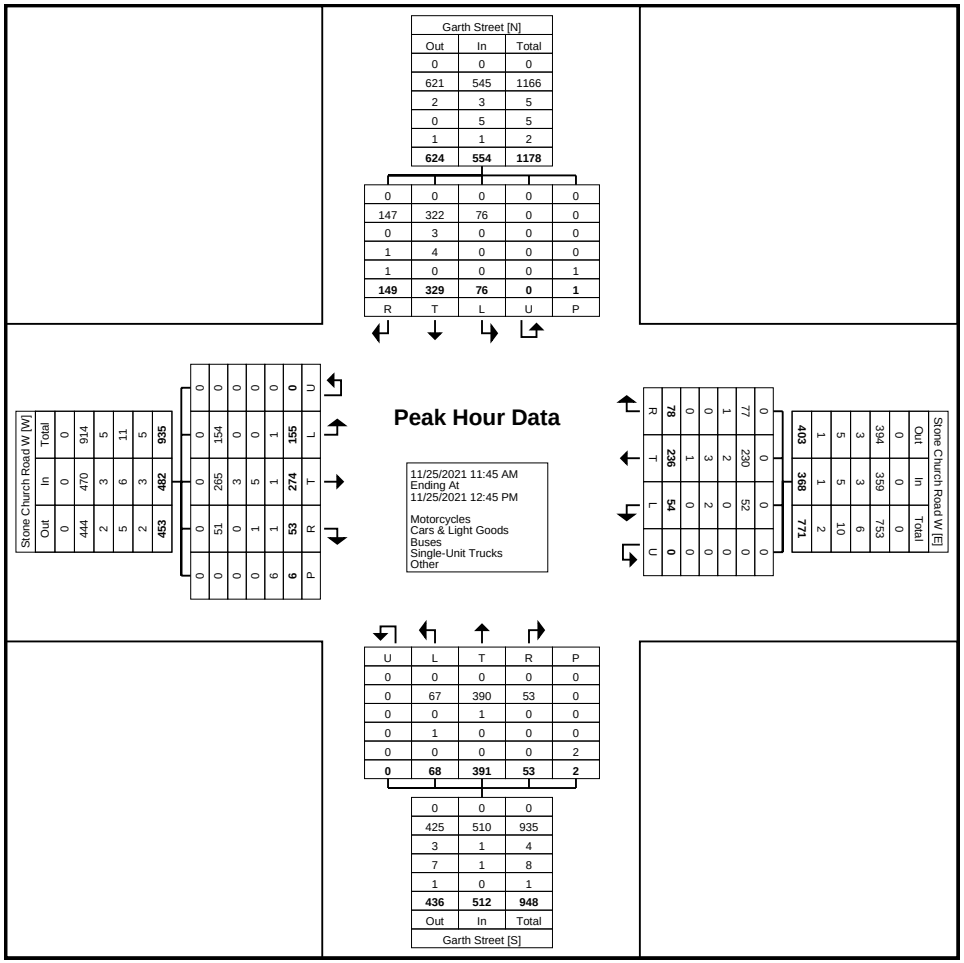
Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Peak Hour Data (3:45 PM)

Start Time	Stone Church Road W Eastbound						Stone Church Road W Westbound					Garth Street Northbound						Garth Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
3:45 PM	48	84	13	0	0	145	19	79	26	0	124	15	125	17	0	1	157	35	133	51	0	2	219	645
4:00 PM	59	109	19	0	5	187	18	79	30	0	127	16	123	15	0	4	154	39	141	46	0	1	226	694
4:15 PM	45	91	16	0	2	152	19	82	19	0	120	9	126	14	0	0	149	38	126	58	0	1	222	643
4:30 PM	49	99	19	0	2	167	12	75	22	0	109	20	109	25	0	1	154	40	134	57	0	1	231	661
Total	201	383	67	0	9	651	68	315	97	0	480	60	483	71	0	6	614	152	534	212	0	5	898	2643
Approach %	30.9	58.8	10.3	0.0	-	-	14.2	65.6	20.2	0.0	-	9.8	78.7	11.6	0.0	-	-	16.9	59.5	23.6	0.0	-	-	-
Total %	7.6	14.5	2.5	0.0	-	24.6	2.6	11.9	3.7	0.0	18.2	2.3	18.3	2.7	0.0	-	23.2	5.8	20.2	8.0	0.0	-	34.0	-
PHF	0.852	0.878	0.882	0.000	-	0.870	0.895	0.960	0.808	0.000	0.945	0.750	0.958	0.710	0.000	-	0.978	0.950	0.947	0.914	0.000	-	0.972	0.952
Motorcycles	0	0	0	0	-	0	0	0	1	0	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.0	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	200	378	65	0	-	643	66	307	95	0	468	58	479	71	0	-	608	151	525	208	0	-	884	2603
% Cars & Light Goods	99.5	98.7	97.0	-	-	98.8	97.1	97.5	97.9	-	97.5	96.7	99.2	100.0	-	-	99.0	99.3	98.3	98.1	-	-	98.4	98.5
Buses	1	3	2	0	-	6	2	5	1	0	8	1	4	0	0	-	5	0	8	3	0	-	11	30
% Buses	0.5	0.8	3.0	-	-	0.9	2.9	1.6	1.0	-	1.7	1.7	0.8	0.0	-	-	0.8	0.0	1.5	1.4	-	-	1.2	1.1
Single-Unit Trucks	0	2	0	0	-	2	0	2	0	0	2	1	0	0	0	-	1	1	1	1	0	-	3	8
% Single-Unit Trucks	0.0	0.5	0.0	-	-	0.3	0.0	0.6	0.0	-	0.4	1.7	0.0	0.0	-	-	0.2	0.7	0.2	0.5	-	-	0.3	0.3
Articulated Trucks	0	0	0	0	-	0	0	1	0	0	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.3	0.0	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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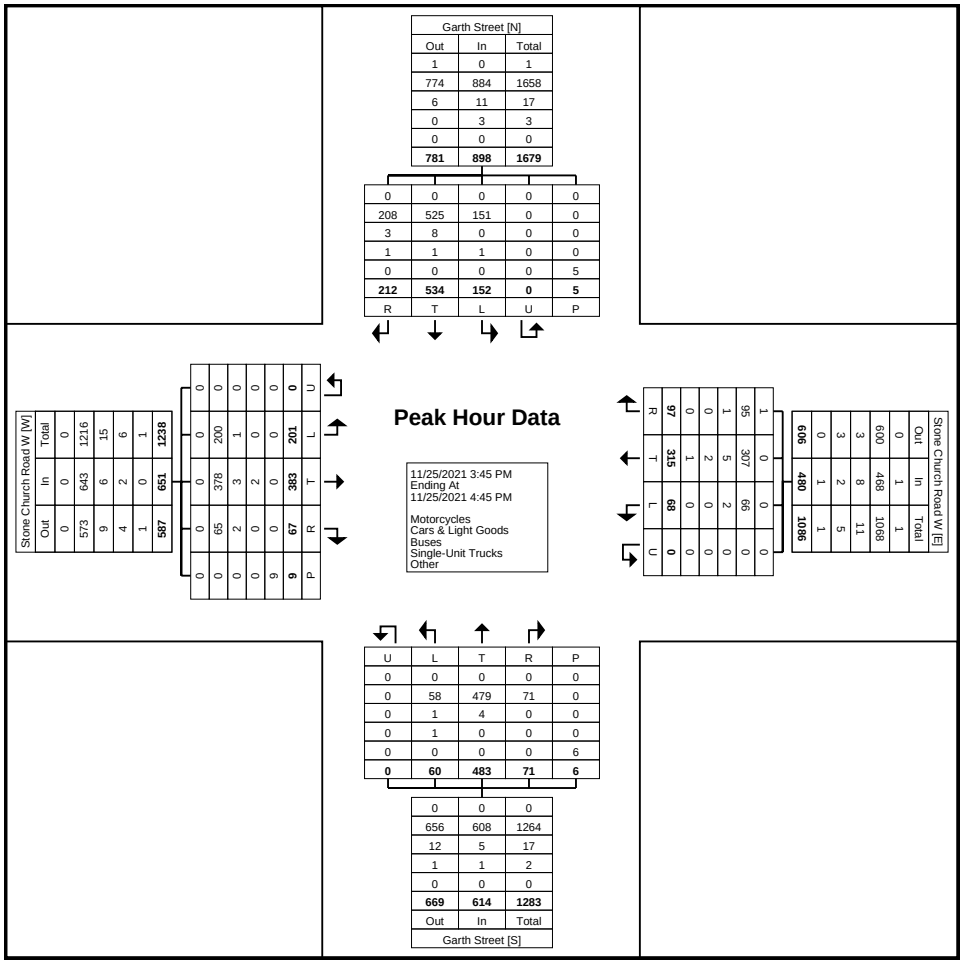
Start Date: 11/25/2021



Turning Movement Peak Hour Data Plot (3:45 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Data

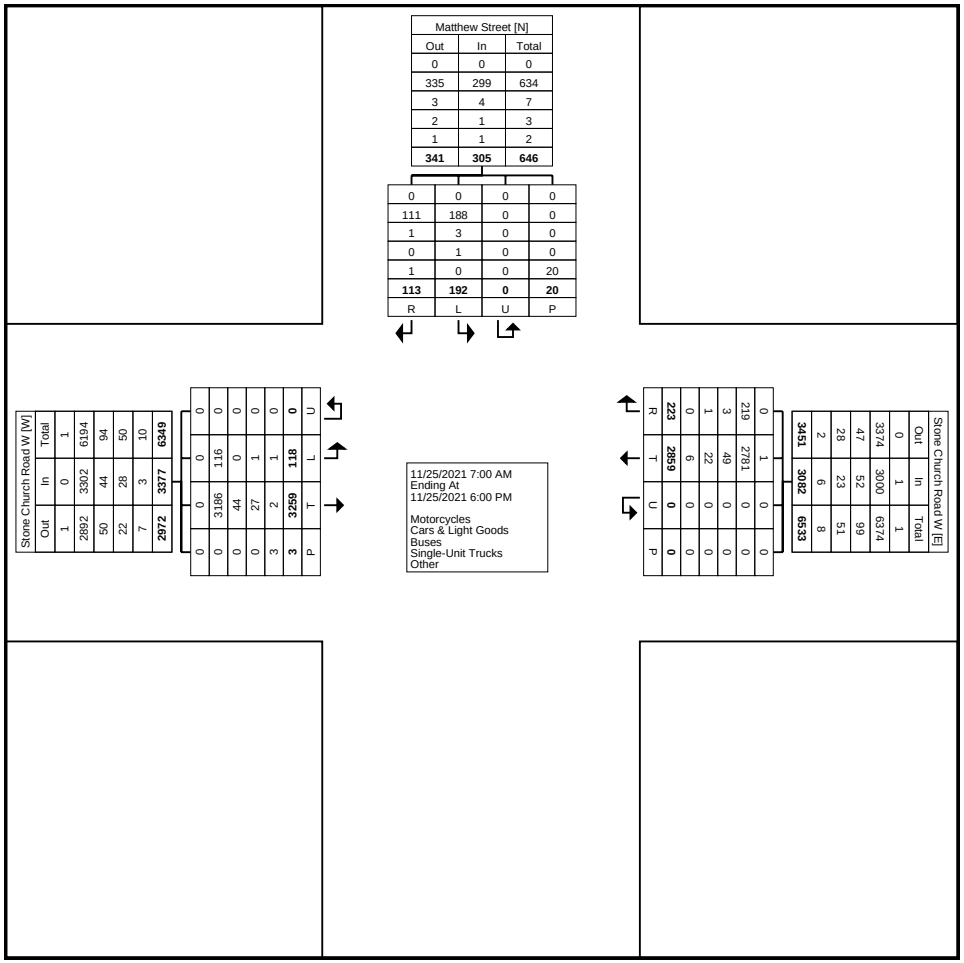
Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound					Matthew Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	1	41	0	0	42	33	2	0	0	35	1	0	0	1	1	78
7:15 AM	0	42	0	1	42	37	2	0	0	39	2	2	0	0	4	85
7:30 AM	1	61	0	0	62	62	2	0	0	64	6	7	0	1	13	139
7:45 AM	1	98	0	0	99	109	2	0	0	111	7	15	0	0	22	232
Hourly Total	3	242	0	1	245	241	8	0	0	249	16	24	0	2	40	534
8:00 AM	7	142	0	0	149	87	4	0	0	91	8	7	0	0	15	255
8:15 AM	8	104	0	0	112	82	1	0	0	83	5	4	0	0	9	204
8:30 AM	0	79	0	0	79	80	1	0	0	81	7	3	0	1	10	170
8:45 AM	3	88	0	0	91	87	3	0	0	90	7	7	0	0	14	195
Hourly Total	18	413	0	0	431	336	9	0	0	345	27	21	0	1	48	824
9:00 AM	4	86	0	0	90	75	3	0	0	78	9	4	0	1	13	181
9:15 AM	2	104	0	0	106	68	7	0	0	75	6	1	0	2	7	188
9:30 AM	2	63	0	0	65	71	6	0	0	77	7	3	0	1	10	152
9:45 AM	3	77	0	0	80	71	4	0	0	75	8	0	0	0	8	163
Hourly Total	11	330	0	0	341	285	20	0	0	305	30	8	0	4	38	684
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	5	80	0	0	85	61	6	0	0	67	5	1	0	0	6	158
11:15 AM	3	92	0	0	95	98	14	0	0	112	6	4	0	2	10	217
11:30 AM	3	91	0	0	94	86	5	0	0	91	3	2	0	1	5	190
11:45 AM	1	91	0	0	92	84	8	0	0	92	7	2	0	0	9	193
Hourly Total	12	354	0	0	366	329	33	0	0	362	21	9	0	3	30	758
12:00 PM	3	86	0	1	89	93	7	0	0	100	11	1	0	0	12	201
12:15 PM	4	102	0	0	106	88	7	0	0	95	2	2	0	0	4	205
12:30 PM	2	111	0	0	113	94	3	0	0	97	3	3	0	0	6	216
12:45 PM	4	87	0	0	91	100	8	0	0	108	9	3	0	0	12	211
Hourly Total	13	386	0	1	399	375	25	0	0	400	25	9	0	0	34	833
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	3	96	0	0	99	99	8	0	0	107	8	4	0	1	12	218
3:15 PM	4	115	0	0	119	106	12	0	0	118	3	6	0	0	9	246
3:30 PM	5	108	0	0	113	106	14	0	0	120	5	4	0	0	9	242
3:45 PM	6	137	0	0	143	115	6	0	0	121	6	1	0	2	7	271
Hourly Total	18	456	0	0	474	426	40	0	0	466	22	15	0	3	37	977
4:00 PM	6	155	0	0	161	119	9	0	0	128	6	7	0	1	13	302
4:15 PM	5	147	0	0	152	114	7	0	0	121	9	3	0	2	12	285
4:30 PM	6	155	0	0	161	107	14	0	0	121	5	5	0	1	10	292
4:45 PM	5	140	0	0	145	116	15	0	0	131	6	4	0	0	10	286

Hourly Total	22	597	0	0	619	456	45	0	0	501	26	19	0	4	45	1165
5:00 PM	8	123	0	0	131	114	15	0	0	129	5	2	0	0	7	267
5:15 PM	5	129	0	0	134	96	12	0	0	108	2	2	0	0	4	246
5:30 PM	4	125	0	0	129	108	8	0	0	116	8	2	0	1	10	255
5:45 PM	4	104	0	1	108	93	8	0	0	101	10	2	0	2	12	221
Hourly Total	21	481	0	1	502	411	43	0	0	454	25	8	0	3	33	989
Grand Total	118	3259	0	3	3377	2859	223	0	0	3082	192	113	0	20	305	6764
Approach %	3.5	96.5	0.0	-	-	92.8	7.2	0.0	-	-	63.0	37.0	0.0	-	-	-
Total %	1.7	48.2	0.0	-	49.9	42.3	3.3	0.0	-	45.6	2.8	1.7	0.0	-	4.5	-
Motorcycles	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	116	3186	0	-	3302	2781	219	0	-	3000	188	111	0	-	299	6601
% Cars & Light Goods	98.3	97.8	-	-	97.8	97.3	98.2	-	-	97.3	97.9	98.2	-	-	98.0	97.6
Buses	0	44	0	-	44	49	3	0	-	52	3	1	0	-	4	100
% Buses	0.0	1.4	-	-	1.3	1.7	1.3	-	-	1.7	1.6	0.9	-	-	1.3	1.5
Single-Unit Trucks	1	27	0	-	28	22	1	0	-	23	1	0	0	-	1	52
% Single-Unit Trucks	0.8	0.8	-	-	0.8	0.8	0.4	-	-	0.7	0.5	0.0	-	-	0.3	0.8
Articulated Trucks	0	2	0	-	2	3	0	0	-	3	0	0	0	-	0	5
% Articulated Trucks	0.0	0.1	-	-	0.1	0.1	0.0	-	-	0.1	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	1	0	0	-	1	3	0	0	-	3	0	1	0	-	1	5
% Bicycles on Road	0.8	0.0	-	-	0.0	0.1	0.0	-	-	0.1	0.0	0.9	-	-	0.3	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	3	-	-	-	-	0	-	-	-	-	20	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021

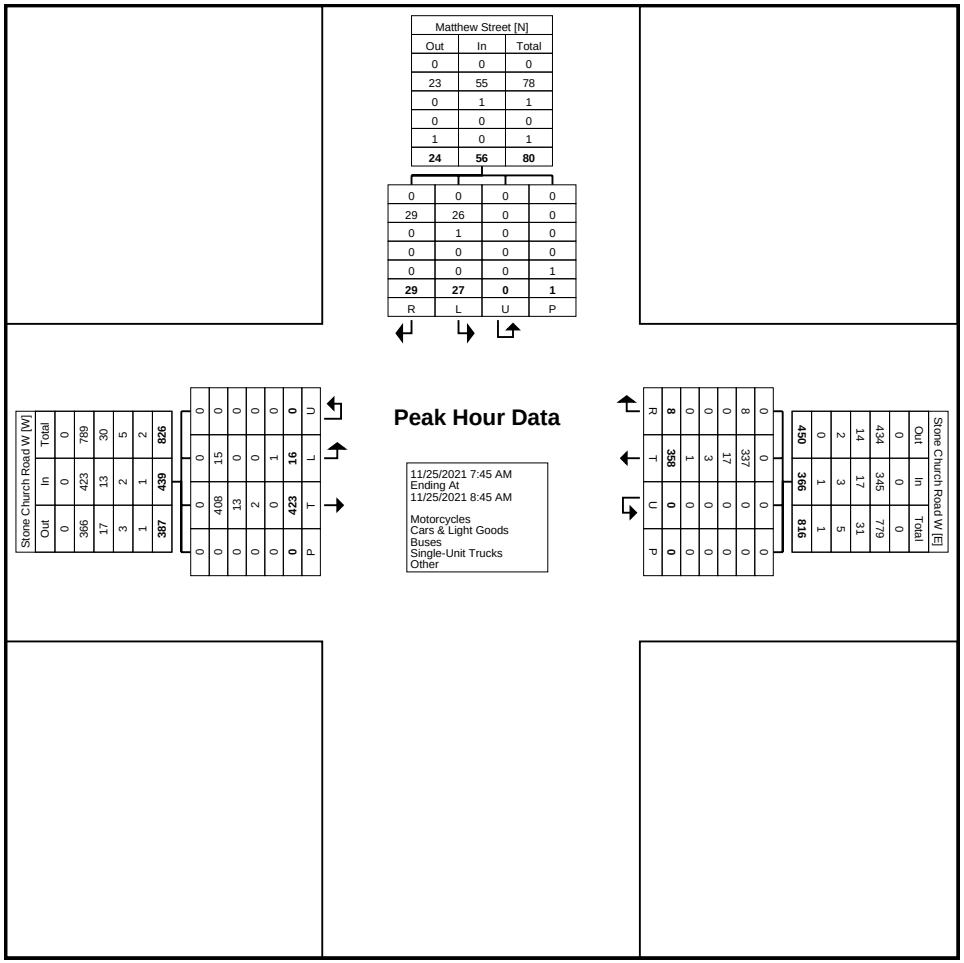
Turning Movement Peak Hour Data (7:45 AM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound					Matthew Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	1	98	0	0	99	109	2	0	0	111	7	15	0	0	22	232
8:00 AM	7	142	0	0	149	87	4	0	0	91	8	7	0	0	15	255
8:15 AM	8	104	0	0	112	82	1	0	0	83	5	4	0	0	9	204
8:30 AM	0	79	0	0	79	80	1	0	0	81	7	3	0	1	10	170
Total	16	423	0	0	439	358	8	0	0	366	27	29	0	1	56	861
Approach %	3.6	96.4	0.0	-	-	97.8	2.2	0.0	-	-	48.2	51.8	0.0	-	-	-
Total %	1.9	49.1	0.0	-	51.0	41.6	0.9	0.0	-	42.5	3.1	3.4	0.0	-	6.5	-
PHF	0.500	0.745	0.000	-	0.737	0.821	0.500	0.000	-	0.824	0.844	0.483	0.000	-	0.636	0.844
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	15	408	0	-	423	337	8	0	-	345	26	29	0	-	55	823
% Cars & Light Goods	93.8	96.5	-	-	96.4	94.1	100.0	-	-	94.3	96.3	100.0	-	-	98.2	95.6
Buses	0	13	0	-	13	17	0	0	-	17	1	0	0	-	1	31
% Buses	0.0	3.1	-	-	3.0	4.7	0.0	-	-	4.6	3.7	0.0	-	-	1.8	3.6
Single-Unit Trucks	0	2	0	-	2	3	0	0	-	3	0	0	0	-	0	5
% Single-Unit Trucks	0.0	0.5	-	-	0.5	0.8	0.0	-	-	0.8	0.0	0.0	-	-	0.0	0.6
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.3	0.0	-	-	0.3	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	6.3	0.0	-	-	0.2	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021

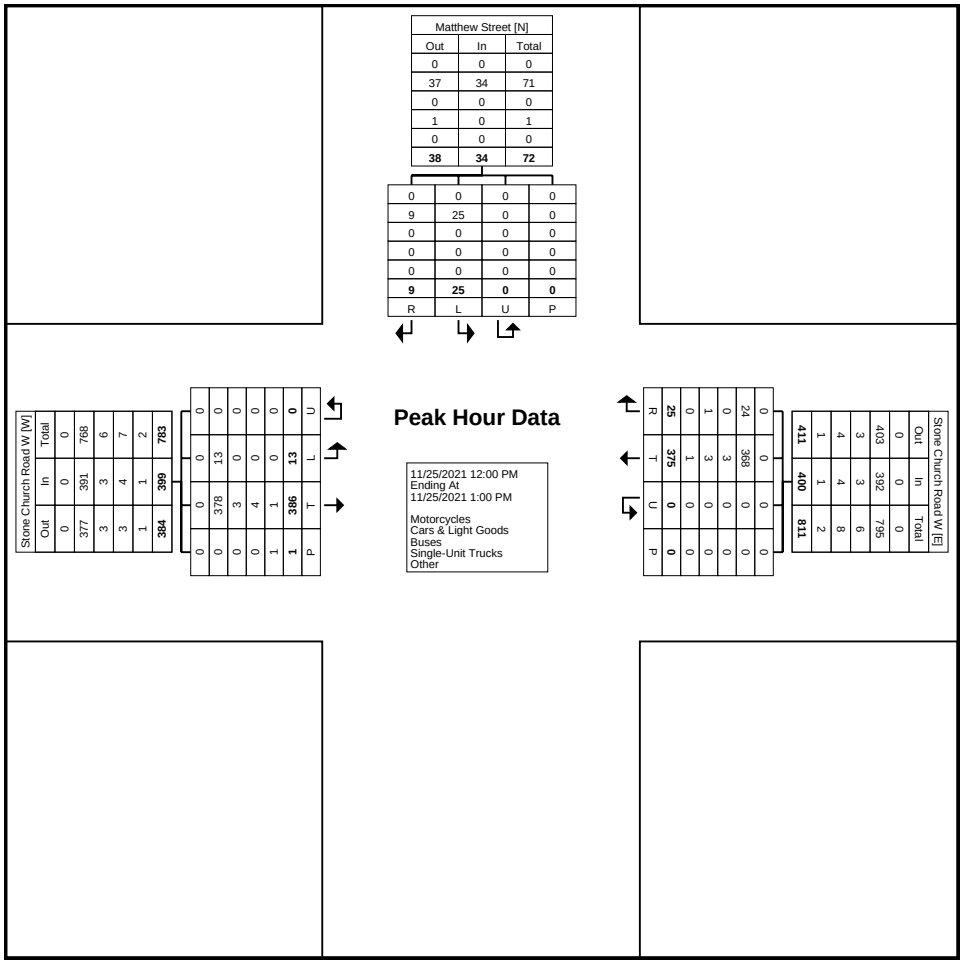
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound					Matthew Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
12:00 PM	3	86	0	1	89	93	7	0	0	100	11	1	0	0	12	201
12:15 PM	4	102	0	0	106	88	7	0	0	95	2	2	0	0	4	205
12:30 PM	2	111	0	0	113	94	3	0	0	97	3	3	0	0	6	216
12:45 PM	4	87	0	0	91	100	8	0	0	108	9	3	0	0	12	211
Total	13	386	0	1	399	375	25	0	0	400	25	9	0	0	34	833
Approach %	3.3	96.7	0.0	-	-	93.8	6.3	0.0	-	-	73.5	26.5	0.0	-	-	-
Total %	1.6	46.3	0.0	-	47.9	45.0	3.0	0.0	-	48.0	3.0	1.1	0.0	-	4.1	-
PHF	0.813	0.869	0.000	-	0.883	0.938	0.781	0.000	-	0.926	0.568	0.750	0.000	-	0.708	0.964
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	13	378	0	-	391	368	24	0	-	392	25	9	0	-	34	817
% Cars & Light Goods	100.0	97.9	-	-	98.0	98.1	96.0	-	-	98.0	100.0	100.0	-	-	100.0	98.1
Buses	0	3	0	-	3	3	0	0	-	3	0	0	0	-	0	6
% Buses	0.0	0.8	-	-	0.8	0.8	0.0	-	-	0.8	0.0	0.0	-	-	0.0	0.7
Single-Unit Trucks	0	4	0	-	4	3	1	0	-	4	0	0	0	-	0	8
% Single-Unit Trucks	0.0	1.0	-	-	1.0	0.8	4.0	-	-	1.0	0.0	0.0	-	-	0.0	1.0
Articulated Trucks	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.3	-	-	0.3	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.3	0.0	-	-	0.3	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound					Matthew Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:00 PM	6	155	0	0	161	119	9	0	0	128	6	7	0	1	13	302
4:15 PM	5	147	0	0	152	114	7	0	0	121	9	3	0	2	12	285
4:30 PM	6	155	0	0	161	107	14	0	0	121	5	5	0	1	10	292
4:45 PM	5	140	0	0	145	116	15	0	0	131	6	4	0	0	10	286
Total	22	597	0	0	619	456	45	0	0	501	26	19	0	4	45	1165
Approach %	3.6	96.4	0.0	-	-	91.0	9.0	0.0	-	-	57.8	42.2	0.0	-	-	-
Total %	1.9	51.2	0.0	-	53.1	39.1	3.9	0.0	-	43.0	2.2	1.6	0.0	-	3.9	-
PHF	0.917	0.963	0.000	-	0.961	0.958	0.750	0.000	-	0.956	0.722	0.679	0.000	-	0.865	0.964
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	590	0	-	612	450	44	0	-	494	25	18	0	-	43	1149
% Cars & Light Goods	100.0	98.8	-	-	98.9	98.7	97.8	-	-	98.6	96.2	94.7	-	-	95.6	98.6
Buses	0	4	0	-	4	4	1	0	-	5	1	1	0	-	2	11
% Buses	0.0	0.7	-	-	0.6	0.9	2.2	-	-	1.0	3.8	5.3	-	-	4.4	0.9
Single-Unit Trucks	0	3	0	-	3	2	0	0	-	2	0	0	0	-	0	5
% Single-Unit Trucks	0.0	0.5	-	-	0.5	0.4	0.0	-	-	0.4	0.0	0.0	-	-	0.0	0.4
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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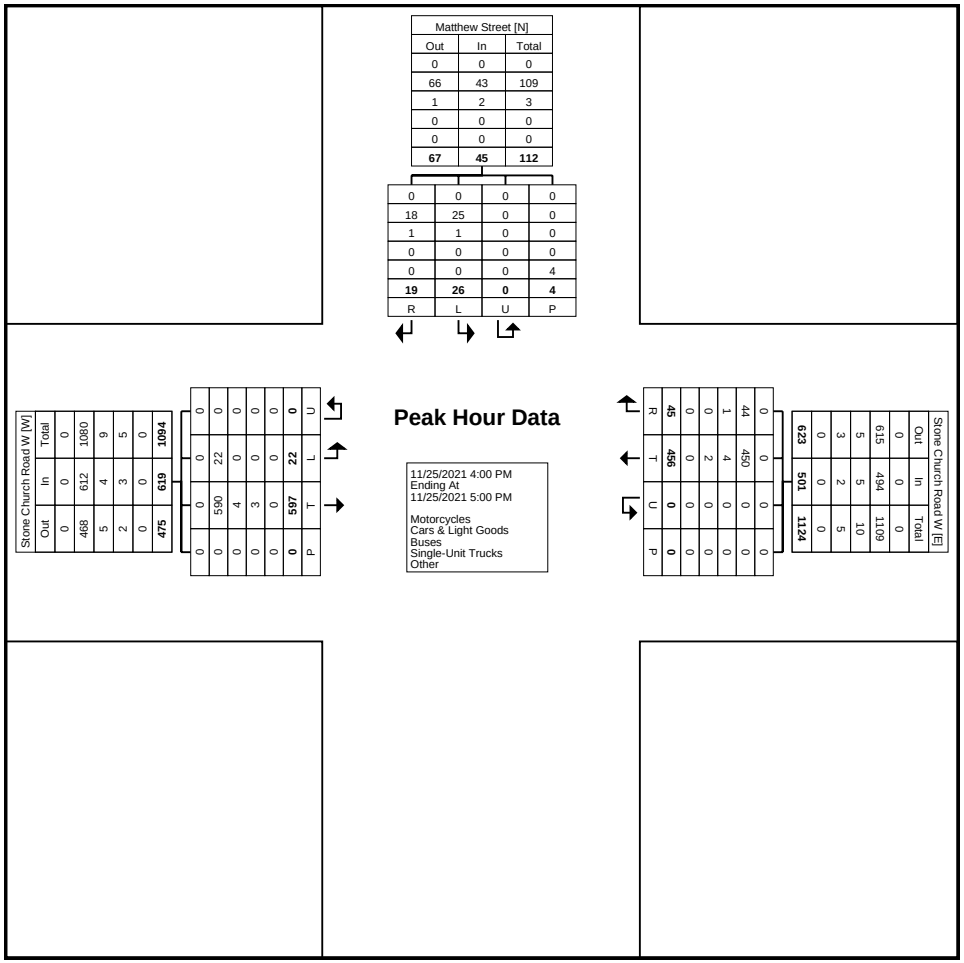
Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Data

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound						West 5th Street Northbound						West 5th Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	11	28	3	0	42	3	21	18	0	0	42	2	33	6	0	0	41	13	16	12	0	2	41	166
7:15 AM	9	45	3	0	57	1	20	20	0	0	41	4	46	7	0	1	57	20	34	7	0	1	61	216
7:30 AM	17	52	7	0	76	10	44	20	0	1	74	7	52	11	0	2	70	20	34	17	0	1	71	291
7:45 AM	19	63	9	0	91	3	67	24	0	3	94	5	77	12	0	2	94	33	51	24	0	1	108	387
Hourly Total	56	188	22	0	266	17	152	82	0	4	251	18	208	36	0	5	262	86	135	60	0	5	281	1060
8:00 AM	39	98	4	0	141	7	49	36	0	1	92	6	91	13	0	4	110	30	35	22	0	2	87	430
8:15 AM	33	89	9	0	131	7	44	45	0	0	96	13	107	10	0	1	130	22	36	12	0	3	70	427
8:30 AM	27	52	7	0	86	3	54	51	0	1	108	12	105	9	0	1	126	44	59	20	0	1	123	443
8:45 AM	14	72	11	0	97	6	54	28	0	0	88	12	67	4	0	1	83	56	75	23	0	1	154	422
Hourly Total	113	311	31	0	455	23	201	160	0	2	384	43	370	36	0	7	449	152	205	77	0	7	434	1722
9:00 AM	25	64	9	0	98	12	53	23	0	1	88	4	45	9	0	0	58	35	48	14	0	0	97	341
9:15 AM	17	64	15	0	96	10	63	25	0	0	98	4	51	9	0	0	64	33	30	10	0	2	73	331
9:30 AM	12	77	5	0	94	9	62	19	0	0	90	7	44	17	0	1	68	39	42	10	0	1	91	343
9:45 AM	7	70	16	0	93	8	49	17	0	1	74	10	41	14	0	1	65	29	38	15	0	1	82	314
Hourly Total	61	275	45	0	381	39	227	84	0	2	350	25	181	49	0	2	255	136	158	49	0	4	343	1329
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	10	65	6	0	81	13	58	19	0	0	90	10	46	7	0	0	63	28	34	13	0	2	75	309
11:15 AM	14	70	9	0	93	6	80	21	0	0	107	8	67	10	0	0	85	30	42	10	0	0	82	367
11:30 AM	12	74	9	0	95	10	60	20	0	2	90	15	44	8	0	2	67	31	41	13	0	0	85	337
11:45 AM	14	83	11	0	108	7	70	28	0	1	105	12	53	14	0	1	79	33	42	17	0	1	92	384
Hourly Total	50	292	35	0	377	36	268	88	0	3	392	45	210	39	0	3	294	122	159	53	0	3	334	1397
12:00 PM	11	79	9	0	99	9	70	29	0	0	108	12	40	16	0	1	68	34	33	14	0	0	81	356
12:15 PM	21	78	9	0	108	7	67	28	0	0	102	16	40	14	0	0	70	48	42	18	0	0	108	388
12:30 PM	17	86	9	0	112	11	63	25	0	0	99	12	58	11	0	0	81	19	47	19	0	1	85	377
12:45 PM	11	71	14	0	96	9	79	16	0	0	104	6	54	14	0	0	74	31	46	17	0	0	94	368
Hourly Total	60	314	41	0	415	36	279	98	0	0	413	46	192	55	0	1	293	132	168	68	0	1	368	1489
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	21	79	6	0	106	10	80	38	0	0	128	14	87	17	0	2	118	34	62	16	0	0	112	464
3:15 PM	18	95	10	0	123	8	81	38	0	2	127	10	62	12	0	2	84	60	90	30	0	2	180	514
3:30 PM	13	74	8	0	95	12	85	34	0	0	131	12	44	13	0	1	69	54	94	28	0	2	176	471
3:45 PM	15	108	11	0	134	17	97	32	0	1	146	7	60	12	0	2	79	52	63	29	0	1	144	503
Hourly Total	67	356	35	0	458	47	343	142	0	3	532	43	253	54	0	7	350	200	309	103	0	5	612	1952
4:00 PM	24	125	17	0	166	16	92	39	0	4	147	14	62	21	0	1	97	43	87	23	0	3	153	563
4:15 PM	13	134	13	0	160	15	89	27	0	1	131	18	52	12	0	0	82	52	84	25	0	0	161	534
4:30 PM	16	124	5	0	145	12	97	31	0	3	140	11	75	20	0	0	106	50	104	21	0	1	175	566

4:45 PM	16	117	13	0	146	10	86	38	0	0	134	20	67	9	0	3	96	50	78	29	0	0	157	533
Hourly Total	69	500	48	0	617	53	364	135	0	8	552	63	256	62	0	4	381	195	353	98	0	4	646	2196
5:00 PM	9	101	13	0	123	12	88	37	0	1	137	15	64	10	0	0	89	43	59	24	0	1	126	475
5:15 PM	10	114	8	0	132	8	82	27	0	0	117	11	66	11	0	0	88	47	84	18	0	0	149	486
5:30 PM	20	107	11	0	138	15	106	31	0	0	152	14	51	8	0	0	73	42	51	17	0	0	110	473
5:45 PM	14	92	13	0	119	15	81	24	0	0	120	14	49	10	0	1	73	49	64	16	0	1	129	441
Hourly Total	53	414	45	0	512	50	357	119	0	1	526	54	230	39	0	1	323	181	258	75	0	2	514	1875
Grand Total	529	2650	302	0	3481	301	2191	908	0	23	3400	337	1900	370	0	30	2607	1204	1745	583	0	31	3532	13020
Approach %	15.2	76.1	8.7	0.0	-	8.9	64.4	26.7	0.0	-	-	12.9	72.9	14.2	0.0	-	-	34.1	49.4	16.5	0.0	-	-	-
Total %	4.1	20.4	2.3	0.0	26.7	2.3	16.8	7.0	0.0	-	26.1	2.6	14.6	2.8	0.0	-	20.0	9.2	13.4	4.5	0.0	-	27.1	-
Motorcycles	0	0	0	0	0	0	1	0	0	-	1	0	0	0	0	-	0	0	2	0	0	-	2	3
% 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	0.1	0.0	-	-	0.1	0.0
Cars & Light Goods	518	2578	292	0	3388	288	2110	893	0	-	3291	334	1863	354	0	-	2551	1187	1707	572	0	-	3466	12696
% Cars & Light Goods	97.9	97.3	96.7	-	97.3	95.7	96.3	98.3	-	-	96.8	99.1	98.1	95.7	-	-	97.9	98.6	97.8	98.1	-	-	98.1	97.5
Buses	4	50	6	0	60	5	52	9	0	-	66	1	23	6	0	-	30	11	22	7	0	-	40	196
% Buses	0.8	1.9	2.0	-	1.7	1.7	2.4	1.0	-	-	1.9	0.3	1.2	1.6	-	-	1.2	0.9	1.3	1.2	-	-	1.1	1.5
Single-Unit Trucks	6	19	3	0	28	7	23	4	0	-	34	1	14	7	0	-	22	6	13	2	0	-	21	105
% Single-Unit Trucks	1.1	0.7	1.0	-	0.8	2.3	1.0	0.4	-	-	1.0	0.3	0.7	1.9	-	-	0.8	0.5	0.7	0.3	-	-	0.6	0.8
Articulated Trucks	0	3	0	0	3	1	3	0	0	-	4	1	0	3	0	-	4	0	0	0	0	-	0	11
% Articulated Trucks	0.0	0.1	0.0	-	0.1	0.3	0.1	0.0	-	-	0.1	0.3	0.0	0.8	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	1	0	1	0	2	0	2	2	0	-	4	0	0	0	0	-	0	0	1	2	0	-	3	9
% Bicycles on Road	0.2	0.0	0.3	-	0.1	0.0	0.1	0.2	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.3	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	3.3	-	-	-	-	-	9.7	-	-
Pedestrians	-	-	-	-	-	-	-	-	-	23	-	-	-	-	-	29	-	-	-	-	-	28	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	96.7	-	-	-	-	-	90.3	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

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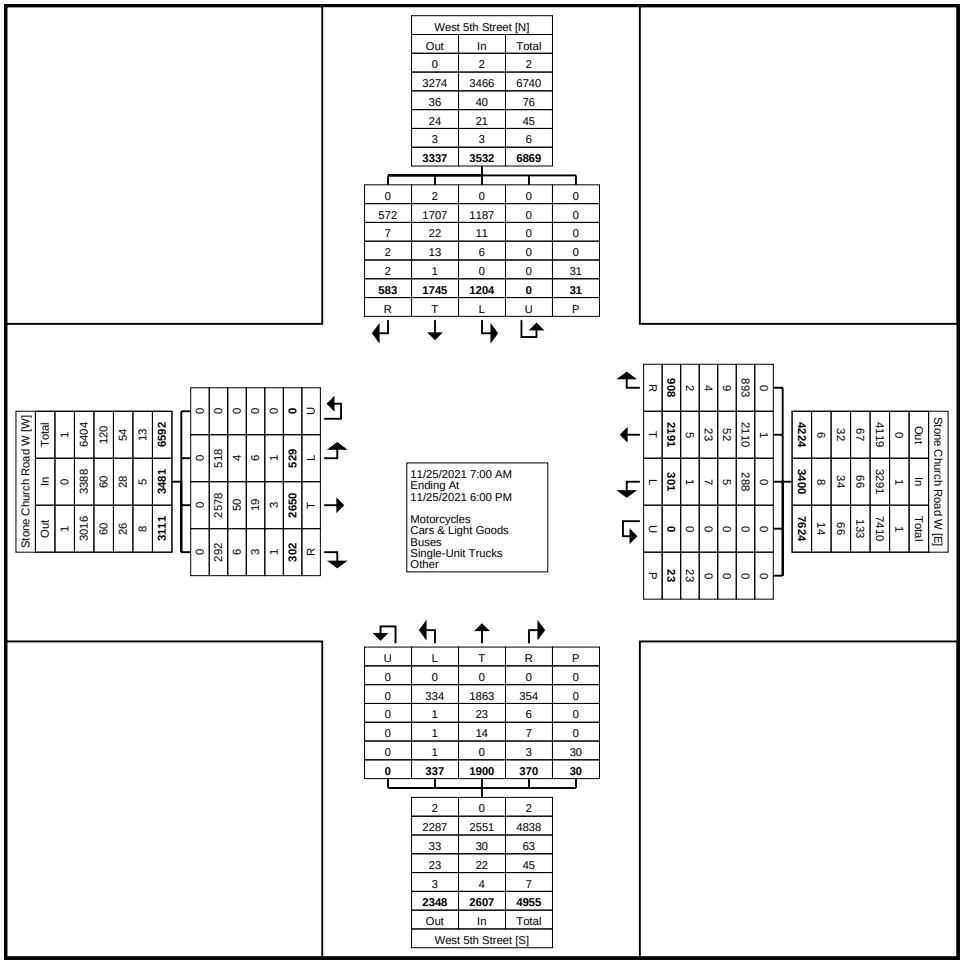
Site Code: 210669
Start Date: 11/25/2021



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound						West 5th Street Northbound						West 5th Street Southbound						
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
8:00 AM	39	98	4	0	141	7	49	36	0	1	92	6	91	13	0	4	110	30	35	22	0	2	87	430
8:15 AM	33	89	9	0	131	7	44	45	0	0	96	13	107	10	0	1	130	22	36	12	0	3	70	427
8:30 AM	27	52	7	0	86	3	54	51	0	1	108	12	105	9	0	1	126	44	59	20	0	1	123	443
8:45 AM	14	72	11	0	97	6	54	28	0	0	88	12	67	4	0	1	83	56	75	23	0	1	154	422
Total	113	311	31	0	455	23	201	160	0	2	384	43	370	36	0	7	449	152	205	77	0	7	434	1722
Approach %	24.8	68.4	6.8	0.0	-	6.0	52.3	41.7	0.0	-	-	9.6	82.4	8.0	0.0	-	-	35.0	47.2	17.7	0.0	-	-	-
Total %	6.6	18.1	1.8	0.0	26.4	1.3	11.7	9.3	0.0	-	22.3	2.5	21.5	2.1	0.0	-	26.1	8.8	11.9	4.5	0.0	-	25.2	-
PHF	0.724	0.793	0.705	0.000	0.807	0.821	0.931	0.784	0.000	-	0.889	0.827	0.864	0.692	0.000	-	0.863	0.679	0.683	0.837	0.000	-	0.705	0.972
Motorcycles	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	112	301	28	0	441	21	189	152	0	-	362	42	362	31	0	-	435	150	198	74	0	-	422	1660
% Cars & Light Goods	99.1	96.8	90.3	-	96.9	91.3	94.0	95.0	-	-	94.3	97.7	97.8	86.1	-	-	96.9	98.7	96.6	96.1	-	-	97.2	96.4
Buses	1	9	3	0	13	1	8	5	0	-	14	1	6	4	0	-	11	2	3	2	0	-	7	45
% Buses	0.9	2.9	9.7	-	2.9	4.3	4.0	3.1	-	-	3.6	2.3	1.6	11.1	-	-	2.4	1.3	1.5	2.6	-	-	1.6	2.6
Single-Unit Trucks	0	1	0	0	1	1	3	2	0	-	6	0	2	1	0	-	3	0	3	1	0	-	4	14
% Single-Unit Trucks	0.0	0.3	0.0	-	0.2	4.3	1.5	1.3	-	-	1.6	0.0	0.5	2.8	-	-	0.7	0.0	1.5	1.3	-	-	0.9	0.8
Articulated Trucks	0	0	0	0	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.5	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	0	0	0	1	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	2
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.6	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.5	0.0	-	-	0.2	0.1
Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	14.3	-	-
Pedestrians	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	7	-	-	-	-	-	6	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	85.7	-	-

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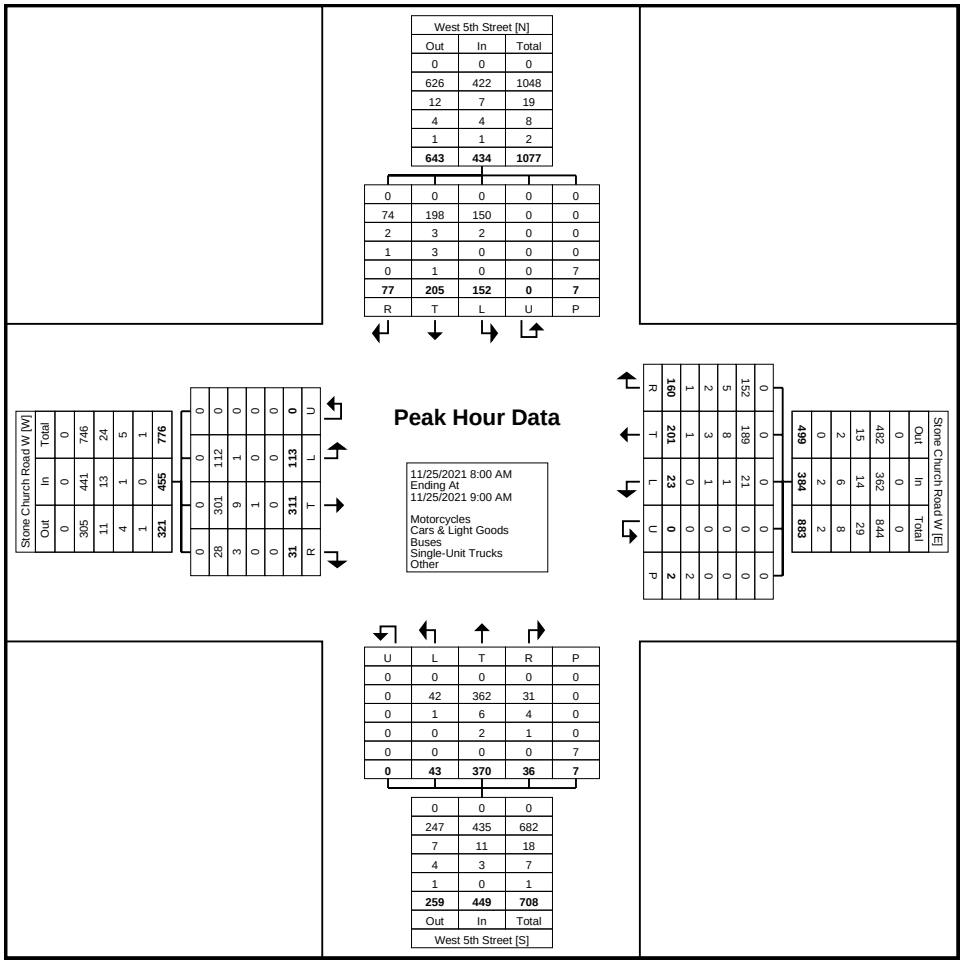

Turning Movement Peak Hour Data Plot (8:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Peak Hour Data (11:45 AM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound						West 5th Street Northbound						West 5th Street Southbound						
	Left	Thru	Right	U-Turn	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
11:45 AM	14	83	11	0	108	7	70	28	0	1	105	12	53	14	0	1	79	33	42	17	0	1	92	384
12:00 PM	11	79	9	0	99	9	70	29	0	0	108	12	40	16	0	1	68	34	33	14	0	0	81	356
12:15 PM	21	78	9	0	108	7	67	28	0	0	102	16	40	14	0	0	70	48	42	18	0	0	108	388
12:30 PM	17	86	9	0	112	11	63	25	0	0	99	12	58	11	0	0	81	19	47	19	0	1	85	377
Total	63	326	38	0	427	34	270	110	0	1	414	52	191	55	0	2	298	134	164	68	0	2	366	1505
Approach %	14.8	76.3	8.9	0.0	-	8.2	65.2	26.6	0.0	-	-	17.4	64.1	18.5	0.0	-	-	36.6	44.8	18.6	0.0	-	-	-
Total %	4.2	21.7	2.5	0.0	28.4	2.3	17.9	7.3	0.0	-	27.5	3.5	12.7	3.7	0.0	-	19.8	8.9	10.9	4.5	0.0	-	24.3	-
PHF	0.750	0.948	0.864	0.000	0.953	0.773	0.964	0.948	0.000	-	0.958	0.813	0.823	0.859	0.000	-	0.920	0.698	0.872	0.895	0.000	-	0.847	0.970
Motorcycles	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	2
% 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	1.2	0.0	-	-	0.5	0.1
Cars & Light Goods	61	315	38	0	414	33	261	109	0	-	403	51	188	52	0	-	291	133	162	68	0	-	363	1471
% Cars & Light Goods	96.8	96.6	100.0	-	97.0	97.1	96.7	99.1	-	-	97.3	98.1	98.4	94.5	-	-	97.7	99.3	98.8	100.0	-	-	99.2	97.7
Buses	0	5	0	0	5	0	3	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	8
% Buses	0.0	1.5	0.0	-	1.2	0.0	1.1	0.0	-	-	0.7	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.5
Single-Unit Trucks	2	5	0	0	7	0	6	1	0	-	7	0	3	2	0	-	5	1	0	0	0	-	1	20
% Single-Unit Trucks	3.2	1.5	0.0	-	1.6	0.0	2.2	0.9	-	-	1.7	0.0	1.6	3.6	-	-	1.7	0.7	0.0	0.0	-	-	0.3	1.3
Articulated Trucks	0	1	0	0	1	1	0	0	0	-	1	1	0	1	0	-	2	0	0	0	0	-	0	4
% Articulated Trucks	0.0	0.3	0.0	-	0.2	2.9	0.0	0.0	-	-	0.2	1.9	0.0	1.8	-	-	0.7	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	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	50.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	50.0	-	-	-	-	-	100.0	-	-

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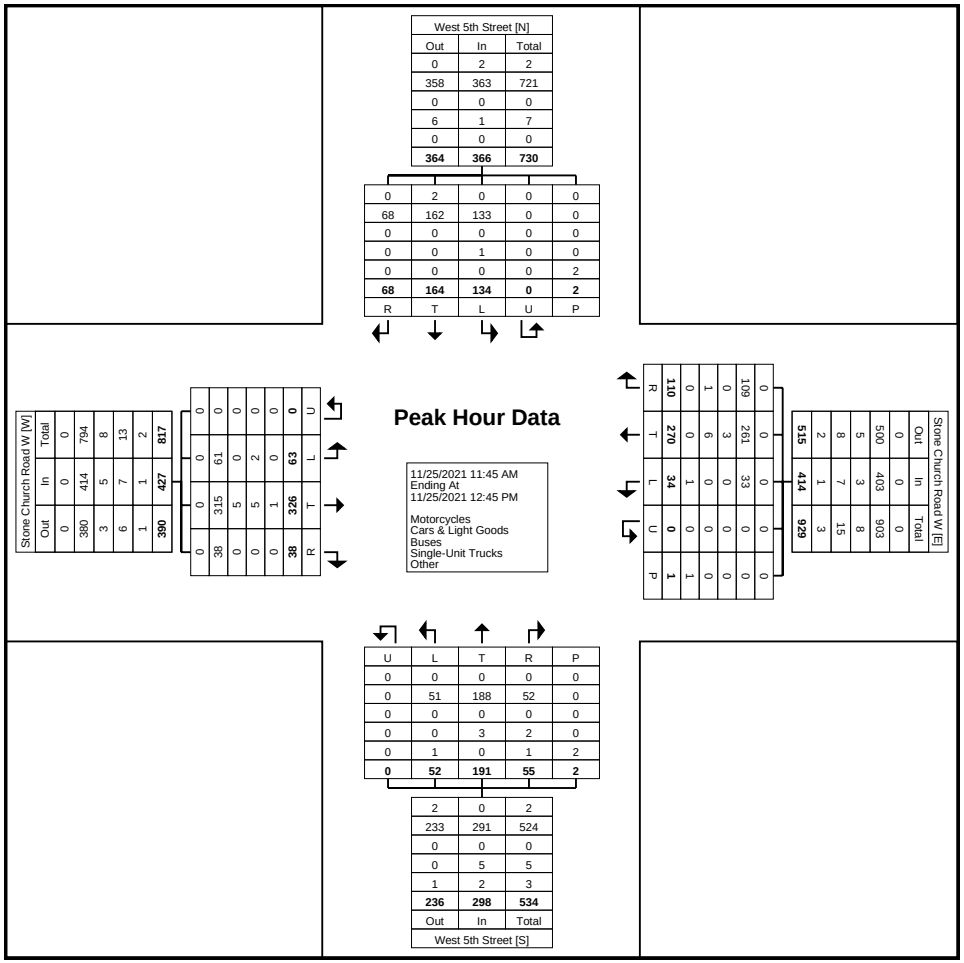

Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound						West 5th Street Northbound						West 5th Street Southbound						
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:00 PM	24	125	17	0	166	16	92	39	0	4	147	14	62	21	0	1	97	43	87	23	0	3	153	563
4:15 PM	13	134	13	0	160	15	89	27	0	1	131	18	52	12	0	0	82	52	84	25	0	0	161	534
4:30 PM	16	124	5	0	145	12	97	31	0	3	140	11	75	20	0	0	106	50	104	21	0	1	175	566
4:45 PM	16	117	13	0	146	10	86	38	0	0	134	20	67	9	0	3	96	50	78	29	0	0	157	533
Total	69	500	48	0	617	53	364	135	0	8	552	63	256	62	0	4	381	195	353	98	0	4	646	2196
Approach %	11.2	81.0	7.8	0.0	-	9.6	65.9	24.5	0.0	-	-	16.5	67.2	16.3	0.0	-	-	30.2	54.6	15.2	0.0	-	-	-
Total %	3.1	22.8	2.2	0.0	28.1	2.4	16.6	6.1	0.0	-	25.1	2.9	11.7	2.8	0.0	-	17.3	8.9	16.1	4.5	0.0	-	29.4	-
PHF	0.719	0.933	0.706	0.000	0.929	0.828	0.938	0.865	0.000	-	0.939	0.788	0.853	0.738	0.000	-	0.899	0.938	0.849	0.845	0.000	-	0.923	0.970
Motorcycles	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	69	492	47	0	608	51	356	135	0	-	542	63	251	61	0	-	375	188	349	97	0	-	634	2159
% Cars & Light Goods	100.0	98.4	97.9	-	98.5	96.2	97.8	100.0	-	-	98.2	100.0	98.0	98.4	-	-	98.4	96.4	98.9	99.0	-	-	98.1	98.3
Buses	0	6	1	0	7	2	6	0	0	-	8	0	5	0	0	-	5	4	2	1	0	-	7	27
% Buses	0.0	1.2	2.1	-	1.1	3.8	1.6	0.0	-	-	1.4	0.0	2.0	0.0	-	-	1.3	2.1	0.6	1.0	-	-	1.1	1.2
Single-Unit Trucks	0	2	0	0	2	0	2	0	0	-	2	0	0	1	0	-	1	3	2	0	0	-	5	10
% Single-Unit Trucks	0.0	0.4	0.0	-	0.3	0.0	0.5	0.0	-	-	0.4	0.0	0.0	1.6	-	-	0.3	1.5	0.6	0.0	-	-	0.8	0.5
Articulated Trucks	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	4	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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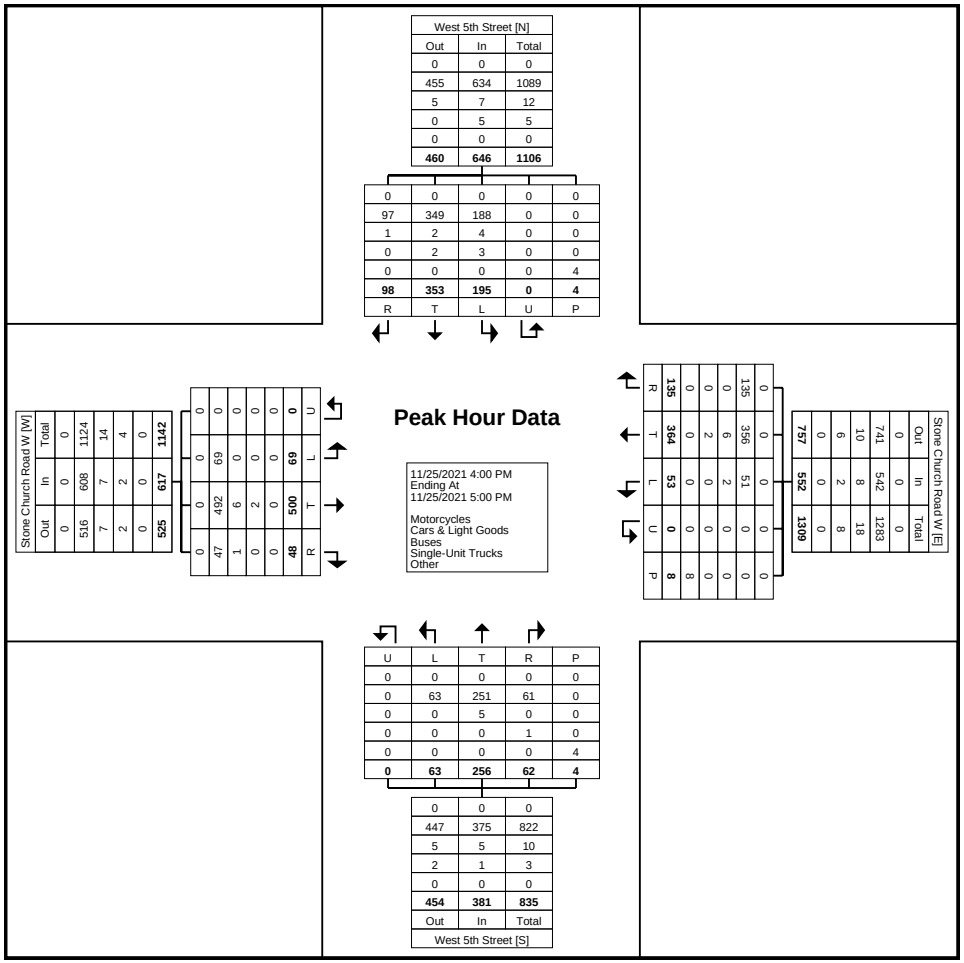


Turning Movement Peak Hour Data Plot (4:00 PM)

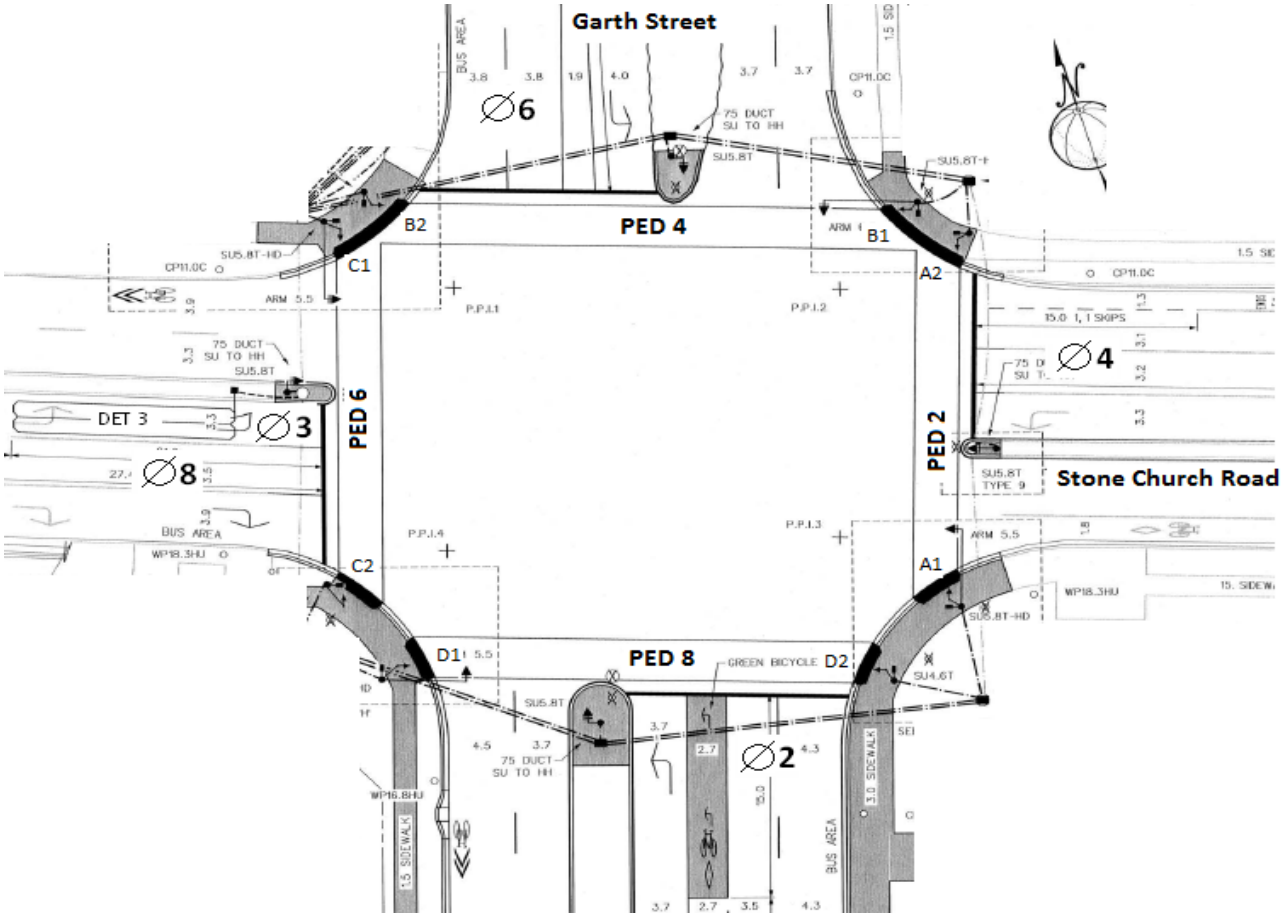
City of Hamilton - Traffic
Traffic Signal Controller Timing Data

Intersection: **Garth & Stone Church**

Controller Type: **3000E** Page **1** of **17**

Programmed By: **DLB** Installed By: **DLB**

Date: **2-Feb-18** Date: **6-Feb-18**



ϕ1:
ϕ2: **Garth - NB, East Xwalk**
ϕ3: **Stone Church - EBLT**
ϕ4: **Stone Church - WB, North Xwalk**
ϕ5:
ϕ6: **Garth - SB, West Xwalk**
ϕ7:
ϕ8: **Stone Church - EB, South Xwalk**

Flash Operation: **Red: Stone Church**
Red: Garth

SEQUENCE/START-UP (MM-3-1-1)

START-UP PHASES/INTERVAL/SEQUENCE

(X = Enable for start-up phases. Must be compatible if more than one)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
START-UP	Phases				X				X								
	Interval	0	(0=Red, 1=Yel, 2= Grn, determines color of selected phases above on start-up)														
	Flash	10	(0-255 seconds start-up flash time)														
	Red	5.0	(0-25.5 secs = length of first red after start-up if start-up in yellow or red)														
	Sequence	3	(2=single ring, 3=dual ring, 4=123/567+48, 5=12/56+3478, 6=1234/56+78, 7=1234/5678, 8=dual quad, 9=12ph														

PHASE RING ASSIGNMENTS

X = Phase assigned to ring (if used). Phases in different rings but same co-phase group can time together.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
RING	Ring 1		X	X	X												
	Ring 2						X		X								
	Ring 3																
	Ring 4																

CO-PHASE GRP 1-4 ASSIGNMENTS

X = phase assigned to co-phase group. All ph's assigned to rings must be assigned to co-phase group.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CO-PHASE	CO PH 1		X				X										
	CO PH 2			X	X				X								
	CO PH 3																
	CO PH 4																

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CONTROLLER DATA

PHASE RECALLS/MODES; MIN, MAX, etc. (MM-3-1-2-1-PGDN, etc.) USE 1 TO ALL 4 TIMING PLANS

TP1 PHASE RECALLS

(X = ENABLE)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE RECALLS	MIN RCL																
	MAX RCL																
	PED RCL																
	SOFT REC																
	NON-LOCK			X													
	VEH OMIT																
	PED OMIT																
	WLK REST																
	MAX II																
	RED REST																
	NO SKIP																

TP2 PHASE RECALLS

(X = ENABLE)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE RECALLS	MIN RCL																
	MAX RCL																
	PED RCL																
	SOFT REC																
	NON-LOCK			X													
	VEH OMIT																
	PED OMIT																
	WLK REST																
	MAX II																
	RED REST																
	NO SKIP																

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TP3 PHASE RECALLS

(X = ENABLE)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE RECALLS	MIN RCL																
	MAX RCL																
	PED RCL																
	SOFT REC																
	NON-LOCK			X													
	VEH OMIT																
	PED OMIT																
	WLK REST																
	MAX II																
	RED REST																
	NO SKIP																

TP4 PHASE RECALLS

(X = ENABLE)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE RECALLS	MIN RCL																
	MAX RCL																
	PED RCL																
	SOFT REC																
	NON-LOCK																
	VEH OMIT			X													
	PED OMIT																
	WLK REST																
	MAX II																
	RED REST																
	NO SKIP																

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CONTROLLER DATA

PHASE RECALLS/MODES; CNA, INH MAX, PED OPTIONS, etc. (MM-3-1-2-2) ONLY 1 PLAN PER UNIT

(X = ENABLE)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE RECALLS	CNA 1		X		X		X		X								
	CNA 2																
	CNA 3																
	CNA 4																
	WRM		X		X		X		X								
	INH MAX																
	PED RECY																
	FL WALK																
	FDW->YEL																
	FDW->RED																
	COND PED																

PHASE TIMES (MM-3-1-3-PGDN, etc.) USE 1 TO ALL 4 TIMING PLANS

		TP1															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		20	5	20		20		20								
	Passage			2.0													
	Yellow		3.3	3.0	3.3		3.3		3.3								
	Red		3.0	0.0	3.5		3.0		3.5								
	Walk		12		12		12		12								
	Ped Clr		19		28		19		28								
	Max 1		55	10	40		55		40								
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	AI/Act																
	Max In																

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CONTROLLER DATA

TP2

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		**20**	**5**	**20**		**20**		**20**								
	Passage			**2.0**													
	Yellow		**3.3**	**3.0**	**3.3**		**3.3**		**3.3**								
	Red		**3.0**	**0.0**	**3.5**		**3.0**		**3.5**								
	Walk		**12**		**12**		**12**		**12**								
	Ped Clr		**19**		**28**		**19**		**28**								
	Max 1		**55**	**10**	**40**		**55**		**40**								
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	AI/Act																
	Max In																

TP3

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		**20**	**5**	**20**		**20**		**20**								
	Passage			**2.0**													
	Yellow		**3.3**	**3.0**	**3.3**		**3.3**		**3.3**								
	Red		**3.0**	**0.0**	**3.5**		**3.0**		**3.5**								
	Walk		**12**		**12**		**12**		**15**								
	Ped Clr		**19**		**28**		**19**		**28**								
	Max 1		**55**	**10**	**40**		**55**		**40**								
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	AI/Act																
	Max In																

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CONTROLLER DATA

		TP4															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		**20**		**20**		**20**		**20**								
	Passage																
	Yellow		**3.3**		**3.3**		**3.3**		**3.3**								
	Red		**3.0**		**3.5**		**3.0**		**3.5**								
	Walk		**12**		**12**		**12**		**12**								
	Ped Clr		**19**		**28**		**19**		**28**								
	Max 1		**55**		**40**		**55**		**40**								
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	Al/Act																
	Max In																

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DUAL ENTRY (MM-3-1-6)

DUAL ENTRY ENABLE:	Y	Y/N: Y=Enable Dual Entry. Note this is only one setting even though it appears on each controller screen.

PG1	PH/CALLS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DUAL	1																
ENTRY	2						X										
ASSIGN-	3								X								
MENTS	4								X								
	5																
	6		X														
	7																
	8				X												

VEHICLE DETECTOR ASSIGNMENTS (MM-3-1-4-1, PGDN etc.)

(X = ASSIGN VEH DETECTOR TO THAT PHASE)

	DET/PH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
VEH	1																
DET	2																
ASSIGN-	3			X													
MENTS	4																
	5																
	6																
	7																
	8																
	9																

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PED DETECTOR ASSIGNMENTS (MM-3-1-4-2)

(X = ASSIGN PED DETECTOR TO THAT PHASE)

	DET/PH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PED	1																
DET	2																
ASSIGN-	3																
MENTS	4																
	5																
	6																
	7																
	8																

DETECTOR MODES (MM-3-1-4-3)

	DET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
VEH DET	Mode	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**								
MODES																	

	DET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
VEH DET	**Lock**																
LOCKS																	

DETECTOR TIMES (MM-3-1-4-4)

	DET	1	2	3	4	5	6	7	8
DET	Delay	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TIMES	Str/Stp								

	DET	9	10	11	12	13	14	15	16
DET	Delay	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TIMES	Str/Stp								

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ENHANCED OPTIONS

DYNAMIC OMITS (MM-3-1-9-1-1)

DYNAM OMITS GP1 ENABLE:	**Y**	Y/N: Y=Enable. Note: This is one setting but appears on each screen. No input rquired for GP1.

(X = ENABLE)

GRP1-1	FUNC/PH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DYNAM.	OMIT PHS			**X**													
OMITS	IF PH ON				**X**				**X**								
ASSIGN-	OR O/L	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MENTS	GRN																

Select phases to be dynamically omitted from OMIT PHS row. Select the PH-ONs and/or O/L GRNs that will cause those omits. Phases are omitted when controller state matches IF PH ON row or O/L GRN row.
Note that there are 2 groups of dynamic omits, each with 8 patterns. Group 1 is the default group and group 2 can be selected by input or TOD ckt 96. When a group is active, any one or all of the pattterns within that group may be true depending on the controller state.

DYNAMIC RECALLS (MM-3-1-9-1-2)

DYN. RECALL GP1 ENABLE:	**Y**	Y/N: Y=Enable. Note: This is one setting but appears on each screen. No input rquired for GP1.

(X = ENABLE)

GRP1-1	FUNC/PH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DYNAM.	RCL PHS				**X**				**X**								
RECALLS	IF PH ON			**X**													
ASSIGN-	OR O/L	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MENTS	GRN																

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SELECTION SOURCE (MM-3-2-2)

Entries determine how parameters get selected

Cycle Source:	**1**	0=TOD, 1=CL, 2=INT
Split Source:	**1**	0=TOD, 1=CL, 2=INT
Offset Source:	**1**	0=TOD, 1=CL, 2=INT

Free Source:	**1**	0=TOD, 1=CL, 2=INT
Flash Source:	**0**	0=TOD, 1=CL, 2=INT
Inter-TOD Revert:	**255**	0-255 SECS

TOD = Time of day control by internal clock, CL = Closed loop (comm), INT = Interconnect. Inter-TOD Revert is time allowed after failed interconnect before unit reverts to TOD (Time Base) control.

COORD BASIC OPTIONS (MM-3-2-3)

Reference to End (vs. begin) of Main St.:	**N**	Y/N: Y = Offset references to end of main st. green. N = Beginning of Main st. green.
Use % (vs. secs) for Phase Allocation:	**N**	Y/N: Y = Phase allocations loaded as percent of 100. N = Allocations in seconds.
Use % (vs. secs) for Offset Entry:	**N**	Y/N: Y = Offset loaded as percent of 100. N = Offset loaded in seconds.
Use Fixed (vs. floating) Force Offs:	**Y**	Y/N: Y = Force offs are fixed to cycle. N=Force offs like max times, begin with green.
Permissive Type:	**0**	0-2: 0=Yield, 1= Single, 2= Multiple. See Permissives note below

C/S TO TIMING PLAN (MM-3-2-9-6)

USE THIS CHART WHEN 4 SPLITS/CYCLE = Y

	CYCLE	1	2	3	4	5	6
SPLIT TO TIME PLAN	SPLIT 1	**1**	**2**	**3**	**4**		
	SPLIT 2						
	SPLIT 3						
	SPLIT 4						

(0-4 = TIME PLAN IMPLEMENTED WHEN SPLIT IN EFFECT)

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CYCLES & OFFSETS (MM-3-2-4)

NOTE: FIRST SPECIFY OFSET SEEKING MODE AND 4 SPLITS CYCLE MODE (ENHANCED OPTIONS, OPERATING MODES)

	Cycle #	1/1	2/1	3/1	4/1			
	Length	**100**	**110**	**110**	**90**			
CYCLE	Offset 1	**39**	**80**	**99**	**53**			**Secs**
&	Offset 2							
OFFSETS	Offset 3							
	Offset 4							
	Offset 5							
	Max Dwell	**32**	**32**	**32**	**32**			

COORD PHASES (MM-3-2-5)

	CYCLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1-1		**X**				**X**										
	2-1		**X**				**X**										
COORD	**3-1**		**X**				**X**										
PHASES	**4-1**		**X**				**X**										

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PHASE ALLOCATION (MM-3-2-6)

ENTRY IN:	Secs	% or Secs: Not a controller entry--for reference only. Controller entry is under

	PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE ALLO-CATION	**C1 S1**		**43**	**9**	**48**		**43**		**57**								
	C1 S2																
	C1 S3																
	C1 S4																
	C2 S1		**53**	**11**	**46**		**53**		**57**								
	C2 S2																
	C2 S3																
	C2 S4																
	C3 S1		**49**	**13**	**48**		**49**		**61**								
	C3 S2																
	C3 S3																
	C3 S4																
	C4 S1		**42**		**48**		**42**		**48**								
	C4 S2																
	C4 S3																
	C4 S4																

OFFSET SEEKING MODE (MM-3-2-7)

Offset Seeeling Mode:	0

Mode

0 Add only, cycle times 20% slow only to get in sync

1 Dwell, cycle timer stops at cycle 0 up to max dwell time to get in step

2 Short Route, cycle times 20% fast or slow--whichever gets in step fastest

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ENHANCED OPTIONS

OPERATING OPTIONS (MM-3-2-9-1)

Enhanced Perm:	**Y**	Y/N: See note	Invert Free In:	**N**	Y/N: See note
Central Override:	**N**	Y/N: See note	Split Matrix:	**N**	Y/N: See note
No PCL Offset Adjust:	**N**	Y/N: See note	4 Splits/Cycle:	**Y**	Y/N: See note
			No Early Coord Ped:	**N**	Y/N: See note

Yield Percent	**1**	0-10%: See note
EGB%	**0**	0-100%: See note
RGB%	**0**	0-100%: See note
# Cycles to out of step:	**0**	0-255: 0=Disable

CYCLE SYNC OPTIONS (MM-3-2-9-2)

Sync Source:	**0**	0-2, 0=TOD/CL/Interconnect, 1= City Zero, 2= Absolute

Charts below only For City Zero offfsets or Absolute (0's). These are not daily reference times for Sync Source Option 0 (see TOD).

Cycle 1:	**0**	Cycle 2:	**0**	Cycle 3:	**0**
Cycle 4:	**0**	Cycle 5:	**0**	Cycle 6:	**0**

MANUAL/AUTO FORCE OFFS & PERMS

SET MANUAL MODE (MM-3-2-9-3-1)

Auto Perm and FO:	**Y**	Y/N: Y = Perms & Force offs auto-calculated from phase allocations. N = Manually entered
Ped Perm:	**0**	0-255: 0 = Auto calculated. 1-255 = secs each ped perm, starting with vehicle permissives

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DAY PLANS (MM-3-3-1-#)

	HH	MM	CIRCUIT PLAN	C	O	S	CKT	ON/OFF
1	00	00					11(FRE)	OFF
	00	00		4	1	1		
	08	00		1	1	1		
	18	00		4	1	1		
2	00	00					11(FRE)	OFF
	00	00		4	1	1		
	06	30		2	1	1		
	10	00		1	1	1		
	14	30		3	1	1		
	18	30		1	1	1		
	20	00		4	1	1		

WEEK PLANS (MM-3-3-3)

Plan	SUN	MON	TUE	WED	THU	FRI	SAT
1	1	2	2	2	2	2	1
2							
3							
4							
5							

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CIRCUIT OVERRIDES (MM-3-3-6)

For each ciruit specify TOD (time of day controlled), or manually ON or OFF. Default = TOD

CIRCUIT OVER-RIDES	Circuit	65	66	67	68	69	70	71	72
	Function	LL1	LL2	LL3	LL4	LL5	LL6	LL7	LL8
	State								
	Circuit	**73**	74	75	76	**77**	78	79	80
	Function	**CN1**	CN2	CN3	CN4	**WRM**	MIN	DIM	CVS
	State	**ON**				**ON**			
CIRCUIT OVER-RIDES	Circuit	113	114	115	116	117	118	119	120
	Function	UD1	UD2	UD3	UD4	UD5	UD6	UD7	UD8
	State								
	Circuit	121	122	123	124	**125**	**126**	127	128
	Function	PH2	DP2	DP3	3CD	**EVL**	**EML**	ASC	DCP
	State					**ON**	**ON**		

DAYLIGHT SAVINGS (MM-3-3-7)

DAY LIGHT SAVINGS	Spring		Fall	
	(0-12)	(0-5)	(0-12)	(0-5)
	Month	WOM	Month	WOM
	3	**2**	**11**	**1**

Enter Month and Week of Month for Spring Forward and Fall Back days (typical 4 - 1 and 10 - 5). Unit will adjust at 2AM on Sunday of week specified. Enter zero (or leave blank) if Daylight Savings not used.

SYNC REFERENCE MODE (MM-3-3-8)

Mode:	**0**	0 = Time dependent, 1 = C/O/S Event

	HH	MM	
Time Clock Reset:	**00**	**00**	TOD clock reset to by TBC input
Interrupter:		**N**	Y/N; Y = Interrupter pulses provided
Pulses:		**0**	0-6 = Number of interrupter pulses

TIME DEPENDENT CYCLE REFERENCES		HH	MM		HH	MM		HH	MM
	CYC 1:	**00**	**00**	CYC 2:	**00**	**00**	CYC 3:	**00**	**00**
	CYC 4:	**00**	**00**	CYC 5:	**00**	**00**	CYC 6:	**00**	**00**

When mode = Time dependent, enter reference times of day for each cycle. Default = 00:00 = midnight = most commonly used reference.
When mode = C/O/S Event, cycle restarts on each COS change. Only use this mode for specific reasons. Time dependent most common used mode.

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CLOSED LOOP ID (MM-3-5-1)

CLOSED LOOP ID	Master Type:	**1**	0 = None, 1 = 3000 Series Master, 2 = 3800 EL master
	Intersection ID	**14**	0-255
	Master Identification	**17**	0-255
	Allow Comm Xfer Between Ports 2 & 3		Y/N: Y = Incoming signal on Master port (2 or 3), gets echo'd on other port

COMM SET-UP (MM-3-5-2)

PG1 PORT ASSIGN	Master (CL) Port:		0 = None, 2 = Port 2, 3 = Port 3 (Port to be used to receive Master Comm)
	Monitor Port		0 = None, 2 = Port 2, 3 = Port 3 (Port to be used for Monitor Data Upload)
	Central Port:		0 = None, 2 = Port 2, 3 = Port 3 (Port to be used for Direct Dial-up Modem)

PG2 PORT 2 SETUP	Data Rate:	**9600**	1200, 2400, 4800, 9600, 14400, 19200
	Parity	**0**	0 = None, 1 = Odd, 2=Even
	Data bits	**1**	0 = 7 bits, 1 = 8 bits

PG3 PORT 3 SETUP	Data Rate:	**1200**	1200, 2400, 4800, 9600, 14400, 19200
	Parity	**0**	0 = None, 1 = Odd, 2=Even
	Data bits	**1**	0 = 7 bits, 1 = 8 bits

PG4	Modem Set-up String:		Up to 40 charaters; A-Z, or # @ = , ! ; % \ &

PHONE NUMBERS (MM-3-5-3)

PHONE NUM-BERS	Tone:		Y/N
	Phone 1:		Number & control characters (W , ; # ' / T P) if used
	Phone 2:		Number & control characters (W , ; # ' / T P) if used

LOG DATA (MM-3-5-5)

PG1 SAMPLE	Volume Log Sample period:	**60**	0, 6, 10, 15, 20, 30, 60 minutes, Enabled by TOD Ckt. 125 (EVL)
	MOE Log Sample period:	**60**	0, 6, 10, 15, 20, 30, 60 minutes, Enabled by TOD Ckt. 126 (EML

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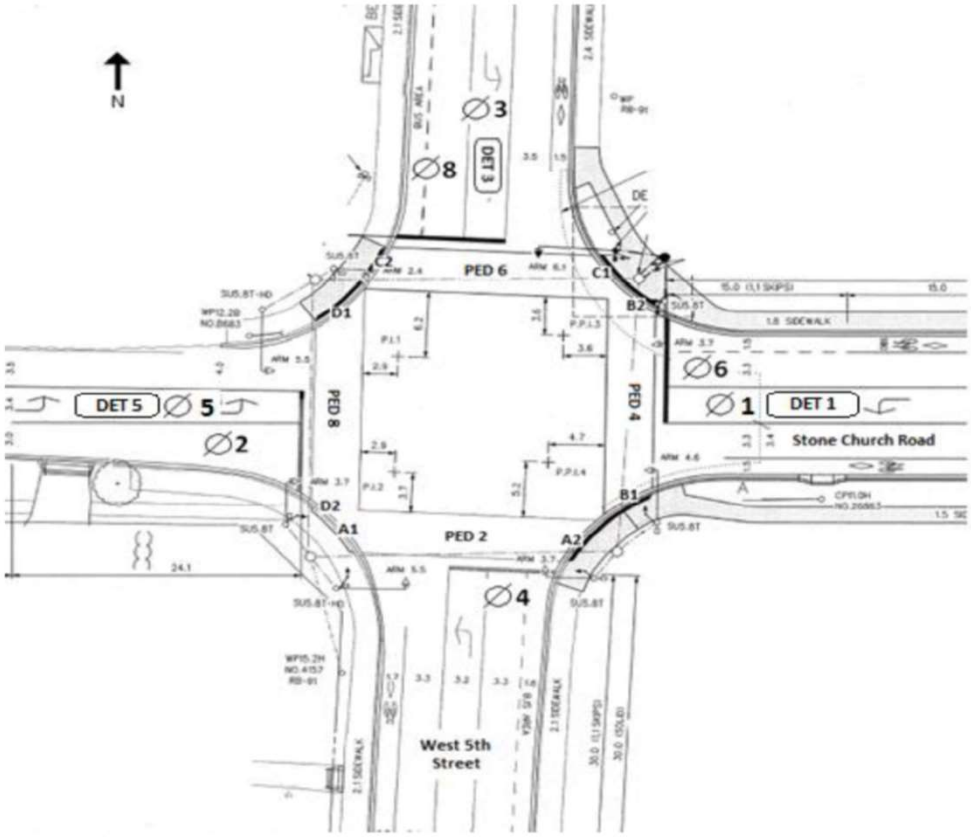
City of Hamilton - Traffic
Traffic Signal Controller Timing Data

Intersection:	**Stone Church & West 5th - Int # 340**		
Controller Type:	**Intelight D4**	Revision:	**10032**
Converted By:	**SC**	Installed By:	
Date:	**30-Jun-20**	Date:	
Reason for Timing Change:	**D4 Controller Swap**		
Communication:	**Radio**	System:	**KITS**
Operation Type:	**LT - Actuated**	UPS:	
APS:		IP Address:	**10.240.115.53**



- ϕ1: **Stone Church - WBL**
- ϕ2: **Stone Church- EB, South Xwalk**
- ϕ3: **West 5th - SBL**
- ϕ4: **West 5th - NB, East Xwalk**
- ϕ5: **Stone Church - EBL**
- ϕ6: **Stone Church - WB, North Xwalk**
- ϕ7:
- ϕ8: **West 5th - SB, West Xwalk**

Flash Operation: Red/Red

West 5th @ Stone Church

Phase Timing

6/30/20 11:56:27 AM

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Green	5	20	5	20	5	20	0	20	0	0	0	0	0	0	0	0
Veh Ext	2.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Green 1	10	60	10	60	10	60	0	60	0	0	0	0	0	0	0	0
Max Green 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Green 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow	3.0	3.3	3.0	3.3	3.0	3.3	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clr	0.0	2.6	0.0	2.5	0.0	2.6	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adv Flash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bike MG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	12	0	12	0	12	0	12	0	0	0	0	0	0	0	0
Ped Clr	0	14	0	14	0	14	0	14	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sol DW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Early Wlk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay Wlk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Added	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TTReduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Revert	4.0	4.0	4.0	4.0	4.0	4.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neg Ped	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AP Disc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pmt Ped Clr	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Return Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West 5th @ Stone Church

Phase Options

6/30/20 11:56:27 AM

Phases	1-8								9-16							
Min Recalls																
Max Recalls																
Ped Recalls		2		4		6		8								
Soft Recall																
Dual Entry		2		4		6		8								
Red Rest																
Walk Rest		2		4		6		8								
Walk Expand																
Ped Recycle		2		4		6		8								
Sim Ped Term																
PC Thru Clr																
Guar Passage																
No Simult Gap																
Yel Lock																
Red Lock																
PhaseNext Lock	1	2	3	4	5	6	7	8								
No Term Call	1	2	3	4	5	6	7	8								
Cond Serv																
CS Enable																
Cond Reserve																
Reserve																
Veh Omit																
Ped Omit																
Perm Phase		2		4		6		8								
Protect Calls																
Protect Calls 2																
Flash Entry																
Flash Exit																
Flash Exit Yel																
Flash Exit Red																
Ped Scramble																
No Min Yel																
No Min Red Rev																
Max Scramble Walk																
Flash Yellow																
Flash FYA																
CNA 1																
CNA 2																

West 5th @ Stone Church

Phase Startup Options

6/30/20 11:56:27 AM

Startup Flash	10	Mode	Yel->Red
Startup All Red	5	Yellow	0.0

Phases	1-8							9-16							
Startup Phases				4			8								
Startup Yellow															
Startup Red				4			8								
Startup No Walk															
Startup Next															
Startup Yel Fls															
Startup FYA															
No Veh Call															
No Ped Call															

Phase Startup Timing

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Start Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Start Max Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Unit

Red Revert	0.0	Ped Protect	No	AdvFls in Flash	No

West 5th @ Stone Church

Ring Sequence / Conflicting Phases

6/30/20 11:56:27 AM

Ringgroup 1

Ring 1	1	2	3	4	0	0	0	0	0	0	0	0	0	0	0	0
Ring 2	5	6	0	8	0	0	0	0	0	0	0	0	0	0	0	0

Ringgroup 2

Custom Sequences

Seq 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seq 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Conflicting Phases

	1-8							9-16							
Phase 1															
Phase 2															
Phase 3															
Phase 4															
Phase 5															
Phase 6															
Phase 7															
Phase 8															
Phase 9															
Phase 10															
Phase 11															
Phase 12															
Phase 13															
Phase 14															
Phase 15															
Phase 16															

West 5th @ Stone Church

Coordination Pattern 1

6/30/20 11:56:27 AM

Cycle	110	Ringgroup 1 - Offset 1	73	Offset 2	0	Offset 3	0
		Ringgroup 2 - Offset 1	0	Offset 2	0	Offset 3	0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Splits	9	51	10	40	9	51	0	50	0	0	0	0	0	0	0	0
Split Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Float Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perm Min Green	8	12	8	12	8	12	0	12	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Permissive Mode	Sing Band	Max Mode	Max 1	Walk Rest	Opp Call
Ped Permissive	Yield				
Permissive Limit	10	Perm 2 Start	0	Perm 2 End	0
Alt Sequence		TOD Link	0		

Phases/Overlaps	1-8								9-16							
Coord Phases		2				6										
No Extend																
Float Enable																
Veh = Ped Perm																
Walk Rest																
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Serv																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm 1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phases																

Trans Mode	Best 2
Offset Ref	Lag Grn
Adaptive Mode	Disabled

Disable Priority	
Progression Phases	
Priority Alt Seq	
Reserve Extend	

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Priority Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recovery Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West 5th @ Stone Church

Coordination Pattern 2

6/30/20 11:56:27 AM

Cycle	110	Ringgroup 1 - Offset 1	0	Offset 2	0	Offset 3	0
		Ringgroup 2 - Offset 1	0	Offset 2	0	Offset 3	0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Splits	9	41	10	50	9	41	0	60	0	0	0	0	0	0	0	0
Split Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Float Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perm Min Green	8	12	8	12	8	12	0	12	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Permissive Mode	Sing Band	Max Mode	Max 1	Walk Rest	Opp Call
Ped Permissive	Yield				
Permissive Limit	10	Perm 2 Start	0	Perm 2 End	0
Alt Sequence		TOD Link	0		

Phases/Overlaps	1-8								9-16							
Coord Phases		2				6										
No Extend																
Float Enable																
Veh = Ped Perm																
Walk Rest																
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Serv																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm 1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phases																

Trans Mode	Best 2
Offset Ref	Lag Grn
Adaptive Mode	Disabled

Disable Priority	
Progression Phases	
Priority Alt Seq	
Reserve Extend	

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Priority Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recovery Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West 5th @ Stone Church

Coordination Pattern 3

6/30/20 11:56:27 AM

Cycle	110	Ringgroup 1 - Offset 1	81	Offset 2	0	Offset 3	0
		Ringgroup 2 - Offset 1	0	Offset 2	0	Offset 3	0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Splits	9	45	12	44	9	45	0	56	0	0	0	0	0	0	0	0
Split Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Float Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perm Min Green	8	12	8	12	8	12	0	12	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Permissive Mode	Sing Band	Max Mode	Max 1	Walk Rest	Opp Call
Ped Permissive	Yield				
Permissive Limit	10	Perm 2 Start	0	Perm 2 End	0
Alt Sequence		TOD Link	0		

Phases/Overlaps	1-8								9-16							
Coord Phases		2				6										
No Extend																
Float Enable																
Veh = Ped Perm																
Walk Rest																
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Serv																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm 1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phases																

Trans Mode	Best 2
Offset Ref	Lag Grn
Adaptive Mode	Disabled

Disable Priority		
Progression Phases		
Priority Alt Seq		
Reserve Extend		

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Priority Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recovery Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West 5th @ Stone Church

Coordination Pattern 4

6/30/20 11:56:27 AM

Cycle	90	Ringgroup 1 - Offset 1	7	Offset 2	0	Offset 3	0
		Ringgroup 2 - Offset 1	0	Offset 2	0	Offset 3	0

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Splits	0	48	0	42	0	48	0	42	0	0	0	0	0	0	0	0
Split Ext	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Float Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perm Min Green	0	12	0	12	0	12	0	12	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Permissive Mode	Sing Band	Max Mode	Max 1	Walk Rest	Opp Call
Ped Permissive	Yield				
Permissive Limit	10	Perm 2 Start	0	Perm 2 End	0
Alt Sequence		TOD Link	0		

Phases/Overlaps	1-8								9-16							
Coord Phases		2				6										
No Extend																
Float Enable																
Veh = Ped Perm																
Walk Rest																
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Serv																
Reservice																
Veh Omit	1		3		5											
Ped Omit																
Olap Omit																
Perm Reserve																
Perm 1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phases																

Trans Mode	Best 2
Offset Ref	Lag Grn
Adaptive Mode	Disabled

Disable Priority		
Progression Phases		
Priority Alt Seq		
Reserve Extend		

Priority Timing-Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Priority Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recovery Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

West 5th @ Stone Church

TOD Pattern Events

6/30/20 11:56:27 AM

	Time	DOW							Holidays								Mode	Pattern	Offset
Event 1	00:00	S						S									Sched	4	1
Event 2	06:00	S						S									Sched	1	1
Event 3	23:00	S						S									Sched	4	1
Event 4	00:00		M	T	W	T	F										Sched	4	1
Event 5	06:00		M	T	W	T	F										Sched	2	1
Event 6	10:00		M	T	W	T	F										Sched	1	1
Event 7	14:30		M	T	W	T	F										Sched	3	1
Event 8	18:30		M	T	W	T	F										Sched	1	1
Event 9	23:00		M	T	W	T	F										Sched	4	1
Event 10	00:00																Sched	0	0
Event 11	00:00																Sched	0	0
Event 12	00:00																Sched	0	0
Event 13	00:00																Sched	0	0
Event 14	00:00																Sched	0	0
Event 15	00:00																Sched	0	0
Event 16	00:00																Sched	0	0
Event 17	00:00																Sched	0	0
Event 18	00:00																Sched	0	0
Event 19	00:00																Sched	0	0
Event 20	00:00																Sched	0	0
Event 21	00:00																Sched	0	0
Event 22	00:00																Sched	0	0
Event 23	00:00																Sched	0	0
Event 24	00:00																Sched	0	0
Event 25	00:00																Sched	0	0
Event 26	00:00																Sched	0	0
Event 27	00:00																Sched	0	0
Event 28	00:00																Sched	0	0
Event 29	00:00																Sched	0	0
Event 30	00:00																Sched	0	0
Event 31	00:00																Sched	0	0
Event 32	00:00																Sched	0	0

West 5th @ Stone Church

Vehicle Detector 1

6/30/20 11:56:27 AM

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						
Delay 2	0.0						

Phases	1-8	9-16
Call Phases	1	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	1	
XSwitch Phases		
Bike Call Phases		

Vehicle Detector 3

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						
Delay 2	0.0						

Phases	1-8	9-16
Call Phases	3	
Yellow Lock Phases		
Red Lock Phases		
Extend Phases	3	
XSwitch Phases		
Bike Call Phases		

West 5th @ Stone Church

Vehicle Detector 5

6/30/20 11:56:27 AM

Delay	0.0	Extend	0.0	Carryover	0.0	Queue Limit	0
Mode	No Disc	Added	Disabled	System	Disabled		
Fail Mode	None	Max Pres	0	No Act	0	Erratic	0
Fail Time	0						
Delay 2	0.0						

Phases	1-8							9-16							
Call Phases				5											
Yellow Lock Phases															
Red Lock Phases															
Extend Phases				5											
XSwitch Phases															
Bike Call Phases															

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Data

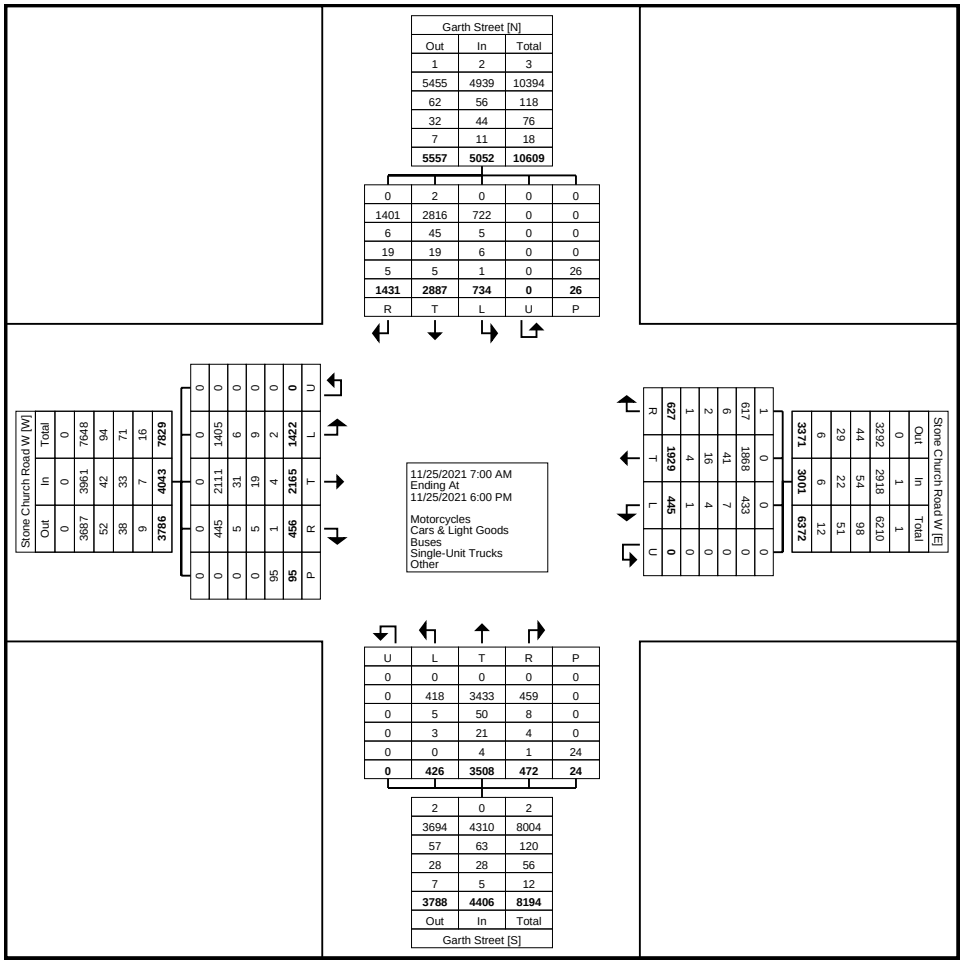
Start Time	Stone Church Road W Eastbound						Stone Church Road W Westbound					Garth Street Northbound						Garth Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	26	27	8	0	0	61	5	17	10	0	32	6	77	5	0	0	88	7	29	22	0	1	58	239
7:15 AM	35	31	2	0	0	68	6	17	15	0	38	5	83	7	0	0	95	8	30	24	0	0	62	263
7:30 AM	46	43	6	0	3	95	13	44	16	0	73	13	100	11	0	2	124	7	39	34	0	1	80	372
7:45 AM	52	60	9	0	1	121	15	90	15	0	120	13	145	18	0	4	176	16	56	66	0	0	138	555
Hourly Total	159	161	25	0	4	345	39	168	56	0	263	37	405	41	0	6	483	38	154	146	0	2	338	1429
8:00 AM	78	106	19	0	5	203	15	67	17	0	99	20	157	24	0	1	201	17	60	69	0	1	146	649
8:15 AM	67	78	11	0	4	156	17	50	19	0	86	19	138	20	0	0	177	14	74	34	0	1	122	541
8:30 AM	54	47	12	0	13	113	10	46	27	0	83	10	150	21	0	1	181	17	94	41	0	1	152	529
8:45 AM	48	58	13	0	1	119	17	68	20	0	105	16	123	21	0	2	160	14	109	34	0	0	157	541
Hourly Total	247	289	55	0	23	591	59	231	83	0	373	65	568	86	0	4	719	62	337	178	0	3	577	2260
9:00 AM	48	57	13	0	4	118	15	58	9	0	82	15	119	12	0	0	146	16	91	29	0	1	136	482
9:15 AM	39	63	10	0	2	112	8	42	18	0	68	9	115	22	0	0	146	19	82	42	0	1	143	469
9:30 AM	46	48	12	0	1	106	9	45	16	0	70	12	81	11	0	0	104	7	63	22	0	1	92	372
9:45 AM	37	54	6	0	3	97	9	43	20	0	72	17	77	9	0	1	103	18	59	34	0	0	111	383
Hourly Total	170	222	41	0	10	433	41	188	63	0	292	53	392	54	0	1	499	60	295	127	0	3	482	1706
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	36	58	22	0	2	116	9	44	12	0	65	10	123	16	0	1	149	16	64	36	0	1	116	446
11:15 AM	33	54	15	0	2	102	13	73	16	0	102	13	109	10	0	0	132	26	77	40	0	3	143	479
11:30 AM	27	67	13	0	1	107	7	48	28	0	83	16	82	12	0	0	110	14	67	37	0	2	118	418
11:45 AM	42	62	16	0	0	120	12	58	22	0	92	16	121	11	0	1	148	19	104	36	0	0	159	519
Hourly Total	138	241	66	0	5	445	41	223	78	0	342	55	435	49	0	2	539	75	312	149	0	6	536	1862
12:00 PM	35	61	15	0	2	111	14	57	25	0	96	14	94	12	0	0	120	18	79	41	0	1	138	465
12:15 PM	36	74	9	0	1	119	10	56	16	0	82	17	88	16	0	0	121	19	75	37	0	0	131	453
12:30 PM	42	77	13	0	3	132	18	65	15	0	98	21	88	14	0	1	123	20	71	35	0	0	126	479
12:45 PM	34	65	21	0	1	120	13	72	21	0	106	12	60	8	0	0	80	17	86	34	0	0	137	443
Hourly Total	147	277	58	0	7	482	55	250	77	0	382	64	330	50	0	1	444	74	311	147	0	1	532	1840
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	45	67	22	0	1	134	14	61	30	0	105	17	131	12	0	2	160	23	99	59	0	0	181	580
3:15 PM	51	78	22	0	20	151	25	64	15	0	104	17	113	12	0	0	142	34	133	52	0	1	219	616
3:30 PM	40	67	19	0	5	126	14	77	17	0	108	16	92	14	0	1	122	34	119	59	0	0	212	568
3:45 PM	48	84	13	0	0	145	19	79	26	0	124	15	125	17	0	1	157	35	133	51	0	2	219	645
Hourly Total	184	296	76	0	26	556	72	281	88	0	441	65	461	55	0	4	581	126	484	221	0	3	831	2409
4:00 PM	59	109	19	0	5	187	18	79	30	0	127	16	123	15	0	4	154	39	141	46	0	1	226	694
4:15 PM	45	91	16	0	2	152	19	82	19	0	120	9	126	14	0	0	149	38	126	58	0	1	222	643
4:30 PM	49	99	19	0	2	167	12	75	22	0	109	20	109	25	0	1	154	40	134	57	0	1	231	661

4:45 PM	48	84	11	0	0	143	20	69	24	0	113	5	121	14	0	0	140	46	111	51	0	1	208	604
Hourly Total	201	383	65	0	9	649	69	305	95	0	469	50	479	68	0	5	597	163	512	212	0	4	887	2602
5:00 PM	40	86	14	0	1	140	15	90	20	0	125	11	108	18	0	1	137	34	121	70	0	2	225	627
5:15 PM	55	74	16	0	3	145	22	60	22	0	104	14	120	15	0	0	149	40	131	59	0	1	230	628
5:30 PM	42	74	20	0	4	136	18	70	26	0	114	8	100	18	0	0	126	33	115	55	0	0	203	579
5:45 PM	39	62	20	0	3	121	14	63	19	0	96	4	110	18	0	0	132	29	115	67	0	1	211	560
Hourly Total	176	296	70	0	11	542	69	283	87	0	439	37	438	69	0	1	544	136	482	251	0	4	869	2394
Grand Total	1422	2165	456	0	95	4043	445	1929	627	0	3001	426	3508	472	0	24	4406	734	2887	1431	0	26	5052	16502
Approach %	35.2	53.5	11.3	0.0	-	-	14.8	64.3	20.9	0.0	-	9.7	79.6	10.7	0.0	-	-	14.5	57.1	28.3	0.0	-	-	-
Total %	8.6	13.1	2.8	0.0	-	24.5	2.7	11.7	3.8	0.0	18.2	2.6	21.3	2.9	0.0	-	26.7	4.4	17.5	8.7	0.0	-	30.6	-
Motorcycles	0	0	0	0	-	0	0	0	1	0	1	0	0	0	0	-	0	0	2	0	0	-	2	3
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.2	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	-	0.0	0.0
Cars & Light Goods	1405	2111	445	0	-	3961	433	1868	617	0	2918	418	3433	459	0	-	4310	722	2816	1401	0	-	4939	16128
% Cars & Light Goods	98.8	97.5	97.6	-	-	98.0	97.3	96.8	98.4	-	97.2	98.1	97.9	97.2	-	-	97.8	98.4	97.5	97.9	-	-	97.8	97.7
Buses	6	31	5	0	-	42	7	41	6	0	54	5	50	8	0	-	63	5	45	6	0	-	56	215
% Buses	0.4	1.4	1.1	-	-	1.0	1.6	2.1	1.0	-	1.8	1.2	1.4	1.7	-	-	1.4	0.7	1.6	0.4	-	-	1.1	1.3
Single-Unit Trucks	9	19	5	0	-	33	4	16	2	0	22	3	21	4	0	-	28	6	19	19	0	-	44	127
% Single-Unit Trucks	0.6	0.9	1.1	-	-	0.8	0.9	0.8	0.3	-	0.7	0.7	0.6	0.8	-	-	0.6	0.8	0.7	1.3	-	-	0.9	0.8
Articulated Trucks	2	0	1	0	-	3	1	1	1	0	3	0	3	1	0	-	4	1	5	5	0	-	11	21
% Articulated Trucks	0.1	0.0	0.2	-	-	0.1	0.2	0.1	0.2	-	0.1	0.0	0.1	0.2	-	-	0.1	0.1	0.2	0.3	-	-	0.2	0.1
Bicycles on Road	0	4	0	0	-	4	0	3	0	0	3	0	1	0	0	-	1	0	0	0	0	-	0	8
% Bicycles on Road	0.0	0.2	0.0	-	-	0.1	0.0	0.2	0.0	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	95	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	26	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Stone Church Road W Eastbound						Stone Church Road W Westbound					Garth Street Northbound						Garth Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	52	60	9	0	1	121	15	90	15	0	120	13	145	18	0	4	176	16	56	66	0	0	138	555
8:00 AM	78	106	19	0	5	203	15	67	17	0	99	20	157	24	0	1	201	17	60	69	0	1	146	649
8:15 AM	67	78	11	0	4	156	17	50	19	0	86	19	138	20	0	0	177	14	74	34	0	1	122	541
8:30 AM	54	47	12	0	13	113	10	46	27	0	83	10	150	21	0	1	181	17	94	41	0	1	152	529
Total	251	291	51	0	23	593	57	253	78	0	388	62	590	83	0	6	735	64	284	210	0	3	558	2274
Approach %	42.3	49.1	8.6	0.0	-	-	14.7	65.2	20.1	0.0	-	8.4	80.3	11.3	0.0	-	-	11.5	50.9	37.6	0.0	-	-	-
Total %	11.0	12.8	2.2	0.0	-	26.1	2.5	11.1	3.4	0.0	17.1	2.7	25.9	3.6	0.0	-	32.3	2.8	12.5	9.2	0.0	-	24.5	-
PHF	0.804	0.686	0.671	0.000	-	0.730	0.838	0.703	0.722	0.000	0.808	0.775	0.939	0.865	0.000	-	0.914	0.941	0.755	0.761	0.000	-	0.918	0.876
Motorcycles	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	246	280	50	0	-	576	54	236	77	0	367	62	574	80	0	-	716	62	273	203	0	-	538	2197
% Cars & Light Goods	98.0	96.2	98.0	-	-	97.1	94.7	93.3	98.7	-	94.6	100.0	97.3	96.4	-	-	97.4	96.9	96.1	96.7	-	-	96.4	96.6
Buses	3	9	1	0	-	13	2	14	0	0	16	0	12	3	0	-	15	2	9	2	0	-	13	57
% Buses	1.2	3.1	2.0	-	-	2.2	3.5	5.5	0.0	-	4.1	0.0	2.0	3.6	-	-	2.0	3.1	3.2	1.0	-	-	2.3	2.5
Single-Unit Trucks	2	1	0	0	-	3	1	3	0	0	4	0	3	0	0	-	3	0	2	4	0	-	6	16
% Single-Unit Trucks	0.8	0.3	0.0	-	-	0.5	1.8	1.2	0.0	-	1.0	0.0	0.5	0.0	-	-	0.4	0.0	0.7	1.9	-	-	1.1	0.7
Articulated Trucks	0	0	0	0	-	0	0	0	1	0	1	0	1	0	0	-	1	0	0	1	0	-	1	3
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.3	-	0.3	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.5	-	-	0.2	0.1
Bicycles on Road	0	1	0	0	-	1	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.3	0.0	-	-	0.2	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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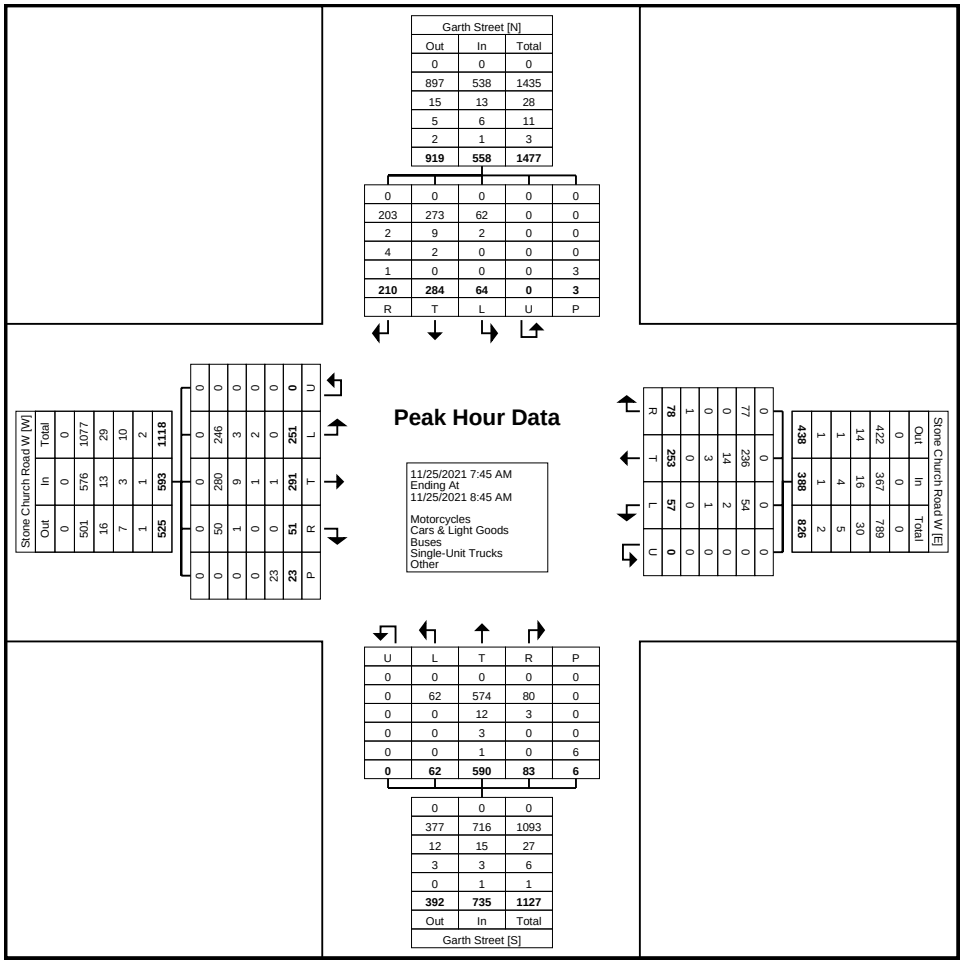
Start Date: 11/25/2021



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Peak Hour Data (11:45 AM)

Start Time	Stone Church Road W Eastbound						Stone Church Road W Westbound					Garth Street Northbound						Garth Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:45 AM	42	62	16	0	0	120	12	58	22	0	92	16	121	11	0	1	148	19	104	36	0	0	159	519
12:00 PM	35	61	15	0	2	111	14	57	25	0	96	14	94	12	0	0	120	18	79	41	0	1	138	465
12:15 PM	36	74	9	0	1	119	10	56	16	0	82	17	88	16	0	0	121	19	75	37	0	0	131	453
12:30 PM	42	77	13	0	3	132	18	65	15	0	98	21	88	14	0	1	123	20	71	35	0	0	126	479
Total	155	274	53	0	6	482	54	236	78	0	368	68	391	53	0	2	512	76	329	149	0	1	554	1916
Approach %	32.2	56.8	11.0	0.0	-	-	14.7	64.1	21.2	0.0	-	13.3	76.4	10.4	0.0	-	-	13.7	59.4	26.9	0.0	-	-	-
Total %	8.1	14.3	2.8	0.0	-	25.2	2.8	12.3	4.1	0.0	19.2	3.5	20.4	2.8	0.0	-	26.7	4.0	17.2	7.8	0.0	-	28.9	-
PHF	0.923	0.890	0.828	0.000	-	0.913	0.750	0.908	0.780	0.000	0.939	0.810	0.808	0.828	0.000	-	0.865	0.950	0.791	0.909	0.000	-	0.871	0.923
Motorcycles	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	154	265	51	0	-	470	52	230	77	0	359	67	390	53	0	-	510	76	322	147	0	-	545	1884
% Cars & Light Goods	99.4	96.7	96.2	-	-	97.5	96.3	97.5	98.7	-	97.6	98.5	99.7	100.0	-	-	99.6	100.0	97.9	98.7	-	-	98.4	98.3
Buses	0	3	0	0	-	3	0	2	1	0	3	0	1	0	0	-	1	0	3	0	0	-	3	10
% Buses	0.0	1.1	0.0	-	-	0.6	0.0	0.8	1.3	-	0.8	0.0	0.3	0.0	-	-	0.2	0.0	0.9	0.0	-	-	0.5	0.5
Single-Unit Trucks	0	5	1	0	-	6	2	3	0	0	5	1	0	0	0	-	1	0	4	1	0	-	5	17
% Single-Unit Trucks	0.0	1.8	1.9	-	-	1.2	3.7	1.3	0.0	-	1.4	1.5	0.0	0.0	-	-	0.2	0.0	1.2	0.7	-	-	0.9	0.9
Articulated Trucks	1	0	1	0	-	2	0	0	0	0	0	0	0	0	0	-	0	0	0	1	0	-	1	3
% Articulated Trucks	0.6	0.0	1.9	-	-	0.4	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.7	-	-	0.2	0.2
Bicycles on Road	0	1	0	0	-	1	0	1	0	0	1	0	0	0	0	-	0	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.4	0.0	-	-	0.2	0.0	0.4	0.0	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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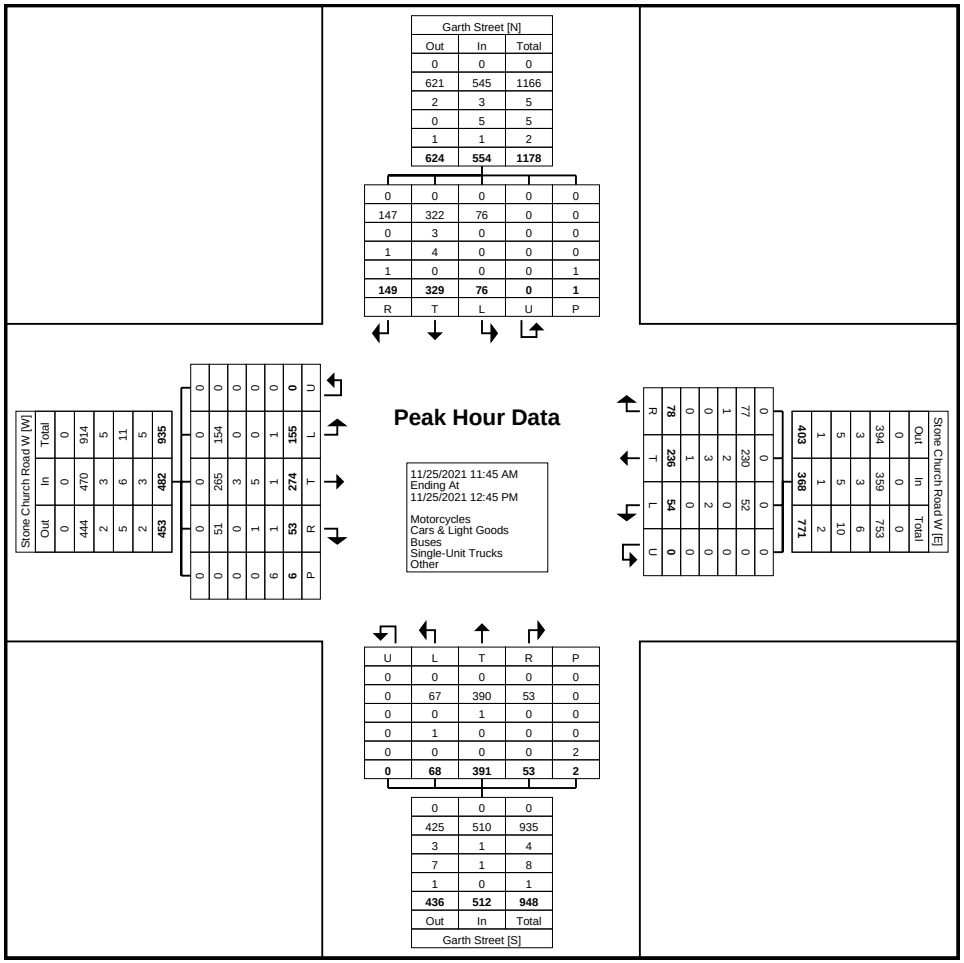


Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021

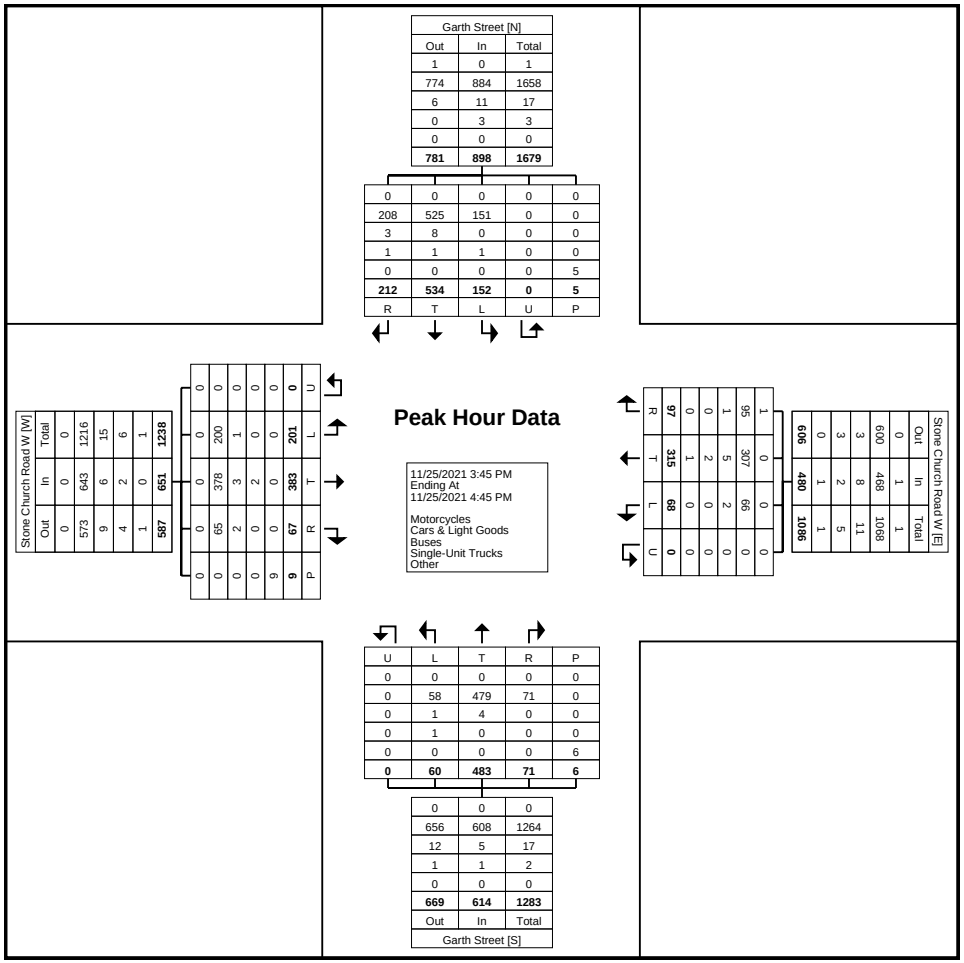
Turning Movement Peak Hour Data (3:45 PM)

Start Time	Stone Church Road W Eastbound						Stone Church Road W Westbound					Garth Street Northbound						Garth Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
3:45 PM	48	84	13	0	0	145	19	79	26	0	124	15	125	17	0	1	157	35	133	51	0	2	219	645
4:00 PM	59	109	19	0	5	187	18	79	30	0	127	16	123	15	0	4	154	39	141	46	0	1	226	694
4:15 PM	45	91	16	0	2	152	19	82	19	0	120	9	126	14	0	0	149	38	126	58	0	1	222	643
4:30 PM	49	99	19	0	2	167	12	75	22	0	109	20	109	25	0	1	154	40	134	57	0	1	231	661
Total	201	383	67	0	9	651	68	315	97	0	480	60	483	71	0	6	614	152	534	212	0	5	898	2643
Approach %	30.9	58.8	10.3	0.0	-	-	14.2	65.6	20.2	0.0	-	9.8	78.7	11.6	0.0	-	-	16.9	59.5	23.6	0.0	-	-	-
Total %	7.6	14.5	2.5	0.0	-	24.6	2.6	11.9	3.7	0.0	18.2	2.3	18.3	2.7	0.0	-	23.2	5.8	20.2	8.0	0.0	-	34.0	-
PHF	0.852	0.878	0.882	0.000	-	0.870	0.895	0.960	0.808	0.000	0.945	0.750	0.958	0.710	0.000	-	0.978	0.950	0.947	0.914	0.000	-	0.972	0.952
Motorcycles	0	0	0	0	-	0	0	0	1	0	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.0	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	200	378	65	0	-	643	66	307	95	0	468	58	479	71	0	-	608	151	525	208	0	-	884	2603
% Cars & Light Goods	99.5	98.7	97.0	-	-	98.8	97.1	97.5	97.9	-	97.5	96.7	99.2	100.0	-	-	99.0	99.3	98.3	98.1	-	-	98.4	98.5
Buses	1	3	2	0	-	6	2	5	1	0	8	1	4	0	0	-	5	0	8	3	0	-	11	30
% Buses	0.5	0.8	3.0	-	-	0.9	2.9	1.6	1.0	-	1.7	1.7	0.8	0.0	-	-	0.8	0.0	1.5	1.4	-	-	1.2	1.1
Single-Unit Trucks	0	2	0	0	-	2	0	2	0	0	2	1	0	0	0	-	1	1	1	1	0	-	3	8
% Single-Unit Trucks	0.0	0.5	0.0	-	-	0.3	0.0	0.6	0.0	-	0.4	1.7	0.0	0.0	-	-	0.2	0.7	0.2	0.5	-	-	0.3	0.3
Articulated Trucks	0	0	0	0	-	0	0	1	0	0	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.3	0.0	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Garth Street
Site Code: 210669
Start Date: 11/25/2021



Turning Movement Peak Hour Data Plot (3:45 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Data

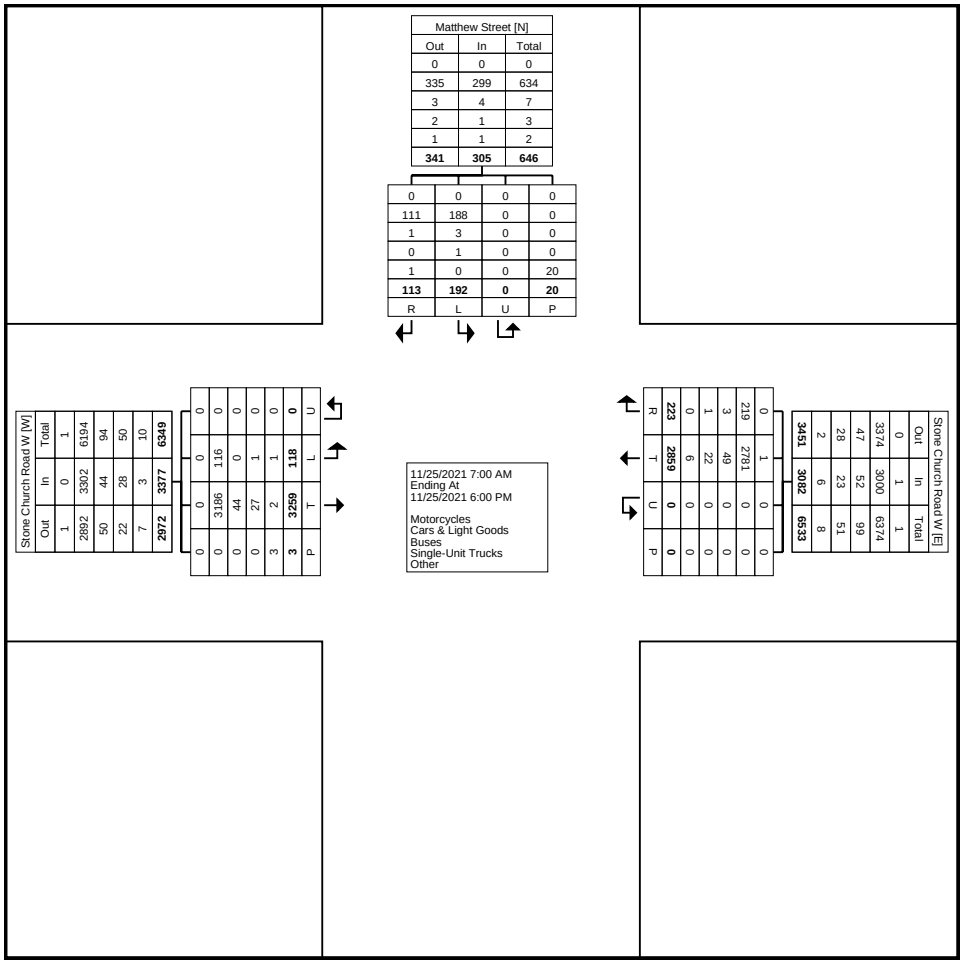
Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound					Matthew Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	1	41	0	0	42	33	2	0	0	35	1	0	0	1	1	78
7:15 AM	0	42	0	1	42	37	2	0	0	39	2	2	0	0	4	85
7:30 AM	1	61	0	0	62	62	2	0	0	64	6	7	0	1	13	139
7:45 AM	1	98	0	0	99	109	2	0	0	111	7	15	0	0	22	232
Hourly Total	3	242	0	1	245	241	8	0	0	249	16	24	0	2	40	534
8:00 AM	7	142	0	0	149	87	4	0	0	91	8	7	0	0	15	255
8:15 AM	8	104	0	0	112	82	1	0	0	83	5	4	0	0	9	204
8:30 AM	0	79	0	0	79	80	1	0	0	81	7	3	0	1	10	170
8:45 AM	3	88	0	0	91	87	3	0	0	90	7	7	0	0	14	195
Hourly Total	18	413	0	0	431	336	9	0	0	345	27	21	0	1	48	824
9:00 AM	4	86	0	0	90	75	3	0	0	78	9	4	0	1	13	181
9:15 AM	2	104	0	0	106	68	7	0	0	75	6	1	0	2	7	188
9:30 AM	2	63	0	0	65	71	6	0	0	77	7	3	0	1	10	152
9:45 AM	3	77	0	0	80	71	4	0	0	75	8	0	0	0	8	163
Hourly Total	11	330	0	0	341	285	20	0	0	305	30	8	0	4	38	684
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	5	80	0	0	85	61	6	0	0	67	5	1	0	0	6	158
11:15 AM	3	92	0	0	95	98	14	0	0	112	6	4	0	2	10	217
11:30 AM	3	91	0	0	94	86	5	0	0	91	3	2	0	1	5	190
11:45 AM	1	91	0	0	92	84	8	0	0	92	7	2	0	0	9	193
Hourly Total	12	354	0	0	366	329	33	0	0	362	21	9	0	3	30	758
12:00 PM	3	86	0	1	89	93	7	0	0	100	11	1	0	0	12	201
12:15 PM	4	102	0	0	106	88	7	0	0	95	2	2	0	0	4	205
12:30 PM	2	111	0	0	113	94	3	0	0	97	3	3	0	0	6	216
12:45 PM	4	87	0	0	91	100	8	0	0	108	9	3	0	0	12	211
Hourly Total	13	386	0	1	399	375	25	0	0	400	25	9	0	0	34	833
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	3	96	0	0	99	99	8	0	0	107	8	4	0	1	12	218
3:15 PM	4	115	0	0	119	106	12	0	0	118	3	6	0	0	9	246
3:30 PM	5	108	0	0	113	106	14	0	0	120	5	4	0	0	9	242
3:45 PM	6	137	0	0	143	115	6	0	0	121	6	1	0	2	7	271
Hourly Total	18	456	0	0	474	426	40	0	0	466	22	15	0	3	37	977
4:00 PM	6	155	0	0	161	119	9	0	0	128	6	7	0	1	13	302
4:15 PM	5	147	0	0	152	114	7	0	0	121	9	3	0	2	12	285
4:30 PM	6	155	0	0	161	107	14	0	0	121	5	5	0	1	10	292
4:45 PM	5	140	0	0	145	116	15	0	0	131	6	4	0	0	10	286

Hourly Total	22	597	0	0	619	456	45	0	0	501	26	19	0	4	45	1165
5:00 PM	8	123	0	0	131	114	15	0	0	129	5	2	0	0	7	267
5:15 PM	5	129	0	0	134	96	12	0	0	108	2	2	0	0	4	246
5:30 PM	4	125	0	0	129	108	8	0	0	116	8	2	0	1	10	255
5:45 PM	4	104	0	1	108	93	8	0	0	101	10	2	0	2	12	221
Hourly Total	21	481	0	1	502	411	43	0	0	454	25	8	0	3	33	989
Grand Total	118	3259	0	3	3377	2859	223	0	0	3082	192	113	0	20	305	6764
Approach %	3.5	96.5	0.0	-	-	92.8	7.2	0.0	-	-	63.0	37.0	0.0	-	-	-
Total %	1.7	48.2	0.0	-	49.9	42.3	3.3	0.0	-	45.6	2.8	1.7	0.0	-	4.5	-
Motorcycles	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	116	3186	0	-	3302	2781	219	0	-	3000	188	111	0	-	299	6601
% Cars & Light Goods	98.3	97.8	-	-	97.8	97.3	98.2	-	-	97.3	97.9	98.2	-	-	98.0	97.6
Buses	0	44	0	-	44	49	3	0	-	52	3	1	0	-	4	100
% Buses	0.0	1.4	-	-	1.3	1.7	1.3	-	-	1.7	1.6	0.9	-	-	1.3	1.5
Single-Unit Trucks	1	27	0	-	28	22	1	0	-	23	1	0	0	-	1	52
% Single-Unit Trucks	0.8	0.8	-	-	0.8	0.8	0.4	-	-	0.7	0.5	0.0	-	-	0.3	0.8
Articulated Trucks	0	2	0	-	2	3	0	0	-	3	0	0	0	-	0	5
% Articulated Trucks	0.0	0.1	-	-	0.1	0.1	0.0	-	-	0.1	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	1	0	0	-	1	3	0	0	-	3	0	1	0	-	1	5
% Bicycles on Road	0.8	0.0	-	-	0.0	0.1	0.0	-	-	0.1	0.0	0.9	-	-	0.3	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	3	-	-	-	-	0	-	-	-	-	20	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021

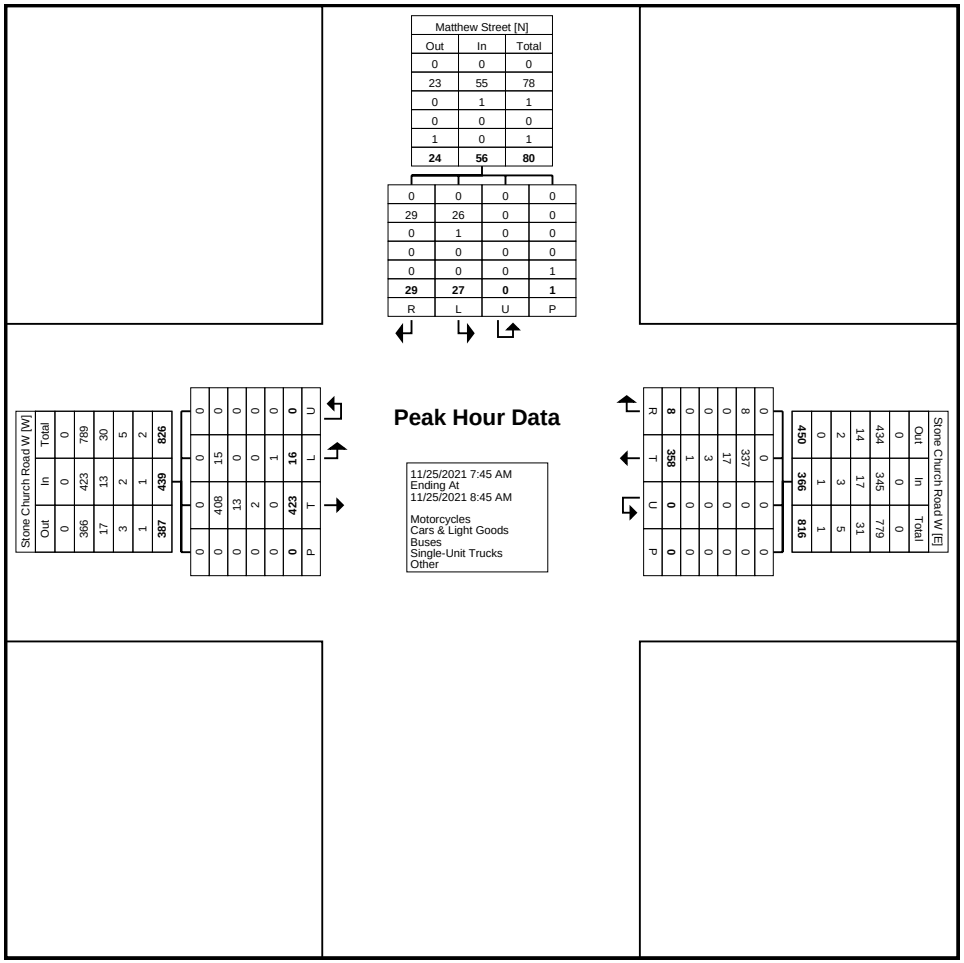
Turning Movement Peak Hour Data (7:45 AM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound					Matthew Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	1	98	0	0	99	109	2	0	0	111	7	15	0	0	22	232
8:00 AM	7	142	0	0	149	87	4	0	0	91	8	7	0	0	15	255
8:15 AM	8	104	0	0	112	82	1	0	0	83	5	4	0	0	9	204
8:30 AM	0	79	0	0	79	80	1	0	0	81	7	3	0	1	10	170
Total	16	423	0	0	439	358	8	0	0	366	27	29	0	1	56	861
Approach %	3.6	96.4	0.0	-	-	97.8	2.2	0.0	-	-	48.2	51.8	0.0	-	-	-
Total %	1.9	49.1	0.0	-	51.0	41.6	0.9	0.0	-	42.5	3.1	3.4	0.0	-	6.5	-
PHF	0.500	0.745	0.000	-	0.737	0.821	0.500	0.000	-	0.824	0.844	0.483	0.000	-	0.636	0.844
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	15	408	0	-	423	337	8	0	-	345	26	29	0	-	55	823
% Cars & Light Goods	93.8	96.5	-	-	96.4	94.1	100.0	-	-	94.3	96.3	100.0	-	-	98.2	95.6
Buses	0	13	0	-	13	17	0	0	-	17	1	0	0	-	1	31
% Buses	0.0	3.1	-	-	3.0	4.7	0.0	-	-	4.6	3.7	0.0	-	-	1.8	3.6
Single-Unit Trucks	0	2	0	-	2	3	0	0	-	3	0	0	0	-	0	5
% Single-Unit Trucks	0.0	0.5	-	-	0.5	0.8	0.0	-	-	0.8	0.0	0.0	-	-	0.0	0.6
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.3	0.0	-	-	0.3	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	6.3	0.0	-	-	0.2	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound					Matthew Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
12:00 PM	3	86	0	1	89	93	7	0	0	100	11	1	0	0	12	201
12:15 PM	4	102	0	0	106	88	7	0	0	95	2	2	0	0	4	205
12:30 PM	2	111	0	0	113	94	3	0	0	97	3	3	0	0	6	216
12:45 PM	4	87	0	0	91	100	8	0	0	108	9	3	0	0	12	211
Total	13	386	0	1	399	375	25	0	0	400	25	9	0	0	34	833
Approach %	3.3	96.7	0.0	-	-	93.8	6.3	0.0	-	-	73.5	26.5	0.0	-	-	-
Total %	1.6	46.3	0.0	-	47.9	45.0	3.0	0.0	-	48.0	3.0	1.1	0.0	-	4.1	-
PHF	0.813	0.869	0.000	-	0.883	0.938	0.781	0.000	-	0.926	0.568	0.750	0.000	-	0.708	0.964
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	13	378	0	-	391	368	24	0	-	392	25	9	0	-	34	817
% Cars & Light Goods	100.0	97.9	-	-	98.0	98.1	96.0	-	-	98.0	100.0	100.0	-	-	100.0	98.1
Buses	0	3	0	-	3	3	0	0	-	3	0	0	0	-	0	6
% Buses	0.0	0.8	-	-	0.8	0.8	0.0	-	-	0.8	0.0	0.0	-	-	0.0	0.7
Single-Unit Trucks	0	4	0	-	4	3	1	0	-	4	0	0	0	-	0	8
% Single-Unit Trucks	0.0	1.0	-	-	1.0	0.8	4.0	-	-	1.0	0.0	0.0	-	-	0.0	1.0
Articulated Trucks	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.3	-	-	0.3	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.3	0.0	-	-	0.3	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

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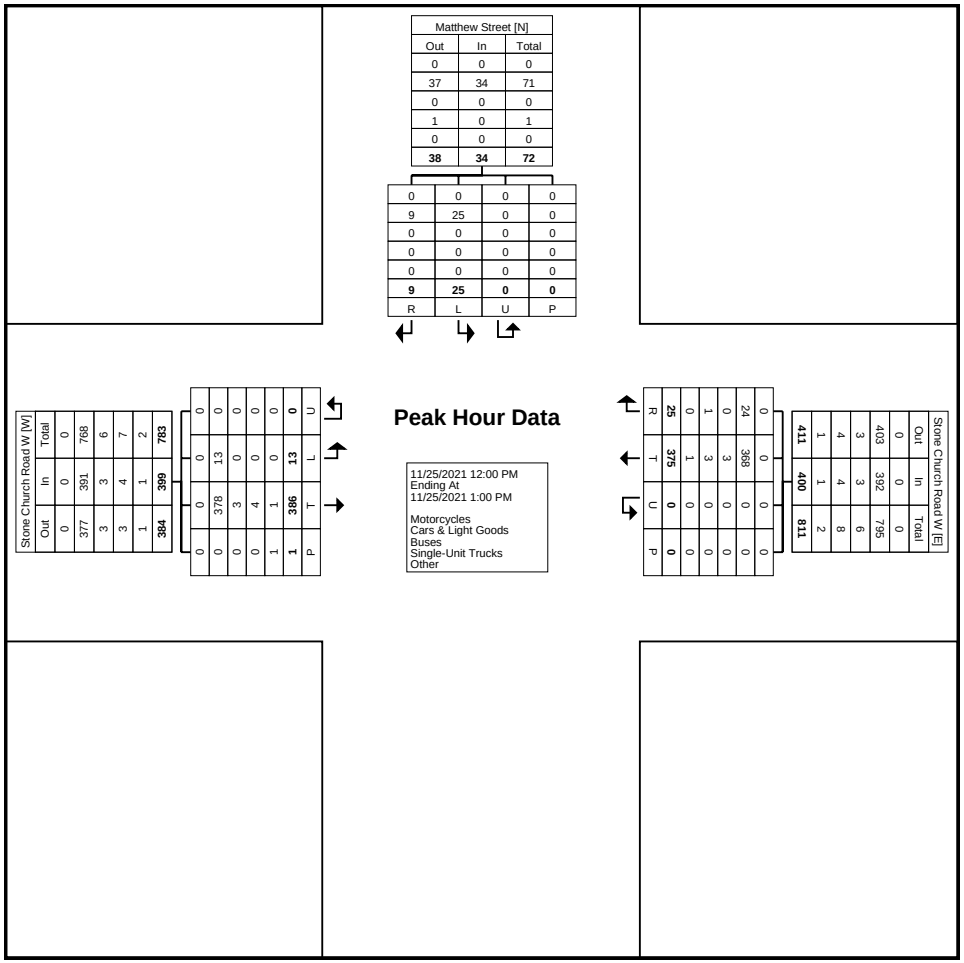
Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021

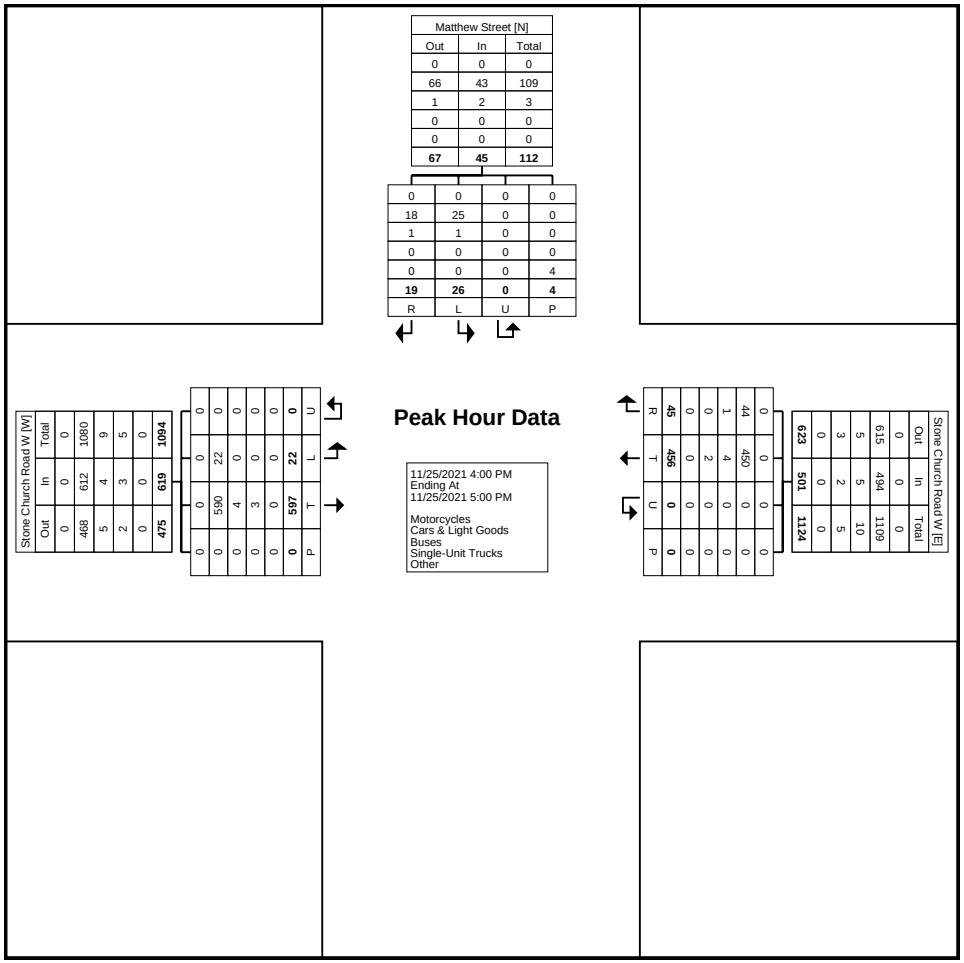
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound					Matthew Street Southbound					
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:00 PM	6	155	0	0	161	119	9	0	0	128	6	7	0	1	13	302
4:15 PM	5	147	0	0	152	114	7	0	0	121	9	3	0	2	12	285
4:30 PM	6	155	0	0	161	107	14	0	0	121	5	5	0	1	10	292
4:45 PM	5	140	0	0	145	116	15	0	0	131	6	4	0	0	10	286
Total	22	597	0	0	619	456	45	0	0	501	26	19	0	4	45	1165
Approach %	3.6	96.4	0.0	-	-	91.0	9.0	0.0	-	-	57.8	42.2	0.0	-	-	-
Total %	1.9	51.2	0.0	-	53.1	39.1	3.9	0.0	-	43.0	2.2	1.6	0.0	-	3.9	-
PHF	0.917	0.963	0.000	-	0.961	0.958	0.750	0.000	-	0.956	0.722	0.679	0.000	-	0.865	0.964
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	590	0	-	612	450	44	0	-	494	25	18	0	-	43	1149
% Cars & Light Goods	100.0	98.8	-	-	98.9	98.7	97.8	-	-	98.6	96.2	94.7	-	-	95.6	98.6
Buses	0	4	0	-	4	4	1	0	-	5	1	1	0	-	2	11
% Buses	0.0	0.7	-	-	0.6	0.9	2.2	-	-	1.0	3.8	5.3	-	-	4.4	0.9
Single-Unit Trucks	0	3	0	-	3	2	0	0	-	2	0	0	0	-	0	5
% Single-Unit Trucks	0.0	0.5	-	-	0.5	0.4	0.0	-	-	0.4	0.0	0.0	-	-	0.0	0.4
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & Matthews Street
Site Code: 210669
Start Date: 11/25/2021



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Data

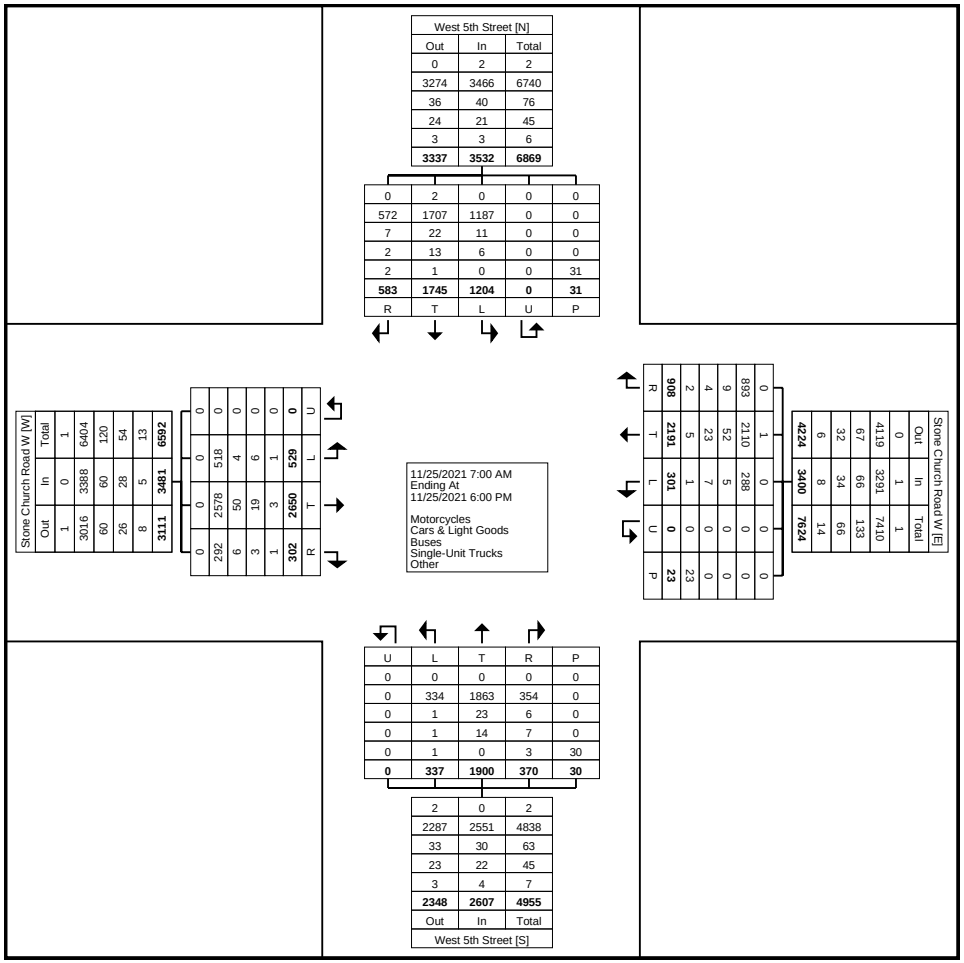
Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound						West 5th Street Northbound						West 5th Street Southbound						Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	11	28	3	0	42	3	21	18	0	0	42	2	33	6	0	0	41	13	16	12	0	2	41	166
7:15 AM	9	45	3	0	57	1	20	20	0	0	41	4	46	7	0	1	57	20	34	7	0	1	61	216
7:30 AM	17	52	7	0	76	10	44	20	0	1	74	7	52	11	0	2	70	20	34	17	0	1	71	291
7:45 AM	19	63	9	0	91	3	67	24	0	3	94	5	77	12	0	2	94	33	51	24	0	1	108	387
Hourly Total	56	188	22	0	266	17	152	82	0	4	251	18	208	36	0	5	262	86	135	60	0	5	281	1060
8:00 AM	39	98	4	0	141	7	49	36	0	1	92	6	91	13	0	4	110	30	35	22	0	2	87	430
8:15 AM	33	89	9	0	131	7	44	45	0	0	96	13	107	10	0	1	130	22	36	12	0	3	70	427
8:30 AM	27	52	7	0	86	3	54	51	0	1	108	12	105	9	0	1	126	44	59	20	0	1	123	443
8:45 AM	14	72	11	0	97	6	54	28	0	0	88	12	67	4	0	1	83	56	75	23	0	1	154	422
Hourly Total	113	311	31	0	455	23	201	160	0	2	384	43	370	36	0	7	449	152	205	77	0	7	434	1722
9:00 AM	25	64	9	0	98	12	53	23	0	1	88	4	45	9	0	0	58	35	48	14	0	0	97	341
9:15 AM	17	64	15	0	96	10	63	25	0	0	98	4	51	9	0	0	64	33	30	10	0	2	73	331
9:30 AM	12	77	5	0	94	9	62	19	0	0	90	7	44	17	0	1	68	39	42	10	0	1	91	343
9:45 AM	7	70	16	0	93	8	49	17	0	1	74	10	41	14	0	1	65	29	38	15	0	1	82	314
Hourly Total	61	275	45	0	381	39	227	84	0	2	350	25	181	49	0	2	255	136	158	49	0	4	343	1329
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	10	65	6	0	81	13	58	19	0	0	90	10	46	7	0	0	63	28	34	13	0	2	75	309
11:15 AM	14	70	9	0	93	6	80	21	0	0	107	8	67	10	0	0	85	30	42	10	0	0	82	367
11:30 AM	12	74	9	0	95	10	60	20	0	2	90	15	44	8	0	2	67	31	41	13	0	0	85	337
11:45 AM	14	83	11	0	108	7	70	28	0	1	105	12	53	14	0	1	79	33	42	17	0	1	92	384
Hourly Total	50	292	35	0	377	36	268	88	0	3	392	45	210	39	0	3	294	122	159	53	0	3	334	1397
12:00 PM	11	79	9	0	99	9	70	29	0	0	108	12	40	16	0	1	68	34	33	14	0	0	81	356
12:15 PM	21	78	9	0	108	7	67	28	0	0	102	16	40	14	0	0	70	48	42	18	0	0	108	388
12:30 PM	17	86	9	0	112	11	63	25	0	0	99	12	58	11	0	0	81	19	47	19	0	1	85	377
12:45 PM	11	71	14	0	96	9	79	16	0	0	104	6	54	14	0	0	74	31	46	17	0	0	94	368
Hourly Total	60	314	41	0	415	36	279	98	0	0	413	46	192	55	0	1	293	132	168	68	0	1	368	1489
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	21	79	6	0	106	10	80	38	0	0	128	14	87	17	0	2	118	34	62	16	0	0	112	464
3:15 PM	18	95	10	0	123	8	81	38	0	2	127	10	62	12	0	2	84	60	90	30	0	2	180	514
3:30 PM	13	74	8	0	95	12	85	34	0	0	131	12	44	13	0	1	69	54	94	28	0	2	176	471
3:45 PM	15	108	11	0	134	17	97	32	0	1	146	7	60	12	0	2	79	52	63	29	0	1	144	503
Hourly Total	67	356	35	0	458	47	343	142	0	3	532	43	253	54	0	7	350	200	309	103	0	5	612	1952
4:00 PM	24	125	17	0	166	16	92	39	0	4	147	14	62	21	0	1	97	43	87	23	0	3	153	563
4:15 PM	13	134	13	0	160	15	89	27	0	1	131	18	52	12	0	0	82	52	84	25	0	0	161	534
4:30 PM	16	124	5	0	145	12	97	31	0	3	140	11	75	20	0	0	106	50	104	21	0	1	175	566

4:45 PM	16	117	13	0	146	10	86	38	0	0	134	20	67	9	0	3	96	50	78	29	0	0	157	533
Hourly Total	69	500	48	0	617	53	364	135	0	8	552	63	256	62	0	4	381	195	353	98	0	4	646	2196
5:00 PM	9	101	13	0	123	12	88	37	0	1	137	15	64	10	0	0	89	43	59	24	0	1	126	475
5:15 PM	10	114	8	0	132	8	82	27	0	0	117	11	66	11	0	0	88	47	84	18	0	0	149	486
5:30 PM	20	107	11	0	138	15	106	31	0	0	152	14	51	8	0	0	73	42	51	17	0	0	110	473
5:45 PM	14	92	13	0	119	15	81	24	0	0	120	14	49	10	0	1	73	49	64	16	0	1	129	441
Hourly Total	53	414	45	0	512	50	357	119	0	1	526	54	230	39	0	1	323	181	258	75	0	2	514	1875
Grand Total	529	2650	302	0	3481	301	2191	908	0	23	3400	337	1900	370	0	30	2607	1204	1745	583	0	31	3532	13020
Approach %	15.2	76.1	8.7	0.0	-	8.9	64.4	26.7	0.0	-	-	12.9	72.9	14.2	0.0	-	-	34.1	49.4	16.5	0.0	-	-	-
Total %	4.1	20.4	2.3	0.0	26.7	2.3	16.8	7.0	0.0	-	26.1	2.6	14.6	2.8	0.0	-	20.0	9.2	13.4	4.5	0.0	-	27.1	-
Motorcycles	0	0	0	0	0	0	1	0	0	-	1	0	0	0	0	-	0	0	2	0	0	-	2	3
% 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	0.1	0.0	-	-	0.1	0.0
Cars & Light Goods	518	2578	292	0	3388	288	2110	893	0	-	3291	334	1863	354	0	-	2551	1187	1707	572	0	-	3466	12696
% Cars & Light Goods	97.9	97.3	96.7	-	97.3	95.7	96.3	98.3	-	-	96.8	99.1	98.1	95.7	-	-	97.9	98.6	97.8	98.1	-	-	98.1	97.5
Buses	4	50	6	0	60	5	52	9	0	-	66	1	23	6	0	-	30	11	22	7	0	-	40	196
% Buses	0.8	1.9	2.0	-	1.7	1.7	2.4	1.0	-	-	1.9	0.3	1.2	1.6	-	-	1.2	0.9	1.3	1.2	-	-	1.1	1.5
Single-Unit Trucks	6	19	3	0	28	7	23	4	0	-	34	1	14	7	0	-	22	6	13	2	0	-	21	105
% Single-Unit Trucks	1.1	0.7	1.0	-	0.8	2.3	1.0	0.4	-	-	1.0	0.3	0.7	1.9	-	-	0.8	0.5	0.7	0.3	-	-	0.6	0.8
Articulated Trucks	0	3	0	0	3	1	3	0	0	-	4	1	0	3	0	-	4	0	0	0	0	-	0	11
% Articulated Trucks	0.0	0.1	0.0	-	0.1	0.3	0.1	0.0	-	-	0.1	0.3	0.0	0.8	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	1	0	1	0	2	0	2	2	0	-	4	0	0	0	0	-	0	0	1	2	0	-	3	9
% Bicycles on Road	0.2	0.0	0.3	-	0.1	0.0	0.1	0.2	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.3	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	3.3	-	-	-	-	-	9.7	-	-
Pedestrians	-	-	-	-	-	-	-	-	-	23	-	-	-	-	-	29	-	-	-	-	-	28	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	96.7	-	-	-	-	-	90.3	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021

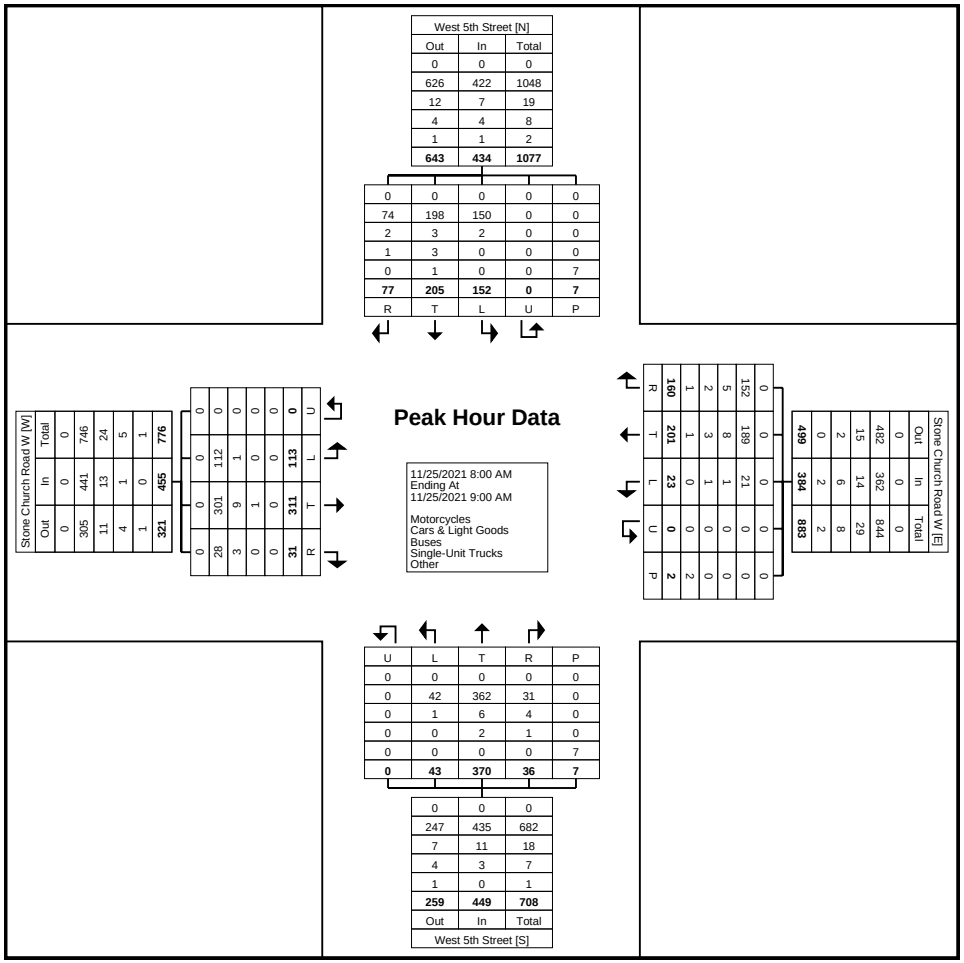
Turning Movement Peak Hour Data (8:00 AM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound						West 5th Street Northbound						West 5th Street Southbound						
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
8:00 AM	39	98	4	0	141	7	49	36	0	1	92	6	91	13	0	4	110	30	35	22	0	2	87	430
8:15 AM	33	89	9	0	131	7	44	45	0	0	96	13	107	10	0	1	130	22	36	12	0	3	70	427
8:30 AM	27	52	7	0	86	3	54	51	0	1	108	12	105	9	0	1	126	44	59	20	0	1	123	443
8:45 AM	14	72	11	0	97	6	54	28	0	0	88	12	67	4	0	1	83	56	75	23	0	1	154	422
Total	113	311	31	0	455	23	201	160	0	2	384	43	370	36	0	7	449	152	205	77	0	7	434	1722
Approach %	24.8	68.4	6.8	0.0	-	6.0	52.3	41.7	0.0	-	-	9.6	82.4	8.0	0.0	-	-	35.0	47.2	17.7	0.0	-	-	-
Total %	6.6	18.1	1.8	0.0	26.4	1.3	11.7	9.3	0.0	-	22.3	2.5	21.5	2.1	0.0	-	26.1	8.8	11.9	4.5	0.0	-	25.2	-
PHF	0.724	0.793	0.705	0.000	0.807	0.821	0.931	0.784	0.000	-	0.889	0.827	0.864	0.692	0.000	-	0.863	0.679	0.683	0.837	0.000	-	0.705	0.972
Motorcycles	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	112	301	28	0	441	21	189	152	0	-	362	42	362	31	0	-	435	150	198	74	0	-	422	1660
% Cars & Light Goods	99.1	96.8	90.3	-	96.9	91.3	94.0	95.0	-	-	94.3	97.7	97.8	86.1	-	-	96.9	98.7	96.6	96.1	-	-	97.2	96.4
Buses	1	9	3	0	13	1	8	5	0	-	14	1	6	4	0	-	11	2	3	2	0	-	7	45
% Buses	0.9	2.9	9.7	-	2.9	4.3	4.0	3.1	-	-	3.6	2.3	1.6	11.1	-	-	2.4	1.3	1.5	2.6	-	-	1.6	2.6
Single-Unit Trucks	0	1	0	0	1	1	3	2	0	-	6	0	2	1	0	-	3	0	3	1	0	-	4	14
% Single-Unit Trucks	0.0	0.3	0.0	-	0.2	4.3	1.5	1.3	-	-	1.6	0.0	0.5	2.8	-	-	0.7	0.0	1.5	1.3	-	-	0.9	0.8
Articulated Trucks	0	0	0	0	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.5	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	0	0	0	1	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	2
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.6	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.5	0.0	-	-	0.2	0.1
Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	14.3	-	-
Pedestrians	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	7	-	-	-	-	-	6	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	85.7	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021

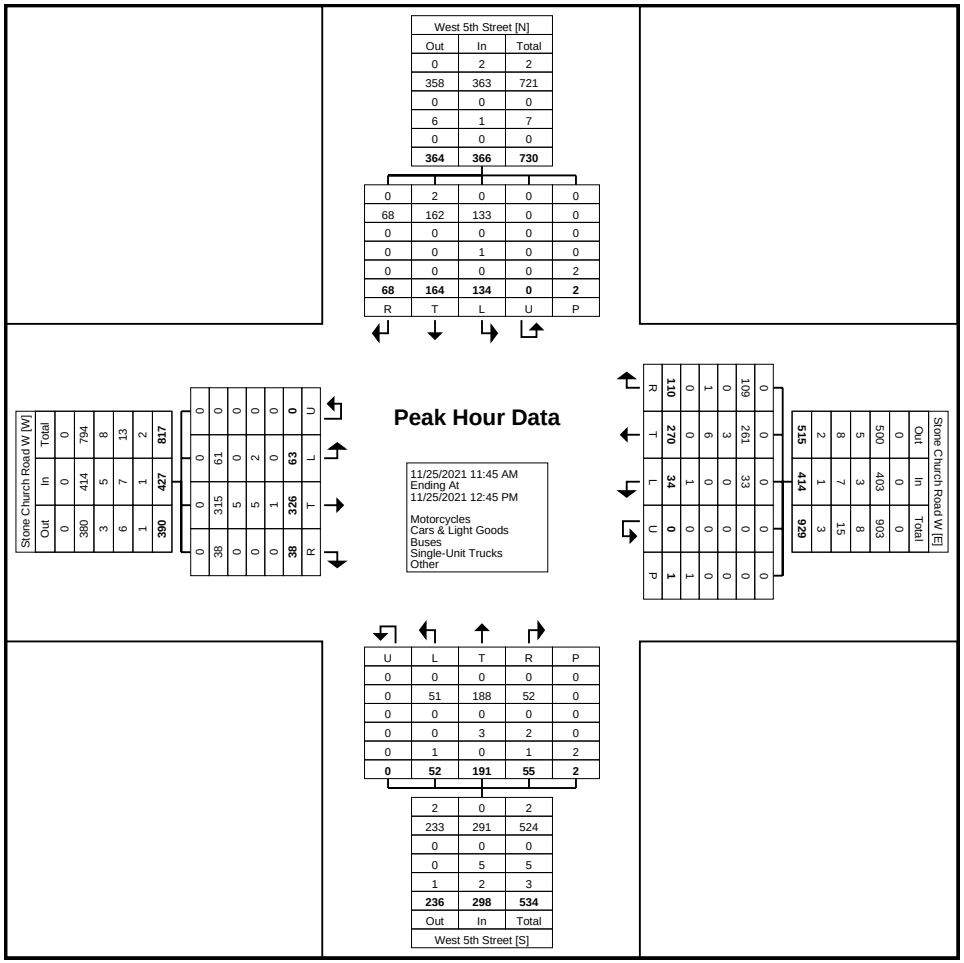
Turning Movement Peak Hour Data (11:45 AM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound						West 5th Street Northbound						West 5th Street Southbound						
	Left	Thru	Right	U-Turn	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
11:45 AM	14	83	11	0	108	7	70	28	0	1	105	12	53	14	0	1	79	33	42	17	0	1	92	384
12:00 PM	11	79	9	0	99	9	70	29	0	0	108	12	40	16	0	1	68	34	33	14	0	0	81	356
12:15 PM	21	78	9	0	108	7	67	28	0	0	102	16	40	14	0	0	70	48	42	18	0	0	108	388
12:30 PM	17	86	9	0	112	11	63	25	0	0	99	12	58	11	0	0	81	19	47	19	0	1	85	377
Total	63	326	38	0	427	34	270	110	0	1	414	52	191	55	0	2	298	134	164	68	0	2	366	1505
Approach %	14.8	76.3	8.9	0.0	-	8.2	65.2	26.6	0.0	-	-	17.4	64.1	18.5	0.0	-	-	36.6	44.8	18.6	0.0	-	-	-
Total %	4.2	21.7	2.5	0.0	28.4	2.3	17.9	7.3	0.0	-	27.5	3.5	12.7	3.7	0.0	-	19.8	8.9	10.9	4.5	0.0	-	24.3	-
PHF	0.750	0.948	0.864	0.000	0.953	0.773	0.964	0.948	0.000	-	0.958	0.813	0.823	0.859	0.000	-	0.920	0.698	0.872	0.895	0.000	-	0.847	0.970
Motorcycles	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	2
% 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	1.2	0.0	-	-	0.5	0.1
Cars & Light Goods	61	315	38	0	414	33	261	109	0	-	403	51	188	52	0	-	291	133	162	68	0	-	363	1471
% Cars & Light Goods	96.8	96.6	100.0	-	97.0	97.1	96.7	99.1	-	-	97.3	98.1	98.4	94.5	-	-	97.7	99.3	98.8	100.0	-	-	99.2	97.7
Buses	0	5	0	0	5	0	3	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	8
% Buses	0.0	1.5	0.0	-	1.2	0.0	1.1	0.0	-	-	0.7	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.5
Single-Unit Trucks	2	5	0	0	7	0	6	1	0	-	7	0	3	2	0	-	5	1	0	0	0	-	1	20
% Single-Unit Trucks	3.2	1.5	0.0	-	1.6	0.0	2.2	0.9	-	-	1.7	0.0	1.6	3.6	-	-	1.7	0.7	0.0	0.0	-	-	0.3	1.3
Articulated Trucks	0	1	0	0	1	1	0	0	0	-	1	1	0	1	0	-	2	0	0	0	0	-	0	4
% Articulated Trucks	0.0	0.3	0.0	-	0.2	2.9	0.0	0.0	-	-	0.2	1.9	0.0	1.8	-	-	0.7	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	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	50.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	50.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stone Church Road W & West 5th Street
Site Code: 210669
Start Date: 11/25/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Stone Church Road W Eastbound					Stone Church Road W Westbound						West 5th Street Northbound						West 5th Street Southbound						
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:00 PM	24	125	17	0	166	16	92	39	0	4	147	14	62	21	0	1	97	43	87	23	0	3	153	563
4:15 PM	13	134	13	0	160	15	89	27	0	1	131	18	52	12	0	0	82	52	84	25	0	0	161	534
4:30 PM	16	124	5	0	145	12	97	31	0	3	140	11	75	20	0	0	106	50	104	21	0	1	175	566
4:45 PM	16	117	13	0	146	10	86	38	0	0	134	20	67	9	0	3	96	50	78	29	0	0	157	533
Total	69	500	48	0	617	53	364	135	0	8	552	63	256	62	0	4	381	195	353	98	0	4	646	2196
Approach %	11.2	81.0	7.8	0.0	-	9.6	65.9	24.5	0.0	-	-	16.5	67.2	16.3	0.0	-	-	30.2	54.6	15.2	0.0	-	-	-
Total %	3.1	22.8	2.2	0.0	28.1	2.4	16.6	6.1	0.0	-	25.1	2.9	11.7	2.8	0.0	-	17.3	8.9	16.1	4.5	0.0	-	29.4	-
PHF	0.719	0.933	0.706	0.000	0.929	0.828	0.938	0.865	0.000	-	0.939	0.788	0.853	0.738	0.000	-	0.899	0.938	0.849	0.845	0.000	-	0.923	0.970
Motorcycles	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	69	492	47	0	608	51	356	135	0	-	542	63	251	61	0	-	375	188	349	97	0	-	634	2159
% Cars & Light Goods	100.0	98.4	97.9	-	98.5	96.2	97.8	100.0	-	-	98.2	100.0	98.0	98.4	-	-	98.4	96.4	98.9	99.0	-	-	98.1	98.3
Buses	0	6	1	0	7	2	6	0	0	-	8	0	5	0	0	-	5	4	2	1	0	-	7	27
% Buses	0.0	1.2	2.1	-	1.1	3.8	1.6	0.0	-	-	1.4	0.0	2.0	0.0	-	-	1.3	2.1	0.6	1.0	-	-	1.1	1.2
Single-Unit Trucks	0	2	0	0	2	0	2	0	0	-	2	0	0	1	0	-	1	3	2	0	0	-	5	10
% Single-Unit Trucks	0.0	0.4	0.0	-	0.3	0.0	0.5	0.0	-	-	0.4	0.0	0.0	1.6	-	-	0.3	1.5	0.6	0.0	-	-	0.8	0.5
Articulated Trucks	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	4	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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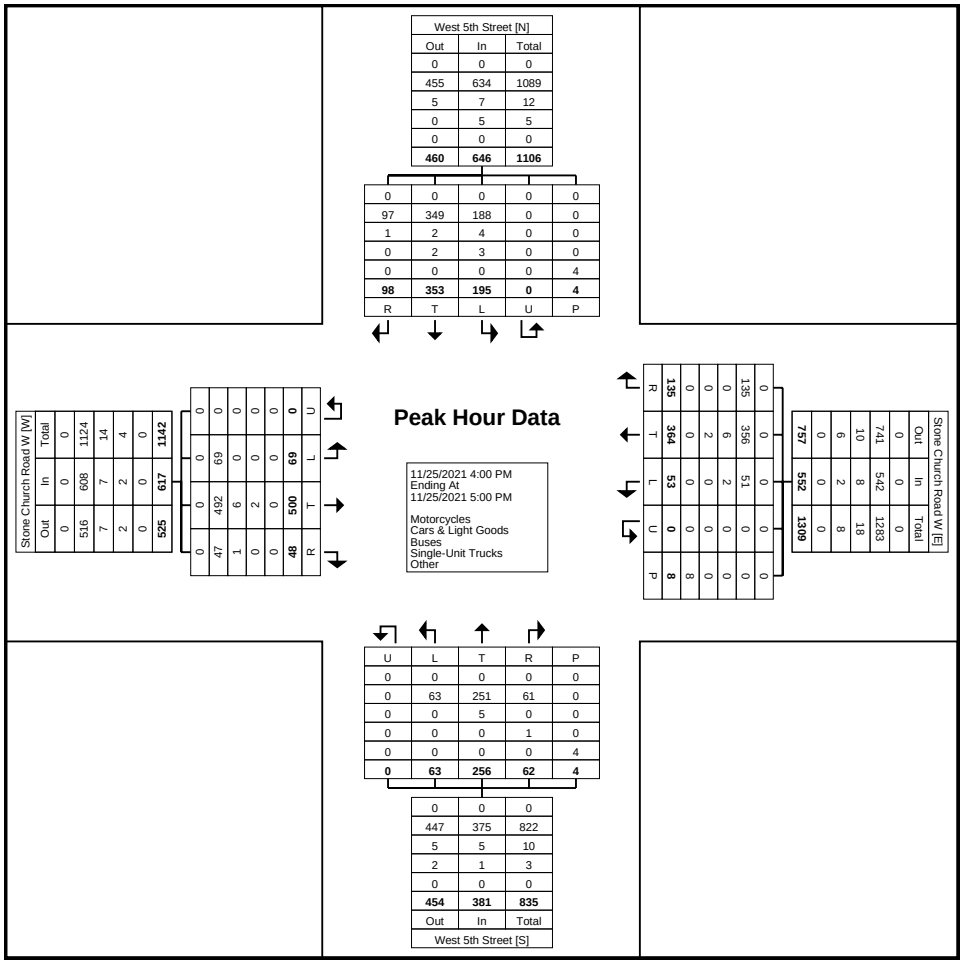


Turning Movement Peak Hour Data Plot (4:00 PM)

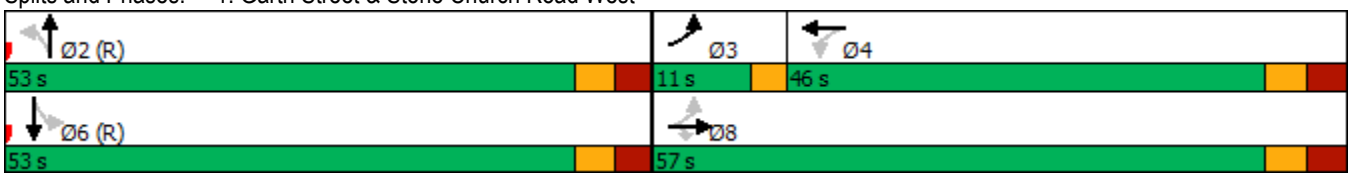
Appendix C

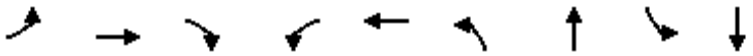
Base Year Traffic Operations

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	286	332	58	65	288	71	673	73	324
Future Volume (vph)	286	332	58	65	288	71	673	73	324
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	3	8			4		2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	4	4	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	46.8	46.8	46.0	46.0	37.3	37.3	37.3	37.3
Total Split (s)	11.0	57.0	57.0	46.0	46.0	53.0	53.0	53.0	53.0
Total Split (%)	10.0%	51.8%	51.8%	41.8%	41.8%	48.2%	48.2%	48.2%	48.2%
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	0.0	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8	6.8	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lead			Lag	Lag				
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	36.1	32.3	32.3	21.3	21.3	64.6	64.6	64.6	64.6
Actuated g/C Ratio	0.33	0.29	0.29	0.19	0.19	0.59	0.59	0.59	0.59
v/c Ratio	1.16	0.70	0.13	0.47	0.64	0.19	0.43	0.28	0.32
Control Delay	137.1	42.1	7.2	46.4	39.4	12.6	13.3	14.9	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	137.1	42.1	7.2	46.4	39.4	12.6	13.3	14.9	8.1
LOS	F	D	A	D	D	B	B	B	A
Approach Delay		79.3			40.4		13.3		8.9
Approach LOS		E			D		B		A

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 80 (73%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.16	
Intersection Signal Delay: 34.0	Intersection LOS: C
Intersection Capacity Utilization 101.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: Garth Street & Stone Church Road West





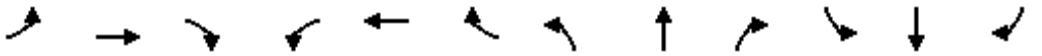
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	325	377	66	74	428	81	873	83	640
v/c Ratio	1.16	0.70	0.13	0.47	0.64	0.19	0.43	0.28	0.32
Control Delay	137.1	42.1	7.2	46.4	39.4	12.6	13.3	14.9	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	137.1	42.1	7.2	46.4	39.4	12.6	13.3	14.9	8.1
Queue Length 50th (m)	~71.8	73.0	0.0	15.7	44.4	7.4	48.4	8.0	20.8
Queue Length 95th (m)	#114.0	95.2	8.7	m27.0	57.5	17.1	69.1	19.6	34.3
Internal Link Dist (m)		44.8			401.9		333.7		258.3
Turn Bay Length (m)	45.0		45.0	45.0		80.0		55.0	
Base Capacity (vph)	280	841	746	294	1198	423	2025	301	1975
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	0.45	0.09	0.25	0.36	0.19	0.43	0.28	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

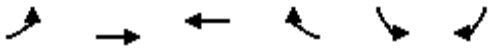
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	332	58	65	288	89	71	673	95	73	324	239
Future Volume (vph)	286	332	58	65	288	89	71	673	95	73	324	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1769	1845	1557	1682	3287		1788	3436		1752	3213	
Flt Permitted	0.32	1.00	1.00	0.47	1.00		0.38	1.00		0.28	1.00	
Satd. Flow (perm)	594	1845	1557	828	3287		720	3436		514	3213	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	325	377	66	74	327	101	81	765	108	83	368	272
RTOR Reduction (vph)	0	0	47	0	33	0	0	7	0	0	87	0
Lane Group Flow (vph)	325	377	19	74	395	0	81	866	0	83	553	0
Confl. Peds. (#/hr)	3		6	6		3	23					23
Heavy Vehicles (%)	2%	3%	2%	7%	7%	1%	0%	3%	4%	3%	4%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	3	8			4			2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	32.3	32.3	32.3	21.3	21.3		64.6	64.6		64.6	64.6	
Effective Green, g (s)	32.3	32.3	32.3	21.3	21.3		64.6	64.6		64.6	64.6	
Actuated g/C Ratio	0.29	0.29	0.29	0.19	0.19		0.59	0.59		0.59	0.59	
Clearance Time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	259	541	457	160	636		422	2017		301	1886	
v/s Ratio Prot	c0.09	0.20			0.12			c0.25			0.17	
v/s Ratio Perm	c0.28		0.01	0.09			0.11			0.16		
v/c Ratio	1.25	0.70	0.04	0.46	0.62		0.19	0.43		0.28	0.29	
Uniform Delay, d1	37.0	34.5	27.8	39.3	40.7		10.6	12.5		11.2	11.3	
Progression Factor	1.00	1.00	1.00	0.94	0.95		1.00	1.00		1.00	1.00	
Incremental Delay, d2	142.3	3.9	0.0	2.0	1.8		1.0	0.7		2.3	0.4	
Delay (s)	179.3	38.4	27.8	39.0	40.5		11.6	13.2		13.4	11.7	
Level of Service	F	D	C	D	D		B	B		B	B	
Approach Delay (s)		97.1			40.3			13.1			11.9	
Approach LOS		F			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	39.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	101.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	482	408	9	31	33
Future Volume (Veh/h)	18	482	408	9	31	33
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	19	513	434	10	33	35
Pedestrians					1	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	445				991	440
vC1, stage 1 conf vol					440	
vC2, stage 2 conf vol					551	
vCu, unblocked vol	445				991	440
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				93	94
cM capacity (veh/h)	1125				475	621

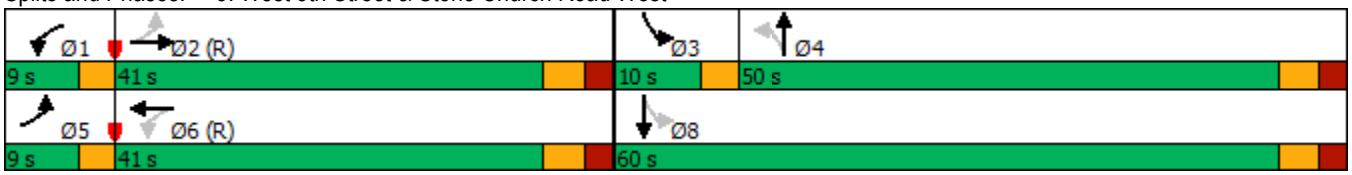
Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	19	513	444	68
Volume Left	19	0	0	33
Volume Right	0	0	10	35
cSH	1125	1700	1700	541
Volume to Capacity	0.02	0.30	0.26	0.13
Queue Length 95th (m)	0.4	0.0	0.0	3.3
Control Delay (s)	8.3	0.0	0.0	12.6
Lane LOS	A			B
Approach Delay (s)	0.3		0.0	12.6
Approach LOS				B

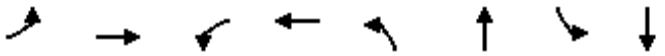
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	129	355	26	229	48	413	173	234
Future Volume (vph)	129	355	26	229	48	413	173	234
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+pt	NA
Protected Phases	5	2	1	6		4	3	8
Permitted Phases	2		6		4		8	
Detector Phase	5	2	1	6	4	4	3	8
Switch Phase								
Minimum Initial (s)	6.0	12.0	6.0	12.0	12.0	12.0	7.0	12.0
Minimum Split (s)	9.0	31.9	9.0	31.9	31.8	31.8	10.0	31.8
Total Split (s)	9.0	41.0	9.0	41.0	50.0	50.0	10.0	60.0
Total Split (%)	8.2%	37.3%	8.2%	37.3%	45.5%	45.5%	9.1%	54.5%
Yellow Time (s)	3.0	3.3	3.0	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.6	0.0	2.6	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.8	5.8	3.0	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	57.1	48.8	52.5	43.1	33.5	33.5	46.3	43.5
Actuated g/C Ratio	0.52	0.44	0.48	0.39	0.30	0.30	0.42	0.40
v/c Ratio	0.33	0.50	0.07	0.63	0.15	0.83	0.77	0.47
Control Delay	12.9	17.0	16.0	31.5	26.4	47.6	42.4	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	17.0	16.0	31.5	26.4	47.6	42.4	23.9
LOS	B	B	B	C	C	D	D	C
Approach Delay		16.0		30.6		45.6		30.4
Approach LOS		B		C		D		C

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 30.5	Intersection LOS: C
Intersection Capacity Utilization 80.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: West 5th Street & Stone Church Road West





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	402	27	424	49	462	178	332
v/c Ratio	0.33	0.50	0.07	0.63	0.15	0.83	0.77	0.47
Control Delay	12.9	17.0	16.0	31.5	26.4	47.6	42.4	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	17.0	16.0	31.5	26.4	47.6	42.4	23.9
Queue Length 50th (m)	8.8	30.9	2.7	67.4	7.6	90.7	24.0	47.9
Queue Length 95th (m)	17.0	70.8	8.3	#112.6	14.9	114.1	#36.5	62.1
Internal Link Dist (m)		806.9		233.4		182.3		205.6
Turn Bay Length (m)	55.0		60.0		35.0		90.0	
Base Capacity (vph)	401	803	413	673	419	734	232	881
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.50	0.07	0.63	0.12	0.63	0.77	0.38

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	355	35	26	229	182	48	413	35	173	234	88
Future Volume (vph)	129	355	35	26	229	182	48	413	35	173	234	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.93		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1784	1803		1651	1662		1770	1821		1787	1764	
Flt Permitted	0.32	1.00		0.44	1.00		0.56	1.00		0.18	1.00	
Satd. Flow (perm)	596	1803		756	1662		1044	1821		330	1764	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	133	366	36	27	236	188	49	426	36	178	241	91
RTOR Reduction (vph)	0	3	0	0	23	0	0	3	0	0	15	0
Lane Group Flow (vph)	133	399	0	27	401	0	49	459	0	178	317	0
Confl. Peds. (#/hr)	7		7	7		7			2	2		
Heavy Vehicles (%)	1%	3%	10%	9%	6%	4%	2%	2%	14%	1%	3%	4%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	54.8	47.7		47.2	43.1		33.5	33.5		43.5	43.5	
Effective Green, g (s)	54.8	47.7		47.2	43.1		33.5	33.5		43.5	43.5	
Actuated g/C Ratio	0.50	0.43		0.43	0.39		0.30	0.30		0.40	0.40	
Clearance Time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	390	781		357	651		317	554		223	697	
v/s Ratio Prot	c0.03	0.22		0.00	c0.24			0.25		c0.05	0.18	
v/s Ratio Perm	0.14			0.03			0.05			c0.26		
v/c Ratio	0.34	0.51		0.08	0.62		0.15	0.83		0.80	0.46	
Uniform Delay, d1	16.6	22.7		18.5	26.8		27.9	35.6		26.3	24.5	
Progression Factor	0.69	0.59		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	2.2		0.1	4.3		0.2	9.9		17.8	0.5	
Delay (s)	12.0	15.7		18.6	31.1		28.1	45.4		44.1	25.0	
Level of Service	B	B		B	C		C	D		D	C	
Approach Delay (s)		14.8			30.4			43.8			31.7	
Approach LOS		B			C			D			C	

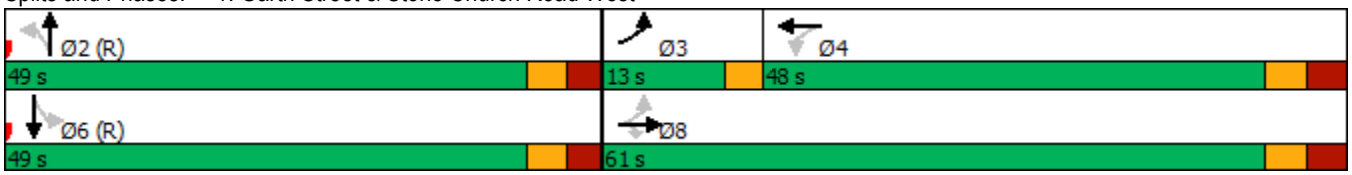
Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

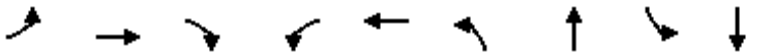
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	229	437	76	78	359	68	551	173	609
Future Volume (vph)	229	437	76	78	359	68	551	173	609
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	3	8			4		2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	4	4	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	46.8	46.8	46.8	46.8	37.3	37.3	37.3	37.3
Total Split (s)	13.0	61.0	61.0	48.0	48.0	49.0	49.0	49.0	49.0
Total Split (%)	11.8%	55.5%	55.5%	43.6%	43.6%	44.5%	44.5%	44.5%	44.5%
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	0.0	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8	6.8	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lead			Lag	Lag				
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	39.6	35.8	35.8	22.8	22.8	61.1	61.1	61.1	61.1
Actuated g/C Ratio	0.36	0.33	0.33	0.21	0.21	0.56	0.56	0.56	0.56
v/c Ratio	0.81	0.75	0.14	0.58	0.67	0.27	0.34	0.48	0.47
Control Delay	47.7	41.3	6.1	51.9	38.8	17.8	14.2	21.6	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	41.3	6.1	51.9	38.8	17.8	14.2	21.6	15.2
LOS	D	D	A	D	D	B	B	C	B
Approach Delay		39.6			40.7		14.6		16.3
Approach LOS		D			D		B		B

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 99 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 26.1	Intersection LOS: C
Intersection Capacity Utilization 105.9%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: Garth Street & Stone Church Road West





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	241	460	80	82	495	72	665	182	896
v/c Ratio	0.81	0.75	0.14	0.58	0.67	0.27	0.34	0.48	0.47
Control Delay	47.7	41.3	6.1	51.9	38.8	17.8	14.2	21.6	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	41.3	6.1	51.9	38.8	17.8	14.2	21.6	15.2
Queue Length 50th (m)	39.6	91.3	0.3	13.0	38.7	7.2	35.4	21.0	50.1
Queue Length 95th (m)	#54.1	110.5	9.3	m18.5	46.5	20.7	59.0	50.6	82.0
Internal Link Dist (m)		44.8			401.9		333.7		258.3
Turn Bay Length (m)	45.0		45.0	45.0		80.0		55.0	
Base Capacity (vph)	299	926	799	257	1294	266	1957	379	1896
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.50	0.10	0.32	0.38	0.27	0.34	0.48	0.47

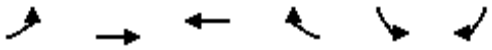
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	437	76	78	359	111	68	551	81	173	609	242
Future Volume (vph)	229	437	76	78	359	111	68	551	81	173	609	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	1881	1542	1748	3383		1748	3510		1787	3368	
Flt Permitted	0.27	1.00	1.00	0.37	1.00		0.26	1.00		0.36	1.00	
Satd. Flow (perm)	509	1881	1542	689	3383		479	3510		683	3368	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	241	460	80	82	378	117	72	580	85	182	641	255
RTOR Reduction (vph)	0	0	53	0	34	0	0	8	0	0	28	0
Lane Group Flow (vph)	241	460	27	82	461	0	72	657	0	182	868	0
Confl. Peds. (#/hr)	5		6	6		5	9					9
Heavy Vehicles (%)	1%	1%	3%	3%	3%	1%	3%	1%	0%	1%	2%	2%
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	3	8			4			2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	35.8	35.8	35.8	22.8	22.8		61.1	61.1		61.1	61.1	
Effective Green, g (s)	35.8	35.8	35.8	22.8	22.8		61.1	61.1		61.1	61.1	
Actuated g/C Ratio	0.33	0.33	0.33	0.21	0.21		0.56	0.56		0.56	0.56	
Clearance Time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	612	501	142	701		266	1949		379	1870	
v/s Ratio Prot	c0.08	0.24			0.14			0.19			0.26	
v/s Ratio Perm	c0.20		0.02	0.12			0.15			c0.27		
v/c Ratio	0.86	0.75	0.05	0.58	0.66		0.27	0.34		0.48	0.46	
Uniform Delay, d1	31.2	33.1	25.5	39.3	40.0		12.8	13.4		14.8	14.6	
Progression Factor	1.00	1.00	1.00	1.01	0.97		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.9	5.2	0.0	4.4	1.7		2.5	0.5		4.3	0.8	
Delay (s)	53.0	38.3	25.5	44.0	40.5		15.3	13.8		19.1	15.5	
Level of Service	D	D	C	D	D		B	B		B	B	
Approach Delay (s)		41.5			41.0			14.0			16.1	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	105.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	681	520	51	30	22
Future Volume (Veh/h)	25	681	520	51	30	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	26	709	542	53	31	23
Pedestrians					4	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	599				1334	572
vC1, stage 1 conf vol					572	
vC2, stage 2 conf vol					761	
vCu, unblocked vol	599				1334	572
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				92	96
cM capacity (veh/h)	985				372	512

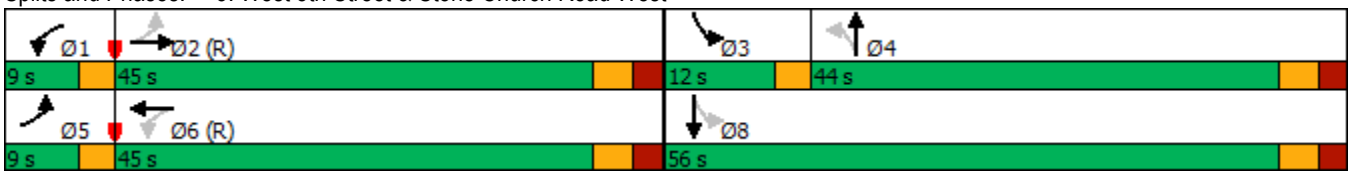
Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	26	709	595	54
Volume Left	26	0	0	31
Volume Right	0	0	53	23
cSH	985	1700	1700	421
Volume to Capacity	0.03	0.42	0.35	0.13
Queue Length 95th (m)	0.6	0.0	0.0	3.3
Control Delay (s)	8.8	0.0	0.0	14.8
Lane LOS	A			B
Approach Delay (s)	0.3		0.0	14.8
Approach LOS				B

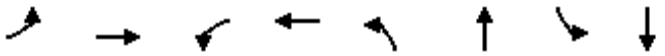
Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	79	570	60	415	72	292	222	402
Future Volume (vph)	79	570	60	415	72	292	222	402
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+pt	NA
Protected Phases	5	2	1	6		4	3	8
Permitted Phases	2		6		4		8	
Detector Phase	5	2	1	6	4	4	3	8
Switch Phase								
Minimum Initial (s)	6.0	12.0	6.0	12.0	12.0	12.0	8.0	12.0
Minimum Split (s)	9.0	31.9	9.0	31.9	31.8	31.8	11.0	31.8
Total Split (s)	9.0	45.0	9.0	45.0	44.0	44.0	12.0	56.0
Total Split (%)	8.2%	40.9%	8.2%	40.9%	40.0%	40.0%	10.9%	50.9%
Yellow Time (s)	3.0	3.3	3.0	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.6	0.0	2.6	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.8	5.8	3.0	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	59.3	50.1	58.8	49.9	27.7	27.7	42.5	39.7
Actuated g/C Ratio	0.54	0.46	0.53	0.45	0.25	0.25	0.39	0.36
v/c Ratio	0.25	0.77	0.23	0.72	0.56	0.81	0.89	0.79
Control Delay	22.3	46.6	15.2	32.4	51.4	50.9	59.7	39.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	46.6	15.2	32.4	51.4	50.9	59.7	39.2
LOS	C	D	B	C	D	D	E	D
Approach Delay		43.9		30.7		51.0		45.4
Approach LOS		D		C		D		D

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 81 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 42.2	Intersection LOS: D
Intersection Capacity Utilization 94.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: West 5th Street & Stone Church Road West





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	645	62	587	74	374	229	529
v/c Ratio	0.25	0.77	0.23	0.72	0.56	0.81	0.89	0.79
Control Delay	22.3	46.6	15.2	32.4	51.4	50.9	59.7	39.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	46.6	15.2	32.4	51.4	50.9	59.7	39.2
Queue Length 50th (m)	11.8	139.7	5.8	100.4	13.9	73.3	34.2	97.5
Queue Length 95th (m)	21.8	#215.1	14.1	#182.0	27.4	96.8	#58.7	121.9
Internal Link Dist (m)		806.9		233.4		182.3		205.6
Turn Bay Length (m)	55.0		60.0		35.0		90.0	
Base Capacity (vph)	329	838	272	818	180	631	257	839
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.77	0.23	0.72	0.41	0.59	0.89	0.63

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	570	55	60	415	154	72	292	71	222	402	112
Future Volume (vph)	79	570	55	60	415	154	72	292	71	222	402	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1804	1833		1736	1783		1805	1795		1734	1820	
Flt Permitted	0.23	1.00		0.19	1.00		0.27	1.00		0.21	1.00	
Satd. Flow (perm)	438	1833		339	1783		521	1795		382	1820	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	81	588	57	62	428	159	74	301	73	229	414	115
RTOR Reduction (vph)	0	3	0	0	10	0	0	9	0	0	11	0
Lane Group Flow (vph)	81	642	0	62	577	0	74	365	0	229	518	0
Confl. Peds. (#/hr)	4		4	4		4			8	8		
Heavy Vehicles (%)	0%	2%	2%	4%	2%	0%	0%	2%	2%	4%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	55.9	49.6		55.3	49.3		27.7	27.7		39.7	39.7	
Effective Green, g (s)	55.9	49.6		55.3	49.3		27.7	27.7		39.7	39.7	
Actuated g/C Ratio	0.51	0.45		0.50	0.45		0.25	0.25		0.36	0.36	
Clearance Time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	300	826		246	799		131	452		248	656	
v/s Ratio Prot	c0.02	c0.35		0.01	0.32			0.20		c0.08	0.28	
v/s Ratio Perm	0.12			0.11			0.14			c0.26		
v/c Ratio	0.27	0.78		0.25	0.72		0.56	0.81		0.92	0.79	
Uniform Delay, d1	16.8	25.5		17.9	24.8		35.9	38.6		30.5	31.4	
Progression Factor	1.57	1.48		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	6.5		0.5	5.6		5.5	10.2		36.9	6.3	
Delay (s)	26.9	44.3		18.4	30.3		41.4	48.8		67.4	37.7	
Level of Service	C	D		B	C		D	D		E	D	
Approach Delay (s)		42.4			29.2			47.6			46.7	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Appendix D

Background Development Traffic

Sheldon Neighbourhood Traffic Forecast

Transportation Planning staff provided land use assumptions for the Sheldon neighbourhood as a traffic study is not available. The Sheldon neighbourhood is assumed to consist of:

- 54 single detached dwellings;
- 73 street townhouse dwellings; and
- 169 Condominium block townhouses.

TABLE 1: BACKGROUND DEVELOPMENT TRAFFIC

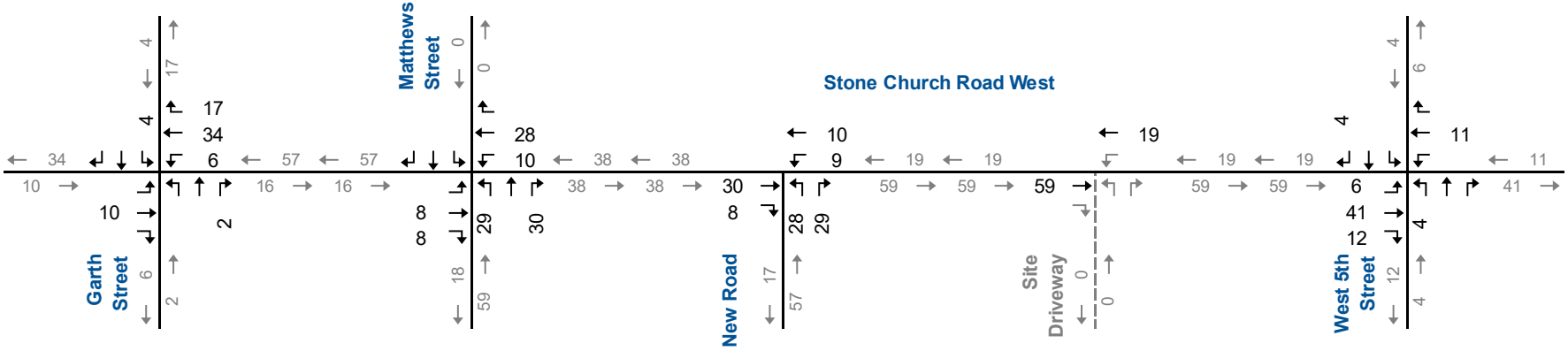
Land Use	No. of Units	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
LUC 210 - Single-Family Detached Housing	54	Eq	11	32	43	Eq	35	21	56
LUC 220 - Multifamily Housing (Low-Rise)	73	Eq	10	35	45	Eq	33	19	52
LUC 221 - Multi-Family Housing (Mid-Rise)	169	Eq	14	49	63	Eq	40	26	66
Total Trip Generation			**35**	**116**	**151**		**108**	**66**	**174**

LUC 210 - AM: Ln(T) = 0.91 Ln(X) + 0.12 | PM: Ln(T) = 0.94 Ln(X) + 0.27

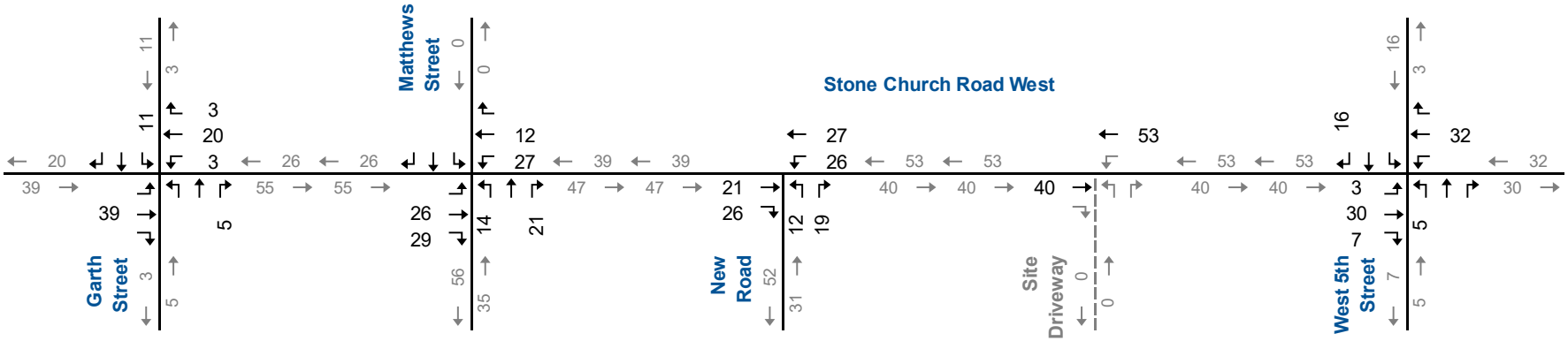
LUC 220 - AM: T = 0.31(X) + 22.85 | PM: T = 0.43(X) + 20.55

LUC 221 - AM: T = 0.44(X) - 11.61 | PM: T = 0.39(X) + 0.34

AM Peak Hour



PM Peak Hour



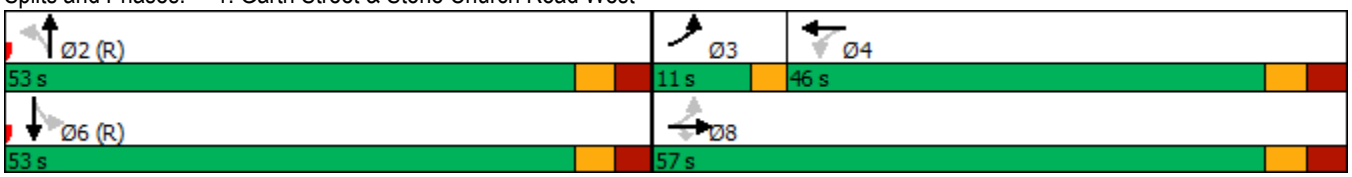
Appendix E

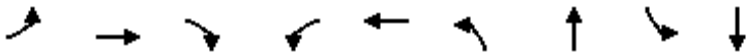
Background Traffic Operations

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	335	399	68	82	372	83	788	89	379
Future Volume (vph)	335	399	68	82	372	83	788	89	379
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	3	8			4		2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	4	4	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	46.8	46.8	46.0	46.0	37.3	37.3	37.3	37.3
Total Split (s)	11.0	57.0	57.0	46.0	46.0	53.0	53.0	53.0	53.0
Total Split (%)	10.0%	51.8%	51.8%	41.8%	41.8%	48.2%	48.2%	48.2%	48.2%
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	0.0	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8	6.8	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lead			Lag	Lag				
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	39.2	35.4	35.4	24.4	24.4	61.5	61.5	61.5	61.5
Actuated g/C Ratio	0.36	0.32	0.32	0.22	0.22	0.56	0.56	0.56	0.56
v/c Ratio	1.52	0.76	0.14	0.67	0.74	0.28	0.53	0.45	0.40
Control Delay	279.6	42.2	6.8	59.4	40.1	17.0	16.9	24.9	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	279.6	42.2	6.8	59.4	40.1	17.0	16.9	24.9	10.8
LOS	F	D	A	E	D	B	B	C	B
Approach Delay		138.5			42.9		16.9		12.5
Approach LOS		F			D		B		B

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 80 (73%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.52	
Intersection Signal Delay: 52.0	Intersection LOS: D
Intersection Capacity Utilization 104.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: Garth Street & Stone Church Road West





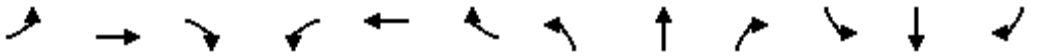
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	381	453	77	93	561	94	1023	101	749
v/c Ratio	1.52	0.76	0.14	0.67	0.74	0.28	0.53	0.45	0.40
Control Delay	279.6	42.2	6.8	59.4	40.1	17.0	16.9	24.9	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	279.6	42.2	6.8	59.4	40.1	17.0	16.9	24.9	10.8
Queue Length 50th (m)	~104.6	88.8	0.9	20.1	59.5	9.6	65.2	11.8	30.3
Queue Length 95th (m)	#145.2	106.8	9.4	m29.7	m70.6	23.7	97.5	32.5	50.5
Internal Link Dist (m)		43.1			400.6		333.7		258.3
Turn Bay Length (m)	45.0		45.0	45.0		80.0		55.0	
Base Capacity (vph)	251	841	749	222	1198	341	1927	222	1888
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.52	0.54	0.10	0.42	0.47	0.28	0.53	0.45	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

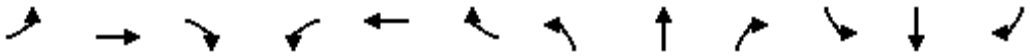
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	399	68	82	372	121	83	788	113	89	379	280
Future Volume (vph)	335	399	68	82	372	121	83	788	113	89	379	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1769	1845	1557	1683	3283		1791	3435		1752	3214	
Flt Permitted	0.23	1.00	1.00	0.35	1.00		0.32	1.00		0.21	1.00	
Satd. Flow (perm)	432	1845	1557	623	3283		610	3435		396	3214	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	381	453	77	93	423	138	94	895	128	101	431	318
RTOR Reduction (vph)	0	0	48	0	35	0	0	8	0	0	93	0
Lane Group Flow (vph)	381	453	29	93	526	0	94	1015	0	101	656	0
Confl. Peds. (#/hr)	3		6	6		3	23					23
Heavy Vehicles (%)	2%	3%	2%	7%	7%	1%	0%	3%	4%	3%	4%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	3	8			4			2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	35.4	35.4	35.4	24.4	24.4		61.5	61.5		61.5	61.5	
Effective Green, g (s)	35.4	35.4	35.4	24.4	24.4		61.5	61.5		61.5	61.5	
Actuated g/C Ratio	0.32	0.32	0.32	0.22	0.22		0.56	0.56		0.56	0.56	
Clearance Time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	236	593	501	138	728		341	1920		221	1796	
v/s Ratio Prot	c0.12	0.25			0.16			c0.30			0.20	
v/s Ratio Perm	c0.40		0.02	0.15			0.15			0.26		
v/c Ratio	1.61	0.76	0.06	0.67	0.72		0.28	0.53		0.46	0.37	
Uniform Delay, d1	34.6	33.5	25.8	39.2	39.7		12.6	15.2		14.4	13.4	
Progression Factor	1.00	1.00	1.00	0.97	0.96		1.00	1.00		1.00	1.00	
Incremental Delay, d2	295.3	5.8	0.0	11.4	3.3		2.0	1.0		6.7	0.6	
Delay (s)	329.8	39.4	25.8	49.2	41.2		14.6	16.2		21.0	14.0	
Level of Service	F	D	C	D	D		B	B		C	B	
Approach Delay (s)		159.7			42.3			16.1			14.8	
Approach LOS		F			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	57.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	573	8	10	506	11	29	0	30	36	0	39
Future Volume (Veh/h)	21	573	8	10	506	11	29	0	30	36	0	39
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	22	610	9	11	538	12	31	0	32	38	0	41
Pedestrians											1	
Lane Width (m)											3.6	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	551			619			1260	1232	614	1253	1230	545
vC1, stage 1 conf vol							658	658		567	567	
vC2, stage 2 conf vol							601	573		686	663	
vCu, unblocked vol	551			619			1260	1232	614	1253	1230	545
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			90	100	93	88	100	92
cM capacity (veh/h)	1028			961			325	357	491	323	358	542

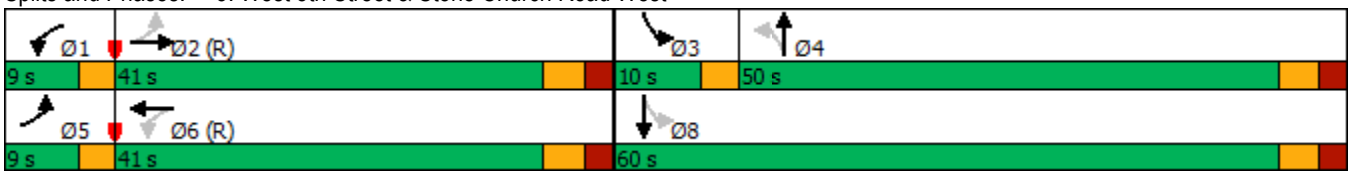
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	22	619	11	550	63	79
Volume Left	22	0	11	0	31	38
Volume Right	0	9	0	12	32	41
cSH	1028	1700	961	1700	392	409
Volume to Capacity	0.02	0.36	0.01	0.32	0.16	0.19
Queue Length 95th (m)	0.5	0.0	0.3	0.0	4.3	5.4
Control Delay (s)	8.6	0.0	8.8	0.0	15.9	15.9
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		0.2		15.9	15.9
Approach LOS					C	C

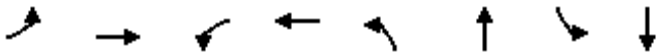
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	42.8%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	157	456	31	279	60	484	203	274
Future Volume (vph)	157	456	31	279	60	484	203	274
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+pt	NA
Protected Phases	5	2	1	6		4	3	8
Permitted Phases	2		6		4		8	
Detector Phase	5	2	1	6	4	4	3	8
Switch Phase								
Minimum Initial (s)	6.0	12.0	6.0	12.0	12.0	12.0	7.0	12.0
Minimum Split (s)	9.0	31.9	9.0	31.9	31.8	31.8	10.0	31.8
Total Split (s)	9.0	41.0	9.0	41.0	50.0	50.0	10.0	60.0
Total Split (%)	8.2%	37.3%	8.2%	37.3%	45.5%	45.5%	9.1%	54.5%
Yellow Time (s)	3.0	3.3	3.0	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.6	0.0	2.6	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.8	5.8	3.0	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	52.6	45.1	48.1	38.8	37.5	37.5	50.3	47.5
Actuated g/C Ratio	0.48	0.41	0.44	0.35	0.34	0.34	0.46	0.43
v/c Ratio	0.57	0.71	0.12	0.83	0.19	0.87	0.97	0.51
Control Delay	24.1	26.1	18.2	45.0	25.1	48.4	75.9	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	26.1	18.2	45.0	25.1	48.4	75.9	22.8
LOS	C	C	B	D	C	D	E	C
Approach Delay		25.6		43.4		46.0		41.3
Approach LOS		C		D		D		D

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 38.5	Intersection LOS: D
Intersection Capacity Utilization 92.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: West 5th Street & Stone Church Road West

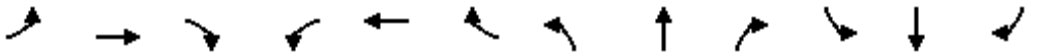




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	162	525	32	509	62	541	209	392
v/c Ratio	0.57	0.71	0.12	0.83	0.19	0.87	0.97	0.51
Control Delay	24.1	26.1	18.2	45.0	25.1	48.4	75.9	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	26.1	18.2	45.0	25.1	48.4	75.9	22.8
Queue Length 50th (m)	12.2	48.6	3.5	98.3	9.2	105.7	26.5	55.1
Queue Length 95th (m)	#32.4	#165.3	9.7	#161.0	17.7	137.3	#57.0	73.4
Internal Link Dist (m)		628.8		233.4		176.1		205.6
Turn Bay Length (m)	55.0		60.0		35.0		90.0	
Base Capacity (vph)	286	739	274	611	380	734	216	880
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.71	0.12	0.83	0.16	0.74	0.97	0.45

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	456	53	31	279	214	60	484	41	203	274	107
Future Volume (vph)	157	456	53	31	279	214	60	484	41	203	274	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.93		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	1796		1654	1664		1770	1821		1787	1762	
Flt Permitted	0.19	1.00		0.27	1.00		0.51	1.00		0.14	1.00	
Satd. Flow (perm)	356	1796		473	1664		946	1821		261	1762	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	162	470	55	32	288	221	62	499	42	209	282	110
RTOR Reduction (vph)	0	4	0	0	24	0	0	3	0	0	14	0
Lane Group Flow (vph)	162	521	0	32	485	0	62	538	0	209	378	0
Confl. Peds. (#/hr)	7		7	7		7			2	2		
Heavy Vehicles (%)	1%	3%	10%	9%	6%	4%	2%	2%	14%	1%	3%	4%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	50.8	43.8		42.8	38.8		37.5	37.5		47.5	47.5	
Effective Green, g (s)	50.8	43.8		42.8	38.8		37.5	37.5		47.5	47.5	
Actuated g/C Ratio	0.46	0.40		0.39	0.35		0.34	0.34		0.43	0.43	
Clearance Time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	715		226	586		322	620		209	760	
v/s Ratio Prot	c0.05	0.29		0.01	c0.29			0.30		c0.06	0.21	
v/s Ratio Perm	0.22			0.05			0.07			c0.37		
v/c Ratio	0.58	0.73		0.14	0.83		0.19	0.87		1.00	0.50	
Uniform Delay, d1	21.0	28.1		22.2	32.5		25.6	33.9		28.3	22.6	
Progression Factor	0.80	0.65		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	5.9		0.3	12.7		0.3	12.2		62.3	0.5	
Delay (s)	19.5	24.1		22.5	45.2		25.9	46.1		90.5	23.1	
Level of Service	B	C		C	D		C	D		F	C	
Approach Delay (s)		23.0			43.9			44.1			46.6	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	631	8	9	499	28	29
Future Volume (Veh/h)	631	8	9	499	28	29
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	686	9	10	542	30	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			695		1252	690
vC1, stage 1 conf vol					690	
vC2, stage 2 conf vol					562	
vCu, unblocked vol			695		1252	690
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		93	93
cM capacity (veh/h)			901		404	445

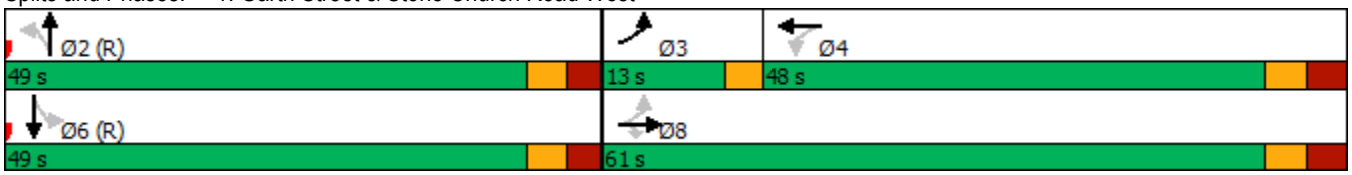
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	695	552	62
Volume Left	0	10	30
Volume Right	9	0	32
cSH	1700	901	424
Volume to Capacity	0.41	0.01	0.15
Queue Length 95th (m)	0.0	0.3	3.9
Control Delay (s)	0.0	0.3	14.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	14.9
Approach LOS			B

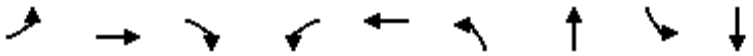
Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		43.7%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	268	551	89	94	441	80	645	214	713
Future Volume (vph)	268	551	89	94	441	80	645	214	713
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	3	8			4		2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	4	4	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	46.8	46.8	46.8	46.8	37.3	37.3	37.3	37.3
Total Split (s)	13.0	61.0	61.0	48.0	48.0	49.0	49.0	49.0	49.0
Total Split (%)	11.8%	55.5%	55.5%	43.6%	43.6%	44.5%	44.5%	44.5%	44.5%
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	0.0	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8	6.8	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lead			Lag	Lag				
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	45.2	41.4	41.4	28.4	28.4	55.5	55.5	55.5	55.5
Actuated g/C Ratio	0.41	0.38	0.38	0.26	0.26	0.50	0.50	0.50	0.50
v/c Ratio	0.92	0.82	0.15	0.85	0.67	0.49	0.44	0.82	0.61
Control Delay	59.8	40.5	6.9	68.6	32.6	33.9	19.2	50.7	21.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	40.5	6.9	68.6	32.6	33.9	19.2	50.7	21.4
LOS	E	D	A	E	C	C	B	D	C
Approach Delay		42.9			37.7		20.6		26.5
Approach LOS		D			D		C		C

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 99 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 31.4	Intersection LOS: C
Intersection Capacity Utilization 114.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Garth Street & Stone Church Road West





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	282	580	94	99	604	84	784	225	1049
v/c Ratio	0.92	0.82	0.15	0.85	0.67	0.49	0.44	0.82	0.61
Control Delay	59.8	40.5	6.9	68.6	32.6	33.9	19.2	50.7	21.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	40.5	6.9	68.6	32.6	33.9	19.2	50.7	21.4
Queue Length 50th (m)	41.5	110.6	3.0	17.4	45.3	11.5	53.1	39.2	76.7
Queue Length 95th (m)	#65.5	131.4	11.2	m14.5	m40.1	#36.9	82.0	#96.5	117.2
Internal Link Dist (m)		48.8			397.8		333.7		258.3
Turn Bay Length (m)	45.0		45.0	45.0		80.0		55.0	
Base Capacity (vph)	306	926	796	168	1293	172	1777	276	1728
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.63	0.12	0.59	0.47	0.49	0.44	0.82	0.61

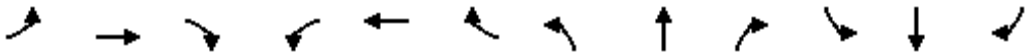
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	268	551	89	94	441	133	80	645	100	214	713	283
Future Volume (vph)	268	551	89	94	441	133	80	645	100	214	713	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1542	1749	3386		1750	3507		1787	3368	
Flt Permitted	0.24	1.00	1.00	0.24	1.00		0.19	1.00		0.29	1.00	
Satd. Flow (perm)	449	1881	1542	451	3386		341	3507		548	3368	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	282	580	94	99	464	140	84	679	105	225	751	298
RTOR Reduction (vph)	0	0	45	0	30	0	0	9	0	0	31	0
Lane Group Flow (vph)	282	580	49	99	574	0	84	775	0	225	1018	0
Confl. Peds. (#/hr)	5		6	6		5	9					9
Heavy Vehicles (%)	1%	1%	3%	3%	3%	1%	3%	1%	0%	1%	2%	2%
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	3	8			4			2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	41.4	41.4	41.4	28.4	28.4		55.5	55.5		55.5	55.5	
Effective Green, g (s)	41.4	41.4	41.4	28.4	28.4		55.5	55.5		55.5	55.5	
Actuated g/C Ratio	0.38	0.38	0.38	0.26	0.26		0.50	0.50		0.50	0.50	
Clearance Time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	290	707	580	116	874		172	1769		276	1699	
v/s Ratio Prot	c0.09	0.31			0.17			0.22			0.30	
v/s Ratio Perm	c0.28		0.03	0.22			0.25			c0.41		
v/c Ratio	0.97	0.82	0.08	0.85	0.66		0.49	0.44		0.82	0.60	
Uniform Delay, d1	30.0	30.9	22.1	38.8	36.4		17.9	17.3		22.9	19.3	
Progression Factor	1.00	1.00	1.00	0.93	0.92		1.00	1.00		1.00	1.00	
Incremental Delay, d2	45.0	7.6	0.1	26.6	1.0		9.6	0.8		22.6	1.6	
Delay (s)	75.1	38.5	22.2	62.6	34.6		27.5	18.1		45.6	20.9	
Level of Service	E	D	C	E	C		C	B		D	C	
Approach Delay (s)		47.7			38.5			19.0			25.3	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	114.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	823	29	27	621	60	14	0	21	35	0	25
Future Volume (Veh/h)	29	823	29	27	621	60	14	0	21	35	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	30	857	30	28	647	63	15	0	22	36	0	26
Pedestrians											4	
Lane Width (m)											3.6	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	714			887			1661	1702	872	1678	1686	682
vC1, stage 1 conf vol							932	932		738	738	
vC2, stage 2 conf vol							729	770		939	947	
vCu, unblocked vol	714			887			1661	1702	872	1678	1686	682
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			94	100	94	83	100	94
cM capacity (veh/h)	892			763			234	254	350	217	249	443

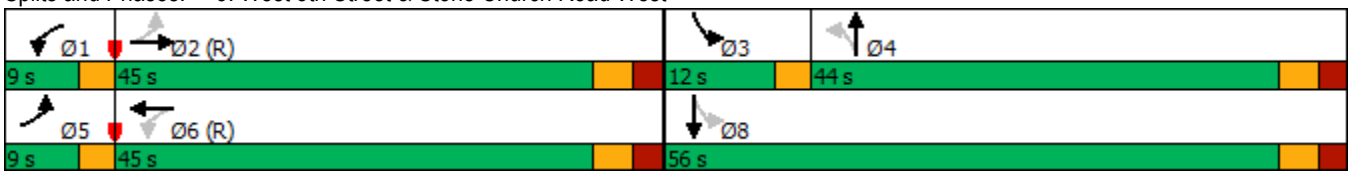
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	30	887	28	710	37	62
Volume Left	30	0	28	0	15	36
Volume Right	0	30	0	63	22	26
cSH	892	1700	763	1700	292	276
Volume to Capacity	0.03	0.52	0.04	0.42	0.13	0.22
Queue Length 95th (m)	0.8	0.0	0.9	0.0	3.3	6.4
Control Delay (s)	9.2	0.0	9.9	0.0	19.1	21.8
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		0.4		19.1	21.8
Approach LOS					C	C

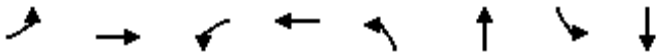
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	95	698	71	518	89	342	260	471
Future Volume (vph)	95	698	71	518	89	342	260	471
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+pt	NA
Protected Phases	5	2	1	6		4	3	8
Permitted Phases	2		6		4		8	
Detector Phase	5	2	1	6	4	4	3	8
Switch Phase								
Minimum Initial (s)	6.0	12.0	6.0	12.0	12.0	12.0	8.0	12.0
Minimum Split (s)	9.0	31.9	9.0	31.9	31.8	31.8	11.0	31.8
Total Split (s)	9.0	45.0	9.0	45.0	44.0	44.0	12.0	56.0
Total Split (%)	8.2%	40.9%	8.2%	40.9%	40.0%	40.0%	10.9%	50.9%
Yellow Time (s)	3.0	3.3	3.0	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.6	0.0	2.6	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.8	5.8	3.0	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	55.7	46.9	54.5	44.8	31.4	31.4	46.2	43.4
Actuated g/C Ratio	0.51	0.43	0.50	0.41	0.29	0.29	0.42	0.39
v/c Ratio	0.52	1.01	0.41	0.98	1.00	0.84	1.08	0.88
Control Delay	30.3	74.1	22.0	61.4	134.8	50.6	104.1	43.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	74.1	22.0	61.4	134.8	50.6	104.1	43.7
LOS	C	E	C	E	F	D	F	D
Approach Delay		69.3		57.7		65.2		61.6
Approach LOS		E		E		E		E

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 81 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 63.4	Intersection LOS: E
Intersection Capacity Utilization 107.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: West 5th Street & Stone Church Road West





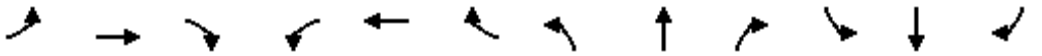
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	98	793	73	720	92	439	268	638
v/c Ratio	0.52	1.01	0.41	0.98	1.00	0.84	1.08	0.88
Control Delay	30.3	74.1	22.0	61.4	134.8	50.6	104.1	43.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	74.1	22.0	61.4	134.8	50.6	104.1	43.7
Queue Length 50th (m)	14.0	~195.7	7.5	~155.4	19.6	86.0	~38.8	121.1
Queue Length 95th (m)	m22.1	#284.1	16.8	#246.7	#48.3	113.9	#81.9	154.2
Internal Link Dist (m)		630.3		233.4		182.3		205.6
Turn Bay Length (m)	55.0		60.0		35.0		90.0	
Base Capacity (vph)	188	783	178	737	112	631	249	837
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	1.01	0.41	0.98	0.82	0.70	1.08	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	698	71	71	518	180	89	342	83	260	471	147
Future Volume (vph)	95	698	71	71	518	180	89	342	83	260	471	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1832		1736	1787		1805	1795		1734	1814	
Flt Permitted	0.09	1.00		0.09	1.00		0.17	1.00		0.17	1.00	
Satd. Flow (perm)	164	1832		163	1787		323	1795		319	1814	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	98	720	73	73	534	186	92	353	86	268	486	152
RTOR Reduction (vph)	0	3	0	0	11	0	0	9	0	0	12	0
Lane Group Flow (vph)	98	790	0	73	709	0	92	430	0	268	626	0
Confl. Peds. (#/hr)	4		4	4		4			8	8		
Heavy Vehicles (%)	0%	2%	2%	4%	2%	0%	0%	2%	2%	4%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	53.4	46.3		50.4	44.8		31.4	31.4		43.4	43.4	
Effective Green, g (s)	53.4	46.3		50.4	44.8		31.4	31.4		43.4	43.4	
Actuated g/C Ratio	0.49	0.42		0.46	0.41		0.29	0.29		0.39	0.39	
Clearance Time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	771		154	727		92	512		241	715	
v/s Ratio Prot	c0.03	c0.43		0.02	0.40			0.24		c0.09	0.35	
v/s Ratio Perm	0.22			0.19			0.28			c0.35		
v/c Ratio	0.53	1.02		0.47	0.98		1.00	0.84		1.11	0.88	
Uniform Delay, d1	23.0	31.9		24.7	32.1		39.3	36.9		29.6	30.8	
Progression Factor	1.35	1.32		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	36.0		2.3	28.0		93.8	11.8		91.3	11.7	
Delay (s)	33.4	77.9		27.0	60.0		133.1	48.8		121.0	42.5	
Level of Service	C	E		C	E		F	D		F	D	
Approach Delay (s)		73.0			57.0			63.4			65.7	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	65.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	107.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	853	26	26	696	12	19
Future Volume (Veh/h)	853	26	26	696	12	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	927	28	28	757	13	21
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			955		1754	941
vC1, stage 1 conf vol					941	
vC2, stage 2 conf vol					813	
vCu, unblocked vol			955		1754	941
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			96		95	93
cM capacity (veh/h)			720		288	319

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	955	785	34
Volume Left	0	28	13
Volume Right	28	0	21
cSH	1700	720	307
Volume to Capacity	0.56	0.04	0.11
Queue Length 95th (m)	0.0	0.9	2.8
Control Delay (s)	0.0	1.1	18.2
Lane LOS		A	C
Approach Delay (s)	0.0	1.1	18.2
Approach LOS			C

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

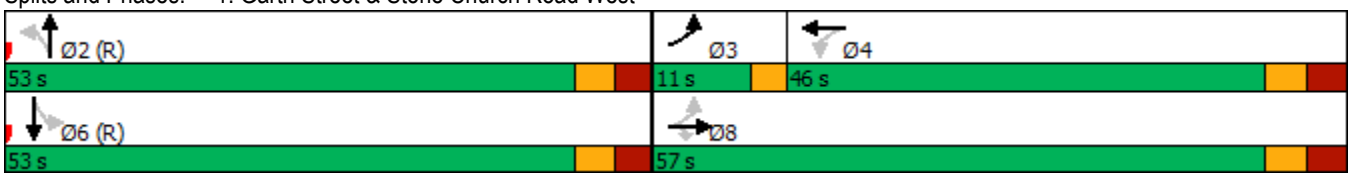
Appendix F

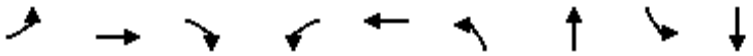
Total Traffic Operations

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	335	404	68	84	386	83	788	90	379
Future Volume (vph)	335	404	68	84	386	83	788	90	379
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	3	8			4		2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	4	4	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	46.8	46.8	46.0	46.0	37.3	37.3	37.3	37.3
Total Split (s)	11.0	57.0	57.0	46.0	46.0	53.0	53.0	53.0	53.0
Total Split (%)	10.0%	51.8%	51.8%	41.8%	41.8%	48.2%	48.2%	48.2%	48.2%
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	0.0	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8	6.8	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lead			Lag	Lag				
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	39.8	36.0	36.0	25.0	25.0	60.9	60.9	60.9	60.9
Actuated g/C Ratio	0.36	0.33	0.33	0.23	0.23	0.55	0.55	0.55	0.55
v/c Ratio	1.54	0.76	0.14	0.68	0.75	0.28	0.54	0.47	0.40
Control Delay	290.1	41.6	7.0	59.5	40.5	17.4	17.3	26.0	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	290.1	41.6	7.0	59.5	40.5	17.4	17.3	26.0	11.0
LOS	F	D	A	E	D	B	B	C	B
Approach Delay		141.9			43.1		17.3		12.8
Approach LOS		F			D		B		B

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 80 (73%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.54	
Intersection Signal Delay: 53.2	Intersection LOS: D
Intersection Capacity Utilization 104.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: Garth Street & Stone Church Road West





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	381	459	77	95	584	94	1025	102	749
v/c Ratio	1.54	0.76	0.14	0.68	0.75	0.28	0.54	0.47	0.40
Control Delay	290.1	41.6	7.0	59.5	40.5	17.4	17.3	26.0	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	290.1	41.6	7.0	59.5	40.5	17.4	17.3	26.0	11.0
Queue Length 50th (m)	~102.8	88.1	1.0	20.2	61.4	10.1	68.1	12.5	31.5
Queue Length 95th (m)	#148.5	109.2	9.6	m30.8	m73.6	23.7	97.2	33.0	50.2
Internal Link Dist (m)		43.1			400.6		333.7		258.3
Turn Bay Length (m)	45.0		45.0	45.0		80.0		55.0	
Base Capacity (vph)	247	841	748	219	1199	335	1908	216	1871
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.54	0.55	0.10	0.43	0.49	0.28	0.54	0.47	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

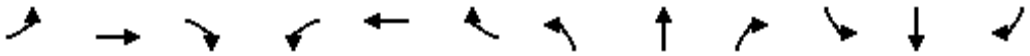
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	404	68	84	386	128	83	788	114	90	379	280
Future Volume (vph)	335	404	68	84	386	128	83	788	114	90	379	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1769	1845	1557	1683	3282		1791	3434		1752	3214	
Flt Permitted	0.22	1.00	1.00	0.35	1.00		0.32	1.00		0.21	1.00	
Satd. Flow (perm)	411	1845	1557	617	3282		608	3434		391	3214	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	381	459	77	95	439	145	94	895	130	102	431	318
RTOR Reduction (vph)	0	0	47	0	36	0	0	8	0	0	94	0
Lane Group Flow (vph)	381	459	30	95	548	0	94	1017	0	102	655	0
Confl. Peds. (#/hr)	3		6	6		3	23					23
Heavy Vehicles (%)	2%	3%	2%	7%	7%	1%	0%	3%	4%	3%	4%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	3	8			4			2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	36.0	36.0	36.0	25.0	25.0		60.9	60.9		60.9	60.9	
Effective Green, g (s)	36.0	36.0	36.0	25.0	25.0		60.9	60.9		60.9	60.9	
Actuated g/C Ratio	0.33	0.33	0.33	0.23	0.23		0.55	0.55		0.55	0.55	
Clearance Time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	233	603	509	140	745		336	1901		216	1779	
v/s Ratio Prot	c0.12	0.25			0.17			c0.30			0.20	
v/s Ratio Perm	c0.42		0.02	0.15			0.15			0.26		
v/c Ratio	1.64	0.76	0.06	0.68	0.74		0.28	0.53		0.47	0.37	
Uniform Delay, d1	34.1	33.1	25.4	38.8	39.4		13.0	15.6		14.8	13.8	
Progression Factor	1.00	1.00	1.00	0.97	0.96		1.00	1.00		1.00	1.00	
Incremental Delay, d2	304.5	5.6	0.0	11.5	3.5		2.1	1.1		7.2	0.6	
Delay (s)	338.6	38.8	25.4	49.2	41.5		15.0	16.7		22.1	14.4	
Level of Service	F	D	C	D	D		B	B		C	B	
Approach Delay (s)		162.2			42.6			16.5			15.3	
Approach LOS		F			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	58.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	580	8	10	529	11	29	0	30	36	0	39
Future Volume (Veh/h)	21	580	8	10	529	11	29	0	30	36	0	39
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	22	617	9	11	563	12	31	0	32	38	0	41
Pedestrians											1	
Lane Width (m)											3.6	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	576			626			1292	1264	622	1285	1262	570
vC1, stage 1 conf vol							666	666		592	592	
vC2, stage 2 conf vol							626	598		693	670	
vCu, unblocked vol	576			626			1292	1264	622	1285	1262	570
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			90	100	93	88	100	92
cM capacity (veh/h)	1007			956			316	349	487	316	351	524

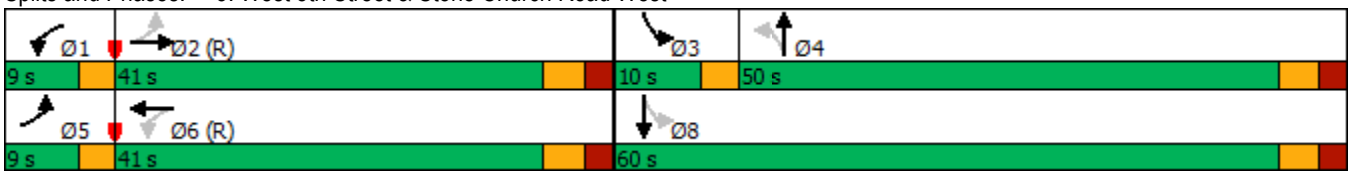
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	22	626	11	575	63	79
Volume Left	22	0	11	0	31	38
Volume Right	0	9	0	12	32	41
cSH	1007	1700	956	1700	385	398
Volume to Capacity	0.02	0.37	0.01	0.34	0.16	0.20
Queue Length 95th (m)	0.5	0.0	0.3	0.0	4.4	5.5
Control Delay (s)	8.7	0.0	8.8	0.0	16.2	16.3
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		0.2		16.2	16.3
Approach LOS					C	C

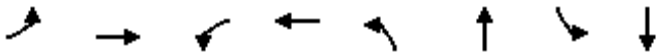
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	43.1%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	159	472	31	283	61	484	203	274
Future Volume (vph)	159	472	31	283	61	484	203	274
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+pt	NA
Protected Phases	5	2	1	6		4	3	8
Permitted Phases	2		6		4		8	
Detector Phase	5	2	1	6	4	4	3	8
Switch Phase								
Minimum Initial (s)	6.0	12.0	6.0	12.0	12.0	12.0	7.0	12.0
Minimum Split (s)	9.0	31.9	9.0	31.9	31.8	31.8	10.0	31.8
Total Split (s)	9.0	41.0	9.0	41.0	50.0	50.0	10.0	60.0
Total Split (%)	8.2%	37.3%	8.2%	37.3%	45.5%	45.5%	9.1%	54.5%
Yellow Time (s)	3.0	3.3	3.0	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.6	0.0	2.6	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.8	5.8	3.0	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	52.6	45.1	48.0	38.7	37.5	37.5	50.3	47.5
Actuated g/C Ratio	0.48	0.41	0.44	0.35	0.34	0.34	0.46	0.43
v/c Ratio	0.58	0.74	0.12	0.84	0.20	0.87	0.97	0.51
Control Delay	25.0	28.0	18.4	46.0	25.2	48.4	75.9	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	28.0	18.4	46.0	25.2	48.4	75.9	22.9
LOS	C	C	B	D	C	D	E	C
Approach Delay		27.3		44.4		46.0		41.3
Approach LOS		C		D		D		D

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 39.1	Intersection LOS: D
Intersection Capacity Utilization 92.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: West 5th Street & Stone Church Road West





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	164	547	32	513	63	541	209	393
v/c Ratio	0.58	0.74	0.12	0.84	0.20	0.87	0.97	0.51
Control Delay	25.0	28.0	18.4	46.0	25.2	48.4	75.9	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	28.0	18.4	46.0	25.2	48.4	75.9	22.9
Queue Length 50th (m)	12.8	53.1	3.5	99.8	9.4	105.7	26.5	55.3
Queue Length 95th (m)	#34.4	#175.7	9.7	#163.1	18.0	137.3	#57.0	73.8
Internal Link Dist (m)		572.0		233.4		176.1		205.6
Turn Bay Length (m)	55.0		60.0		35.0		90.0	
Base Capacity (vph)	284	738	259	609	378	734	216	880
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.74	0.12	0.84	0.17	0.74	0.97	0.45

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	472	58	31	283	214	61	484	41	203	274	108
Future Volume (vph)	159	472	58	31	283	214	61	484	41	203	274	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.94		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	1794		1654	1665		1770	1821		1787	1762	
Flt Permitted	0.18	1.00		0.25	1.00		0.51	1.00		0.14	1.00	
Satd. Flow (perm)	346	1794		430	1665		943	1821		261	1762	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	164	487	60	32	292	221	63	499	42	209	282	111
RTOR Reduction (vph)	0	4	0	0	23	0	0	3	0	0	14	0
Lane Group Flow (vph)	164	543	0	32	490	0	63	538	0	209	379	0
Confl. Peds. (#/hr)	7		7	7		7			2	2		
Heavy Vehicles (%)	1%	3%	10%	9%	6%	4%	2%	2%	14%	1%	3%	4%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	50.8	43.8		42.7	38.7		37.5	37.5		47.5	47.5	
Effective Green, g (s)	50.8	43.8		42.7	38.7		37.5	37.5		47.5	47.5	
Actuated g/C Ratio	0.46	0.40		0.39	0.35		0.34	0.34		0.43	0.43	
Clearance Time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	278	714		211	585		321	620		209	760	
v/s Ratio Prot	c0.05	0.30		0.01	c0.29			0.30		c0.06	0.22	
v/s Ratio Perm	0.22			0.05			0.07			c0.37		
v/c Ratio	0.59	0.76		0.15	0.84		0.20	0.87		1.00	0.50	
Uniform Delay, d1	21.2	28.6		22.5	32.8		25.6	33.9		28.3	22.6	
Progression Factor	0.81	0.67		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.9	6.9		0.3	13.4		0.3	12.2		62.3	0.5	
Delay (s)	20.2	26.0		22.8	46.1		25.9	46.1		90.5	23.1	
Level of Service	C	C		C	D		C	D		F	C	
Approach Delay (s)		24.6			44.8			44.0			46.5	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	638	8	9	522	28	29
Future Volume (Veh/h)	638	8	9	522	28	29
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	693	9	10	567	30	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			702		1284	698
vC1, stage 1 conf vol					698	
vC2, stage 2 conf vol					587	
vCu, unblocked vol			702		1284	698
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		92	93
cM capacity (veh/h)			895		396	441

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	702	577	62
Volume Left	0	10	30
Volume Right	9	0	32
cSH	1700	895	418
Volume to Capacity	0.41	0.01	0.15
Queue Length 95th (m)	0.0	0.3	3.9
Control Delay (s)	0.0	0.3	15.1
Lane LOS		A	C
Approach Delay (s)	0.0	0.3	15.1
Approach LOS			C

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	660	7	6	508	23	23
Future Volume (Veh/h)	660	7	6	508	23	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	717	8	7	552	25	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			725		1287	721
vC1, stage 1 conf vol					721	
vC2, stage 2 conf vol					566	
vCu, unblocked vol			725		1287	721
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	94
cM capacity (veh/h)			878		394	427

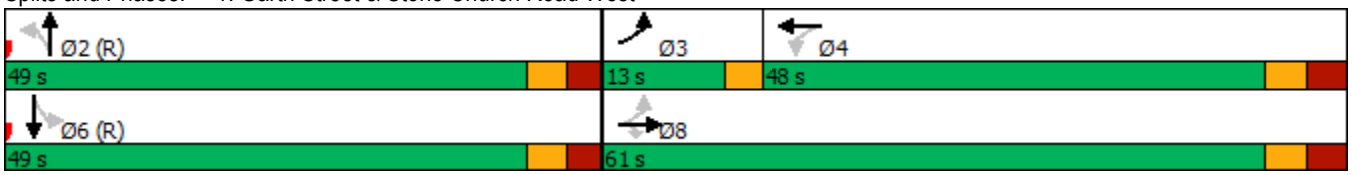
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	725	559	50
Volume Left	0	7	25
Volume Right	8	0	25
cSH	1700	878	410
Volume to Capacity	0.43	0.01	0.12
Queue Length 95th (m)	0.0	0.2	3.1
Control Delay (s)	0.0	0.2	15.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	15.0
Approach LOS			B

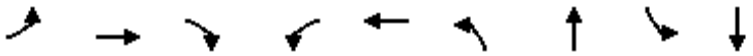
Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		45.2%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	268	564	89	95	449	80	645	218	713
Future Volume (vph)	268	564	89	95	449	80	645	218	713
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	Perm	NA
Protected Phases	3	8			4		2		6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	4	4	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	46.8	46.8	46.8	46.8	37.3	37.3	37.3	37.3
Total Split (s)	13.0	61.0	61.0	48.0	48.0	49.0	49.0	49.0	49.0
Total Split (%)	11.8%	55.5%	55.5%	43.6%	43.6%	44.5%	44.5%	44.5%	44.5%
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	0.0	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8	6.8	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lead			Lag	Lag				
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	46.0	42.2	42.2	29.2	29.2	54.7	54.7	54.7	54.7
Actuated g/C Ratio	0.42	0.38	0.38	0.27	0.27	0.50	0.50	0.50	0.50
v/c Ratio	0.91	0.82	0.15	0.87	0.66	0.51	0.45	0.85	0.62
Control Delay	57.1	40.1	6.8	70.7	31.5	35.9	19.8	56.6	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.1	40.1	6.8	70.7	31.5	35.9	19.8	56.6	22.0
LOS	E	D	A	E	C	D	B	E	C
Approach Delay		41.8			37.0		21.3		28.2
Approach LOS		D			D		C		C

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 99 (90%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 31.7	Intersection LOS: C
Intersection Capacity Utilization 114.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Garth Street & Stone Church Road West





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	282	594	94	100	614	84	786	229	1049
v/c Ratio	0.91	0.82	0.15	0.87	0.66	0.51	0.45	0.85	0.62
Control Delay	57.1	40.1	6.8	70.7	31.5	35.9	19.8	56.6	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.1	40.1	6.8	70.7	31.5	35.9	19.8	56.6	22.0
Queue Length 50th (m)	40.8	112.7	3.0	17.5	45.2	11.8	54.5	41.7	78.5
Queue Length 95th (m)	#63.3	133.2	11.2	m14.2	m39.2	#38.2	83.6	#100.5	119.1
Internal Link Dist (m)		48.8			397.8		333.7		258.3
Turn Bay Length (m)	45.0		45.0	45.0		80.0		55.0	
Base Capacity (vph)	309	926	795	162	1294	166	1753	269	1705
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.64	0.12	0.62	0.47	0.51	0.45	0.85	0.62

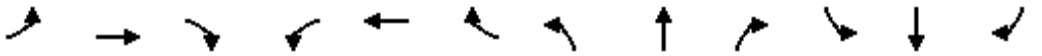
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	268	564	89	95	449	134	80	645	102	218	713	283
Future Volume (vph)	268	564	89	95	449	134	80	645	102	218	713	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1542	1749	3387		1750	3506		1787	3368	
Flt Permitted	0.24	1.00	1.00	0.24	1.00		0.18	1.00		0.29	1.00	
Satd. Flow (perm)	449	1881	1542	433	3387		336	3506		542	3368	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	282	594	94	100	473	141	84	679	107	229	751	298
RTOR Reduction (vph)	0	0	44	0	30	0	0	10	0	0	32	0
Lane Group Flow (vph)	282	594	50	100	584	0	84	776	0	229	1017	0
Confl. Peds. (#/hr)	5		6	6		5	9					9
Heavy Vehicles (%)	1%	1%	3%	3%	3%	1%	3%	1%	0%	1%	2%	2%
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases	3	8			4			2			6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	42.2	42.2	42.2	29.2	29.2		54.7	54.7		54.7	54.7	
Effective Green, g (s)	42.2	42.2	42.2	29.2	29.2		54.7	54.7		54.7	54.7	
Actuated g/C Ratio	0.38	0.38	0.38	0.27	0.27		0.50	0.50		0.50	0.50	
Clearance Time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	293	721	591	114	899		167	1743		269	1674	
v/s Ratio Prot	c0.09	0.32			0.17			0.22			0.30	
v/s Ratio Perm	c0.28		0.03	0.23			0.25			c0.42		
v/c Ratio	0.96	0.82	0.09	0.88	0.65		0.50	0.45		0.85	0.61	
Uniform Delay, d1	29.4	30.6	21.6	38.7	35.9		18.5	17.9		24.1	19.9	
Progression Factor	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00	
Incremental Delay, d2	42.2	7.6	0.1	30.9	0.9		10.4	0.8		27.2	1.7	
Delay (s)	71.5	38.1	21.7	66.0	33.4		29.0	18.7		51.3	21.6	
Level of Service	E	D	C	E	C		C	B		D	C	
Approach Delay (s)		46.2			37.9			19.7			26.9	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	114.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	842	29	27	631	60	14	0	21	35	0	25
Future Volume (Veh/h)	29	842	29	27	631	60	14	0	21	35	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	30	877	30	28	657	63	15	0	22	36	0	26
Pedestrians											4	
Lane Width (m)											3.6	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	724			907			1691	1732	892	1708	1716	692
vC1, stage 1 conf vol							952	952		748	748	
vC2, stage 2 conf vol							739	780		959	967	
vCu, unblocked vol	724			907			1691	1732	892	1708	1716	692
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			93	100	94	83	100	94
cM capacity (veh/h)	885			750			229	249	341	211	244	437

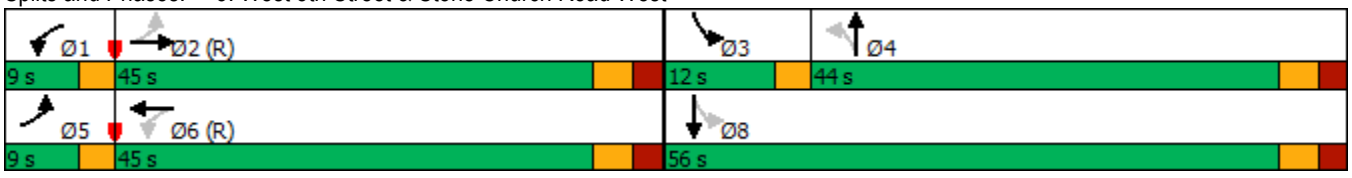
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	30	907	28	720	37	62
Volume Left	30	0	28	0	15	36
Volume Right	0	30	0	63	22	26
cSH	885	1700	750	1700	284	270
Volume to Capacity	0.03	0.53	0.04	0.42	0.13	0.23
Queue Length 95th (m)	0.8	0.0	0.9	0.0	3.4	6.6
Control Delay (s)	9.2	0.0	10.0	0.0	19.5	22.3
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		0.4		19.5	22.3
Approach LOS					C	C

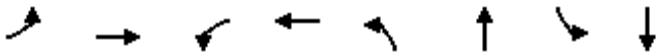
Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	58.0%	ICU Level of Service		B
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	96	709	71	529	91	342	260	471
Future Volume (vph)	96	709	71	529	91	342	260	471
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+pt	NA
Protected Phases	5	2	1	6		4	3	8
Permitted Phases	2		6		4		8	
Detector Phase	5	2	1	6	4	4	3	8
Switch Phase								
Minimum Initial (s)	6.0	12.0	6.0	12.0	12.0	12.0	8.0	12.0
Minimum Split (s)	9.0	31.9	9.0	31.9	31.8	31.8	11.0	31.8
Total Split (s)	9.0	45.0	9.0	45.0	44.0	44.0	12.0	56.0
Total Split (%)	8.2%	40.9%	8.2%	40.9%	40.0%	40.0%	10.9%	50.9%
Yellow Time (s)	3.0	3.3	3.0	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.6	0.0	2.6	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.8	5.8	3.0	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	55.6	46.9	54.5	44.8	31.4	31.4	46.2	43.4
Actuated g/C Ratio	0.51	0.43	0.50	0.41	0.29	0.29	0.42	0.39
v/c Ratio	0.53	1.03	0.41	0.99	1.07	0.84	1.08	0.89
Control Delay	30.2	78.1	22.1	64.8	156.0	50.4	103.8	44.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	78.1	22.1	64.8	156.0	50.4	103.8	44.5
LOS	C	E	C	E	F	D	F	D
Approach Delay		72.9		60.9		69.1		61.9
Approach LOS		E		E		E		E

Intersection Summary	
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 81 (74%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 135	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 66.0	Intersection LOS: E
Intersection Capacity Utilization 108.9%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: West 5th Street & Stone Church Road West





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	807	73	731	94	439	268	644
v/c Ratio	0.53	1.03	0.41	0.99	1.07	0.84	1.08	0.89
Control Delay	30.2	78.1	22.1	64.8	156.0	50.4	103.8	44.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	78.1	22.1	64.8	156.0	50.4	103.8	44.5
Queue Length 50th (m)	14.1	~202.2	7.5	~166.3	~22.2	86.0	~38.8	122.6
Queue Length 95th (m)	m22.1	m#289.0	16.8	#251.9	#50.8	113.9	#81.9	156.5
Internal Link Dist (m)		572.4		233.4		182.3		205.6
Turn Bay Length (m)	55.0		60.0		35.0		90.0	
Base Capacity (vph)	188	783	178	738	106	631	249	837
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	1.03	0.41	0.99	0.89	0.70	1.08	0.77

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	709	74	71	529	180	91	342	83	260	471	153
Future Volume (vph)	96	709	74	71	529	180	91	342	83	260	471	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1832		1736	1788		1805	1795		1734	1812	
Flt Permitted	0.09	1.00		0.09	1.00		0.16	1.00		0.17	1.00	
Satd. Flow (perm)	164	1832		163	1788		308	1795		319	1812	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	99	731	76	73	545	186	94	353	86	268	486	158
RTOR Reduction (vph)	0	3	0	0	10	0	0	9	0	0	12	0
Lane Group Flow (vph)	99	804	0	73	721	0	94	430	0	268	632	0
Confl. Peds. (#/hr)	4		4	4		4			8	8		
Heavy Vehicles (%)	0%	2%	2%	4%	2%	0%	0%	2%	2%	4%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	53.4	46.3		50.4	44.8		31.4	31.4		43.4	43.4	
Effective Green, g (s)	53.4	46.3		50.4	44.8		31.4	31.4		43.4	43.4	
Actuated g/C Ratio	0.49	0.42		0.46	0.41		0.29	0.29		0.39	0.39	
Clearance Time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	185	771		154	728		87	512		241	714	
v/s Ratio Prot	c0.03	c0.44		0.02	0.40			0.24		c0.09	0.35	
v/s Ratio Perm	0.22			0.19			0.31			c0.35		
v/c Ratio	0.54	1.04		0.47	0.99		1.08	0.84		1.11	0.89	
Uniform Delay, d1	23.4	31.9		24.7	32.4		39.3	36.9		29.6	31.0	
Progression Factor	1.33	1.30		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	41.2		2.3	31.1		120.0	11.8		91.3	12.6	
Delay (s)	33.4	82.7		27.0	63.5		159.3	48.8		121.0	43.6	
Level of Service	C	F		C	E		F	D		F	D	
Approach Delay (s)		77.3			60.2			68.3			66.3	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	68.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	108.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	872	26	26	706	12	19
Future Volume (Veh/h)	872	26	26	706	12	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	948	28	28	767	13	21
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			976		1785	962
vC1, stage 1 conf vol					962	
vC2, stage 2 conf vol					823	
vCu, unblocked vol			976		1785	962
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			96		95	93
cM capacity (veh/h)			707		282	310

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	976	795	34
Volume Left	0	28	13
Volume Right	28	0	21
cSH	1700	707	299
Volume to Capacity	0.57	0.04	0.11
Queue Length 95th (m)	0.0	0.9	2.9
Control Delay (s)	0.0	1.1	18.6
Lane LOS		A	C
Approach Delay (s)	0.0	1.1	18.6
Approach LOS			C

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		68.2%	ICU Level of Service C
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	872	19	19	722	10	15
Future Volume (Veh/h)	872	19	19	722	10	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	948	21	21	785	11	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			969		1786	958
vC1, stage 1 conf vol					958	
vC2, stage 2 conf vol					827	
vCu, unblocked vol			969		1786	958
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		96	95
cM capacity (veh/h)			711		284	312

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	969	806	27
Volume Left	0	21	11
Volume Right	21	0	16
cSH	1700	711	300
Volume to Capacity	0.57	0.03	0.09
Queue Length 95th (m)	0.0	0.7	2.2
Control Delay (s)	0.0	0.8	18.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.8	18.2
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

Appendix G

Signal Warrants

Signal Justification Calculation for Forecasted Volumes
(OTM Book 12 - Justification 7)

Horizon Year: **2029 Total**
Region/City/Township: **Hamilton**

Major Street: **Stone Church Road West**
Minor Street: **Matthews Street**

North/South?: N

Number of Approach Lanes: 1
Tee Intersection? N
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street: Stone Church Road West						Minor Street: Matthews Street						
	Eastbound			Westbound			Northbound			Southbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Peds Crossing
AM Peak Hour	21	580	8	10	529	11	29	0	30	36	0	39	1
PM Peak Hour	29	842	29	27	631	60	14	0	21	35	0	25	4
Avg. Hourly Volume	13	356	9	9	290	18	11	0	13	18	0	16	1

Warrant	AHV
1A - All	752
1B - Minor	57
2A - Major	695
2B - Cross	30

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	752
					% Fulfilled	**104%**

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	120	170	120	170	57
					% Fulfilled	**34%**

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	695
					% Fulfilled	**96%**

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	30
					% Fulfilled	**40%**

Signal Justification Calculation for Forecasted Volumes
(OTM Book 12 - Justification 7)

Horizon Year: **2029 Total**
Region/City/Township: **Hamilton**

Major Street: **Stone Church Road West**
Minor Street: **New Road**

North/South?: N

Number of Approach Lanes: 1
Tee Intersection? Y
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street: Stone Church Road West						Minor Street: New Road						Peds Crossing
	Eastbound			Westbound			Northbound			Southbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM Peak Hour	0	638	8	9	522	0	28	0	29	0	0	0	0
PM Peak Hour	0	872	26	26	706	0	12	0	19	0	0	0	0
Avg. Hourly Volume	0	378	9	9	307	0	10	0	12	0	0	0	0

Warrant	AHV
1A - All	724
1B - Minor	22
2A - Major	702
2B - Cross	10

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	724
					% Fulfilled	**101%**

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	22
					% Fulfilled	**9%**

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	702
					% Fulfilled	**97%**

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	10
					% Fulfilled	**13%**

Signal Justification Calculation for Forecasted Volumes
(OTM Book 12 - Justification 7)

Horizon Year: **2029 Total**
Region/City/Township: **Hamilton**

Major Street: **Stone Church Road West**
Minor Street: **Site Driveway**

North/South?: N

Number of Approach Lanes: 1
Tee Intersection? Y
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street: Stone Church Road West						Minor Street: Site Driveway						
	Eastbound			Westbound			Northbound			Southbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Peds Crossing
AM Peak Hour	0	660	7	6	508	0	23	0	23	0	0	0	
PM Peak Hour	0	872	19	19	722	0	10	0	15	0	0	0	
Avg. Hourly Volume	0	383	7	6	308	0	8	0	10	0	0	0	0

Warrant	AHV
1A - All	721
1B - Minor	18
2A - Major	703
2B - Cross	8

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	721
					% Fulfilled	**100%**

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	18
					% Fulfilled	**7%**

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	703
					% Fulfilled	**98%**

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	8
					% Fulfilled	**11%**

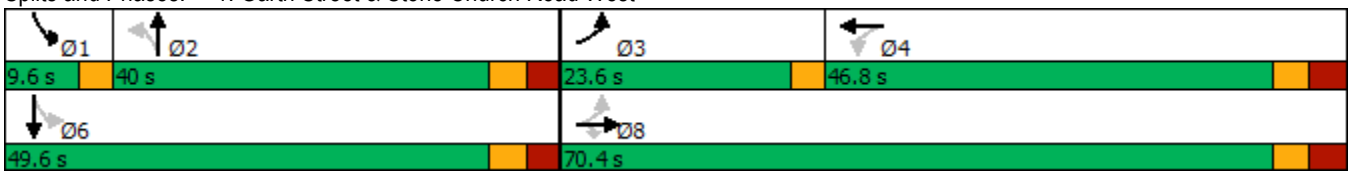
Appendix H

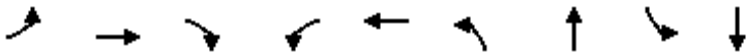
Total Traffic Operations – Optimized Signals

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	335	404	68	84	386	83	788	90	379
Future Volume (vph)	335	404	68	84	386	83	788	90	379
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases	3	8			4		2	1	6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	4	4	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	20.0	20.0	20.0	20.0	20.0	20.0	5.0	20.0
Minimum Split (s)	8.0	46.8	46.8	46.8	46.8	37.3	37.3	9.5	37.3
Total Split (s)	23.6	70.4	70.4	46.8	46.8	40.0	40.0	9.6	49.6
Total Split (%)	19.7%	58.7%	58.7%	39.0%	39.0%	33.3%	33.3%	8.0%	41.3%
Yellow Time (s)	3.0	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	3.5	3.5	3.5	3.5	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8	6.8	6.8	6.8	6.3	6.3	3.0	6.3
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	48.7	44.9	44.9	23.5	23.5	33.8	33.8	46.8	43.4
Actuated g/C Ratio	0.48	0.44	0.44	0.23	0.23	0.33	0.33	0.46	0.43
v/c Ratio	0.85	0.56	0.11	0.47	0.74	0.41	0.89	0.53	0.51
Control Delay	37.0	23.8	4.3	42.2	39.9	35.0	43.5	27.6	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	23.8	4.3	42.2	39.9	35.0	43.5	27.6	18.0
LOS	D	C	A	D	D	D	D	C	B
Approach Delay		27.6			40.2		42.8		19.2
Approach LOS		C			D		D		B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 101.5	
Natural Cycle: 105	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 32.8	Intersection LOS: C
Intersection Capacity Utilization 104.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: Garth Street & Stone Church Road West





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	381	459	77	95	584	94	1025	102	749
v/c Ratio	0.85	0.56	0.11	0.47	0.74	0.41	0.89	0.53	0.51
Control Delay	37.0	23.8	4.3	42.2	39.9	35.0	43.5	27.6	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	23.8	4.3	42.2	39.9	35.0	43.5	27.6	18.0
Queue Length 50th (m)	47.8	65.0	0.3	16.5	53.5	14.4	100.1	11.4	42.5
Queue Length 95th (m)	#82.5	90.5	7.5	31.7	70.6	31.6	#148.8	23.2	64.4
Internal Link Dist (m)		43.1			400.6		333.7		258.3
Turn Bay Length (m)	45.0		45.0	45.0		80.0		55.0	
Base Capacity (vph)	479	1159	1005	349	1322	228	1153	193	1472
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.40	0.08	0.27	0.44	0.41	0.89	0.53	0.51

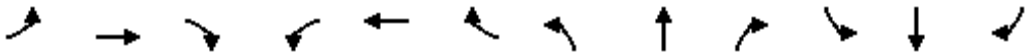
Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	404	68	84	386	128	83	788	114	90	379	280
Future Volume (vph)	335	404	68	84	386	128	83	788	114	90	379	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		3.0	6.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1769	1845	1557	1683	3282		1791	3434		1752	3216	
Flt Permitted	0.23	1.00	1.00	0.50	1.00		0.36	1.00		0.11	1.00	
Satd. Flow (perm)	433	1845	1557	883	3282		685	3434		201	3216	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	381	459	77	95	439	145	94	895	130	102	431	318
RTOR Reduction (vph)	0	0	41	0	31	0	0	9	0	0	100	0
Lane Group Flow (vph)	381	459	36	95	553	0	94	1016	0	102	649	0
Confl. Peds. (#/hr)	3		6	6		3	23					23
Heavy Vehicles (%)	2%	3%	2%	7%	7%	1%	0%	3%	4%	3%	4%	3%
Turn Type	pm+pt	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	3	8			4			2		1	6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	44.9	44.9	44.9	23.5	23.5		33.8	33.8		43.4	43.4	
Effective Green, g (s)	44.9	44.9	44.9	23.5	23.5		33.8	33.8		43.4	43.4	
Actuated g/C Ratio	0.44	0.44	0.44	0.23	0.23		0.33	0.33		0.43	0.43	
Clearance Time (s)	3.0	6.8	6.8	6.8	6.8		6.3	6.3		3.0	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	434	816	689	204	760		228	1144		186	1376	
v/s Ratio Prot	c0.16	0.25			0.17			c0.30		c0.04	0.20	
v/s Ratio Perm	c0.23		0.02	0.11			0.14			0.20		
v/c Ratio	0.88	0.56	0.05	0.47	0.73		0.41	0.89		0.55	0.47	
Uniform Delay, d1	21.5	21.0	16.1	33.5	36.0		26.1	32.0		21.4	20.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.8	0.9	0.0	1.7	3.5		5.4	10.4		3.3	1.2	
Delay (s)	39.3	21.9	16.1	35.2	39.5		31.6	42.4		24.7	22.0	
Level of Service	D	C	B	D	D		C	D		C	C	
Approach Delay (s)		28.6			38.9			41.5			22.3	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	101.4	Sum of lost time (s)	19.1
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	580	8	10	529	11	29	0	30	36	0	39
Future Volume (Veh/h)	21	580	8	10	529	11	29	0	30	36	0	39
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	22	617	9	11	563	12	31	0	32	38	0	41
Pedestrians											1	
Lane Width (m)											3.6	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	576			626			1292	1264	622	1285	1262	570
vC1, stage 1 conf vol							666	666		592	592	
vC2, stage 2 conf vol							626	598		693	670	
vCu, unblocked vol	576			626			1292	1264	622	1285	1262	570
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			90	100	93	88	100	92
cM capacity (veh/h)	1007			956			316	349	487	316	351	524

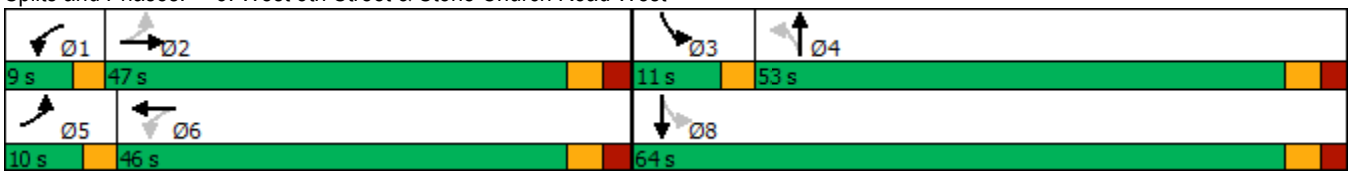
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	22	626	11	575	63	79
Volume Left	22	0	11	0	31	38
Volume Right	0	9	0	12	32	41
cSH	1007	1700	956	1700	385	398
Volume to Capacity	0.02	0.37	0.01	0.34	0.16	0.20
Queue Length 95th (m)	0.5	0.0	0.3	0.0	4.4	5.5
Control Delay (s)	8.7	0.0	8.8	0.0	16.2	16.3
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		0.2		16.2	16.3
Approach LOS					C	C

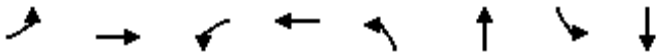
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	43.1%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	159	472	31	283	61	484	203	274
Future Volume (vph)	159	472	31	283	61	484	203	274
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+pt	NA
Protected Phases	5	2	1	6		4	3	8
Permitted Phases	2		6		4		8	
Detector Phase	5	2	1	6	4	4	3	8
Switch Phase								
Minimum Initial (s)	6.0	12.0	6.0	12.0	12.0	12.0	7.0	12.0
Minimum Split (s)	9.0	31.9	9.0	31.9	31.8	31.8	10.0	31.8
Total Split (s)	10.0	47.0	9.0	46.0	53.0	53.0	11.0	64.0
Total Split (%)	8.3%	39.2%	7.5%	38.3%	44.2%	44.2%	9.2%	53.3%
Yellow Time (s)	3.0	3.3	3.0	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.6	0.0	2.6	2.5	2.5	0.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.8	5.8	3.0	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?								
Recall Mode	None	Max	None	Max	None	None	None	None
Act Effct Green (s)	52.2	45.2	49.3	40.3	36.6	36.6	50.5	47.7
Actuated g/C Ratio	0.48	0.41	0.45	0.37	0.33	0.33	0.46	0.43
v/c Ratio	0.59	0.74	0.12	0.81	0.20	0.89	0.95	0.51
Control Delay	28.8	37.1	18.6	42.4	26.8	51.7	72.1	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	37.1	18.6	42.4	26.8	51.7	72.1	23.2
LOS	C	D	B	D	C	D	E	C
Approach Delay		35.2		41.0		49.1		40.1
Approach LOS		D		D		D		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 109.8	
Natural Cycle: 85	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 41.1	Intersection LOS: D
Intersection Capacity Utilization 92.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: West 5th Street & Stone Church Road West





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	164	547	32	513	63	541	209	393
v/c Ratio	0.59	0.74	0.12	0.81	0.20	0.89	0.95	0.51
Control Delay	28.8	37.1	18.6	42.4	26.8	51.7	72.1	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	37.1	18.6	42.4	26.8	51.7	72.1	23.2
Queue Length 50th (m)	19.4	103.1	3.5	92.7	9.5	107.7	26.5	55.8
Queue Length 95th (m)	#37.9	#182.1	10.1	#169.1	19.7	150.7	#70.1	81.4
Internal Link Dist (m)		572.0		233.4		176.1		205.6
Turn Bay Length (m)	55.0		60.0		35.0		90.0	
Base Capacity (vph)	277	743	260	632	416	788	220	949
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.74	0.12	0.81	0.15	0.69	0.95	0.41

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	472	58	31	283	214	61	484	41	203	274	108
Future Volume (vph)	159	472	58	31	283	214	61	484	41	203	274	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.94		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	1794		1654	1665		1770	1821		1787	1762	
Flt Permitted	0.21	1.00		0.25	1.00		0.52	1.00		0.12	1.00	
Satd. Flow (perm)	397	1794		431	1665		963	1821		232	1762	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	164	487	60	32	292	221	63	499	42	209	282	111
RTOR Reduction (vph)	0	4	0	0	21	0	0	3	0	0	13	0
Lane Group Flow (vph)	164	543	0	32	492	0	63	538	0	209	380	0
Confl. Peds. (#/hr)	7		7	7		7			2	2		
Heavy Vehicles (%)	1%	3%	10%	9%	6%	4%	2%	2%	14%	1%	3%	4%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	51.6	45.2		45.0	41.6		36.7	36.7		47.7	47.7	
Effective Green, g (s)	51.6	45.2		45.0	41.6		36.7	36.7		47.7	47.7	
Actuated g/C Ratio	0.46	0.41		0.41	0.37		0.33	0.33		0.43	0.43	
Clearance Time (s)	3.0	5.9		3.0	5.9		5.8	5.8		3.0	5.8	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	272	730		212	624		318	602		211	757	
v/s Ratio Prot	c0.04	c0.30		0.00	0.30			0.30		c0.07	0.22	
v/s Ratio Perm	0.24			0.06			0.07			c0.35		
v/c Ratio	0.60	0.74		0.15	0.79		0.20	0.89		0.99	0.50	
Uniform Delay, d1	20.9	28.0		21.7	30.8		26.6	35.3		26.5	23.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	6.8		0.3	9.7		0.3	15.7		59.1	0.5	
Delay (s)	24.6	34.8		22.1	40.5		26.9	51.0		85.5	23.5	
Level of Service	C	C		C	D		C	D		F	C	
Approach Delay (s)		32.4			39.4			48.5			45.1	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	638	8	9	522	28	29
Future Volume (Veh/h)	638	8	9	522	28	29
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	693	9	10	567	30	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			702		1284	698
vC1, stage 1 conf vol					698	
vC2, stage 2 conf vol					587	
vCu, unblocked vol			702		1284	698
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		92	93
cM capacity (veh/h)			895		396	441

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	702	577	62
Volume Left	0	10	30
Volume Right	9	0	32
cSH	1700	895	418
Volume to Capacity	0.41	0.01	0.15
Queue Length 95th (m)	0.0	0.3	3.9
Control Delay (s)	0.0	0.3	15.1
Lane LOS		A	C
Approach Delay (s)	0.0	0.3	15.1
Approach LOS			C

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	660	7	6	508	23	23
Future Volume (Veh/h)	660	7	6	508	23	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	717	8	7	552	25	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			725		1287	721
vC1, stage 1 conf vol					721	
vC2, stage 2 conf vol					566	
vCu, unblocked vol			725		1287	721
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	94
cM capacity (veh/h)			878		394	427

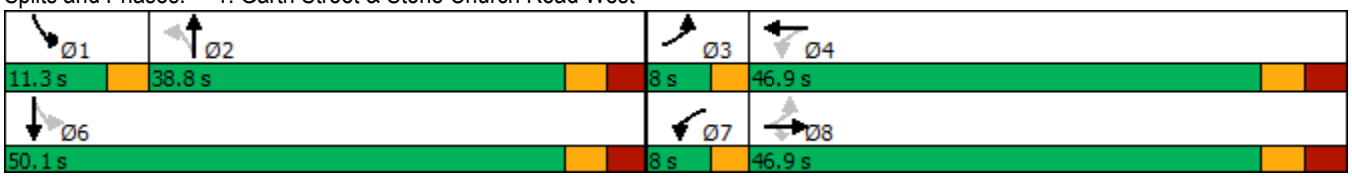
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	725	559	50
Volume Left	0	7	25
Volume Right	8	0	25
cSH	1700	878	410
Volume to Capacity	0.43	0.01	0.12
Queue Length 95th (m)	0.0	0.2	3.1
Control Delay (s)	0.0	0.2	15.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	15.0
Approach LOS			B

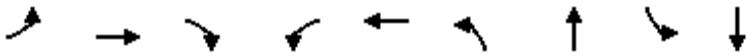
Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		45.2%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	268	564	89	95	449	80	645	218	713
Future Volume (vph)	268	564	89	95	449	80	645	218	713
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	pm+pt	NA
Protected Phases	3	8		7	4		2	1	6
Permitted Phases	8		8	4		2		6	
Detector Phase	3	8	8	7	4	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	20.0	20.0	5.0	20.0	20.0	20.0	5.0	20.0
Minimum Split (s)	8.0	46.8	46.8	8.0	46.8	37.3	37.3	9.5	37.3
Total Split (s)	8.0	46.9	46.9	8.0	46.9	38.8	38.8	11.3	50.1
Total Split (%)	7.6%	44.7%	44.7%	7.6%	44.7%	37.0%	37.0%	10.8%	47.7%
Yellow Time (s)	3.0	3.3	3.3	3.0	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	0.0	3.5	3.5	0.0	3.5	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.8	6.8	3.0	6.8	6.3	6.3	3.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes		Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	43.4	35.7	35.7	42.7	33.8	32.7	32.7	47.1	44.1
Actuated g/C Ratio	0.44	0.36	0.36	0.43	0.34	0.33	0.33	0.47	0.44
v/c Ratio	0.88	0.88	0.15	0.54	0.52	0.65	0.67	0.81	0.68
Control Delay	50.0	45.6	4.6	26.1	25.4	56.8	32.5	42.7	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	45.6	4.6	26.1	25.4	56.8	32.5	42.7	24.3
LOS	D	D	A	C	C	E	C	D	C
Approach Delay		42.9			25.5		34.9		27.6
Approach LOS		D			C		C		C

Intersection Summary	
Cycle Length: 105	
Actuated Cycle Length: 99.2	
Natural Cycle: 105	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 32.7	Intersection LOS: C
Intersection Capacity Utilization 100.8%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: Garth Street & Stone Church Road West





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	282	594	94	100	614	84	786	229	1049
v/c Ratio	0.88	0.88	0.15	0.54	0.52	0.65	0.67	0.81	0.68
Control Delay	50.0	45.6	4.6	26.1	25.4	56.8	32.5	42.7	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	45.6	4.6	26.1	25.4	56.8	32.5	42.7	24.3
Queue Length 50th (m)	33.3	108.0	0.0	10.6	45.3	14.7	71.7	28.3	84.6
Queue Length 95th (m)	#67.5	#165.0	8.9	19.5	61.0	#40.0	94.4	#63.6	110.7
Internal Link Dist (m)		48.8			397.8		333.7		258.3
Turn Bay Length (m)	45.0		45.0	45.0		80.0		55.0	
Base Capacity (vph)	322	765	686	186	1404	130	1168	283	1535
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.78	0.14	0.54	0.44	0.65	0.67	0.81	0.68

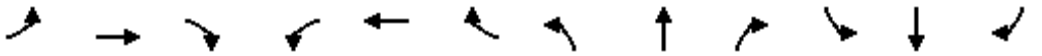
Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	268	564	89	95	449	134	80	645	102	218	713	283
Future Volume (vph)	268	564	89	95	449	134	80	645	102	218	713	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.8	6.8	3.0	6.8		6.3	6.3		3.3	6.3	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	1881	1542	1752	3387		1749	3506		1787	3369	
Flt Permitted	0.32	1.00	1.00	0.14	1.00		0.21	1.00		0.19	1.00	
Satd. Flow (perm)	599	1881	1542	256	3387		396	3506		351	3369	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	282	594	94	100	473	141	84	679	107	229	751	298
RTOR Reduction (vph)	0	0	60	0	28	0	0	11	0	0	39	0
Lane Group Flow (vph)	282	594	34	100	586	0	84	775	0	229	1010	0
Confl. Peds. (#/hr)	5		6	6		5	9					9
Heavy Vehicles (%)	1%	1%	3%	3%	3%	1%	3%	1%	0%	1%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	3	8		7	4			2		1	6	
Permitted Phases	8		8	4			2			6		
Actuated Green, G (s)	40.7	35.7	35.7	38.5	34.6		32.7	32.7		44.1	44.1	
Effective Green, g (s)	40.7	35.7	35.7	38.5	34.6		32.7	32.7		44.1	44.1	
Actuated g/C Ratio	0.41	0.36	0.36	0.39	0.35		0.33	0.33		0.44	0.44	
Clearance Time (s)	3.0	6.8	6.8	3.0	6.8		6.3	6.3		3.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	303	672	551	157	1174		129	1148		271	1488	
v/s Ratio Prot	c0.05	0.32		0.02	0.17			0.22		c0.07	0.30	
v/s Ratio Perm	c0.33		0.02	0.22			0.21			c0.30		
v/c Ratio	0.93	0.88	0.06	0.64	0.50		0.65	0.67		0.85	0.68	
Uniform Delay, d1	27.6	30.1	21.0	23.2	25.8		28.7	29.0		20.2	22.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	33.9	13.2	0.0	8.2	0.3		22.7	3.2		20.8	2.5	
Delay (s)	61.6	43.3	21.1	31.4	26.1		51.4	32.1		41.0	24.7	
Level of Service	E	D	C	C	C		D	C		D	C	
Approach Delay (s)		46.4			26.8			34.0			27.6	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	19.4
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	842	29	27	631	60	14	0	21	35	0	25
Future Volume (Veh/h)	29	842	29	27	631	60	14	0	21	35	0	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	30	877	30	28	657	63	15	0	22	36	0	26
Pedestrians											4	
Lane Width (m)											3.6	
Walking Speed (m/s)											1.2	
Percent Blockage											0	
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	724			907			1691	1732	892	1708	1716	692
vC1, stage 1 conf vol							952	952		748	748	
vC2, stage 2 conf vol							739	780		959	967	
vCu, unblocked vol	724			907			1691	1732	892	1708	1716	692
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			93	100	94	83	100	94
cM capacity (veh/h)	885			750			229	249	341	211	244	437

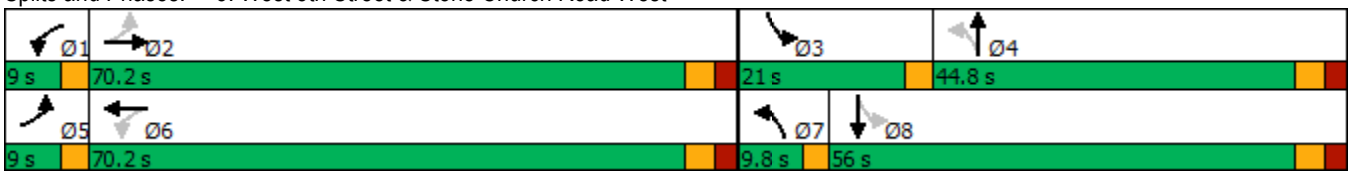
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	30	907	28	720	37	62
Volume Left	30	0	28	0	15	36
Volume Right	0	30	0	63	22	26
cSH	885	1700	750	1700	284	270
Volume to Capacity	0.03	0.53	0.04	0.42	0.13	0.23
Queue Length 95th (m)	0.8	0.0	0.9	0.0	3.4	6.6
Control Delay (s)	9.2	0.0	10.0	0.0	19.5	22.3
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		0.4		19.5	22.3
Approach LOS					C	C

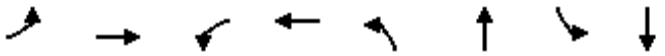
Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	58.0%	ICU Level of Service		B
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	96	709	71	529	91	342	260	471
Future Volume (vph)	96	709	71	529	91	342	260	471
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	5	2	1	6	7	4	3	8
Permitted Phases	2		6		4		8	
Detector Phase	5	2	1	6	7	4	3	8
Switch Phase								
Minimum Initial (s)	6.0	12.0	6.0	12.0	5.0	12.0	8.0	12.0
Minimum Split (s)	9.0	31.9	9.0	31.9	9.5	31.8	11.0	31.8
Total Split (s)	9.0	70.2	9.0	70.2	9.8	44.8	21.0	56.0
Total Split (%)	6.2%	48.4%	6.2%	48.4%	6.8%	30.9%	14.5%	38.6%
Yellow Time (s)	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3
All-Red Time (s)	0.0	2.6	0.0	2.6	0.0	2.5	0.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	3.0	5.8	3.0	5.8
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes			Yes
Recall Mode	None	Max	None	Max	None	None	None	None
Act Effct Green (s)	73.2	64.3	73.2	64.3	48.6	39.0	62.8	50.2
Actuated g/C Ratio	0.50	0.44	0.50	0.44	0.34	0.27	0.43	0.35
v/c Ratio	0.64	0.99	0.59	0.91	0.67	0.90	0.93	1.01
Control Delay	37.6	69.2	39.1	54.1	50.0	72.5	72.5	85.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	69.2	39.1	54.1	50.0	72.5	72.5	85.0
LOS	D	E	D	D	D	E	E	F
Approach Delay		65.8		52.8		68.6		81.3
Approach LOS		E		D		E		F

Intersection Summary	
Cycle Length: 145	
Actuated Cycle Length: 145	
Natural Cycle: 145	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 67.4	Intersection LOS: E
Intersection Capacity Utilization 102.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: West 5th Street & Stone Church Road West





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	807	73	731	94	439	268	644
v/c Ratio	0.64	0.99	0.59	0.91	0.67	0.90	0.93	1.01
Control Delay	37.6	69.2	39.1	54.1	50.0	72.5	72.5	85.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	69.2	39.1	54.1	50.0	72.5	72.5	85.0
Queue Length 50th (m)	13.9	226.2	10.1	190.9	16.0	120.4	54.8	~187.8
Queue Length 95th (m)	#26.3	#315.0	#23.9	#270.5	#33.5	#180.9	#108.4	#266.4
Internal Link Dist (m)		572.4		233.4		182.3		205.6
Turn Bay Length (m)	55.0		60.0		35.0		90.0	
Base Capacity (vph)	154	814	124	800	141	488	287	635
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.99	0.59	0.91	0.67	0.90	0.93	1.01

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	709	74	71	529	180	91	342	83	260	471	153
Future Volume (vph)	96	709	74	71	529	180	91	342	83	260	471	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9		3.0	5.8		3.0	5.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1831		1736	1786		1805	1793		1736	1812	
Flt Permitted	0.09	1.00		0.06	1.00		0.10	1.00		0.13	1.00	
Satd. Flow (perm)	172	1831		114	1786		195	1793		234	1812	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	99	731	76	73	545	186	94	353	86	268	486	158
RTOR Reduction (vph)	0	3	0	0	8	0	0	6	0	0	8	0
Lane Group Flow (vph)	99	804	0	73	723	0	94	433	0	268	636	0
Confl. Peds. (#/hr)	4		4	4		4			8	8		
Heavy Vehicles (%)	0%	2%	2%	4%	2%	0%	0%	2%	2%	4%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	70.3	64.3		70.3	64.3		45.8	39.0		60.0	50.2	
Effective Green, g (s)	70.3	64.3		70.3	64.3		45.8	39.0		60.0	50.2	
Actuated g/C Ratio	0.48	0.44		0.48	0.44		0.32	0.27		0.41	0.35	
Clearance Time (s)	3.0	5.9		3.0	5.9		3.0	5.8		3.0	5.8	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	150	811		122	791		137	482		283	627	
v/s Ratio Prot	c0.03	c0.44		0.02	0.40		0.03	0.24		c0.12	c0.35	
v/s Ratio Perm	0.29			0.27			0.18			0.27		
v/c Ratio	0.66	0.99		0.60	0.91		0.69	0.90		0.95	1.01	
Uniform Delay, d1	30.0	40.1		33.0	37.8		40.2	51.1		37.9	47.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.4	29.6		7.7	16.8		13.3	19.2		39.0	39.6	
Delay (s)	40.4	69.7		40.6	54.6		53.6	70.3		76.9	87.0	
Level of Service	D	E		D	D		D	E		E	F	
Approach Delay (s)		66.5			53.3			67.3			84.0	
Approach LOS		E			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	68.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	872	26	26	706	12	19
Future Volume (Veh/h)	872	26	26	706	12	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	948	28	28	767	13	21
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			976		1785	962
vC1, stage 1 conf vol					962	
vC2, stage 2 conf vol					823	
vCu, unblocked vol			976		1785	962
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			96		95	93
cM capacity (veh/h)			707		282	310

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	976	795	34
Volume Left	0	28	13
Volume Right	28	0	21
cSH	1700	707	299
Volume to Capacity	0.57	0.04	0.11
Queue Length 95th (m)	0.0	0.9	2.9
Control Delay (s)	0.0	1.1	18.6
Lane LOS		A	C
Approach Delay (s)	0.0	1.1	18.6
Approach LOS			C

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		68.2%	ICU Level of Service C
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	872	19	19	722	10	15
Future Volume (Veh/h)	872	19	19	722	10	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	948	21	21	785	11	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			969		1786	958
vC1, stage 1 conf vol					958	
vC2, stage 2 conf vol					827	
vCu, unblocked vol			969		1786	958
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		96	95
cM capacity (veh/h)			711		284	312

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	969	806	27
Volume Left	0	21	11
Volume Right	21	0	16
cSH	1700	711	300
Volume to Capacity	0.57	0.03	0.09
Queue Length 95th (m)	0.0	0.7	2.2
Control Delay (s)	0.0	0.8	18.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.8	18.2
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		