130 Water Street North, Cambridge, ON Transportation Impact Study

Paradigm Transportation Solutions Limited

October 2020

ptsl.com

Project Summary

Project Number
200034

October 2020

Client
Pearle Hospitality
611 Tradewind Drive, Suite 300
Ancaster ON L9G 4V5

Client Contact
Brain Blackmere

Consultant Project Team
Erica Bayley, P.Eng
Andrew Evans, M.Sc.

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

130 Water Street North, Cambridge, ON
Transportation Impact Study

Signatures and Seals

Signature

Engineer's Seal

Disclaimer

Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study for a proposed condominium/hotel development located at 130 Water Street North in Cambridge, Ontario.

This Transportation Impact Study (TIS) includes an analysis of existing traffic conditions, a description of the proposed development, traffic forecasts for five-year horizon from the date of study (Year 2027), recommended Transportation Demand Management strategies, and any recommendations required to improve future traffic conditions.

Development Concept

The proposed development includes a 28-storey hotel building with 146 hotel rooms and a 37-storey condominium with 253 condo units. The hotel and condominium will share a common lower level. Shared commercial space is proposed within the building including: a spa, restaurant/bar areas, and lounge areas with an approximate gross floor area of 1,550 square metres (16,685 square feet). The development is adjacent to the existing Cambridge Mill restaurant and event space (100 Water Street North). The hotel and spa are expected to serve visitors to the Mill.

The site's parking demand is proposed to be accommodated on site by 264 at grade and underground parking structure.

Vehicle access is proposed by two separate driveways to Water Street North.

In addition to the hotel/condominium development, a separate multi-level parking garage in the southeast corner of Water Street and Simcoe Street is also proposed. This parking structure is anticipated to be used by guests attending events at the Cambridge Mill and those staying at the hotel. The parking garage with have a grade separated pedestrian walkway over Water Street connecting the parking garage to the Cambridge Mill. Vehicle access to the parking garage is proposed by one driveway to Simcoe Street and one driveway to Water Street.

Conclusions

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

- **Existing Traffic Conditions:** All study area intersections are currently operating within acceptable levels of service;
- **Development Trip Generation:** The development is forecast to generate approximately 140 and 160 trips during the AM and PM peak hours, respectively;
- **2027 Background Traffic Conditions:** As traffic volumes increase at the study area intersections, intersection capacity issues begin to develop. Capacity issues are identified at the following intersections:
  - Water Street and Park Hill Road;
  - Ainslie Street and Park Hill Road; and
  - Water Street and Simcoe Street/Site Driveway.

  The background traffic capacity deficiencies are forecast to occur without site-specific traffic.

  All study area intersections are forecast to continue to operate within acceptable levels of service;
- **2027 Total Traffic Conditions:** The capacity deficiencies identified under background conditions will continue to occur with the addition of site generated traffic at the following intersections:
  - Water Street and Park Hill Road;
  - Ainslie Street and Park Hill Road; and
  - Water Street and Simcoe Street/Site Driveway.

  The site driveways to Water Street are forecast to operate with high delays during the PM peak hour, however, the low v/c ratios indicate that while there is delay, there remains excess capacity for the site driveways.

  No intersection capacity related issues are forecast to occur at the parking garage accesses to Water Street and Simcoe Street.
- **Remedial Measures:** left-turn lanes are not warranted at the northerly site driveway or the Simcoe Street parking garage access. Traffic signals at Water Street and Simcoe Street/Site Driveway are not warranted; and
- **TDM Measures:** The developer is committed to several TDM measures including pedestrian connectivity, unbundling parking, short-term and long-term bike parking. The site is also located near existing cycling and transit networks that will be supportive to non-automotive travel.

Recommendations

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

- The City of Cambridge and Region of Waterloo monitor the future traffic volumes at the study area intersections to ensure appropriate forms of traffic control and storage lengths are in place; and
- The developer continues in its efforts to reduce Single Occupant Vehicle travel and expand its current TDM program to include:
  - Long term bike parking to be provided at a rate of 0.3 spaces per unit (76 spaces) and short-term parking at a rate of 0.05 spaces (13 spaces);
  - Consideration be given to providing long-term bike parking for hotel staff;
  - Consideration be given to providing carshare spaces for residential tenants on site; and
  - Consideration be given to providing information regarding public transit routes, schedules and fares in accessible and visible location on-site

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Appendices

Figures

Tables

1 Introduction

Paradigm Transportation Solutions Limited (Paradigm) was retained to undertake this Transportation Impact Assessment for the proposed development of a hotel and condominium tower and a parking garage at 130 Water Street North in the City of Cambridge, Ontario. **Figure 1.1** details the location of the subject development.

The scope of the study includes a determination and assessment of the current traffic conditions in the vicinity of the subject site, the additional traffic that will be generated by the proposed development, analyses of the impact that this traffic may have on the adjacent street system, and recommendations with regards to potential remedial measures that may be required to mitigate the site generated traffic impacts in a satisfactory manner. The impact assessment will focus on the following study intersections:

- Water Street and Park Hill Road;
- Water Street and Simcoe Street;
- Simcoe Street and Ainslie Street;
- Park Hill Road and Ainslie Street;
- Two site driveways onto Water Street for access to the hotel/condo; and
- Two driveways onto Water Street/Simcoe Street for access to the parking structure.

The impact assessment includes an analysis of the weekday AM and PM peak hours under existing conditions (2020) and a forecast five-year horizon from opening day (2027).

The study has been prepared in accordance with the requirements of the Region of Waterloo and the City of Cambridge[1]. The scope was confirmed with the Region and City with the pre-study correspondence included in **Appendix A.**

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[1] Transportation Impact Study Guidelines, Region of Waterloo, 2014

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Study Area and Subject Development Location

130 Water Street North, Cambridge TIS
200034

Figure 1.1

2 Existing Conditions

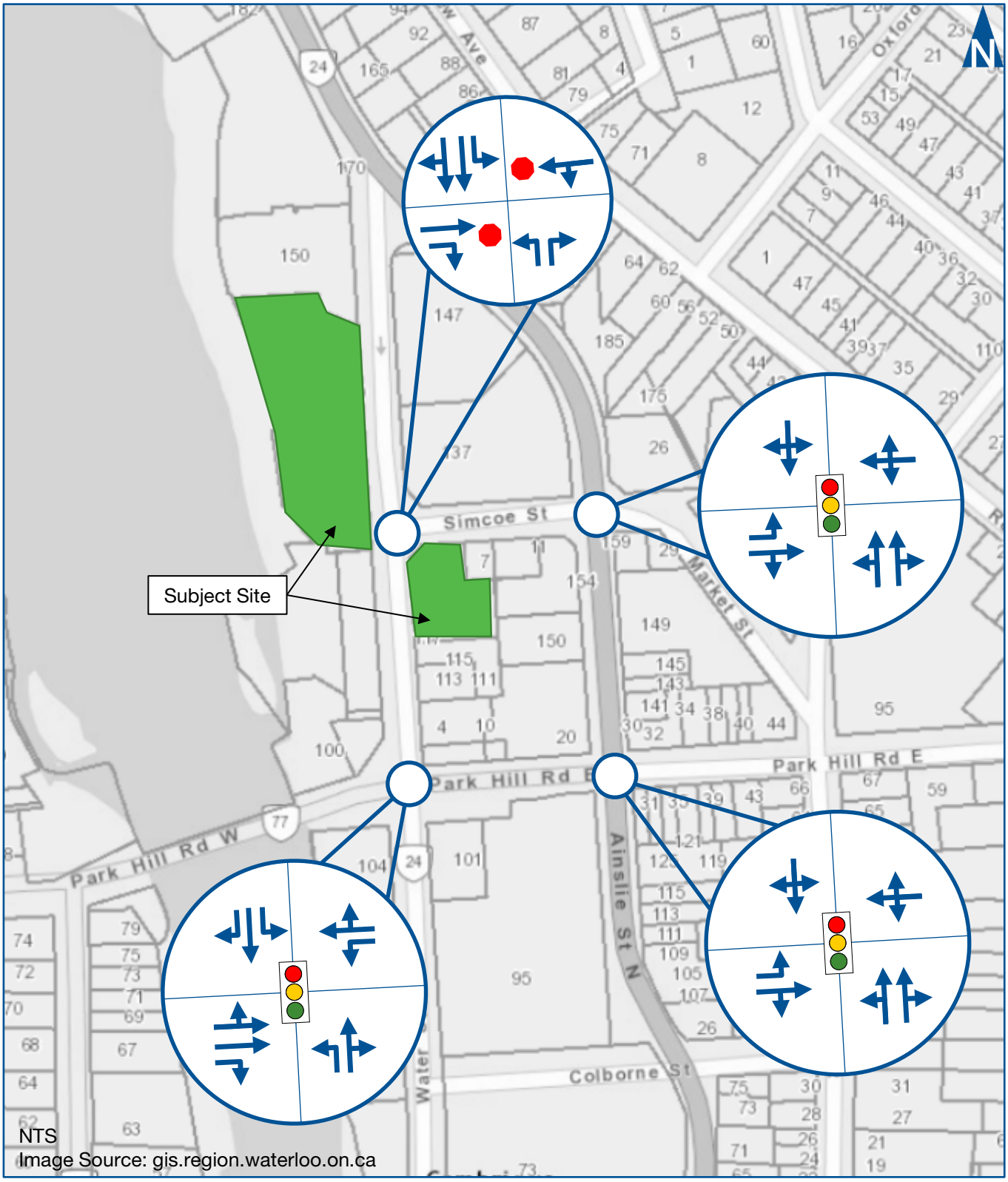
This section documents current traffic conditions, operational deficiencies, and constraints experienced by the public travelling at the intersections within the study area. The operational deficiencies and constraints identified at this stage will be fundamental to the process of defining the required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

2.1 Roadway Characteristics

The study area road network includes the following roads:

- **Water Street** is an arterial roadway under Region of Waterloo jurisdiction. In the study area, Water Street is partially one-way southbound (between Ainslie Street and Simcoe Street) and partially two-way (between Simcoe Street and Park Hill Road) with a two-lane cross-section. Water Street has an assumed speed limit of 50 km/h.
- **Ainslie Street** is an arterial roadway under Region of Waterloo jurisdiction. In the study area, Ainslie Street has a three-lane cross-section with one southbound lane and two northbound lanes. Ainslie Street has an assumed speed limit of 50 km/h.
- **Park Hill Road** is a collector roadway under the City of Cambridge jurisdiction. In the study area, Park Hill Road has a four-lane cross-section west of Ainslie Street. Park Hill Road has an assumed speed limit of 50 km/h. There is a prohibited eastbound left-turn movement from Park Hill Road to Water Street North from 7:00 AM to 10:00 Monday to Friday.
- **Simcoe Street** is a local roadway under the City of Cambridge jurisdiction with a two-lane cross-section. Simcoe Street operates with an assumed speed limit of 50 km/h.

Figure 2.1 displays the existing lane configurations and traffic controls for the study area.



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Existing Lane Configuration & Traffic Control

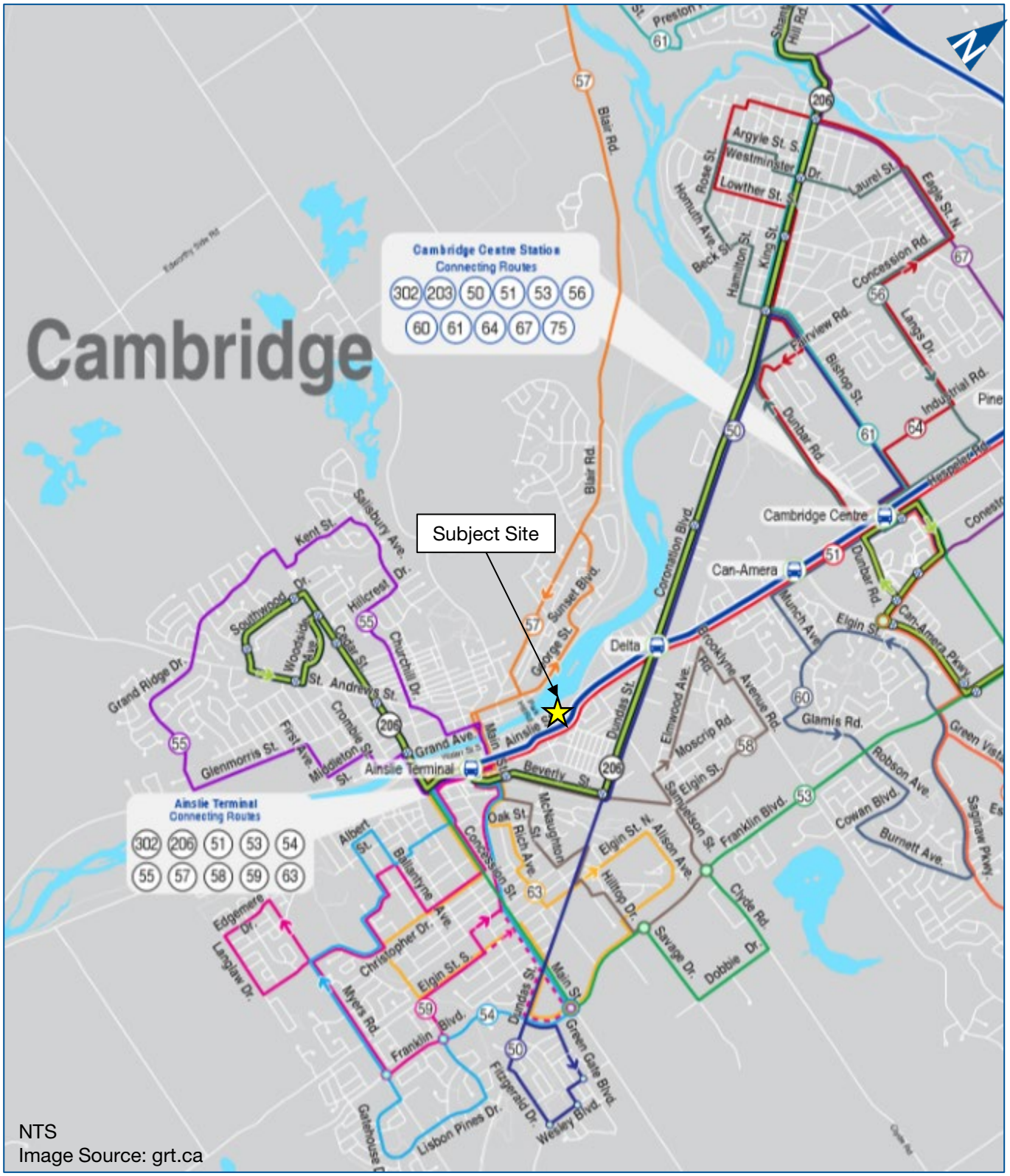
130 Water Street North, Cambridge TIS
200034

Figure 2.1

2.2 Transit

Figure 2.2 illustrates the existing transit network. Grand River Transit currently operates two routes within the study area:

- **Route 51 Hespeler** travels north/south along Ainslie Street, Water Street, and Hespeler Road connecting the Ainslie Street Terminal to Cambridge Centre, and Queen Street in Hespeler. The route operates Monday to Friday (5:50 AM to 12:30 AM) with headways generally alternating between 15 and 30 minutes. Saturday (6:00 AM to 12:30 AM) and Sunday/Holidays (8:00 AM to 12:30 AM) Route 51 operates with headways generally alternating between 30 and 60 minutes.
- **Route 301 Ion Bus iXpress** is an express bus service that travels from the Ainslie Street Terminal to Fairview Mall via Ainslie Street, Water Street, Hespeler Road, Highway 401 and King Street. At Fairview Mall, the route connects with the 301 Ion Light Rail service to downtown Kitchener, Uptown Waterloo, and Conestoga Mall. The route operates Monday to Friday (5:35 AM to 1:00AM) with headways generally every 10 to 15 minutes, Saturdays (6:30 AM to 1:00 AM) with headways generally every 15 to 20 minutes, and Sunday/Holidays (6:50 AM to 12:30 AM) with headways generally every 15 minutes.



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Existing Transit Network

130 Water Street North, Cambridge TIS
200034

Figure 2.2

2.3 Pedestrian and Cycling Environment

2.3.1 Pedestrian

Pedestrian sidewalks are provided along both sides of the roadways throughout the study area. Crosswalks and pedestrian signals are provided for all approaches at the signalized intersections within the study area. The site is located within walking distance of numerous and significant employment, retail, cultural and recreational opportunities that can be readily accessed by foot. The proximity of the site to such a range of amenities and destinations within walking distance serves to reduce the need for residents of the building to travel on a regular basis using a car.

Walk Score is an online tool that assigns a numerical walkability score between 0 and 100. Walk Score ranks communities nationwide based on how many businesses, parks, theatres, schools, and other common destinations are within walking distance of any given address. The subject site is noted to have a Walk Score of 78[2] and is considered to be “Very Walkable.” This means most daily errands can be accomplished on foot.

2.3.2 Cycling

The City of Cambridge’s bicycle network provides a variety of cycling facilities within the immediate area. **Figure 2.3** illustrates the existing cycling network. Designated on-street bicycle lanes are provided on Park Hill Road west of Water Street. Park Hill Road is also designated as a shared route east of Ainslie Street. There is an off-road trail that runs along the east side of the Grand River through the subject site.

2.4 Traffic Volumes

Paradigm collected weekday, eight-hour turning movement counts for all intersection within the study area in March 2020. **Figure 2.4a** and **Figure 2.4b** shows the existing weekday AM and PM peak hour traffic volumes. **Appendix B** includes the complete turning movement count volumes.

[2] https://www.walkscore.com/score/130-water-st-n-cambridge-on-canada

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Image Source: Figure 3, Cambridge Cycling Master Plan

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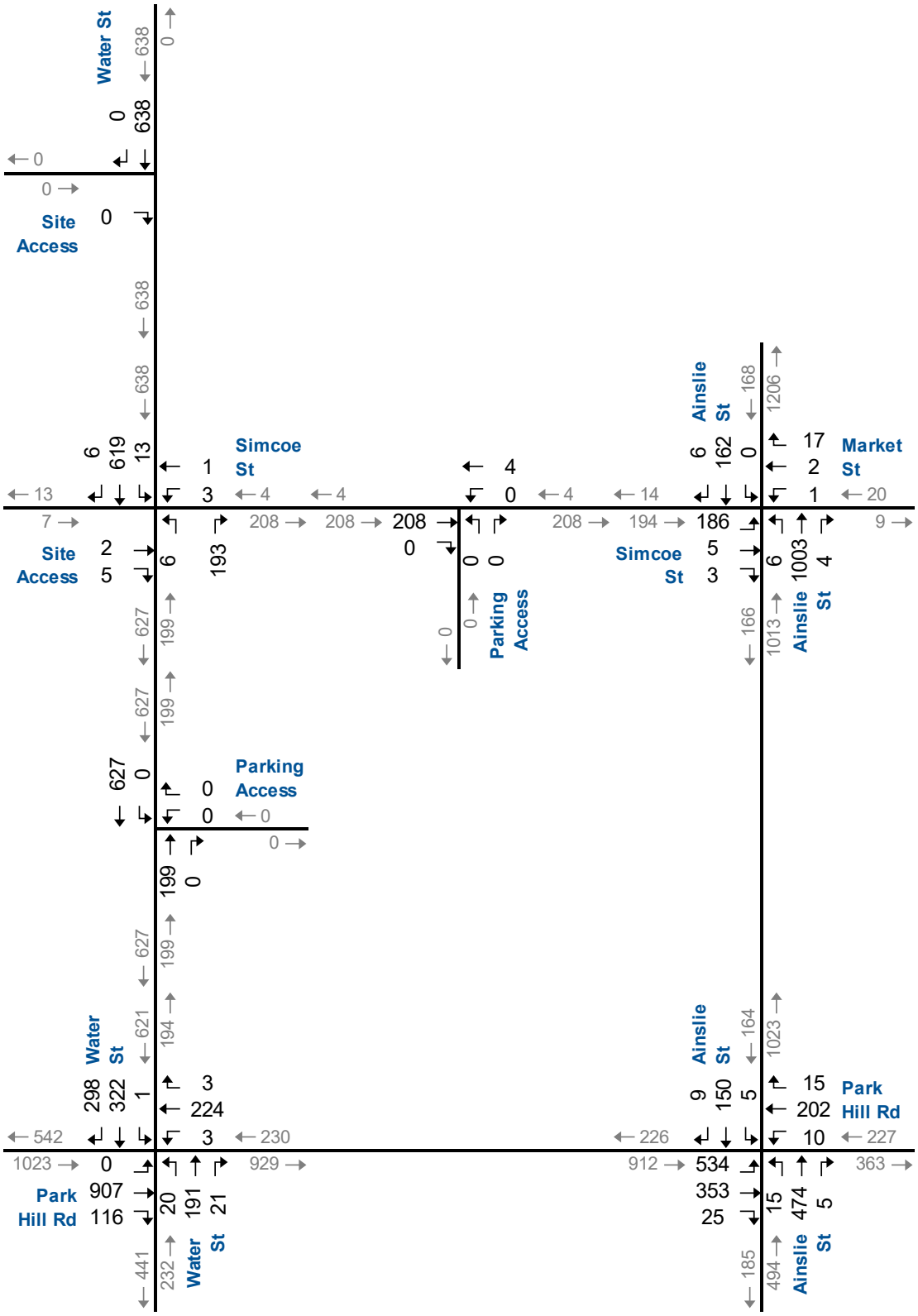
Existing Cycle Network

130 Water Street North, Cambridge TIS
200034

Figure 2.3



Existing Traffic Volumes AM Peak Hour

130 Water Street North, Cambridge TIS
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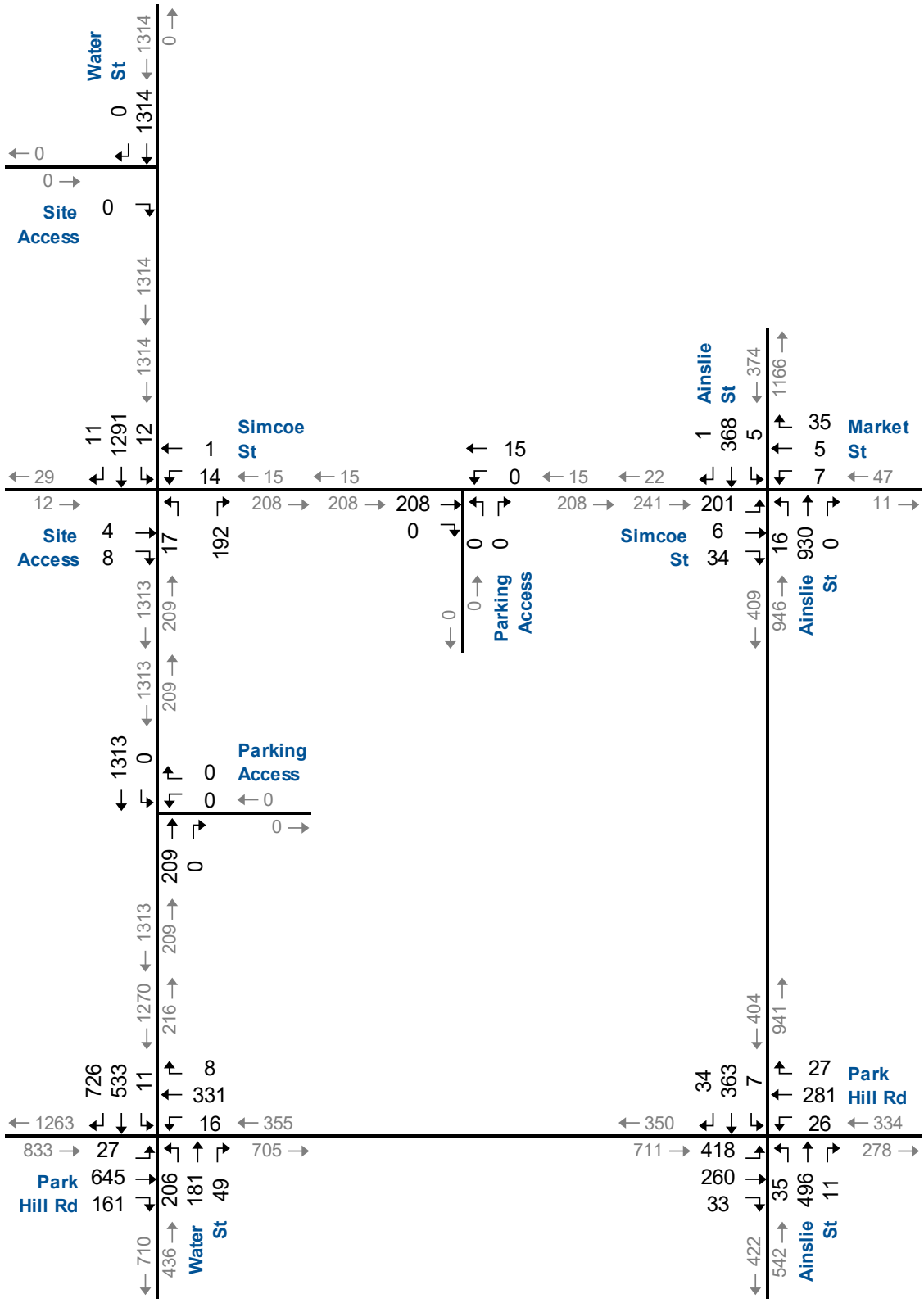
Figure 2.4a



Existing Traffic Volumes PM Peak Hour

Figure 2.4b

2.5 Traffic Operations

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

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

The operations of the study intersections were evaluated using the existing lane configurations, traffic controls and the existing traffic peak volumes. Signal timings were provided by the Region of Waterloo during pre-consultation.

The level of service conditions on the existing road network have been assessed using Synchro 9. Movements are considered critical under the following conditions:

- Volume/capacity (V/C) ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.85 or above;
- V/C ratios for dedicated turning movements that will exceed 0.90;
- 95th percentile queue lengths for individual movements exceeds available lane storage.

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

All intersections operate within acceptable levels under existing traffic conditions with the following critical movements:

- Water Street and Park Hill Road:

- The northbound left-turn movement is operating at LOS F with a v/c ratio greater than 1.0 and queue reach greater than its available storage in the PM peak hour;
- The southbound right-turn movement is operating at LOS E with a v/c ratio greater than 1.0 and queue reach greater than its available storage in the PM peak hour;

- Ainslie Street and Park Hill Road:
  - The eastbound left-turn movement is operating with v/c ratio of 0.92 and a queue reach greater than its available storage in the AM peak hour. In the PM peak hour this movement is operating at LOS E with v/c ratio of 0.99 and queue reach greater than its available storage;
- Ainslie Street and Simcoe Street/Market Street:
  - The eastbound left-turn movement is operating with a queue reach greater than its available storage in the AM and PM peak hours;
- Water Street and Simcoe Street/Site Driveway:
  - The eastbound through movement is operating at LOS E with a v/c ratio of 0.04 during the PM peak hour.

Appendix C contains the detailed Synchro 9 reports.

TABLE 2.1: EXISTING 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	Water Street & Park Hill Roaad	TCS	LOS	<	C	B	**C**	B	B	>	**B**	B	B	>	**B**	B	C	B	**C**	**C**
			Delay	<	23	14	**22**	14	19	>	**19**	15	14	>	**14**	16	24	19	**22**	**21**
			V/C	<	0.73	0.11		0.02	0.42	>		0.08	0.31	>		0.00	0.55	0.24		**0.64**
			Q	<	84	12		2	44	>		6	34	>		1	66	16		
			Ex	<		10		15		>		25		>		40		110		
			Avail.	<		-2		13		>		19		>		39		94		
	Ainslie Street & Park Hill Road	TCS	LOS	C	A	>	**C**	<	C	>	**C**	<	C	>	**C**	<	C	>	**C**	**C**
			Delay	33	10	>	**23**	<	33	>	**33**	<	25	>	**25**	<	21	>	**21**	**21**
			V/C	0.92	0.51	>		<	0.75	>		<	0.70	>		<	0.46	>		**0.90**
			Q	145	62	>		<	65	>		<	48	>		<	34	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-115		>		<		>		<		>		<		>		
	Ainslie Street & Simcoe Street/Market Street	TCS	LOS	C	B	>	**C**	<	B	>	**B**	<	B	>	**B**	<	A	>	**A**	**B**
			Delay	23	15	>	**23**	<	15	>	**15**	<	10	>	**10**	<	6	>	**6**	**11**
			V/C	0.63	0.01	>		<	0.02	>		<	0.66	>		<	0.21	>		**0.65**
			Q	46	4	>		<	5	>		<	72	>		<	21	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-16		>		<		>		<		>		<		>		
	Water Street North & Simcoe Street/Site Driveway	TWSC	LOS		C	B	**B**	<	B		**B**	A	A		**A**	A	A	>	**A**	**A**
			Delay		18	11	**13**	<	13		**13**	9	0		**0**	8	0	>	**0**	**0**
			V/C		0.01	0.01		<	0.01			0.01	0.11			0.01	0.24	>		
			Q		0	0		<	0			0	0			0	0	>		
			Ex					<				25				25		>		
			Avail.					<				25				25		>		
PM Peak Hour	Water Street & Park Hill Roaad	TCS	LOS	<	C	C	**C**	B	C	>	**C**	F	B	>	**E**	B	C	E	**E**	**D**
			Delay	<	26	20	**25**	19	28	>	**27**	113	13	>	**60**	15	29	76	**55**	**44**
			V/C	<	0.64	0.23		0.10	0.61	>		1.07	0.29	>		0.03	0.75	1.04		**0.87**
			Q	<	72	24		7	79	>		61	34	>		4	121	180		
			Ex	<		10		15		>		25		>		40		110		
			Avail.	<		-14		8		>		-36		>		36		-70		
	Ainslie Street & Park Hill Road	TCS	LOS	E	B	>	**D**	<	D	>	**D**	<	C	>	**C**	<	D	>	**D**	**D**
			Delay	58	13	>	**40**	<	44	>	**44**	<	24	>	**24**	<	42	>	**42**	**37**
			V/C	0.99	0.41	>		<	0.86	>		<	0.65	>		<	0.88	>		**0.98**
			Q	121	52	>		<	103	>		<	59	>		<	117	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-91		>		<		>		<		>		<		>		
	Ainslie Street & Simcoe Street/Market Street	TCS	LOS	C	B	>	**C**	<	B	>	**B**	<	B	>	**B**	<	A	>	**A**	**B**
			Delay	23	15	>	**21**	<	15	>	**15**	<	11	>	**11**	<	9	>	**9**	**12**
			V/C	0.65	0.04	>		<	0.06	>		<	0.66	>		<	0.51	>		**0.65**
			Q	50	7	>		<	8	>		<	73	>		<	58	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-20		>		<		>		<		>		<		>		
	Water Street North & Simcoe Street/Site Driveway	TWSC	LOS		E	B	**C**	<	C		**C**	B	A		**A**	A	A	>	**A**	**A**
			Delay		40	14	**23**	<	19		**19**	12	0		**1**	8	0	>	**0**	**1**
			V/C		0.04	0.02		<	0.05			0.03	0.11			0.01	0.51	>		
			Q		1	1		<	1			1	0			0	0	>		
			Ex					<				25				25		>		
			Avail.					<				24				25		>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length (m)
Ex. - Existing Available Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< - Shared Left-Turn
> - Shared Right-Turn

3 Development Concept

The subject site is located at 130 Water Street North in the City of Cambridge. The site is located on the west side of Water Street North, north of Simcoe Street and north of the existing Cambridge Mill restaurant and event space at 100 Water Street North.

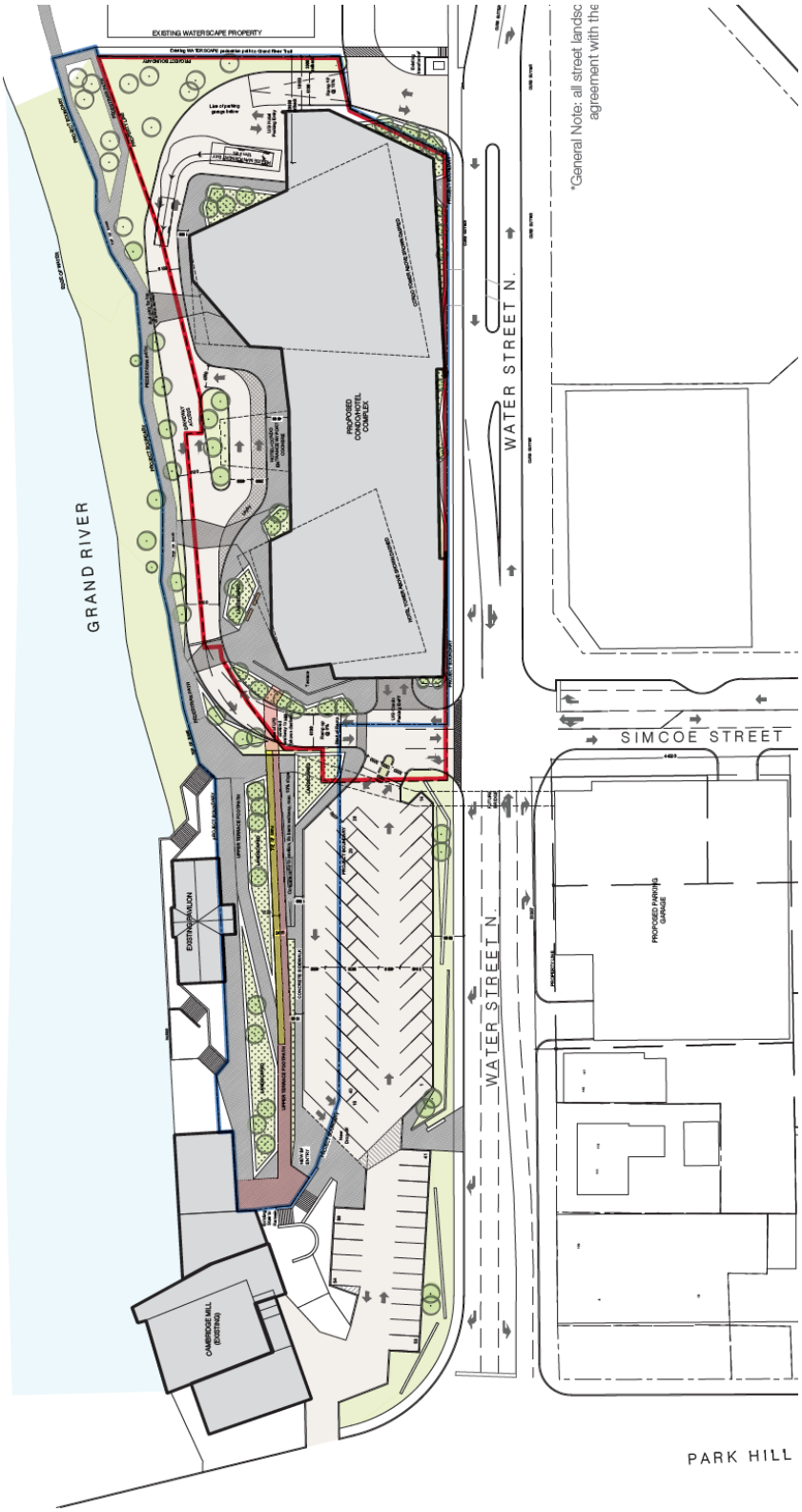
The proposed development includes a 28-storey mixed use hotel/condominium with 146 hotel suites (26 long term stay) and a 37-storey condominium with 253 residential units. The hotel and condominium will share a common lower level. Within the shared portion, amenities proposed include a shared spa, fitness area, and wellness lounge with an approximate gross floor area of 1,550 square metres (16,685 square feet).

The site's parking demand is proposed to be accommodated on site by 264 at grade and underground parking spaces.

Vehicle access is proposed by two separate driveways to Water Street North. The southern driveway is planned to be opposite Simcoe Street and will be shared with the Cambridge Mill.

In addition to the hotel/condominium development, a separate multi-level parking garage on the southeast corner of Water Street and Simcoe Street is also proposed. This parking structure is anticipated to be used by guests attending events at the adjacent Cambridge Mill and guests of the hotel. The parking garage will have a grade separated pedestrian walkway over Water Street connecting the parking garage to the Cambridge Mill and the new development. Vehicle access to the parking garage is proposed by one driveway to Simcoe Street and one driveway to Water Street.

Figure 3.1 shows the proposed development concept.



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Proposed Development Concept

130 Water Street North, Cambridge TIS
200034

Figure 3.1

3.1 Site Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation[3] methods predict the site trip generation. The following Land Use Codes (LUC) were used to estimate the site trip generation:

- LUC 222 (Multifamily Housing, High-Rise); and
- LUC 310 (Hotel).

Table 3.1 summarizes the estimated trip generation. The site's base trip generation is estimated to be approximately 140 AM peak hour trips and 160 PM peak hour trips. A 4 percent modal split (obtained from the 2016 Transportation Tomorrow Survey[4]) was utilized in the calculations. It is noted that 26 of the condominium units will be treated as long-term stay hotel units. The trip generation for these units has been calculated using LUC 222 as it is expected that they will operate similar to the condominium units rather than as hotel units.

TABLE 3.1: TRIP GENERATION

Land Use	ITE Code	Size	AM Peak Hour				PM Peak Hour			
			Rate / Equation	In	Out	Total	Rate / Equation	In	Out	Total
Multifamily Housing (High-Rise) [Units]	222	279	Equation	21	70	91	Equation	62	41	103
Hotel [Rooms]	310	120	Equation	32	23	55	Equation	32	32	64
Total Trip Generation				53	93	146		94	73	167
Modal Split			*4%*	*-2*	*-4*	*-6*	*4%*	*-4*	*-3*	*-7*
Net Trip Generation				**51**	**89**	**140**		**90**	**70**	**160**

LUC 222: AM T= 0.28(X) + 12.86 / PM T = 0.34(X) + 8.56
LUC 310: AM T= 0.50(X) - 5.34 / PM T = 0.75(X) -26.02

The trip distribution used for this study was based on information provided in the 2016 Transportation Tomorrow Survey as well as the existing traffic patterns. The trip distribution is shown in **Table 3.2**.

TABLE 3.2: TRIP DISTRIBUTION

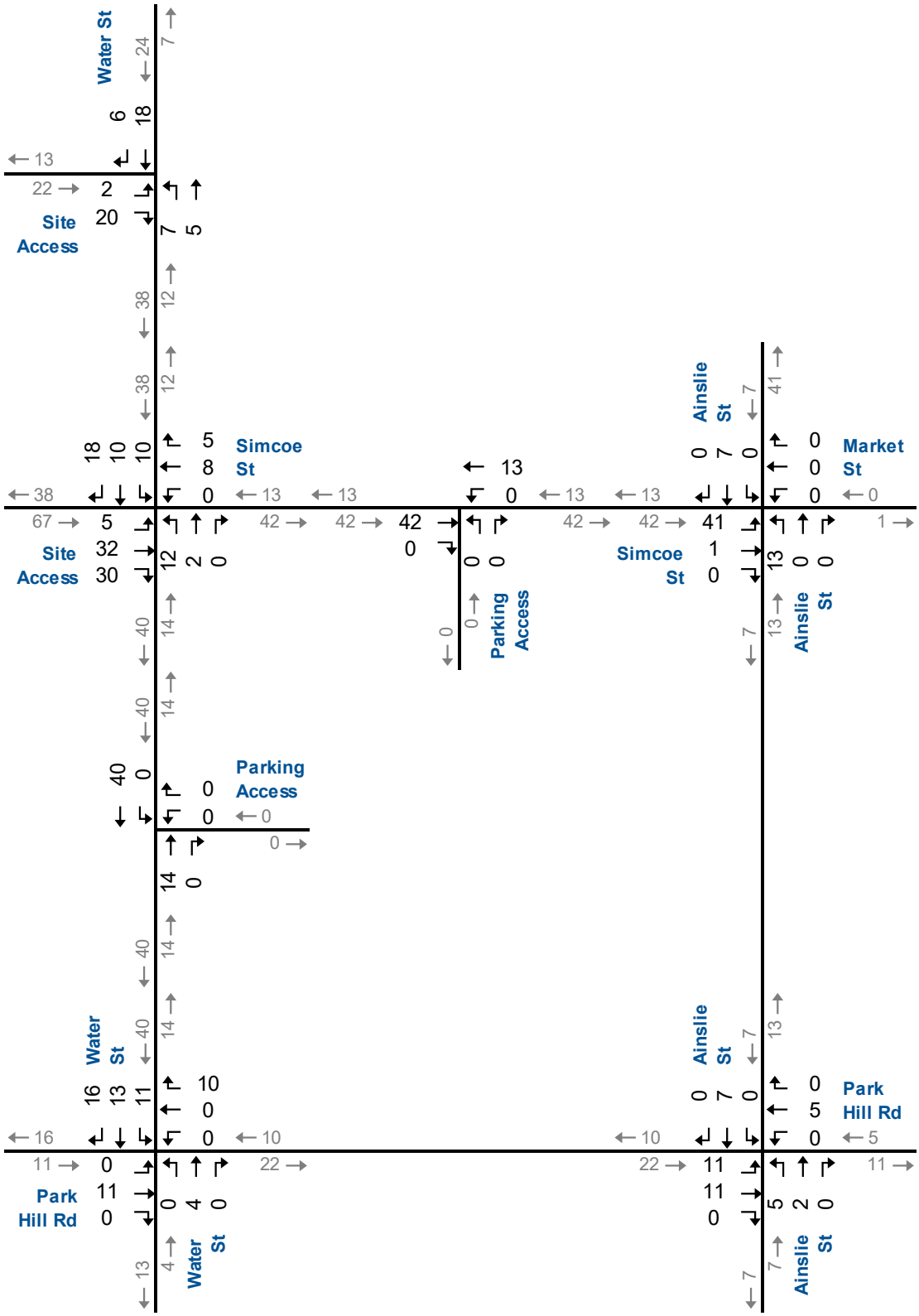
Direction	Route	In	Out
North	Water Street/Ainsle Street	47%	46%
East	Market Street	1%	1%
	Park Hill Road	11%	12%
South	Water Street	9%	15%
	Ainsle Street	13%	8%
West	Park Hill Road	19%	18%
Total		**100%**	**100%**

Figure 3.2a and **Figure 3.2b** contain the AM and PM peak hour site generated trip assignment, respectively.

[3] Trip Generation Tenth Edition, Institute of Transportation Engineers, Washington D.C., 2017
[4] Transportation Tomorrow Survey 2016, GTA 2006 Traffic Zone 7388,7390)

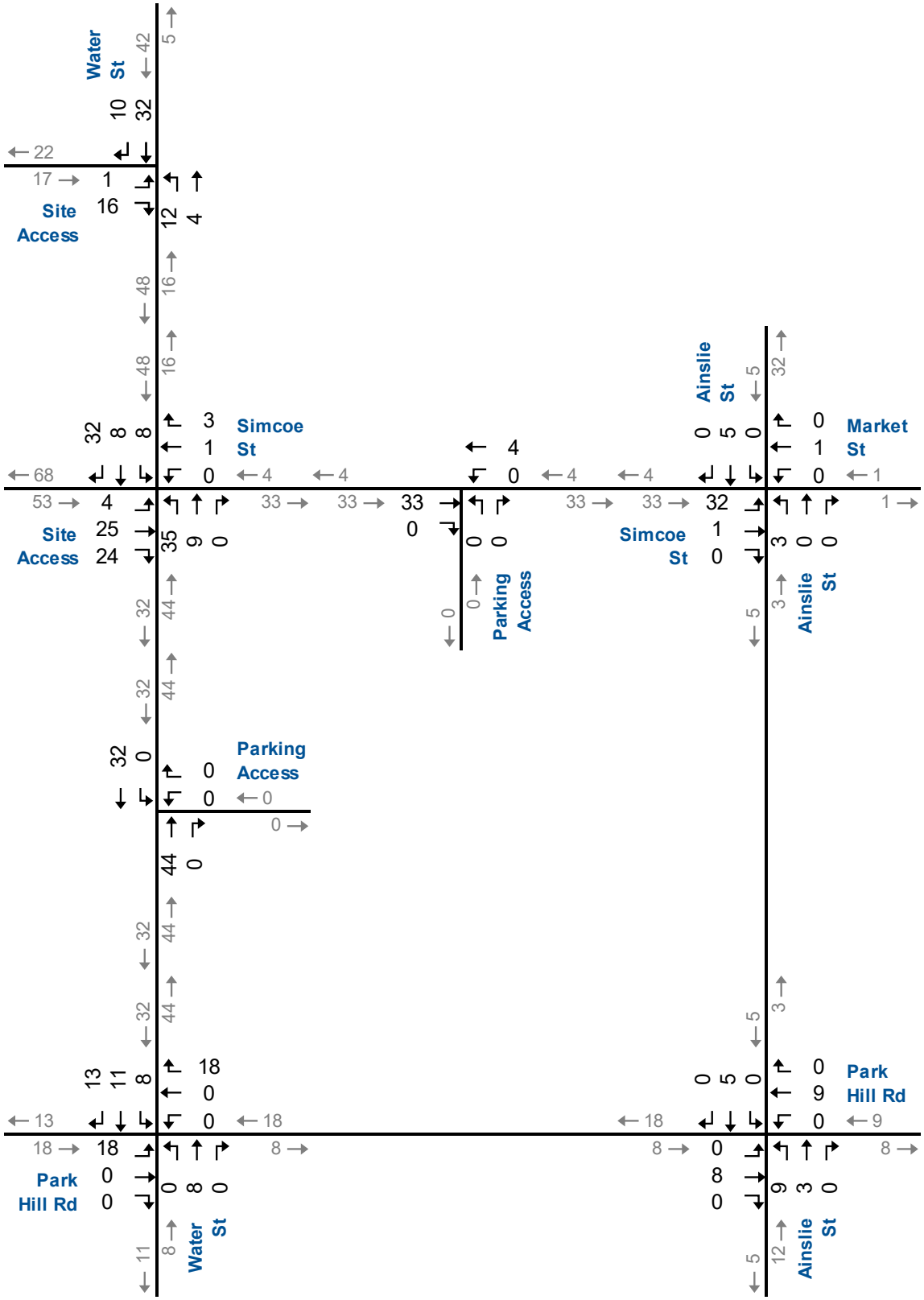
A separate scenario was evaluated for event-based traffic using the stand-alone parking garage as it is likely to occur outside of the peak hours. This scenario was analyzed using the PM forecast for the subject site and traffic forecasted to use the parking garage. There are approximately 259 parking spaces in the garage, assuming 1 trip per space and 90% inbound distribution, the garage generated trips were assigned to the study area road network using the distribution provided in **Table 3.2**.

Figure 3.3 contains the trip assignment for the event scenario.



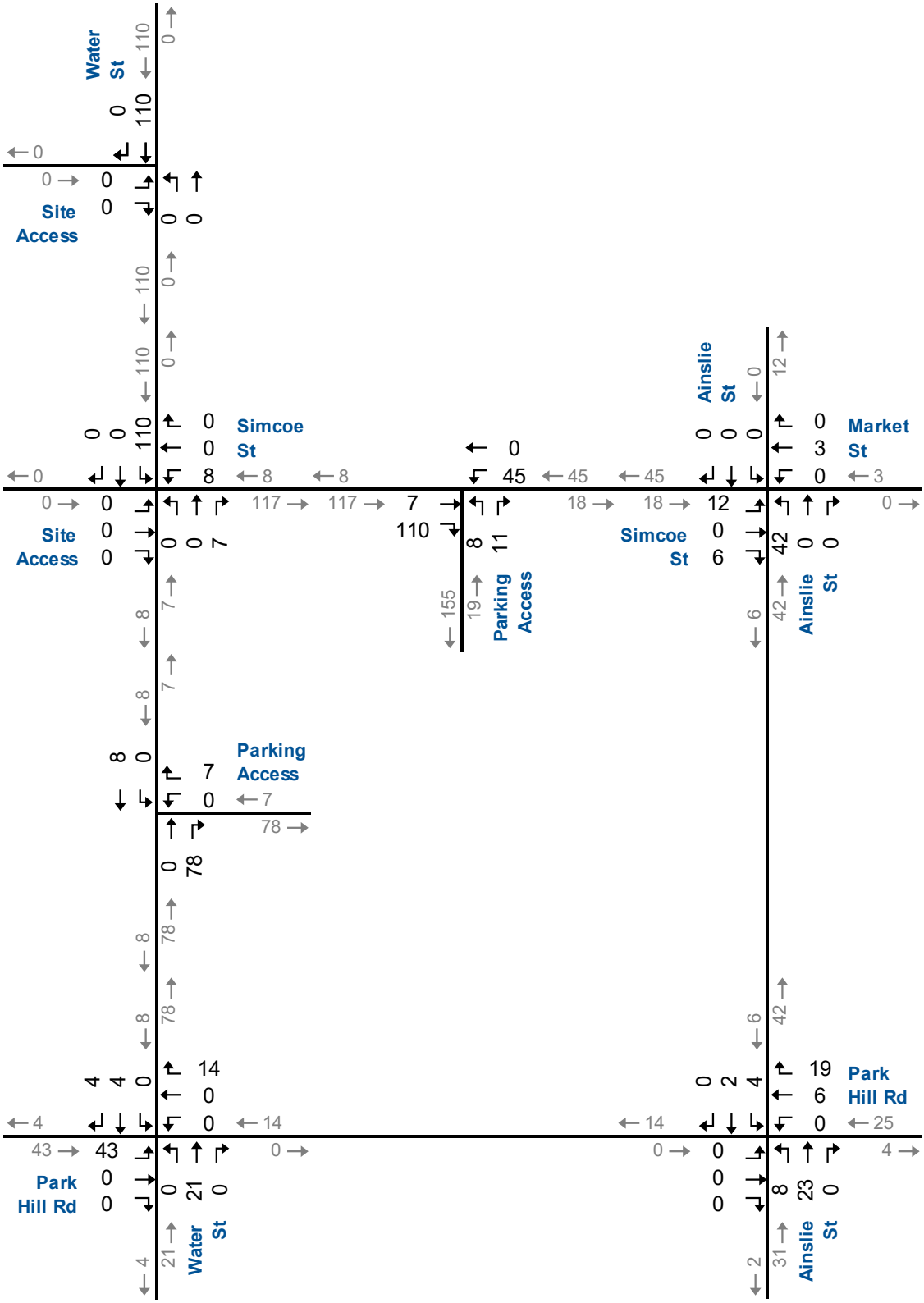
Site Generated Traffic Volumes AM Peak Hour

Figure 3.2a



Site Generated Traffic Volumes PM Peak Hour

Figure 3.2b



Site Generated Traffic Volumes
Event Scenario
PM Peak Hour

Figure 3.3

4 Future Traffic Conditions

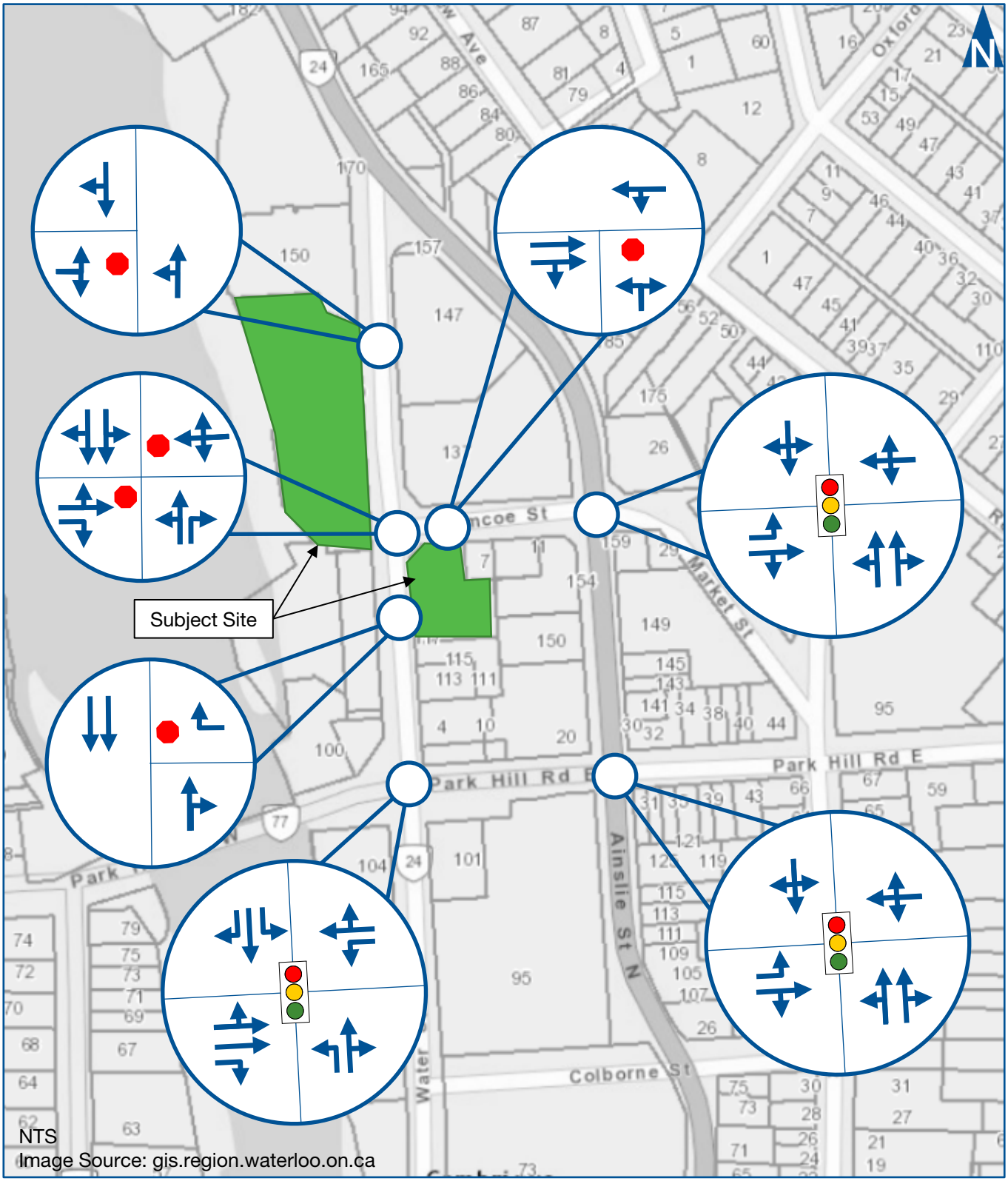
The assessment of the future traffic conditions contained in this section includes the future traffic forecasts as well as the level of service analysis.

4.1 Road Network Improvements

The Region of Waterloo and the City of Cambridge are planning to redesign the one-way section of Water Street between Simcoe Street and Ainslie Street into two-way within the short-term. The new northbound direction of Water Street is anticipated to be one northbound lane with a right-turn only at Ainslie Street. This improvement has been incorporated into the study, however, no future traffic volume forecasts for the northbound direction of Water Street was provided. Therefore, only the site generated trips from **Section 3** have been included in this section.

With the conversion of Water Street from one-way to two-way, the configuration of Water Street and Simcoe Street / Site driveway has been assumed as an shared left/through-turn lane and a right-turn lane for the eastbound (Site Driveway) approach and a shared left/through/right-turn for the westbound (Simcoe Street) approach. The northbound is assumed as a shared left/through-turn lane and an exclusive right-turn. The southbound movement is assumed to have a shared left/through lane and a shared through/right-turn lane.

Figure 4.1 displays the assumed future lane configurations and traffic controls for the study area.



paradigm TRANSPORTATION SOLUTIONS LIMITED

Future Lane Configuration & Traffic Control

130 Water Street North, Cambridge TIS
200034

Figure 4.1

4.2 2027 Background Horizon

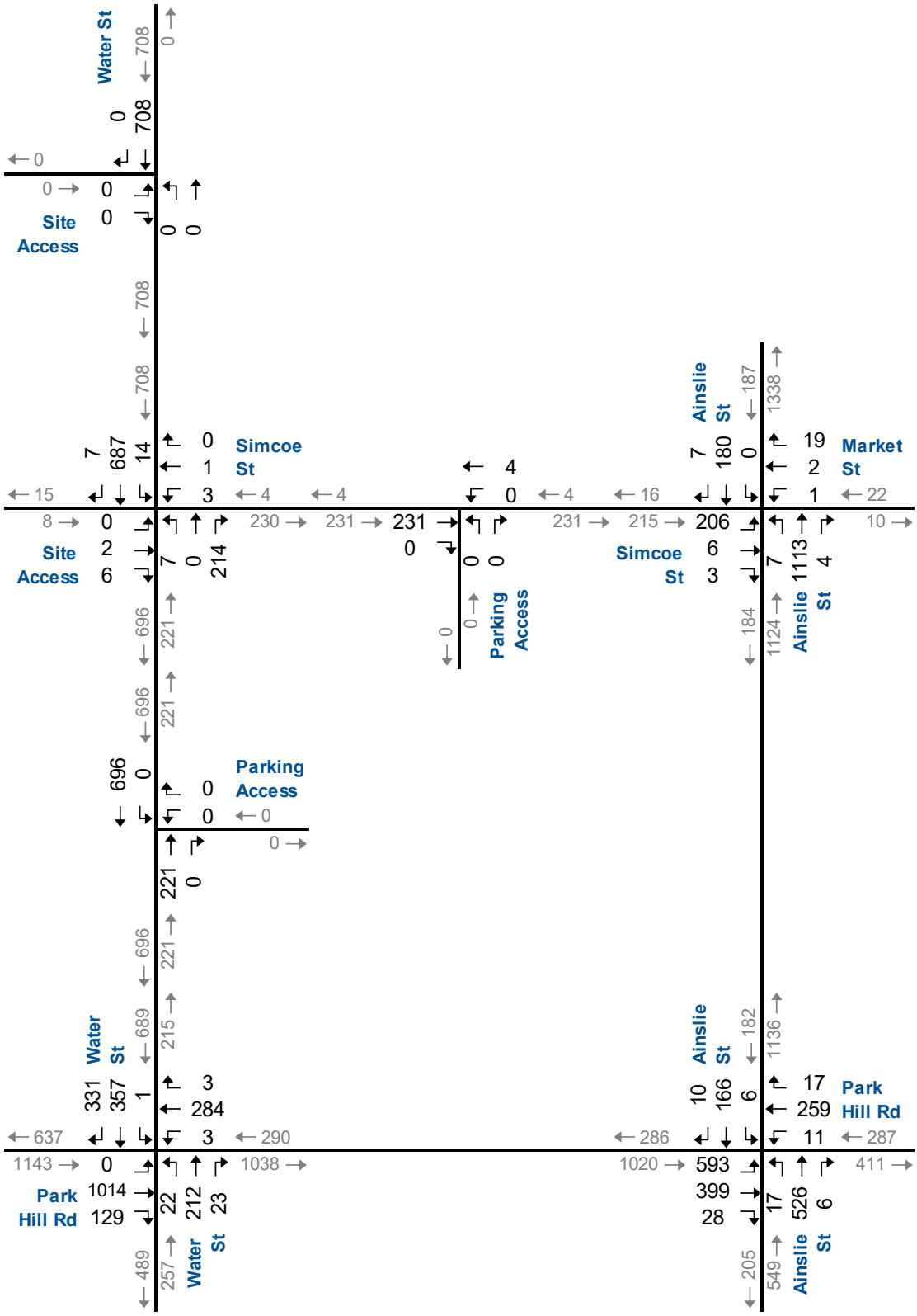
4.2.1 2027 Background Traffic Growth

The 2027 background traffic volumes reflect an assumed annual growth rate of 1.5% per annum applied to the existing traffic volumes and one adjacent development applications identified by the City. The growth rate was confirmed with the City of Cambridge during the pre-study consultation. The following background developments were included in the background forecasts:

- **55 Kerr Street.** High density residential development containing approximately 602 residential units with trip generation and distribution taken from the supportive traffic study[5].

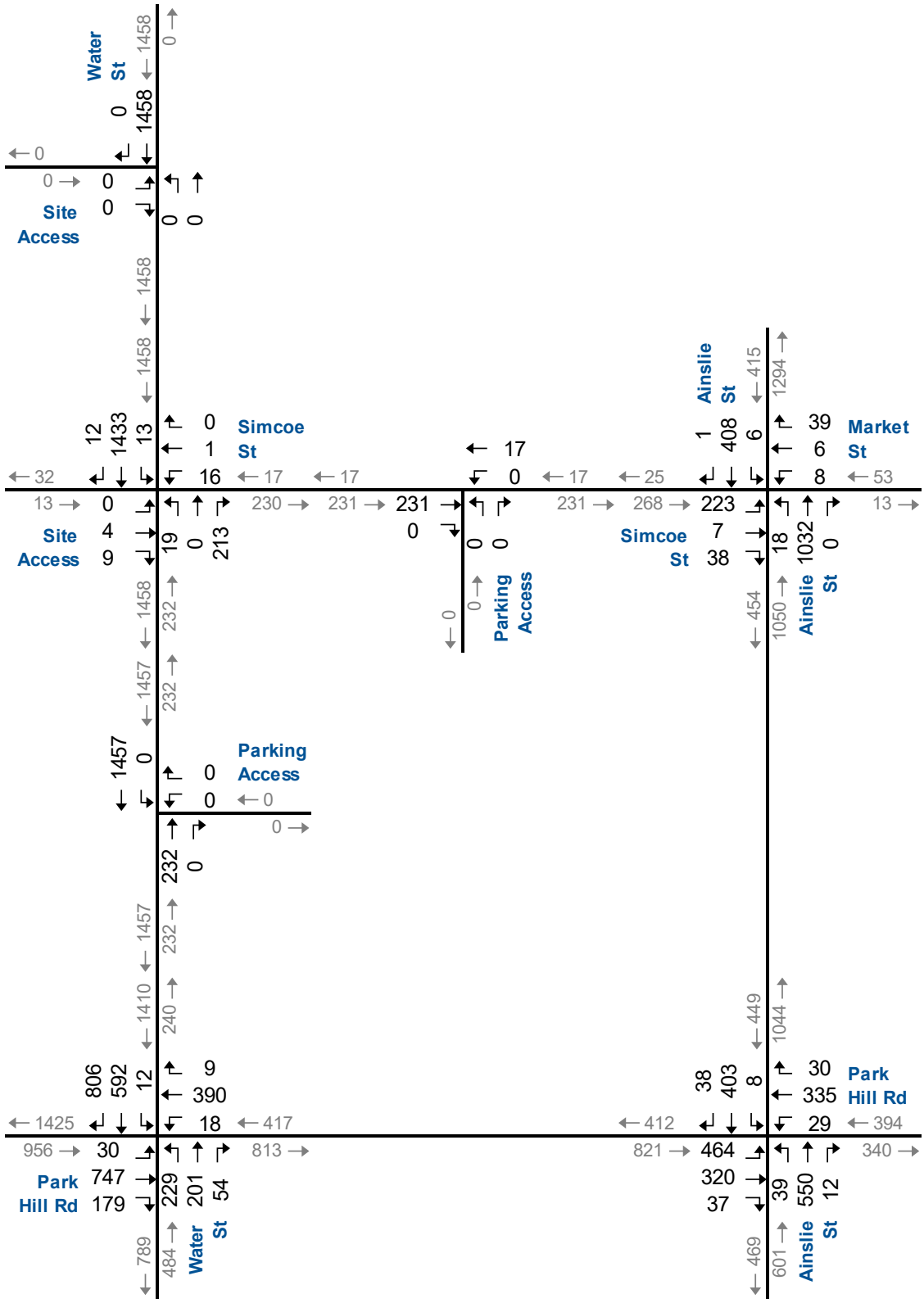
Figure 4.2a and **Figure 4.2b** illustrate the 2027 background traffic volume forecasts

[5] Transportation Impact Study, Proposed Residential Development, 55 Kerr Street, City of Cambridge, LEA Consulting Ltd, June 2019



2027 Background Traffic Volumes AM Peak Hour

Figure 4.2a



2027 Background Traffic Volumes PM Peak Hour

Figure 4.2b

4.2.2 2027 Background Traffic Operations

The study area intersection operations analysis for the background traffic scenario followed the same methodology used for the existing traffic conditions. **Table 4.1** details the level of service conditions. **Appendix D** contains the supporting detailed Synchro 9 reports.

Study area intersections are forecast to operate with the following critical movements:

- Water Street and Park Hill Road:
  - The intersection is forecast to operate with an overall LOS E and v/c ratio greater than 1.0 during the PM peak hour;
  - The northbound left-turn movement is forecast to operate at LOS F with a v/c ratio greater than 1.0 and queue reach greater than its available storage in the PM peak hour; and
  - The southbound right-turn movement is forecast to operate at LOS F with a v/c ratio greater than 1.0 and queue reach greater than its available storage in the PM peak hour;
- Ainslie Street and Park Hill Road:
  - The intersection is forecast to operate with an overall LOS D and v/c ratio of greater than 1.0 during the AM peak hour and LOS E and v/c ratio greater than 1.0 during the PM peak hour.
  - The eastbound left-turn movement is forecast to operate at LOS F with v/c ratio greater than 1.0 and a queue reach greater than its available storage in the AM peak hour. In the PM peak hour this movement is forecast to operate at LOS F with v/c ratio greater than 1.0 and queue reach greater than its available storage;
  - The westbound shared left/through/right-turn movement is forecast to operate at LOS E with v/c ratio of 0.96 during the PM peak hour; and
  - The southbound shared left/through/right-turn movement is forecast to operate at LOS E with v/c ratio of 0.94 during the PM peak hour.
- Ainslie Street and Simcoe Street/Market Street:
  - The eastbound left-turn movement is forecast to operate with a queue reach greater than its available storage in the AM and PM peak hours.
- Water Street and Simcoe Street/Site Driveway:

- The eastbound through movement is operating at LOS E with v/c ratio of 0.05 during the PM peak hour.

TABLE 4.1: 2027 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	Water Street & Park Hill Roaad	TCS	LOS	<	C	B	**C**	B	C	>	**C**	B	B	>	**B**	B	C	B	**C**	**C**
			Delay	<	26	15	**25**	14	21	>	**21**	16	15	>	**15**	16	25	19	**23**	**23**
			V/C	<	0.81	0.14		0.03	0.53	>		0.09	0.34	>		0.00	0.61	0.26		**0.72**
			Q	<	99	13		2	57	>		6	38	>		1	74	17		
			Ex	<		10		15		>		25		>		40		110		
			Avail.	<		-3		13		>		19		>		39		93		
	Ainslie Street & Park Hill Road	TCS	LOS	F	B	>	**E**	<	D	>	**D**	<	C	>	**C**	<	C	>	**C**	**D**
			Delay	86	12	>	**55**	<	43	>	**43**	<	28	>	**28**	<	23	>	**23**	**43**
			V/C	1.11	0.57	>		<	0.85	>		<	0.75	>		<	0.49	>		**1.04**
			Q	178	78	>		<	92	>		<	54	>		<	39	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-148		>		<		>		<		>		<		>		
	Ainslie Street & Simcoe Street/Market Street	TCS	LOS	C	B	>	**C**	<	B	>	**B**	<	B	>	**B**	<	A	>	**A**	**B**
			Delay	28	17	>	**27**	<	17	>	**17**	<	12	>	**12**	<	7	>	**7**	**13**
			V/C	0.70	0.02	>		<	0.02	>		<	0.72	>		<	0.23	>		**0.71**
			Q	58	4	>		<	6	>		<	86	>		<	23	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-28		>		<		>		<		>		<		>		
	Water Street North & Simcoe Street/Site Driveway	TWSC	LOS		C	B	**B**	<	B		**B**	A	A		**A**	A	A	>	**A**	**A**
			Delay		20	12	**14**	<	13		**13**	9	0		**0**	8	0	>	**0**	**0**
			V/C		0.01	0.01		<	0.01			0.01	0.13			0.01	0.27	>		
			Q		0	0		<	0			0	0			0	0	>		
			Ex					<				25				25		>		
			Avail.					<				25				25		>		
PM Peak Hour	Water Street & Park Hill Roaad	TCS	LOS	<	C	C	**C**	C	C	>	**C**	F	B	>	**F**	B	C	F	**F**	**E**
			Delay	<	29	21	**28**	21	32	>	**31**	261	13	>	**130**	15	34	156	**103**	**76**
			V/C	<	0.75	0.26		0.14	0.72	>		1.45	0.33	>		0.03	0.83	1.26		**1.12**
			Q	<	87	28		8	97	>		80	39	>		5	155	227		
			Ex	<		10		15		>		25		>		40		110		
			Avail.	<		-18		7		>		-55		>		35		-117		
	Ainslie Street & Park Hill Road	TCS	LOS	F	B	>	**F**	<	E	>	**E**	<	C	>	**C**	<	E	>	**E**	**E**
			Delay	130	15	>	**80**	<	63	>	**63**	<	27	>	**27**	<	55	>	**55**	**58**
			V/C	1.19	0.50	>		<	0.96	>		<	0.71	>		<	0.94	>		**1.13**
			Q	162	67	>		<	130	>		<	67	>		<	136	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-132		>		<		>		<		>		<		>		
	Ainslie Street & Simcoe Street/Market Street	TCS	LOS	C	B	>	**C**	<	B	>	**B**	<	B	>	**B**	<	A	>	**A**	**B**
			Delay	30	16	>	**28**	<	16	>	**16**	<	12	>	**12**	<	10	>	**10**	**14**
			V/C	0.74	0.05	>		<	0.07	>		<	0.71	>		<	0.55	>		**0.72**
			Q	70	8	>		<	10	>		<	85	>		<	66	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-40		>		<		>		<		>		<		>		
	Water Street North & Simcoe Street/Site Driveway	TWSC	LOS		E	C	**D**	<	C		**C**	B	A		**A**	A	A	>	**A**	**A**
			Delay		50	15	**26**	<	21		**21**	13	0		**1**	8	0	>	**0**	**1**
			V/C		0.05	0.02		<	0.07			0.04	0.13			0.01	0.56	>		
			Q		1	1		<	2			1	0			0	0	>		
			Ex					<				25				25		>		
			Avail.					<				24				25		>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length (m)
Ex. - Existing Available Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< - Shared Left-Turn
> - Shared Right-Turn

4.3 2027 Total Traffic Horizon

4.3.1 2027 Total Traffic Volumes

Figure 4.3a and **Figure 4.3b** illustrate the 2027 total (background + site traffic) traffic volume forecasts.

4.3.2 2027 Total Traffic Operations

The study area intersection operations analysis for the future total traffic scenario followed the same methodology used for the existing and background traffic conditions. **Table 4.2a** and **Table 4.2b** details the level of service conditions for the AM and PM peak hours respectively. **Appendix E** contains the supporting detailed Synchro 9 reports.

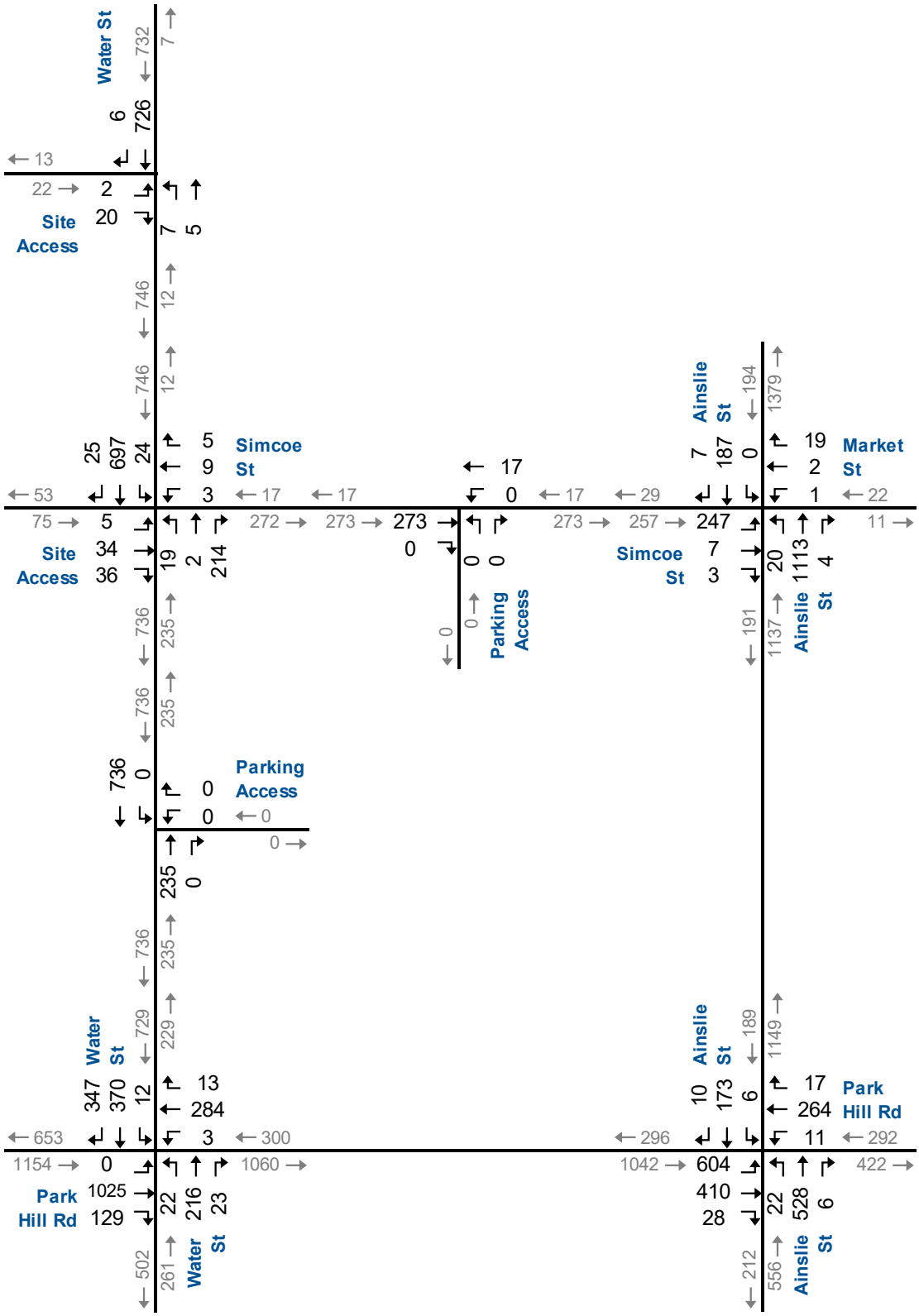
Study area intersections, including the site accesses, are forecast to with the following critical movements:

- Water Street and Park Hill Road:
  - The intersection is forecast to operate with an overall LOS F and v/c ratio of 1.19 during the PM peak hour;
  - The northbound left-turn movement is forecast to operate at LOS F with a v/c ratio greater than 1.0 and queue reach greater than its available storage in the PM peak hour; and
  - The southbound right-turn movement is forecast to operate at LOS F with a v/c ratio greater than 1.0 and queue reach greater than its available storage in the PM peak hour;
- Ainslie Street and Park Hill Road:
  - The intersection is forecast to operate with an overall LOS D and v/c ratio greater than 1.0 during the AM peak hour and LOS E and v/c ratio greater than 1.0 during the PM peak hour.
  - The eastbound left-turn movement is forecast to operate at LOS F with v/c ratio greater than 1.0 and a queue reach greater than its available storage in the AM peak hour. In the PM peak hour this movement is forecast to operate at LOS F with v/c ratio greater than 1.0 and queue reach greater than its available storage;
  - The westbound shared left/through/right-turn movement is forecast to operate at LOS E with v/c ratio of 0.98 during the PM peak hour; and

    - The southbound shared left/through/right-turn movement is forecast to operate at LOS E with v/c ratio of 0.95 during the PM peak hour.
- Ainslie Street and Simcoe Street/Market Street:
    - The eastbound left-turn movement is forecast to operate with a queue reach greater than its available storage in the AM and PM peak hours.
- Water Street and Simcoe Street/Site Driveway:
    - The eastbound left-turn movement is forecast to operate at LOS F with v/c ratio of 0.07 during the PM peak hour;
    - The eastbound shared left/through-turn movement is forecast to operate at LOS F with v/c ratio of 0.51 during the PM peak hour; and
    - The westbound shared left/through/right-turn movement is forecast to operate at LOS E with v/c ratio of 0.16 during the PM peak hour.
- Water Street and Site Driveway:
    - The eastbound shared left/right-turn movement is forecast to operate at LOS D with v/c ratio of 0.11 during the PM peak hour.

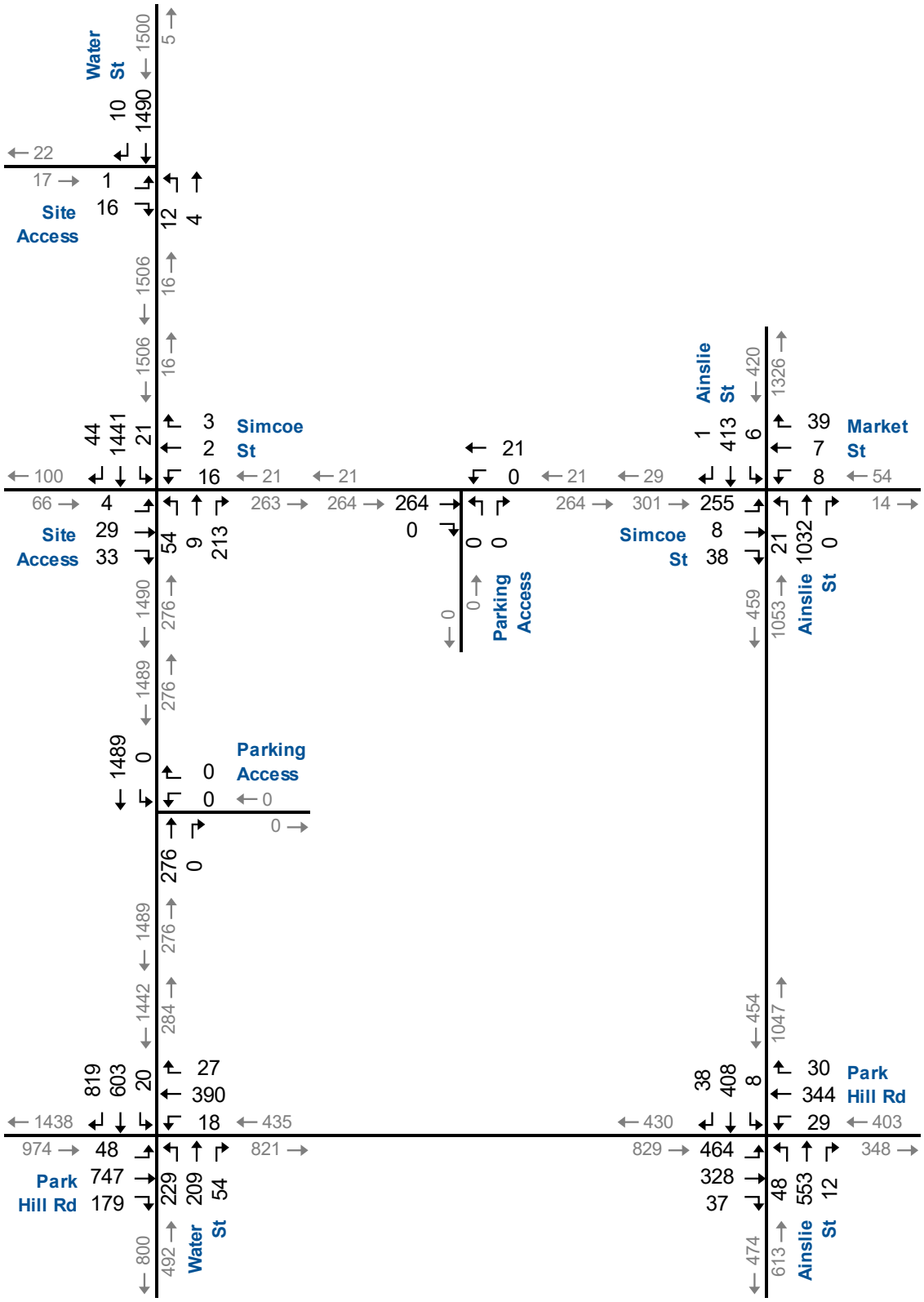
The addition of the site generated trips increases the overall intersection delays by 6 seconds or less during the AM peak hour and 6 seconds or less during the PM peak hour for the study area intersections.

The site driveways to Water Street are forecast to operate with high delays during the PM peak hour, however, the low v/c ratios indicate that while there is delay, there remains excess capacity for the site driveways.



2027 Total Traffic Volumes AM Peak Hour

Figure 4.3a



2027 Total Traffic Volumes PM Peak Hour

130 Water Street North, Cambridge TIS
200034

Figure 4.3b

TABLE 4.2A: 2027 TOTAL TRAFFIC OPERATIONS – AM PEAK HOUR

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	Water Street & Park Hill Roaad	TCS	LOS	<	C	B	**C**	B	C	>	**C**	B	B	>	**B**	B	C	B	**C**	**C**
			Delay	<	26	15	**25**	14	21	>	**21**	16	15	>	**15**	17	26	20	**23**	**23**
			V/C	<	0.82	0.14		0.03	0.55	>		0.10	0.35	>		0.05	0.63	0.27		**0.73**
			Q	<	100	13		2	59	>		6	39	>		5	77	17		
			Ex	<		10		15		>		25		>		40		110		
			Avail.	<		-3		13		>		19		>		35		93		
	Ainslie Street & Park Hill Road	TCS	LOS	F	B	>	**E**	<	D	>	**D**	<	C	>	**C**	<	C	>	**C**	**D**
			Delay	98	12	>	**62**	<	45	>	**45**	<	28	>	**28**	<	23	>	**23**	**47**
			V/C	1.14	0.59	>		<	0.87	>		<	0.76	>		<	0.51	>		**1.06**
			Q	183	81	>		<	94	>		<	55	>		<	41	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-153		>		<		>		<		>		<		>		
	Ainslie Street & Simcoe Street/Market Street	TCS	LOS	C	B	>	**C**	<	B	>	**B**	<	B	>	**B**	<	A	>	**A**	**B**
			Delay	32	16	>	**32**	<	16	>	**16**	<	14	>	**14**	<	8	>	**8**	**16**
			V/C	0.77	0.02	>		<	0.02	>		<	0.76	>		<	0.26	>		**0.77**
			Q	75	4	>		<	6	>		<	88	>		<	25	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-45		>		<		>		<		>		<		>		
	Water Street North & Simcoe Street/Site Driveway	TWSC	LOS	<	D	B	**C**	<	B	>	**B**	<	A	A	**A**	<	A	>	**A**	**A**
			Delay	<	25	12	**19**	<	15	>	**15**	<	9	0	**1**	<	1	>	**0**	**2**
			V/C	<	0.18	0.07		<	0.05	>		<	0.02	0.13		<	0.22	>		
			Q	<	5	2		<	1	>		<	1	0		<	0	>		
			Ex	<				<		>		<				<		>		
			Avail.	<				<		>		<				<		>		
	Water Street & Site Driveway	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	14		>	**14**					<	5		**5**		0	>	**0**	**1**
			V/C	0.05		>						<	0.01				0.43	>		
			Q	1		>						<	0				0	>		
			Ex			>						<						>		
			Avail.			>						<						>		
	Simcoe Street & Parking Garage Access	TWSC	LOS		A	>	**A**	<	A		**A**	A		>	**A**					**A**
			Delay		0	>	**0**	<	0		**0**	0		>	**0**					**0**
			V/C		0.11	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
			Ex			>		<						>						
			Avail.			>		<						>						
	Water Street & Parking Garage Access	TWSC	LOS							A	**A**		A	>	**A**		A		**A**	**A**
			Delay							0	**0**		0	>	**0**		0		**0**	**0**
			V/C							0.00			0.14	>			0.29			
			Q							0			0	>			0			
			Ex											>						
			Avail.											>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
Q - 95th Percentile Queue Length (m)
Ex. - Existing Available Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< - Shared Left-Turn
> - Shared Right-Turn

TABLE 4.2B: 2027 TOTAL TRAFFIC OPERATIONS – PM PEAK HOUR

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	
PM Peak Hour	Water Street & Park Hill Roaad	TCS	LOS	<	D	C	**C**	C	C	>	**C**	F	B	>	**F**	B	C	F	**F**	**F**
			Delay	<	35	21	**33**	21	34	>	**33**	286	13	>	**140**	15	35	167	**109**	**82**
			V/C	<	0.85	0.26		0.15	0.76	>		1.51	0.34	>		0.05	0.85	1.28		**1.19**
			Q	<	103	28		8	111	>		81	40	>		6	159	233		
			Ex	<		10		15		>		25		>		40		110		
			Avail.	<		-18		7		>		-56		>		34		-123		
	Ainslie Street & Park Hill Road	TCS	LOS	F	B	>	**F**	<	E	>	**E**	<	C	>	**C**	<	E	>	**E**	**E**
			Delay	139	16	>	**85**	<	70	>	**70**	<	28	>	**28**	<	55	>	**55**	**61**
			V/C	1.21	0.51	>		<	0.98	>		<	0.74	>		<	0.95	>		**1.15**
			Q	163	69	>		<	134	>		<	70	>		<	139	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-133		>		<		>		<		>		<		>		
	Ainslie Street & Simcoe Street/Market Street	TCS	LOS	C	B	>	**C**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
			Delay	34	16	>	**31**	<	16	>	**16**	<	14	>	**14**	<	11	>	**11**	**16**
			V/C	0.80	0.05	>		<	0.07	>		<	0.73	>		<	0.57	>		**0.76**
			Q	85	9	>		<	10	>		<	85	>		<	67	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-55		>		<		>		<		>		<		>		
	Water Street North & Simcoe Street/Site Driveway	TWSC	LOS	<	F	C	**F**	<	E	>	**A**	<	B	A	**A**	<	A	>	**A**	**A**
			Delay	<	109	16	**63**	<	38	>	**0**	<	12	0	**3**	<	0	>	**0**	**3**
			V/C	<	0.51	0.09		<	0.16	>		<	0.12	0.13		<	0.45	>		
			Q	<	17	2		<	4	>		<	3	0		<	0	>		
			Ex	<				<		>		<				<		>		
			Avail.	<				<		>		<				<		>		
	Water Street & Site Driveway	TWSC	LOS	D		>	**D**					<	B		**B**		A	>	**A**	**A**
			Delay	32		>	**32**					<	10		**10**		0	>	**0**	**1**
			V/C	0.11		>						<	0.03				0.88	>		
			Q	3		>						<	1				0	>		
			Ex			>						<						>		
			Avail.			>						<						>		
	Simcoe Street & Parking Garage Access	TWSC	LOS		A	>	**A**	<	A		**A**	A		>	**A**					**A**
			Delay		0	>	**0**	<	0		**0**	0		>	**0**					**0**
			V/C		0.10	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
			Ex			>		<						>						
			Avail.			>		<						>						
	Water Street & Parking Garage Access	TWSC	LOS							A	**A**		A	>			A		**A**	**A**
			Delay							0	**0**		0	>			0		**0**	**0**
			V/C							0.00			0.16	>			0.58			
			Q							0			0	>			0			
			Ex											>						
			Avail.											>						

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

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

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

< - Shared Left-Turn
> - Shared Right-Turn

4.4 2027 Event Total Traffic Horizon

4.4.1 2027 Event Total Traffic Volumes

Figure 4.4 illustrate the 2027 event total (background + site traffic) traffic volume forecasts for the PM peak hour only.

In discussions with staff from the Region of Waterloo and City of Cambridge, due to the proximity of the Water Street parking garage access to the intersection of Water Street and Simcoe Street, the parking garage access was analyzed as a right-in/right-out only configuration to limit the amount of queuing on the southbound movement of Water Street.

4.4.2 2027 Event Total Traffic Operations

The study area intersection operations analysis of the future total traffic for the event scenario followed the same methodology used for the existing and background traffic conditions. **Table 4.3** details the level of service conditions.

The following critical movements are noted:

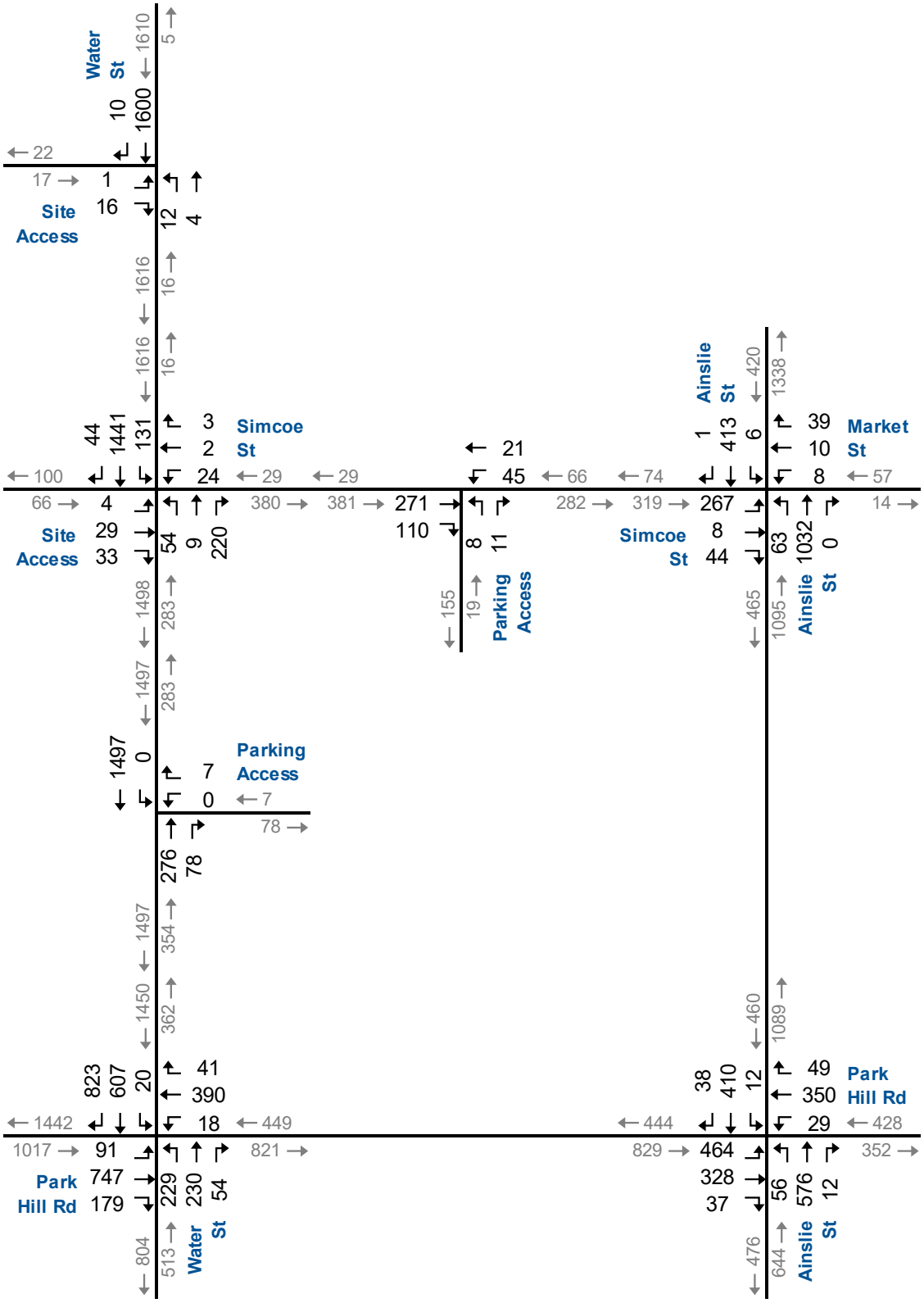
- Water Street and Park Hill Road:
  - The intersection is forecast to operate with an overall LOS F and v/c ratio greater than 1.0 during the PM peak hour;
  - The northbound left-turn movement is forecast to operate at LOS F with a v/c ratio greater than 1.0 and queue reach greater than its available storage in the PM peak hour;
  - The southbound right-turn movement is forecast to operate at LOS F with a v/c ratio greater than 1.0 and queue reach greater than its available storage in the PM peak hour; and
  - The eastbound shared left/through movement is forecast to operate at LOS E with v/c ratio greater than 1.0 during the PM peak hour.
- Ainslie Street and Park Hill Road:
  - The intersection is forecast to operate with an overall LOS E and v/c ratio of greater than 1.0 during the PM peak hour.
  - The eastbound left-turn movement is forecast to operate at LOS F with v/c ratio greater than 1.0 and queue reach greater than its available storage;
  - The westbound shared left/through/right-turn movement is forecast to operate at LOS F with v/c ratio greater than 1.0 during the PM peak hour; and

    - The southbound shared left/through/right-turn movement is forecast to operate at LOS E with v/c ratio of 0.96 during the PM peak hour.
- Ainslie Street and Simcoe Street/Market Street:
    - The eastbound left-turn movement is forecast to operate with a queue reach greater than its available storage in the PM peak hours.
- Water Street and Simcoe Street/Site Driveway:
    - The eastbound shared left/through-turn movement is forecast to operate at LOS F with v/c ratio of 0.78 during the PM peak hour; and
    - The westbound shared left/through/right-turn movement is forecast to operate at LOS F with v/c ratio of 0.47 during the PM peak hour.
- Water Street and Site Driveway:
    - The eastbound shared left/right-turn movement is forecast to operate at LOS E with v/c ratio of 0.13 during the PM peak hour.

Both parking garage accesses are forecast to operate with LOS B or better and v/c ratios of 0.44 or lower.

The site driveways to Water Street are forecast to operate with high delays during the PM peak hour, however, the low v/c ratios indicate that while there is delay, there remains excess capacity for the site driveways.

Appendix F contains the supporting detailed Synchro 9 reports.



2027 Total Traffic Volumes Event Scenario PM Peak Hour

Figure 4.4

TABLE 4.3: 2027 EVENT 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	
PM Peak Hour	Water Street & Park Hill Roaad	TCS	LOS	<	E	C	**E**	C	D	>	**D**	F	B	>	**F**	B	D	F	**F**	**F**
			Delay	<	75	21	**66**	22	36	>	**35**	299	14	>	**141**	15	35	170	**111**	**92**
			V/C	<	1.05	0.26		0.17	0.78	>		1.54	0.37	>		0.05	0.85	1.29		**1.30**
			Q	<	126	28		8	117	>		82	44	>		6	161	235		
			Ex	<		10		15		>		25		>		40		110		
			Avail.	<		-18		7		>		-57		>		34		-125		
	Ainslie Street & Park Hill Road	TCS	LOS	F	B	>	**F**	<	F	>	**F**	<	C	>	**C**	<	E	>	**E**	**E**
			Delay	158	16	>	**96**	<	89	>	**89**	<	31	>	**31**	<	59	>	**59**	**70**
			V/C	1.26	0.51	>		<	1.05	>		<	0.80	>		<	0.96	>		**1.18**
			Q	165	69	>		<	145	>		<	76	>		<	142	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-135		>		<		>		<		>		<		>		
	Ainslie Street & Simcoe Street/Market Street	TCS	LOS	D	B	>	**D**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
			Delay	42	17	>	**38**	<	17	>	**17**	<	16	>	**16**	<	11	>	**11**	**18**
			V/C	0.84	0.05	>		<	0.08	>		<	0.78	>		<	0.56	>		**0.80**
			Q	93	9	>		<	11	>		<	95	>		<	66	>		
			Ex	30		>		<		>		<		>		<		>		
			Avail.	-63		>		<		>		<		>		<		>		
	Water Street North & Simcoe Street/Site Driveway	TWSC	LOS	<	F	C	**F**	<	F	>	**F**	<	B	A	**A**	<	A	>	**A**	**A**
			Delay	<	220	16	**118**	<	108	>	**108**	<	12	0	**3**	<	0	>	**0**	**7**
			V/C	<	0.78	0.09		<	0.47	>		<	0.12	0.13		<	0.45	>		
			Q	<	24	2		<	15	>		<	3	0		<	0	>		
			Ex	<				<		>		<				<		>		
			Avail.	<				<		>		<				<		>		
	Water Street & Site Driveway	TWSC	LOS	E		>	**E**					<	B		**B**		A	>	**A**	**A**
			Delay	37		>	**37**					<	11		**11**		0	>	**0**	**1**
			V/C	0.13		>						<	0.03				0.95	>		
			Q	4		>						<	1				0	>		
			Ex			>						<						>		
			Avail.			>						<						>		
	Simcoe Street & Parking Garage Access	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					**A**
			Delay		0	>	**0**	<	6		**6**	11		>	**11**					**1**
			V/C		0.11	>		<	0.04			0.03		>						
			Q		0	>		<	1			1		>						
			Ex			>		<						>						
			Avail.			>		<						>						
	Water Street & Parking Garage Access	TWSC	LOS							B	**B**		A	>			A		**A**	**A**
			Delay							10	**10**		0	>			0		**0**	**0**
			V/C							0.01			0.21	>			0.44			
			Q							0			0	>			0			
			Ex											>						
			Avail.											>						

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

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

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

< - Shared Left-Turn
> - Shared Right-Turn

5 Remedial Measures

5.1 Left-Turn Lane Warrants

The Ministry of Transportation's Design Supplement for the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads[6] provides guidance on the assessment and/or need for auxiliary left-turn lanes

The warrants have been completed for the northerly site driveway onto Water Street (northbound left-turn) and for the Simcoe Street Parking garage driveway (eastbound left-turn). A design speed of 60 km/h (10 km/h over the assumed speed limit) has been used for the analysis purposes. **Table 5.1** summarizes the left-turn lane warrants.

The warrant analysis suggests that left-turn lanes are not warranted at the two driveways.

TABLE 5.1: LEFT-TURN LANE WARRANT SUMMARY

Roadway	Water Street		Simcoe Street	
Intersection	Site Access (North)		Parking Garage	
Approach Direction	Northbound		Eastbound	
Design Speed	60 km/h		60 km/h	
Horizon	Total 2027		Total 2027 (Event)	
Peak Hour	AM	PM	AM	PM
Advancing Volume	12	16	17	66
Opposing Volumes	732	1500	273	381
Left Turning Traffic	7	12	0	45
% of Left Turning Traffic	58%	75%	0%	68%
Figure Used*	9A-9	9A-9	--	9A-9
Warranted	No	No	No	No
Storage Length Required	--	--	--	--

Based on MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads - June 2017

Appendix G contains the left-turn lane warrant nomographs

5.2 Traffic Control Improvements

The traffic analysis in **Section 4** of the report indicates that traffic control improvements may be required to accommodate forecast traffic volumes.

[6] MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads, June 2017 Appendix 9 for Chapter 9 Intersections

The intersection of Water Street North and Simcoe Street/Site Driveway was assessed using the Ontario Traffic Manual (OTM Book 12 – Justification 7) signal warrant[7] procedures. **Appendix H** contains the warrant analysis. The traffic signal warrant analysis indicates that a traffic control signal is not warranted at the intersection of Water Street North and Simcoe Street/Simcoe Street under 2027 total traffic conditions with or without an event occurring at the Cambridge Mill.

As traffic volumes increase over time the minimum warrant criteria may be met after the 2027 horizon year. It is recommended that the City of Cambridge and Region of Waterloo monitor the future traffic volumes to ensure appropriate forms of traffic control are in place.

5.3 Existing Turn Lane – Additional Storage

As noted in **Section 4**, several study area intersections are forecast to have delay and capacity constraints under future background and total traffic conditions. In order to assess the storage requirements for the auxiliary turning lanes at these intersections, a review of queuing was conducted using the Synchro reports.

Table 5.2 provides a summary of the forecasted 95th percentile queue lengths for the left and right-turn movements at the study area intersections. It indicates the following queue length issues:

- Water Street and Park Hill Road – the eastbound right-turn, northbound left-turn, and southbound right-turn lanes are forecast to have queue lengths greater than their available storage lengths during the PM peak hour under future background and total traffic conditions;
- Ainslie Street and Park Hill Road – the eastbound left-turn lane is forecast to have a queue length greater than its available storage length during the AM and PM peak hours under future background and total traffic conditions; and
- Ainslie Street and Simcoe Street/Market Street – the eastbound left-turn lane is forecast to have a queue length greater than its available storage length during the AM and PM peak hours under future background and total traffic conditions.

The probability of extending storage lanes would be limited due to current limitations such as the Park Hill Road bridge and distance between intersections. It is recommended that the City of Cambridge

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

and Region of Waterloo monitor the future traffic volumes to ensure the storage lengths are able to accommodate the future traffic demand.

TABLE 5.2: 95TH PERCENTILE QUEUING ESTIMATES

Intersection	Turn Lane	Storage Length (m)	95th Percentile Queue Length (m)	
			2027 Background	2027 Total
AM Peak Hour				
Water Street & Park Hill Road	EBR	10	13	13
	WBL	15	2	2
	NBL	25	6	6
	SBL	40	1	5
	SBR	110	17	17
Ainslie Street & Park Hill Road	EBL	30	178	183
Ainslie Street & Simcoe Street/Market Street	EBL	30	58	75
Water Street & Simcoe Street/Site Driveway	EBLT	10	--	5
	EBR	10	--	2
	WBLTR	20	--	1
	NBLT	20	0	1
PM Peak Hour				
Water Street & Park Hill Road	EBR	10	28	28
	WBL	15	8	8
	NBL	25	80	81
	SBL	40	5	6
	SBR	110	227	233
Ainslie Street & Park Hill Road	EBL	30	162	163
Ainslie Street & Simcoe Street/Market Street	EBL	30	70	85
Water Street & Simcoe Street/Site Driveway	EBLT	10	--	17
	EBRT	10	--	2
	WBLT	20	--	4
	NBLT	20	1	3

6 Transportation Demand Management

6.1 Transportation Demand Management Techniques

Transportation Demand Management (TDM) refers to ways of making the capacity of our roads more efficient by reducing vehicle demand. TDM approaches consider how people's choices of travel mode are affected by land use patterns, development design, parking availability, parking cost, and the relative cost, convenience and availability of alternative modes of travel. Various TDM strategies are used to influence those factors so that the alternatives are more competitive with driving alone and potentially reduce reliance on motor vehicles.

TDM strategies at a development can be divided into two basic categories:

- **Pre-occupancy:** things that need to be done while a development is being designed and built; and
- **Post-occupancy:** things that can be done once people are using the development.

The pre-occupancy actions are critical as they are most likely to determine how attractive, convenient, and safe alternative travel will be once the site is occupied. Before a site is occupied, it can be designed to be convenient and safe for pedestrians and cyclists, and vehicle parking can be provided to meet but not exceed demand.

After the development is built, incentives can be offered, but those incentives will not work as well if the site and its surroundings are oriented to cars. The incentives generally include subsidies to use transit, access to rideshare programs, and information about where and how to use alternatives.

6.2 Pre-Occupancy Strategies

6.2.1 Unbundled Parking

Most condominium complexes include the price of parking in the rent or purchase price of the unit, a practice known as bundled parking. This practice assumes that all residents have the same demand for parking, and they all bear the cost through their rent or purchase. This practice fails to reward those who do not own a car and who provide social benefits by their non-auto travel choice. When parking is unbundled, the price of the parking space(s) is separated from the rent or purchase price and allows residents to pay only for parking that they need. Unbundling means that parking is rented or sold separately,

rather than automatically included with building space. Parking can be unbundled in several ways:

- facility managers can unbundle parking when renting building space; developers can make some or all parking optional when selling units;
- in some cases, it may be easier to offer a discount to renters who use fewer than average parking spaces, rather than charging an additional fee;
- parking costs can be itemized in lease agreements to help renters understand the parking costs they bear, and to help them negotiate reductions; and
- informal unbundling can be encouraged by helping to create a secondary market for available spaces.

6.2.2 Transit Support

The development will facilitate on-site pedestrian access to the greater sidewalk network, which in turn, will provide access to the transit stops. The development is located near two well-established bus routes. Route 51 and Ion Bus 302 iXpress. These routes provide access within Cambridge and with further connections to Kitchener and Waterloo, as described in **Section 2.3**. Route 51 runs north-south connecting Ainslie Street Terminal in the south to north of Highway 401. The Ion Bus 302 iXpress is a high-frequency, express route connecting the Ainslie Street Terminal to Fairview Mall where the current southern terminus of the 301 Ion Light Rapid Transit route is located.

The future expansion of the Ion Light Rapid Transit (LRT) route is currently in the planning stage. The southerly terminus of the route is anticipated to be near the Ainslie Street terminal. Once complete, the higher service frequency, lower travel times and longer operating hours of LRT is likely to result in new residents to the area deferring or eliminating automobile purchases. This can likely lead to lower future parking demand when the LRT service is operational.

The proximity and access to these routes is beneficial and can encourage residents to utilize transit, by providing easy access to multiple locations. The provision of high-capacity, high-frequency transit service will be a significant factor contributing to a reduction of automobile trips to/from the site.

6.2.3 Cycling Support

The City of Cambridge requires that long-term bike parking be provided at a rate of 0.3 spaces per dwelling unit for multi-unit

residential developments[8]. This results in a requirement of 76 long-term spaces which should be provided in the building or underground parking structure, a covered enclosure with secure entrance, or bicycle lockers.

The City of Cambridge also requires short-term (visitor) bicycle parking at a rate of 0.05 spaces[9] per dwelling unit with a minimum of 2 spaces and maximum of 12 spaces. Based on the number of dwelling units, a total of 13 short-term bicycle parking spaces are required. These are to be provided close to the main entrance(s) of the building in an area with lighting and non-obtrusive to the pedestrian realm.

The City of Cambridge has also recommended that long-term bicycle parking be provided at the hotel component for both staff and guests. Being located along the Grand River with a number of trails in the downtown area, there is the potential for cycling tourism opportunities for this part of Cambridge that the development could support.

6.3 Alternative Post-Occupancy Strategies

6.3.1 On-Site Transit Support

The owner should investigate the feasibility of providing access to real-time transit information for area transit routes, including the future express transit and that this information is readily available in public areas of the development.

6.3.2 TDM Coordinator

The building owner should look to delegate an interested individual or require the property manager to act as a coordinator for the TDM measures. The TDM coordinator will provide information for the car-share program and administer access to the secured bicycle parking. It is expected that a representative of the City of Cambridge or Region of Waterloo will be available to assist the TDM coordinator to help get the programs started during the early stages of operations.

6.3.3 Car Share Program

Availability of a shared vehicle will allow residents who normally would not need a vehicle for their daily activities to be comfortable with the decision to not own a vehicle. The owner should consider providing a parking space as a designated car-share space, pending demand. The owner should liaise with the “CarShare Anywhere” program, to

[8] Table 4 – Minimum Bicycle Parking Requirements, Cambridge Cycling Master Plan, February 2020
[9] Table 4 – Minimum Bicycle Parking Requirements, Cambridge Cycling Master Plan, February 2020

determine the feasibility of providing a vehicle stored on site in a surface lot space.

6.4 TDM Checklist Assessment

The Region of Waterloo has developed a "TDM Checklist and Parking Management Worksheet" as part of their Transportation Master Plan. This worksheet was created to assist in assessing whether developments are planned in such a manner to support the overall objectives of the Region of Waterloo to increase transit use and to reduce single occupant vehicle (SOV) travel.

Appendix I contains the Region of Waterloo TDM Checklist.

Some features in the checklists are unknown whether they are applicable to the subject development. As such some items were not selected from the list. However, if these features can be confirmed by the developer, a higher score could be achieved.

The features that were considered for the subject development include:

- Building owner/occupant agrees to charge for parking as a separate cost to occupants;
- Connectivity to existing pedestrian, transit, and cycling facilities;
- Parking is located underground or in a structure; and

Several features were unknown at the time of this study and were not included in the checklist scoring:

- Availability of car sharing services (e.g. Community CarShare);
- Provision of subsidized transit passes for all occupants;
- Information regarding public transit routes, schedules and fares provided in accessible and visible location on-site.

7 Conclusions and Recommendations

7.1 Conclusions

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

- **Existing Traffic Conditions:** All study area intersections are currently operating within acceptable levels of service;
- **Development Trip Generation:** The development is forecast to generate approximately 140 and 160 trips during the AM and PM peak hours, respectively;
- **2027 Background Traffic Conditions:** As traffic volumes increase at the study area intersections, intersection capacity issues begin to develop. Capacity issues are identified at the following intersections:
  - Water Street and Park Hill Road;
  - Ainslie Street and Park Hill Road; and
  - Water Street and Simcoe Street/Site Driveway.

  The background traffic capacity deficiencies are forecast to occur without site-specific traffic.

  All study area intersections are forecast to continue to operate within acceptable levels of service;
- **2027 Total Traffic Conditions:** The capacity deficiencies identified under background conditions will continue to occur with the addition of site generated traffic. at the following intersections:
  - Water Street and Park Hill Road;
  - Ainslie Street and Park Hill Road; and
  - Water Street and Simcoe Street/Site Driveway.

  The site driveways to Water Street are forecast to operate with high delays during the PM peak hour, however, the low v/c ratios indicate that while there is delay, there remains excess capacity for the site driveways.

  No intersection capacity related issues are forecast to occur at the parking garage accesses to Water Street and Simcoe Street.
- **Remedial Measures:** left-turn lanes are not warranted at the northerly site driveway or the Simcoe Street parking garage access. Traffic signals at Water Street and Simcoe Street/Site Driveway are not warranted; and

- **TDM Measures:** The developer is committed to several TDM measures including pedestrian connectivity, unbundling parking, short-term and long-term bike parking. The site is also located near existing cycling and transit networks that will be supportive to non-automotive travel.

7.2 Recommendations

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

- The City of Cambridge and Region of Waterloo monitor the future traffic volumes at the study area intersections to ensure appropriate forms of traffic control and storage lengths are in place and
- The developer continues in its efforts to reduce Single Occupant Vehicle travel and expand its current TDM program to include:
  - Long term bike parking to be provided at a rate of 0.3 spaces per unit (76 spaces) and short-term parking at a rate of 0.05 spaces (13 spaces);
  - Consideration be given to providing long-term bike parking at the hotel for both staff and guests;
  - Consideration be given to providing a carshare space on site; and
  - Consideration be given to providing information regarding public transit routes, schedules and fares in accessible and visible location on-site

Appendix A

Pre-Study Consultation

APPENDIX A:
PRE-STUDY CONFERENCE FORM
150 Water Street North, Cambridge

Item	Description	Details
ISSUES		
1	List any issues expected that may impact the content or recommendations of the subject Transportation Impact Study.	○ Pedestrian interaction between site and the proposed Water Street parking structure
INTRODUCTION		
2	Nature of application (Attach a drawing)	○ Official Plan Amendment ○ Zoning Amendment ○ Site Plan Control Application ○ Plan of Subdivision ○ Community Plan ○ Other
3	TIS process, and relevant policies, procedures and approvals	○ Guidelines for the preparation of Transportation Impact Studies in Support of Development Applications ○ Transportation Impact Studies Requirements for Capacity Analysis, Roundabouts, Turn Lanes
4	Public Meeting	○ Unknown currently
CONTEXT		
5	Study intersections (Intersections to be analyzed) Note: the consultant is responsible to identify any further intersections impacted as the study progresses.	○ Water Street & Park Hill Road (signalized) ○ Water Street & Simcoe Street (unsignalized) ○ Simcoe Street & Ainslie Street (signalized) ○ Park Hill Road & Ainslie Street (signalized) ○ Two site driveways onto Water Street (Hotel/Condo access) ○ Two driveways onto Water and Simcoe (parking access)
6	Size and number of phases of development	○ Phase 1: Hotel (156 rooms) / Condo (228 units) and 4,183m^2 (45,034ft^2) Commercial Space
7	Approved and pending approval development applications	○ Unknown currently
8	Planned transportation system improvements	○ Unknown currently
TRAVEL DEMAND		
9	Horizon years	○ 5 years after full occupancy (2027)

Item	Description	Details
10	Peak hour determination	○ AM weekday peak hour of adjacent roadway ○ PM weekday peak hour of adjacent roadway
11	Background	○ Historical traffic/transit counts ○ ROW travel demand forecasts ○ Approved and pending approval development applications ○
12	Trip generation	○ ITE average rates ○ ITE fitted equation
13	Trip reductions (TDM, internal, pass-by)	○ ITE internal capture reductions for mixed-use developments ○ Transportation Tomorrow Survey 2016 Mode Splits
14	Trip distribution	○ ITE trip distribution IN/OUT split
15	Trip assignment	○ Local traffic pattern ○ Transportation Tomorrow Survey 2016
EVALUATION OF IMPACTS		
16	Traffic impact analysis (Use approved software)	○ Unsignalized intersections ○ left turn warrant analysis ○ signal warrant analysis ○ Signalized intersections ○ LOS, v/c, delay, queuing ○ Existing signal timings for existing conditions ○ Optimize signal timings for future conditions ○ Use existing cycle length to respect coordinated corridor ○ Queuing analysis

Item	Description	Details
17	Roundabout feasibility (Use approved software)	
18	Transit assessment	○ Presence of bus stops ○ Passenger loads
19	Pedestrian assessment	○ Presence, connectivity, and width of sidewalks ○ Barriers and buffers from traffic ○ Crossing opportunities at intersections ○ Delay at intersections ○ Number of driveways and traffic volumes at the driveways ○ Presence of illumination ○ Future needs (desire lines / policy / accessibility / demand)
20	Cycling assessment	○ Presence of a dedicated facility ○ Network connectivity
21	Safety analysis	○ Access conflict evaluation
22	Site access and circulation	○ Review sight distances at all new access points
23	Submission format	○ Three hard copies of main report including appendices (other than analysis results/output e.g. Synchro reports) ○ Minimum one original hard copy must be sealed by a professional engineer ○ Electronic copy of complete report and all appendices ○ Electronic copy of operational analysis files (e.g. Synchro, Arcady ○ Electronic copy of all signal warrant calculation files ○

Appendix B

Existing Traffic Data

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Park Hill Road & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020

Turning Movement Data

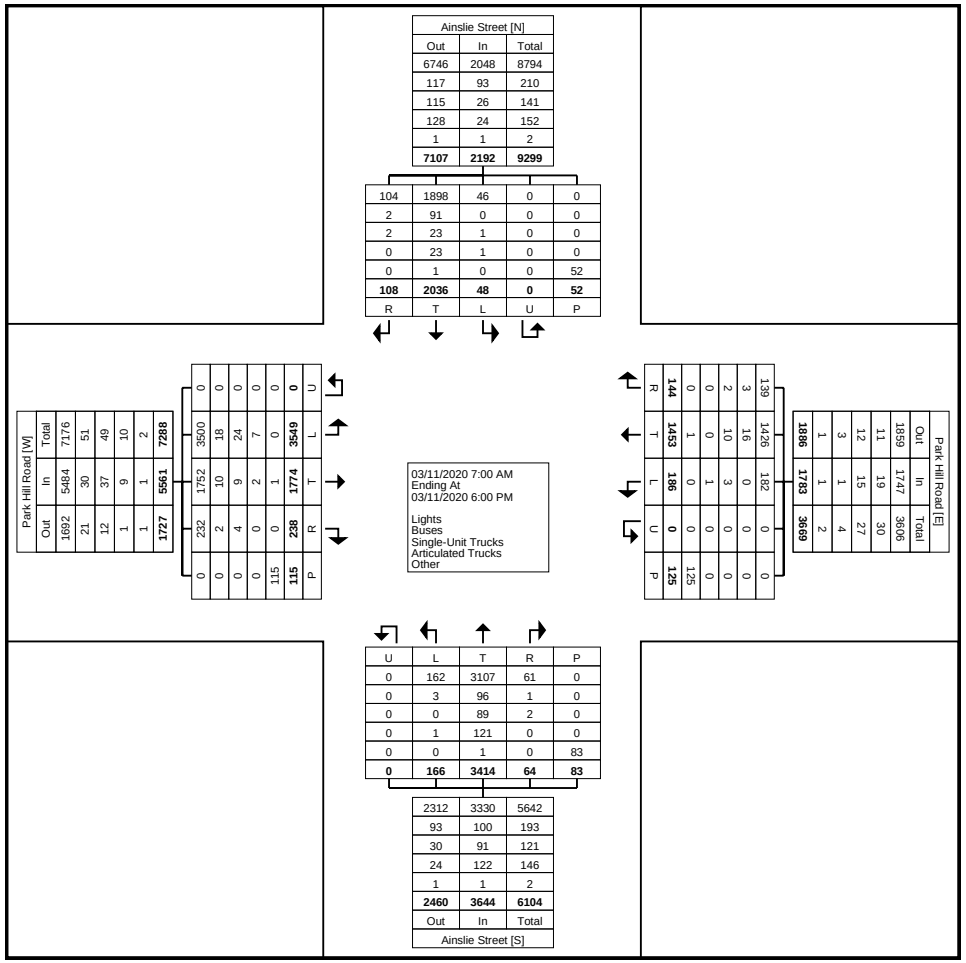
Start Time	Park Hill Road Eastbound						Park Hill Road Westbound						Ainslie Street Northbound						Ainslie Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	115	24	1	0	0	140	1	20	5	0	2	26	2	118	0	0	2	120	0	17	1	0	2	18	304
7:15 AM	133	38	0	0	2	171	0	23	2	0	1	25	3	119	1	0	0	123	0	21	1	0	0	22	341
7:30 AM	147	73	3	0	2	223	1	58	4	0	2	63	7	130	0	0	0	137	1	28	3	0	0	32	455
7:45 AM	149	94	7	0	0	250	1	54	2	0	2	57	1	119	1	0	0	121	1	37	3	0	0	41	469
Hourly Total	544	229	11	0	4	784	3	155	13	0	7	171	13	486	2	0	2	501	2	103	8	0	2	113	1569
8:00 AM	101	87	5	0	2	193	4	53	3	0	2	60	3	100	2	0	6	105	2	42	1	0	1	45	403
8:15 AM	137	99	10	0	1	246	4	37	6	0	2	47	4	125	2	0	1	131	1	43	2	0	1	46	470
8:30 AM	138	69	7	0	3	214	11	48	6	0	7	65	4	87	3	0	2	94	1	41	1	0	1	43	416
8:45 AM	142	80	7	0	2	229	5	45	3	0	6	53	4	98	3	0	2	105	2	55	3	0	1	60	447
Hourly Total	518	335	29	0	8	882	24	183	18	0	17	225	15	410	10	0	11	435	6	181	7	0	4	194	1736
9:00 AM	96	45	4	0	1	145	4	32	3	0	8	39	4	97	5	0	6	106	2	53	0	0	1	55	345
9:15 AM	128	65	6	0	2	199	6	31	2	0	4	39	3	106	0	0	2	109	5	42	1	0	6	48	395
9:30 AM	125	49	7	0	6	181	2	28	7	0	4	37	1	85	2	0	5	88	2	48	0	0	1	50	356
9:45 AM	122	32	6	0	2	160	5	30	1	0	2	36	4	102	2	0	2	108	1	60	4	0	0	65	369
Hourly Total	471	191	23	0	11	685	17	121	13	0	18	151	12	390	9	0	15	411	10	203	5	0	8	218	1465
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 PM	95	49	10	0	3	154	3	32	5	0	5	40	6	101	2	0	3	109	4	48	2	0	1	54	357
12:15 PM	99	39	10	0	3	148	8	34	5	0	2	47	4	89	0	0	3	93	1	62	3	0	4	66	354
12:30 PM	98	45	9	0	3	152	5	33	5	0	4	43	1	93	2	0	3	96	0	57	3	0	2	60	351
12:45 PM	116	40	10	0	3	166	9	23	3	0	3	35	5	96	3	0	0	104	2	76	3	0	2	81	386
Hourly Total	408	173	39	0	12	620	25	122	18	0	14	165	16	379	7	0	9	402	7	243	11	0	9	261	1448
1:00 PM	106	33	5	0	1	144	10	31	5	0	1	46	5	108	3	0	4	116	0	57	5	0	0	62	368
1:15 PM	100	38	9	0	2	147	4	40	4	0	2	48	6	99	1	0	1	106	1	62	3	0	1	66	367
1:30 PM	107	25	9	0	2	141	9	23	6	0	5	38	8	103	1	0	1	112	2	70	3	0	3	75	366
1:45 PM	99	49	5	0	5	153	5	34	5	0	4	44	4	97	4	0	4	105	2	74	1	0	3	77	379
Hourly Total	412	145	28	0	10	585	28	128	20	0	12	176	23	407	9	0	10	439	5	263	12	0	7	280	1480
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	91	51	6	0	3	148	10	49	5	0	8	64	7	121	0	0	2	128	1	78	6	0	6	85	425
3:15 PM	83	55	12	0	4	150	9	70	5	0	6	84	4	96	1	0	4	101	3	79	3	0	2	85	420
3:30 PM	117	57	8	0	3	182	8	55	1	0	8	64	8	123	3	0	2	134	2	87	4	0	2	93	473
3:45 PM	97	63	8	0	3	168	11	48	6	0	1	65	5	119	2	0	1	126	2	80	3	0	0	85	444
Hourly Total	388	226	34	0	13	648	38	222	17	0	23	277	24	459	6	0	9	489	8	324	16	0	10	348	1762
4:00 PM	97	71	17	0	5	185	5	82	5	0	8	92	8	97	3	0	4	108	0	97	1	0	5	98	483
4:15 PM	107	43	7	0	0	157	8	49	9	0	3	66	5	102	2	0	5	109	3	98	6	0	0	107	439
4:30 PM	106	70	10	0	1	186	4	82	2	0	3	88	14	141	5	0	1	160	0	87	8	0	1	95	529

4:45 PM	107	80	6	0	5	193	5	67	6	0	2	78	7	143	3	0	1	153	3	90	8	0	2	101	525
Hourly Total	417	264	40	0	11	721	22	280	22	0	16	324	34	483	13	0	11	530	6	372	23	0	8	401	1976
5:00 PM	98	67	10	0	1	175	9	83	10	0	6	102	9	110	1	0	7	120	1	88	12	0	0	101	498
5:15 PM	90	46	7	0	23	143	10	52	5	0	5	67	6	109	2	0	3	117	0	85	7	0	2	92	419
5:30 PM	105	61	8	0	7	174	2	67	4	0	2	73	9	95	3	0	6	107	1	80	2	0	1	83	437
5:45 PM	98	37	9	0	15	144	8	40	4	0	5	52	5	86	2	0	0	93	2	94	5	0	1	101	390
Hourly Total	391	211	34	0	46	636	29	242	23	0	18	294	29	400	8	0	16	437	4	347	26	0	4	377	1744
Grand Total	3549	1774	238	0	115	5561	186	1453	144	0	125	1783	166	3414	64	0	83	3644	48	2036	108	0	52	2192	13180
Approach %	63.8	31.9	4.3	0.0	-	-	10.4	81.5	8.1	0.0	-	-	4.6	93.7	1.8	0.0	-	-	2.2	92.9	4.9	0.0	-	-	-
Total %	26.9	13.5	1.8	0.0	-	42.2	1.4	11.0	1.1	0.0	-	13.5	1.3	25.9	0.5	0.0	-	27.6	0.4	15.4	0.8	0.0	-	16.6	-
Lights	3500	1752	232	0	-	5484	182	1426	139	0	-	1747	162	3107	61	0	-	3330	46	1898	104	0	-	2048	12609
% Lights	98.6	98.8	97.5	-	-	98.6	97.8	98.1	96.5	-	-	98.0	97.6	91.0	95.3	-	-	91.4	95.8	93.2	96.3	-	-	93.4	95.7
Buses	18	10	2	0	-	30	0	16	3	0	-	19	3	96	1	0	-	100	0	91	2	0	-	93	242
% Buses	0.5	0.6	0.8	-	-	0.5	0.0	1.1	2.1	-	-	1.1	1.8	2.8	1.6	-	-	2.7	0.0	4.5	1.9	-	-	4.2	1.8
Single-Unit Trucks	24	9	4	0	-	37	3	10	2	0	-	15	0	89	2	0	-	91	1	23	2	0	-	26	169
% Single-Unit Trucks	0.7	0.5	1.7	-	-	0.7	1.6	0.7	1.4	-	-	0.8	0.0	2.6	3.1	-	-	2.5	2.1	1.1	1.9	-	-	1.2	1.3
Articulated Trucks	7	2	0	0	-	9	1	0	0	0	-	1	1	121	0	0	-	122	1	23	0	0	-	24	156
% Articulated Trucks	0.2	0.1	0.0	-	-	0.2	0.5	0.0	0.0	-	-	0.1	0.6	3.5	0.0	-	-	3.3	2.1	1.1	0.0	-	-	1.1	1.2
Bicycles on Road	0	1	0	0	-	1	0	1	0	0	-	1	0	1	0	0	-	1	0	1	0	0	-	1	4
% Bicycles on Road	0.0	0.1	0.0	-	-	0.0	0.0	0.1	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	-	-	-	-	1	-	-	-	-	-	10	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.9	-	-	-	-	-	8.0	-	-	-	-	-	0.0	-	-	-	-	-	1.9	-	-
Pedestrians	-	-	-	-	114	-	-	-	-	-	115	-	-	-	-	-	83	-	-	-	-	-	51	-	-
% Pedestrians	-	-	-	-	99.1	-	-	-	-	-	92.0	-	-	-	-	-	100.0	-	-	-	-	-	98.1	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Park Hill Road & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020



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: Park Hill Road & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Park Hill Road Eastbound						Park Hill Road Westbound						Ainslie Street Northbound						Ainslie Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:30 AM	147	73	3	0	2	223	1	58	4	0	2	63	7	130	0	0	0	137	1	28	3	0	0	32	455
7:45 AM	149	94	7	0	0	250	1	54	2	0	2	57	1	119	1	0	0	121	1	37	3	0	0	41	469
8:00 AM	101	87	5	0	2	193	4	53	3	0	2	60	3	100	2	0	6	105	2	42	1	0	1	45	403
8:15 AM	137	99	10	0	1	246	4	37	6	0	2	47	4	125	2	0	1	131	1	43	2	0	1	46	470
Total	534	353	25	0	5	912	10	202	15	0	8	227	15	474	5	0	7	494	5	150	9	0	2	164	1797
Approach %	58.6	38.7	2.7	0.0	-	-	4.4	89.0	6.6	0.0	-	-	3.0	96.0	1.0	0.0	-	-	3.0	91.5	5.5	0.0	-	-	-
Total %	29.7	19.6	1.4	0.0	-	50.8	0.6	11.2	0.8	0.0	-	12.6	0.8	26.4	0.3	0.0	-	27.5	0.3	8.3	0.5	0.0	-	9.1	-
PHF	0.896	0.891	0.625	0.000	-	0.912	0.625	0.871	0.625	0.000	-	0.901	0.536	0.912	0.625	0.000	-	0.901	0.625	0.872	0.750	0.000	-	0.891	0.956
Lights	529	349	24	0	-	902	10	193	15	0	-	218	15	434	5	0	-	454	5	130	6	0	-	141	1715
% Lights	99.1	98.9	96.0	-	-	98.9	100.0	95.5	100.0	-	-	96.0	100.0	91.6	100.0	-	-	91.9	100.0	86.7	66.7	-	-	86.0	95.4
Buses	1	2	0	0	-	3	0	8	0	0	-	8	0	13	0	0	-	13	0	12	1	0	-	13	37
% Buses	0.2	0.6	0.0	-	-	0.3	0.0	4.0	0.0	-	-	3.5	0.0	2.7	0.0	-	-	2.6	0.0	8.0	11.1	-	-	7.9	2.1
Single-Unit Trucks	4	2	1	0	-	7	0	1	0	0	-	1	0	10	0	0	-	10	0	3	2	0	-	5	23
% Single-Unit Trucks	0.7	0.6	4.0	-	-	0.8	0.0	0.5	0.0	-	-	0.4	0.0	2.1	0.0	-	-	2.0	0.0	2.0	22.2	-	-	3.0	1.3
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	17	0	0	-	17	0	5	0	0	-	5	22
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	3.6	0.0	-	-	3.4	0.0	3.3	0.0	-	-	3.0	1.2
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	5	-	-	-	-	-	8	-	-	-	-	-	7	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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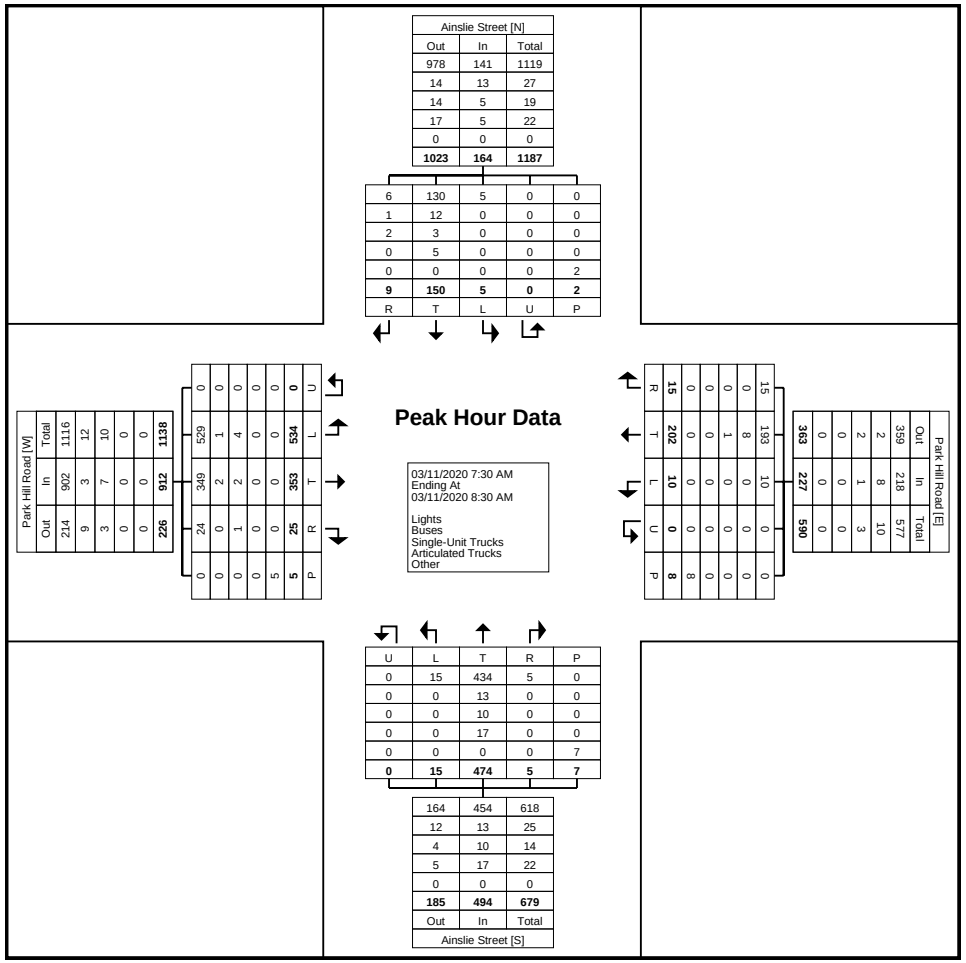
Start Date: 03/11/2020



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Park Hill Road & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020

Turning Movement Peak Hour Data (12:45 PM)

Start Time	Park Hill Road Eastbound						Park Hill Road Westbound						Ainslie Street Northbound						Ainslie Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:45 PM	116	40	10	0	3	166	9	23	3	0	3	35	5	96	3	0	0	104	2	76	3	0	2	81	386
1:00 PM	106	33	5	0	1	144	10	31	5	0	1	46	5	108	3	0	4	116	0	57	5	0	0	62	368
1:15 PM	100	38	9	0	2	147	4	40	4	0	2	48	6	99	1	0	1	106	1	62	3	0	1	66	367
1:30 PM	107	25	9	0	2	141	9	23	6	0	5	38	8	103	1	0	1	112	2	70	3	0	3	75	366
Total	429	136	33	0	8	598	32	117	18	0	11	167	24	406	8	0	6	438	5	265	14	0	6	284	1487
Approach %	71.7	22.7	5.5	0.0	-	-	19.2	70.1	10.8	0.0	-	-	5.5	92.7	1.8	0.0	-	-	1.8	93.3	4.9	0.0	-	-	-
Total %	28.9	9.1	2.2	0.0	-	40.2	2.2	7.9	1.2	0.0	-	11.2	1.6	27.3	0.5	0.0	-	29.5	0.3	17.8	0.9	0.0	-	19.1	-
PHF	0.925	0.850	0.825	0.000	-	0.901	0.800	0.731	0.750	0.000	-	0.870	0.750	0.940	0.667	0.000	-	0.944	0.625	0.872	0.700	0.000	-	0.877	0.963
Lights	421	133	31	0	-	585	32	115	18	0	-	165	24	372	8	0	-	404	5	244	14	0	-	263	1417
% Lights	98.1	97.8	93.9	-	-	97.8	100.0	98.3	100.0	-	-	98.8	100.0	91.6	100.0	-	-	92.2	100.0	92.1	100.0	-	-	92.6	95.3
Buses	2	3	1	0	-	6	0	0	0	0	-	0	0	10	0	0	-	10	0	10	0	0	-	10	26
% Buses	0.5	2.2	3.0	-	-	1.0	0.0	0.0	0.0	-	-	0.0	0.0	2.5	0.0	-	-	2.3	0.0	3.8	0.0	-	-	3.5	1.7
Single-Unit Trucks	4	0	1	0	-	5	0	2	0	0	-	2	0	8	0	0	-	8	0	4	0	0	-	4	19
% Single-Unit Trucks	0.9	0.0	3.0	-	-	0.8	0.0	1.7	0.0	-	-	1.2	0.0	2.0	0.0	-	-	1.8	0.0	1.5	0.0	-	-	1.4	1.3
Articulated Trucks	2	0	0	0	-	2	0	0	0	0	-	0	0	15	0	0	-	15	0	6	0	0	-	6	23
% Articulated Trucks	0.5	0.0	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	3.7	0.0	-	-	3.4	0.0	2.3	0.0	-	-	2.1	1.5
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	2
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.2	0.0	-	-	0.2	0.0	0.4	0.0	-	-	0.4	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	9.1	-	-	-	-	-	0.0	-	-	-	-	-	16.7	-	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	10	-	-	-	-	-	6	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	90.9	-	-	-	-	-	100.0	-	-	-	-	-	83.3	-	-

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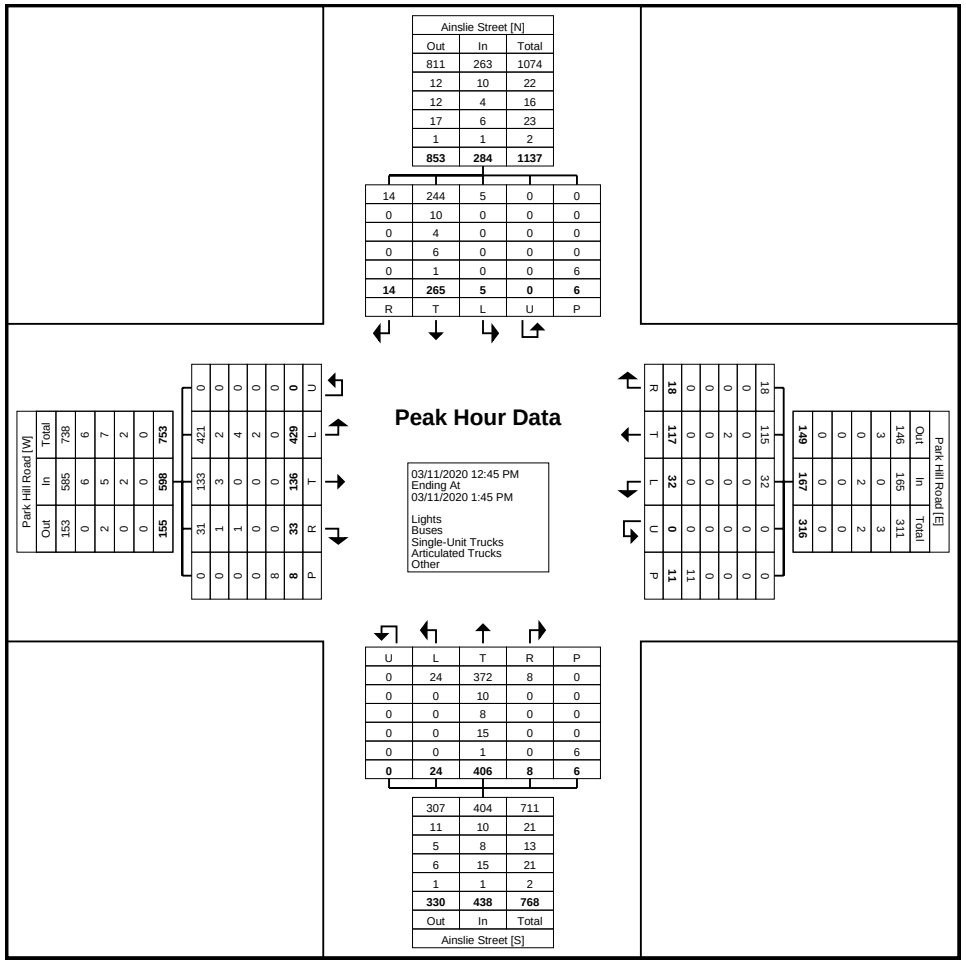


Turning Movement Peak Hour Data Plot (12:45 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

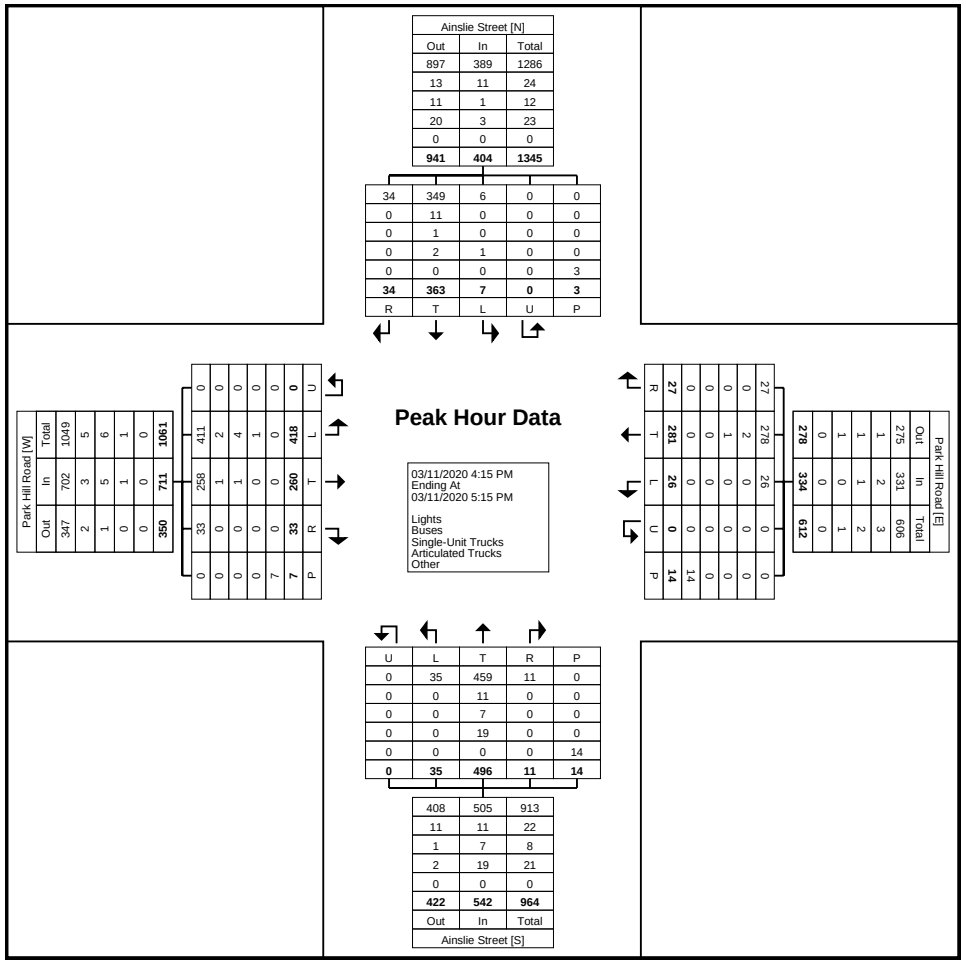
Count Name: Park Hill Road & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Park Hill Road Eastbound						Park Hill Road Westbound						Ainslie Street Northbound						Ainslie Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:15 PM	107	43	7	0	0	157	8	49	9	0	3	66	5	102	2	0	5	109	3	98	6	0	0	107	439
4:30 PM	106	70	10	0	1	186	4	82	2	0	3	88	14	141	5	0	1	160	0	87	8	0	1	95	529
4:45 PM	107	80	6	0	5	193	5	67	6	0	2	78	7	143	3	0	1	153	3	90	8	0	2	101	525
5:00 PM	98	67	10	0	1	175	9	83	10	0	6	102	9	110	1	0	7	120	1	88	12	0	0	101	498
Total	418	260	33	0	7	711	26	281	27	0	14	334	35	496	11	0	14	542	7	363	34	0	3	404	1991
Approach %	58.8	36.6	4.6	0.0	-	-	7.8	84.1	8.1	0.0	-	-	6.5	91.5	2.0	0.0	-	-	1.7	89.9	8.4	0.0	-	-	-
Total %	21.0	13.1	1.7	0.0	-	35.7	1.3	14.1	1.4	0.0	-	16.8	1.8	24.9	0.6	0.0	-	27.2	0.4	18.2	1.7	0.0	-	20.3	-
PHF	0.977	0.813	0.825	0.000	-	0.921	0.722	0.846	0.675	0.000	-	0.819	0.625	0.867	0.550	0.000	-	0.847	0.583	0.926	0.708	0.000	-	0.944	0.941
Lights	411	258	33	0	-	702	26	278	27	0	-	331	35	459	11	0	-	505	6	349	34	0	-	389	1927
% Lights	98.3	99.2	100.0	-	-	98.7	100.0	98.9	100.0	-	-	99.1	100.0	92.5	100.0	-	-	93.2	85.7	96.1	100.0	-	-	96.3	96.8
Buses	2	1	0	0	-	3	0	2	0	0	-	2	0	11	0	0	-	11	0	11	0	0	-	11	27
% Buses	0.5	0.4	0.0	-	-	0.4	0.0	0.7	0.0	-	-	0.6	0.0	2.2	0.0	-	-	2.0	0.0	3.0	0.0	-	-	2.7	1.4
Single-Unit Trucks	4	1	0	0	-	5	0	1	0	0	-	1	0	7	0	0	-	7	0	1	0	0	-	1	14
% Single-Unit Trucks	1.0	0.4	0.0	-	-	0.7	0.0	0.4	0.0	-	-	0.3	0.0	1.4	0.0	-	-	1.3	0.0	0.3	0.0	-	-	0.2	0.7
Articulated Trucks	1	0	0	0	-	1	0	0	0	0	-	0	0	19	0	0	-	19	1	2	0	0	-	3	23
% Articulated Trucks	0.2	0.0	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	3.8	0.0	-	-	3.5	14.3	0.6	0.0	-	-	0.7	1.2
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	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	21.4	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	7	-	-	-	-	-	11	-	-	-	-	-	14	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	78.6	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Park Hill Road & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Simcoe Street & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020

Turning Movement Data

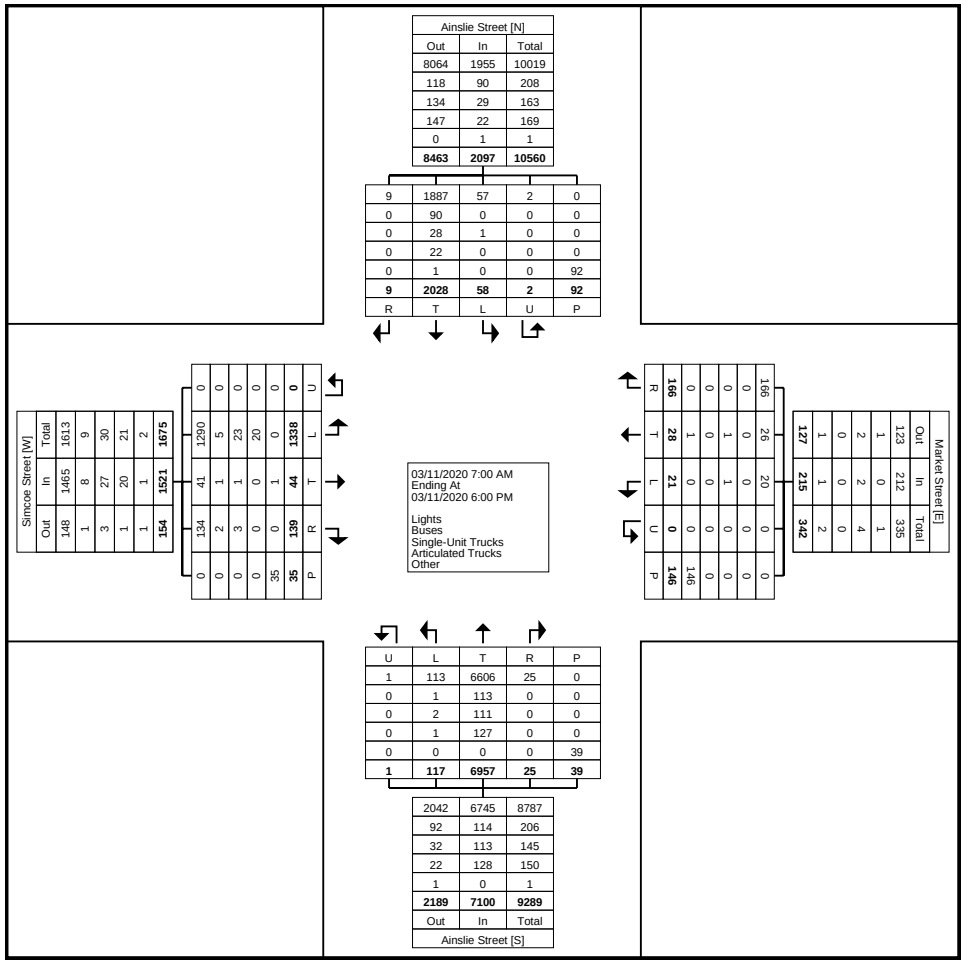
Start Time	Simcoe Street Eastbound						Market Street Westbound						Ainslie Street Northbound						Ainslie Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	25	0	0	0	0	25	0	0	1	0	1	1	3	237	1	0	1	241	0	17	1	0	1	18	285
7:15 AM	42	1	0	0	0	43	0	0	3	0	1	3	1	249	0	0	0	250	1	22	0	1	1	24	320
7:30 AM	62	2	1	0	0	65	0	0	6	0	4	6	0	278	0	0	0	278	1	31	0	0	1	32	381
7:45 AM	39	1	1	0	0	41	0	0	3	0	0	3	2	273	3	0	0	278	2	41	0	0	2	43	365
Hourly Total	168	4	2	0	0	174	0	0	13	0	6	13	6	1037	4	0	1	1047	4	111	1	1	5	117	1351
8:00 AM	31	1	0	0	0	32	0	1	5	0	1	6	1	201	1	0	0	203	2	43	0	0	1	45	286
8:15 AM	54	1	1	0	0	56	1	1	3	0	3	5	3	251	0	0	0	254	1	47	0	0	2	48	363
8:30 AM	60	1	2	0	0	63	1	1	11	0	8	13	3	220	1	0	0	224	3	37	0	0	2	40	340
8:45 AM	48	4	1	0	1	53	1	1	4	0	7	6	2	223	1	0	0	226	9	63	0	0	0	72	357
Hourly Total	193	7	4	0	1	204	3	4	23	0	19	30	9	895	3	0	0	907	15	190	0	0	5	205	1346
9:00 AM	40	0	2	0	0	42	0	2	6	0	4	8	1	205	0	0	0	206	3	51	0	0	4	54	310
9:15 AM	32	0	2	0	2	34	0	2	4	0	14	6	4	228	0	0	5	232	2	45	1	0	2	48	320
9:30 AM	32	1	3	0	0	36	0	1	3	0	7	4	5	217	1	0	1	223	3	48	0	0	2	51	314
9:45 AM	34	1	6	0	0	41	1	1	2	0	2	4	5	221	2	0	3	228	1	65	0	1	7	67	340
Hourly Total	138	2	13	0	2	153	1	6	15	0	27	22	15	871	3	0	9	889	9	209	1	1	15	220	1284
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 PM	39	1	4	0	2	44	1	0	5	0	5	6	8	195	0	0	1	203	2	50	0	0	3	52	305
12:15 PM	48	1	4	0	1	53	1	1	2	0	3	4	1	186	0	0	0	187	1	62	0	0	1	63	307
12:30 PM	33	2	7	0	3	42	0	0	2	0	2	2	7	202	0	0	0	209	2	53	0	0	4	55	308
12:45 PM	52	2	2	0	2	56	1	1	9	0	4	11	7	208	0	0	1	215	0	74	0	0	3	74	356
Hourly Total	172	6	17	0	8	195	3	2	18	0	14	23	23	791	0	0	2	814	5	239	0	0	11	244	1276
1:00 PM	43	1	6	0	0	50	0	0	3	0	2	3	5	219	0	0	0	224	2	59	2	0	1	63	340
1:15 PM	37	3	9	0	1	49	1	0	6	0	0	7	3	202	1	0	2	206	2	53	1	0	4	56	318
1:30 PM	51	3	4	0	1	58	1	2	5	0	9	8	4	210	0	1	2	215	1	73	0	0	3	74	355
1:45 PM	38	2	6	0	2	46	1	1	8	0	9	10	5	192	2	0	4	199	3	63	1	0	5	67	322
Hourly Total	169	9	25	0	4	203	3	3	22	0	20	28	17	823	3	1	8	844	8	248	4	0	13	260	1335
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	31	0	11	0	2	42	1	1	4	0	8	6	4	207	4	0	0	215	2	74	1	0	7	77	340
3:15 PM	40	1	2	0	5	43	0	0	5	0	5	5	2	181	2	0	0	185	0	81	0	0	3	81	314
3:30 PM	36	1	5	0	4	42	2	1	7	0	9	10	1	236	0	0	0	237	2	82	0	0	2	84	373
3:45 PM	44	2	2	0	1	48	0	0	5	0	1	5	4	221	1	0	0	226	1	93	0	0	4	94	373
Hourly Total	151	4	20	0	12	175	3	2	21	0	23	26	11	845	7	0	0	863	5	330	1	0	16	336	1400
4:00 PM	34	0	7	0	1	41	0	2	6	0	2	8	6	194	0	0	2	200	2	84	0	0	4	86	335
4:15 PM	38	3	7	0	0	48	3	4	7	0	3	14	5	211	0	0	1	216	1	101	1	0	1	103	381
4:30 PM	54	1	9	0	0	64	0	1	1	0	1	2	4	247	0	0	0	251	1	85	0	0	3	86	403

4:45 PM	56	0	9	0	0	65	2	0	12	0	8	14	3	262	0	0	5	265	2	91	0	0	0	93	437
Hourly Total	182	4	32	0	1	218	5	7	26	0	14	38	18	914	0	0	8	932	6	361	1	0	8	368	1556
5:00 PM	53	2	9	0	0	64	2	0	15	0	5	17	4	210	0	0	1	214	1	91	0	0	3	92	387
5:15 PM	38	3	6	0	2	47	1	1	4	0	6	6	4	195	2	0	3	201	1	76	0	0	5	77	331
5:30 PM	38	0	5	0	4	43	0	1	7	0	5	8	5	199	1	0	5	205	3	86	1	0	5	90	346
5:45 PM	36	3	6	0	1	45	0	2	2	0	7	4	5	177	2	0	2	184	1	87	0	0	6	88	321
Hourly Total	165	8	26	0	7	199	3	4	28	0	23	35	18	781	5	0	11	804	6	340	1	0	19	347	1385
Grand Total	1338	44	139	0	35	1521	21	28	166	0	146	215	117	6957	25	1	39	7100	58	2028	9	2	92	2097	10933
Approach %	88.0	2.9	9.1	0.0	-	-	9.8	13.0	77.2	0.0	-	-	1.6	98.0	0.4	0.0	-	-	2.8	96.7	0.4	0.1	-	-	-
Total %	12.2	0.4	1.3	0.0	-	13.9	0.2	0.3	1.5	0.0	-	2.0	1.1	63.6	0.2	0.0	-	64.9	0.5	18.5	0.1	0.0	-	19.2	-
Lights	1290	41	134	0	-	1465	20	26	166	0	-	212	113	6606	25	1	-	6745	57	1887	9	2	-	1955	10377
% Lights	96.4	93.2	96.4	-	-	96.3	95.2	92.9	100.0	-	-	98.6	96.6	95.0	100.0	100.0	-	95.0	98.3	93.0	100.0	100.0	-	93.2	94.9
Buses	5	1	2	0	-	8	0	0	0	0	-	0	1	113	0	0	-	114	0	90	0	0	-	90	212
% Buses	0.4	2.3	1.4	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.9	1.6	0.0	0.0	-	1.6	0.0	4.4	0.0	0.0	-	4.3	1.9
Single-Unit Trucks	23	1	3	0	-	27	1	1	0	0	-	2	2	111	0	0	-	113	1	28	0	0	-	29	171
% Single-Unit Trucks	1.7	2.3	2.2	-	-	1.8	4.8	3.6	0.0	-	-	0.9	1.7	1.6	0.0	0.0	-	1.6	1.7	1.4	0.0	0.0	-	1.4	1.6
Articulated Trucks	20	0	0	0	-	20	0	0	0	0	-	0	1	127	0	0	-	128	0	22	0	0	-	22	170
% Articulated Trucks	1.5	0.0	0.0	-	-	1.3	0.0	0.0	0.0	-	-	0.0	0.9	1.8	0.0	0.0	-	1.8	0.0	1.1	0.0	0.0	-	1.0	1.6
Bicycles on Road	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	3
% Bicycles on Road	0.0	2.3	0.0	-	-	0.1	0.0	3.6	0.0	-	-	0.5	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	-	-	-	-	-	6	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	4.1	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	35	-	-	-	-	-	140	-	-	-	-	-	39	-	-	-	-	-	92	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	95.9	-	-	-	-	-	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: Simcoe Street & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020



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: Simcoe Street & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020

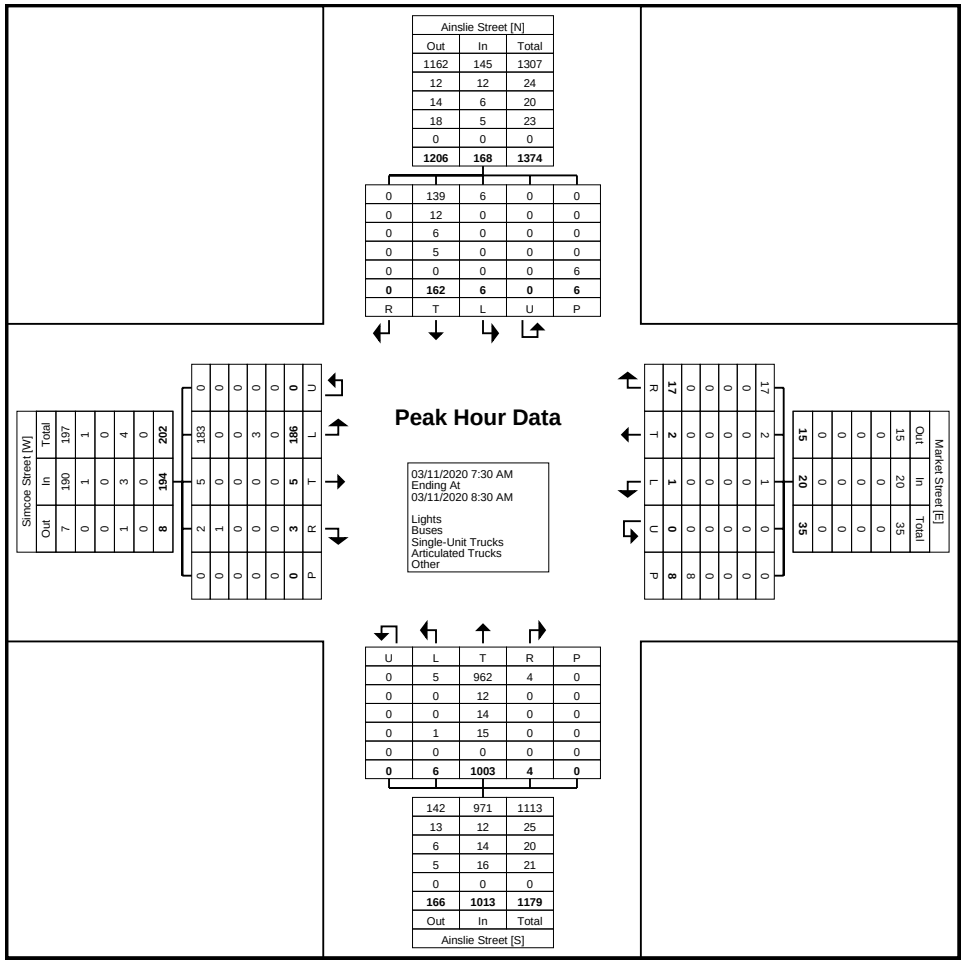
Turning Movement Peak Hour Data (7:30 AM)

Start Time	Simcoe Street Eastbound						Market Street Westbound						Ainslie Street Northbound						Ainslie Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:30 AM	62	2	1	0	0	65	0	0	6	0	4	6	0	278	0	0	0	278	1	31	0	0	1	32	381
7:45 AM	39	1	1	0	0	41	0	0	3	0	0	3	2	273	3	0	0	278	2	41	0	0	2	43	365
8:00 AM	31	1	0	0	0	32	0	1	5	0	1	6	1	201	1	0	0	203	2	43	0	0	1	45	286
8:15 AM	54	1	1	0	0	56	1	1	3	0	3	5	3	251	0	0	0	254	1	47	0	0	2	48	363
Total	186	5	3	0	0	194	1	2	17	0	8	20	6	1003	4	0	0	1013	6	162	0	0	6	168	1395
Approach %	95.9	2.6	1.5	0.0	-	-	5.0	10.0	85.0	0.0	-	-	0.6	99.0	0.4	0.0	-	-	3.6	96.4	0.0	0.0	-	-	-
Total %	13.3	0.4	0.2	0.0	-	13.9	0.1	0.1	1.2	0.0	-	1.4	0.4	71.9	0.3	0.0	-	72.6	0.4	11.6	0.0	0.0	-	12.0	-
PHF	0.750	0.625	0.750	0.000	-	0.746	0.250	0.500	0.708	0.000	-	0.833	0.500	0.902	0.333	0.000	-	0.911	0.750	0.862	0.000	0.000	-	0.875	0.915
Lights	183	5	2	0	-	190	1	2	17	0	-	20	5	962	4	0	-	971	6	139	0	0	-	145	1326
% Lights	98.4	100.0	66.7	-	-	97.9	100.0	100.0	100.0	-	-	100.0	83.3	95.9	100.0	-	-	95.9	100.0	85.8	-	-	-	86.3	95.1
Buses	0	0	1	0	-	1	0	0	0	0	-	0	0	12	0	0	-	12	0	12	0	0	-	12	25
% Buses	0.0	0.0	33.3	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	1.2	0.0	-	-	1.2	0.0	7.4	-	-	-	7.1	1.8
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	14	0	0	-	14	0	6	0	0	-	6	20
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.4	0.0	-	-	1.4	0.0	3.7	-	-	-	3.6	1.4
Articulated Trucks	3	0	0	0	-	3	0	0	0	0	-	0	1	15	0	0	-	16	0	5	0	0	-	5	24
% Articulated Trucks	1.6	0.0	0.0	-	-	1.5	0.0	0.0	0.0	-	-	0.0	16.7	1.5	0.0	-	-	1.6	0.0	3.1	-	-	-	3.0	1.7
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
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	8	-	-	-	-	-	0	-	-	-	-	-	6	-	-
% 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: Simcoe Street & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Simcoe Street & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020

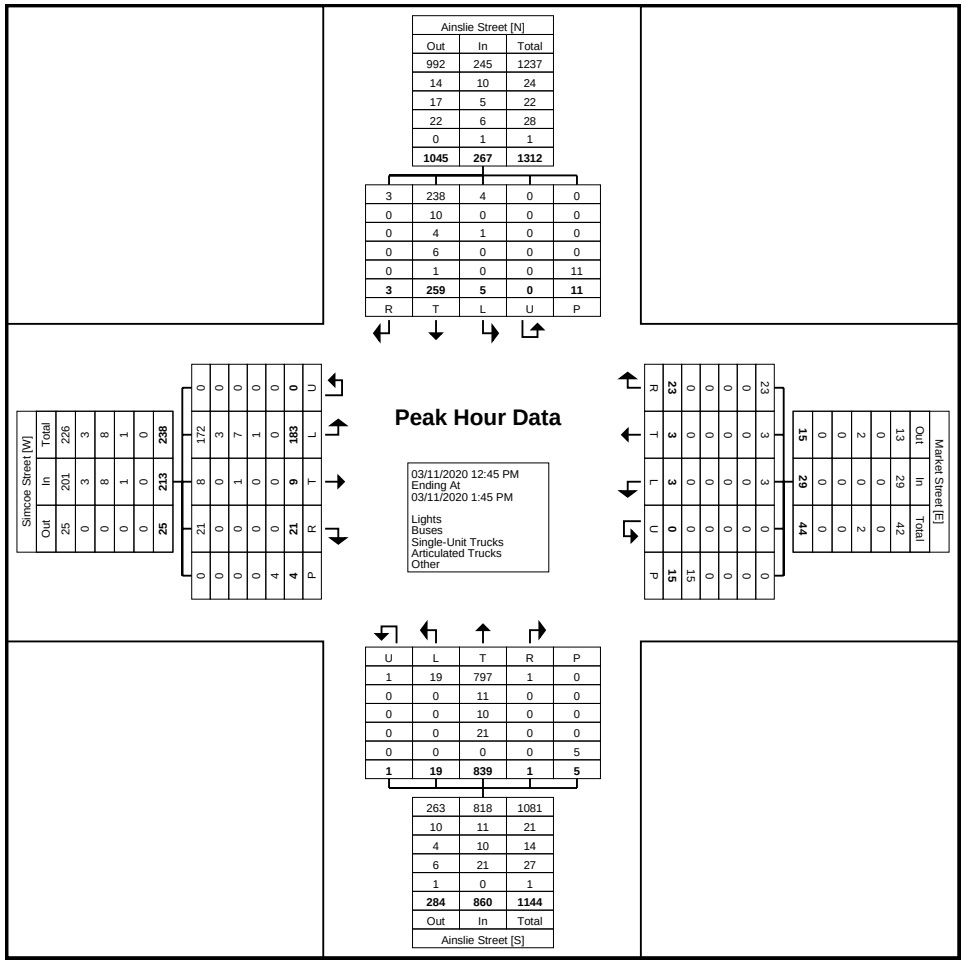
Turning Movement Peak Hour Data (12:45 PM)

Start Time	Simcoe Street Eastbound						Market Street Westbound						Ainslie Street Northbound						Ainslie Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:45 PM	52	2	2	0	2	56	1	1	9	0	4	11	7	208	0	0	1	215	0	74	0	0	3	74	356
1:00 PM	43	1	6	0	0	50	0	0	3	0	2	3	5	219	0	0	0	224	2	59	2	0	1	63	340
1:15 PM	37	3	9	0	1	49	1	0	6	0	0	7	3	202	1	0	2	206	2	53	1	0	4	56	318
1:30 PM	51	3	4	0	1	58	1	2	5	0	9	8	4	210	0	1	2	215	1	73	0	0	3	74	355
Total	183	9	21	0	4	213	3	3	23	0	15	29	19	839	1	1	5	860	5	259	3	0	11	267	1369
Approach %	85.9	4.2	9.9	0.0	-	-	10.3	10.3	79.3	0.0	-	-	2.2	97.6	0.1	0.1	-	-	1.9	97.0	1.1	0.0	-	-	-
Total %	13.4	0.7	1.5	0.0	-	15.6	0.2	0.2	1.7	0.0	-	2.1	1.4	61.3	0.1	0.1	-	62.8	0.4	18.9	0.2	0.0	-	19.5	-
PHF	0.880	0.750	0.583	0.000	-	0.918	0.750	0.375	0.639	0.000	-	0.659	0.679	0.958	0.250	0.250	-	0.960	0.625	0.875	0.375	0.000	-	0.902	0.961
Lights	172	8	21	0	-	201	3	3	23	0	-	29	19	797	1	1	-	818	4	238	3	0	-	245	1293
% Lights	94.0	88.9	100.0	-	-	94.4	100.0	100.0	100.0	-	-	100.0	100.0	95.0	100.0	100.0	-	95.1	80.0	91.9	100.0	-	-	91.8	94.4
Buses	3	0	0	0	-	3	0	0	0	0	-	0	0	11	0	0	-	11	0	10	0	0	-	10	24
% Buses	1.6	0.0	0.0	-	-	1.4	0.0	0.0	0.0	-	-	0.0	0.0	1.3	0.0	0.0	-	1.3	0.0	3.9	0.0	-	-	3.7	1.8
Single-Unit Trucks	7	1	0	0	-	8	0	0	0	0	-	0	0	10	0	0	-	10	1	4	0	0	-	5	23
% Single-Unit Trucks	3.8	11.1	0.0	-	-	3.8	0.0	0.0	0.0	-	-	0.0	0.0	1.2	0.0	0.0	-	1.2	20.0	1.5	0.0	-	-	1.9	1.7
Articulated Trucks	1	0	0	0	-	1	0	0	0	0	-	0	0	21	0	0	-	21	0	6	0	0	-	6	28
% Articulated Trucks	0.5	0.0	0.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	2.5	0.0	0.0	-	2.4	0.0	2.3	0.0	-	-	2.2	2.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.4	0.0	-	-	0.4	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	13.3	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	13	-	-	-	-	-	5	-	-	-	-	-	11	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	86.7	-	-	-	-	-	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: Simcoe Street & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Simcoe Street & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020

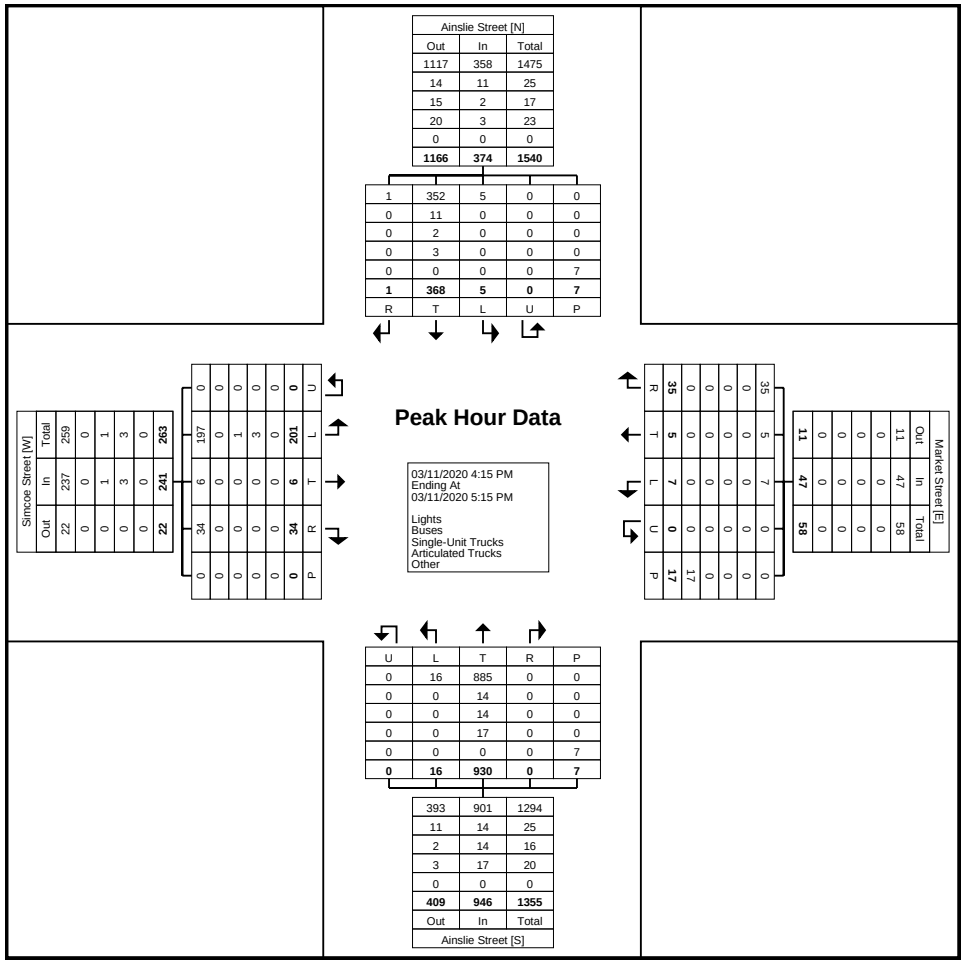
Turning Movement Peak Hour Data (4:15 PM)

Start Time	Simcoe Street Eastbound						Market Street Westbound						Ainslie Street Northbound						Ainslie Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:15 PM	38	3	7	0	0	48	3	4	7	0	3	14	5	211	0	0	1	216	1	101	1	0	1	103	381
4:30 PM	54	1	9	0	0	64	0	1	1	0	1	2	4	247	0	0	0	251	1	85	0	0	3	86	403
4:45 PM	56	0	9	0	0	65	2	0	12	0	8	14	3	262	0	0	5	265	2	91	0	0	0	93	437
5:00 PM	53	2	9	0	0	64	2	0	15	0	5	17	4	210	0	0	1	214	1	91	0	0	3	92	387
Total	201	6	34	0	0	241	7	5	35	0	17	47	16	930	0	0	7	946	5	368	1	0	7	374	1608
Approach %	83.4	2.5	14.1	0.0	-	-	14.9	10.6	74.5	0.0	-	-	1.7	98.3	0.0	0.0	-	-	1.3	98.4	0.3	0.0	-	-	-
Total %	12.5	0.4	2.1	0.0	-	15.0	0.4	0.3	2.2	0.0	-	2.9	1.0	57.8	0.0	0.0	-	58.8	0.3	22.9	0.1	0.0	-	23.3	-
PHF	0.897	0.500	0.944	0.000	-	0.927	0.583	0.313	0.583	0.000	-	0.691	0.800	0.887	0.000	0.000	-	0.892	0.625	0.911	0.250	0.000	-	0.908	0.920
Lights	197	6	34	0	-	237	7	5	35	0	-	47	16	885	0	0	-	901	5	352	1	0	-	358	1543
% Lights	98.0	100.0	100.0	-	-	98.3	100.0	100.0	100.0	-	-	100.0	100.0	95.2	-	-	-	95.2	100.0	95.7	100.0	-	-	95.7	96.0
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	14	0	0	-	14	0	11	0	0	-	11	25
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.5	-	-	-	1.5	0.0	3.0	0.0	-	-	2.9	1.6
Single-Unit Trucks	1	0	0	0	-	1	0	0	0	0	-	0	0	14	0	0	-	14	0	2	0	0	-	2	17
% Single-Unit Trucks	0.5	0.0	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	1.5	-	-	-	1.5	0.0	0.5	0.0	-	-	0.5	1.1
Articulated Trucks	3	0	0	0	-	3	0	0	0	0	-	0	0	17	0	0	-	17	0	3	0	0	-	3	23
% Articulated Trucks	1.5	0.0	0.0	-	-	1.2	0.0	0.0	0.0	-	-	0.0	0.0	1.8	-	-	-	1.8	0.0	0.8	0.0	-	-	0.8	1.4
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	17	-	-	-	-	-	7	-	-	-	-	-	7	-	-
% 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: Simcoe Street & Ainslie Street
Site Code: 200034
Start Date: 03/11/2020



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Water Street & Park Hill Road
Site Code: 200034
Start Date: 03/11/2020

Turning Movement Data

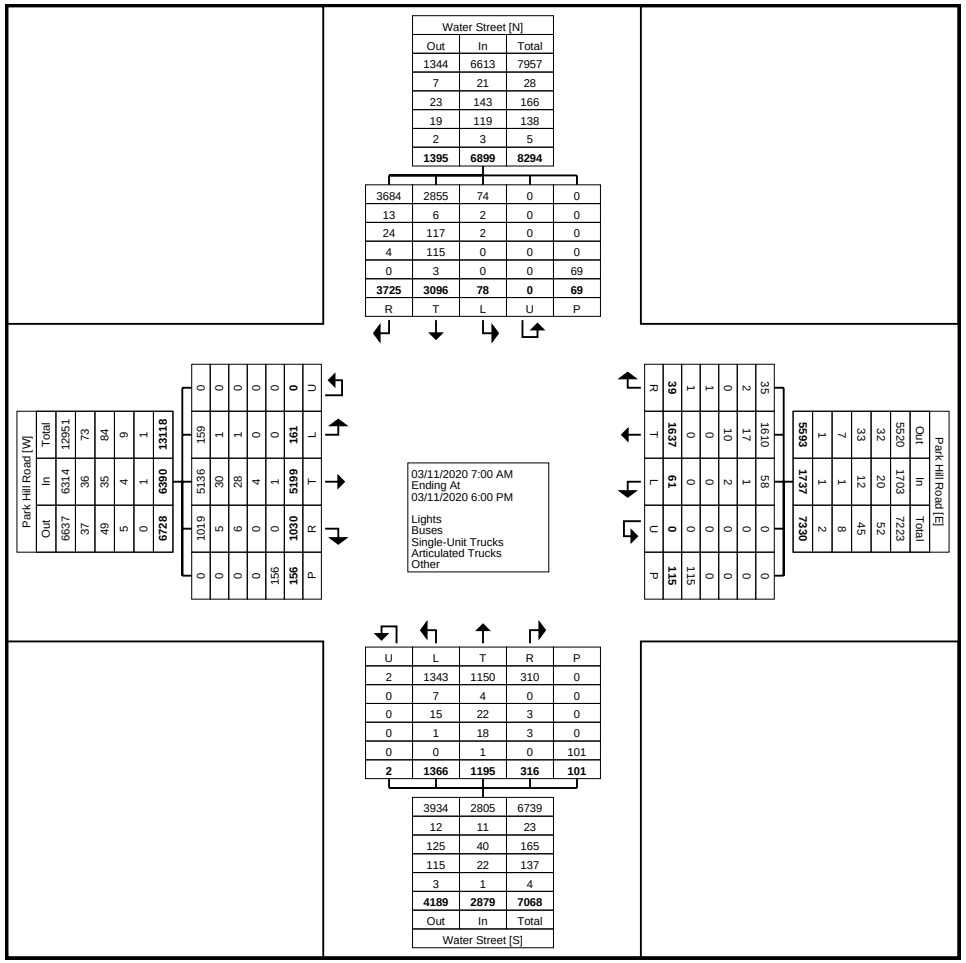
Start Time	Park Hill Road Eastbound						Park Hill Road Westbound						Water Street Northbound						Water Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	0	130	16	0	1	146	1	23	1	0	0	25	49	27	5	0	2	81	1	53	46	0	1	100	352
7:15 AM	0	167	11	0	0	178	1	27	0	0	1	28	59	37	3	0	0	99	1	58	56	0	1	115	420
7:30 AM	2	229	26	0	1	257	2	68	1	0	1	71	66	64	5	0	2	135	0	75	70	0	1	145	608
7:45 AM	0	241	26	0	8	267	1	60	0	0	1	61	46	39	4	0	2	89	0	88	66	0	2	154	571
Hourly Total	2	767	79	0	10	848	5	178	2	0	3	185	220	167	17	0	6	404	2	274	238	0	5	514	1951
8:00 AM	0	203	34	0	0	237	0	54	1	0	1	55	48	40	3	1	4	92	1	85	82	0	1	168	552
8:15 AM	4	234	30	0	5	268	0	42	1	0	0	43	49	48	9	1	0	107	0	74	80	0	0	154	572
8:30 AM	1	211	32	0	0	244	1	49	2	0	0	52	52	53	10	0	0	115	1	68	56	0	2	125	536
8:45 AM	2	221	31	0	2	254	1	50	2	0	4	53	30	43	3	0	4	76	1	64	72	0	0	137	520
Hourly Total	7	869	127	0	7	1003	2	195	6	0	5	203	179	184	25	2	8	390	3	291	290	0	3	584	2180
9:00 AM	0	143	22	0	3	165	1	32	1	0	3	34	30	37	9	0	6	76	3	78	79	0	0	160	435
9:15 AM	1	188	19	0	7	208	1	31	0	0	4	32	33	29	6	0	8	68	3	74	92	0	5	169	477
9:30 AM	0	173	21	0	3	194	3	26	0	0	5	29	27	29	11	0	5	67	4	71	68	0	1	143	433
9:45 AM	0	157	18	0	3	175	2	33	0	0	12	35	31	31	8	0	4	70	7	87	93	0	1	187	467
Hourly Total	1	661	80	0	16	742	7	122	1	0	24	130	121	126	34	0	23	281	17	310	332	0	7	659	1812
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 PM	7	138	34	0	9	179	2	35	3	0	1	40	31	29	14	0	5	74	1	84	106	0	3	191	484
12:15 PM	17	133	34	0	5	184	1	38	1	0	4	40	38	37	11	0	5	86	4	91	111	0	4	206	516
12:30 PM	3	134	28	0	6	165	2	36	1	0	4	39	21	30	11	0	5	62	3	70	85	0	1	158	424
12:45 PM	7	142	30	0	5	179	3	33	1	0	3	37	23	41	12	0	3	76	2	99	116	0	3	217	509
Hourly Total	34	547	126	0	25	707	8	142	6	0	12	156	113	137	48	0	18	298	10	344	418	0	11	772	1933
1:00 PM	12	126	27	0	2	165	2	34	2	0	4	38	30	29	14	0	5	73	0	91	117	0	0	208	484
1:15 PM	7	131	22	0	2	160	2	46	1	0	1	49	34	35	14	0	1	83	3	87	118	0	3	208	500
1:30 PM	8	127	37	0	9	172	2	34	2	0	2	38	32	48	10	0	2	90	2	104	119	0	0	225	525
1:45 PM	10	149	28	0	5	187	0	40	4	0	5	44	40	28	13	0	1	81	3	68	110	0	2	181	493
Hourly Total	37	533	114	0	18	684	6	154	9	0	12	169	136	140	51	0	9	327	8	350	464	0	5	822	2002
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	3	135	48	0	1	186	3	54	3	0	3	60	41	32	13	0	5	86	1	119	158	0	2	278	610
3:15 PM	5	141	55	0	6	201	2	75	0	0	12	77	51	29	8	0	1	88	3	114	144	0	3	261	627
3:30 PM	8	140	47	0	2	195	2	64	1	0	9	67	38	32	13	0	2	83	2	122	162	0	4	286	631
3:45 PM	12	161	46	0	7	219	2	56	1	0	4	59	41	31	10	0	5	82	6	148	152	0	5	306	666
Hourly Total	28	577	196	0	16	801	9	249	5	0	28	263	171	124	44	0	13	339	12	503	616	0	14	1131	2534
4:00 PM	5	169	47	0	4	221	5	85	1	0	3	91	67	30	19	0	5	116	8	121	156	0	1	285	713
4:15 PM	10	141	26	0	5	177	0	60	0	0	3	60	59	28	14	0	4	101	3	136	171	0	5	310	648
4:30 PM	7	171	32	0	5	210	2	91	2	0	6	95	54	47	12	0	3	113	3	130	182	0	0	315	733

4:45 PM	8	178	46	0	8	232	5	91	1	0	3	97	43	48	12	0	1	103	3	134	183	0	2	320	752
Hourly Total	30	659	151	0	22	840	12	327	4	0	15	343	223	153	57	0	13	433	17	521	692	0	8	1230	2846
5:00 PM	6	156	39	0	8	201	7	95	2	0	2	104	54	52	11	0	3	117	0	140	192	0	1	332	754
5:15 PM	6	140	44	0	11	190	2	54	3	0	4	59	55	34	14	0	4	103	5	129	169	0	8	303	655
5:30 PM	3	161	39	0	13	203	2	74	1	0	4	77	48	38	5	0	2	91	4	130	170	0	4	304	675
5:45 PM	7	129	35	0	10	171	1	47	0	0	6	48	46	40	10	0	2	96	0	104	144	0	3	248	563
Hourly Total	22	586	157	0	42	765	12	270	6	0	16	288	203	164	40	0	11	407	9	503	675	0	16	1187	2647
Grand Total	161	5199	1030	0	156	6390	61	1637	39	0	115	1737	1366	1195	316	2	101	2879	78	3096	3725	0	69	6899	17905
Approach %	2.5	81.4	16.1	0.0	-	-	3.5	94.2	2.2	0.0	-	-	47.4	41.5	11.0	0.1	-	-	1.1	44.9	54.0	0.0	-	-	-
Total %	0.9	29.0	5.8	0.0	-	35.7	0.3	9.1	0.2	0.0	-	9.7	7.6	6.7	1.8	0.0	-	16.1	0.4	17.3	20.8	0.0	-	38.5	-
Lights	159	5136	1019	0	-	6314	58	1610	35	0	-	1703	1343	1150	310	2	-	2805	74	2855	3684	0	-	6613	17435
% Lights	98.8	98.8	98.9	-	-	98.8	95.1	98.4	89.7	-	-	98.0	98.3	96.2	98.1	100.0	-	97.4	94.9	92.2	98.9	-	-	95.9	97.4
Buses	1	30	5	0	-	36	1	17	2	0	-	20	7	4	0	0	-	11	2	6	13	0	-	21	88
% Buses	0.6	0.6	0.5	-	-	0.6	1.6	1.0	5.1	-	-	1.2	0.5	0.3	0.0	0.0	-	0.4	2.6	0.2	0.3	-	-	0.3	0.5
Single-Unit Trucks	1	28	6	0	-	35	2	10	0	0	-	12	15	22	3	0	-	40	2	117	24	0	-	143	230
% Single-Unit Trucks	0.6	0.5	0.6	-	-	0.5	3.3	0.6	0.0	-	-	0.7	1.1	1.8	0.9	0.0	-	1.4	2.6	3.8	0.6	-	-	2.1	1.3
Articulated Trucks	0	4	0	0	-	4	0	0	1	0	-	1	1	18	3	0	-	22	0	115	4	0	-	119	146
% Articulated Trucks	0.0	0.1	0.0	-	-	0.1	0.0	0.0	2.6	-	-	0.1	0.1	1.5	0.9	0.0	-	0.8	0.0	3.7	0.1	-	-	1.7	0.8
Bicycles on Road	0	1	0	0	-	1	0	0	1	0	-	1	0	1	0	0	-	1	0	3	0	0	-	3	6
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	2.6	-	-	0.1	0.0	0.1	0.0	0.0	-	0.0	0.0	0.1	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	5	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	3.2	-	-	-	-	-	1.7	-	-	-	-	-	0.0	-	-	-	-	-	1.4	-	-
Pedestrians	-	-	-	-	151	-	-	-	-	-	113	-	-	-	-	-	101	-	-	-	-	-	68	-	-
% Pedestrians	-	-	-	-	96.8	-	-	-	-	-	98.3	-	-	-	-	-	100.0	-	-	-	-	-	98.6	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Water Street & Park Hill Road
Site Code: 200034
Start Date: 03/11/2020



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: Water Street & Park Hill Road
Site Code: 200034
Start Date: 03/11/2020

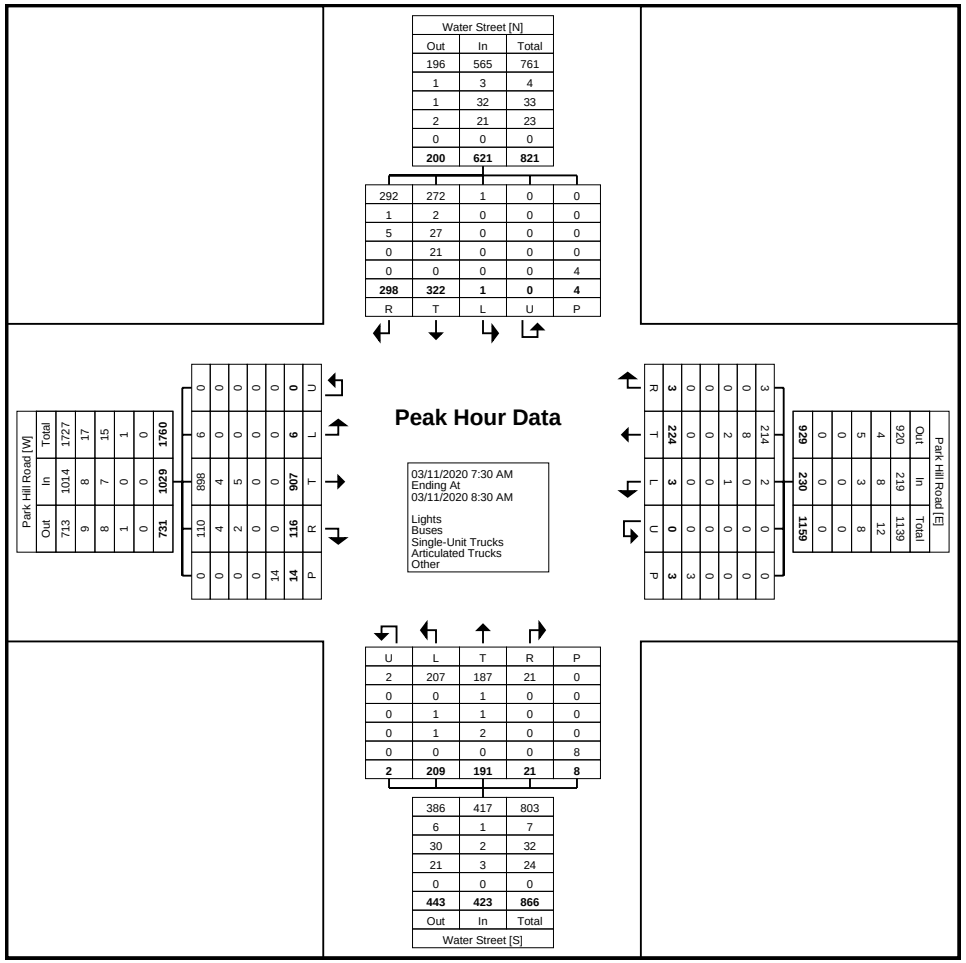
Turning Movement Peak Hour Data (7:30 AM)

Start Time	Park Hill Road Eastbound						Park Hill Road Westbound						Water Street Northbound						Water Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:30 AM	2	229	26	0	1	257	2	68	1	0	1	71	66	64	5	0	2	135	0	75	70	0	1	145	608
7:45 AM	0	241	26	0	8	267	1	60	0	0	1	61	46	39	4	0	2	89	0	88	66	0	2	154	571
8:00 AM	0	203	34	0	0	237	0	54	1	0	1	55	48	40	3	1	4	92	1	85	82	0	1	168	552
8:15 AM	4	234	30	0	5	268	0	42	1	0	0	43	49	48	9	1	0	107	0	74	80	0	0	154	572
Total	6	907	116	0	14	1029	3	224	3	0	3	230	209	191	21	2	8	423	1	322	298	0	4	621	2303
Approach %	0.6	88.1	11.3	0.0	-	-	1.3	97.4	1.3	0.0	-	-	49.4	45.2	5.0	0.5	-	-	0.2	51.9	48.0	0.0	-	-	-
Total %	0.3	39.4	5.0	0.0	-	44.7	0.1	9.7	0.1	0.0	-	10.0	9.1	8.3	0.9	0.1	-	18.4	0.0	14.0	12.9	0.0	-	27.0	-
PHF	0.375	0.941	0.853	0.000	-	0.960	0.375	0.824	0.750	0.000	-	0.810	0.792	0.746	0.583	0.500	-	0.783	0.250	0.915	0.909	0.000	-	0.924	0.947
Lights	6	898	110	0	-	1014	2	214	3	0	-	219	207	187	21	2	-	417	1	272	292	0	-	565	2215
% Lights	100.0	99.0	94.8	-	-	98.5	66.7	95.5	100.0	-	-	95.2	99.0	97.9	100.0	100.0	-	98.6	100.0	84.5	98.0	-	-	91.0	96.2
Buses	0	4	4	0	-	8	0	8	0	0	-	8	0	1	0	0	-	1	0	2	1	0	-	3	20
% Buses	0.0	0.4	3.4	-	-	0.8	0.0	3.6	0.0	-	-	3.5	0.0	0.5	0.0	0.0	-	0.2	0.0	0.6	0.3	-	-	0.5	0.9
Single-Unit Trucks	0	5	2	0	-	7	1	2	0	0	-	3	1	1	0	0	-	2	0	27	5	0	-	32	44
% Single-Unit Trucks	0.0	0.6	1.7	-	-	0.7	33.3	0.9	0.0	-	-	1.3	0.5	0.5	0.0	0.0	-	0.5	0.0	8.4	1.7	-	-	5.2	1.9
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	1	2	0	0	-	3	0	21	0	0	-	21	24
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.5	1.0	0.0	0.0	-	0.7	0.0	6.5	0.0	-	-	3.4	1.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	14	-	-	-	-	-	3	-	-	-	-	-	8	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Water Street & Park Hill Road
Site Code: 200034
Start Date: 03/11/2020



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Water Street & Park Hill Road
Site Code: 200034
Start Date: 03/11/2020

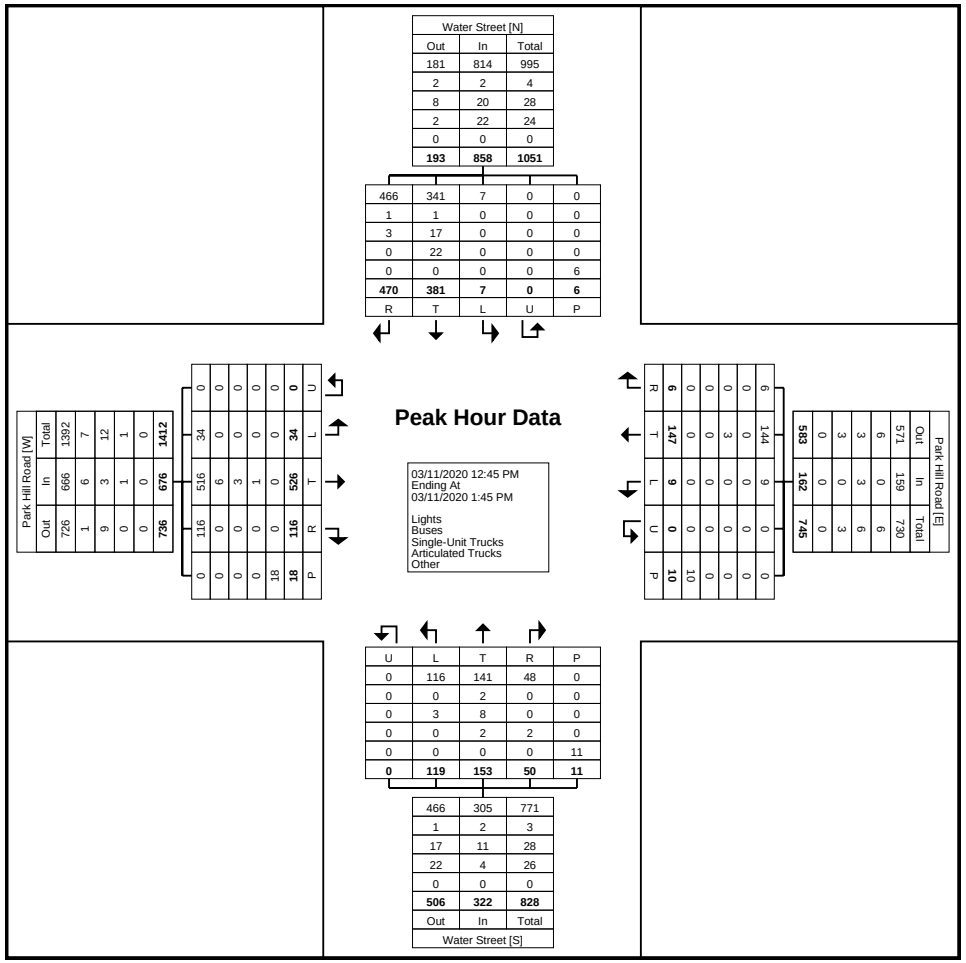
Turning Movement Peak Hour Data (12:45 PM)

Start Time	Park Hill Road Eastbound						Park Hill Road Westbound						Water Street Northbound						Water Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:45 PM	7	142	30	0	5	179	3	33	1	0	3	37	23	41	12	0	3	76	2	99	116	0	3	217	509
1:00 PM	12	126	27	0	2	165	2	34	2	0	4	38	30	29	14	0	5	73	0	91	117	0	0	208	484
1:15 PM	7	131	22	0	2	160	2	46	1	0	1	49	34	35	14	0	1	83	3	87	118	0	3	208	500
1:30 PM	8	127	37	0	9	172	2	34	2	0	2	38	32	48	10	0	2	90	2	104	119	0	0	225	525
Total	34	526	116	0	18	676	9	147	6	0	10	162	119	153	50	0	11	322	7	381	470	0	6	858	2018
Approach %	5.0	77.8	17.2	0.0	-	-	5.6	90.7	3.7	0.0	-	-	37.0	47.5	15.5	0.0	-	-	0.8	44.4	54.8	0.0	-	-	-
Total %	1.7	26.1	5.7	0.0	-	33.5	0.4	7.3	0.3	0.0	-	8.0	5.9	7.6	2.5	0.0	-	16.0	0.3	18.9	23.3	0.0	-	42.5	-
PHF	0.708	0.926	0.784	0.000	-	0.944	0.750	0.799	0.750	0.000	-	0.827	0.875	0.797	0.893	0.000	-	0.894	0.583	0.916	0.987	0.000	-	0.953	0.961
Lights	34	516	116	0	-	666	9	144	6	0	-	159	116	141	48	0	-	305	7	341	466	0	-	814	1944
% Lights	100.0	98.1	100.0	-	-	98.5	100.0	98.0	100.0	-	-	98.1	97.5	92.2	96.0	-	-	94.7	100.0	89.5	99.1	-	-	94.9	96.3
Buses	0	6	0	0	-	6	0	0	0	0	-	0	0	2	0	0	-	2	0	1	1	0	-	2	10
% Buses	0.0	1.1	0.0	-	-	0.9	0.0	0.0	0.0	-	-	0.0	0.0	1.3	0.0	-	-	0.6	0.0	0.3	0.2	-	-	0.2	0.5
Single-Unit Trucks	0	3	0	0	-	3	0	3	0	0	-	3	3	8	0	0	-	11	0	17	3	0	-	20	37
% Single-Unit Trucks	0.0	0.6	0.0	-	-	0.4	0.0	2.0	0.0	-	-	1.9	2.5	5.2	0.0	-	-	3.4	0.0	4.5	0.6	-	-	2.3	1.8
Articulated Trucks	0	1	0	0	-	1	0	0	0	0	-	0	0	2	2	0	-	4	0	22	0	0	-	22	27
% Articulated Trucks	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	1.3	4.0	-	-	1.2	0.0	5.8	0.0	-	-	2.6	1.3
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	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	5.6	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	16.7	-	-
Pedestrians	-	-	-	-	17	-	-	-	-	-	10	-	-	-	-	-	11	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	94.4	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	83.3	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Water Street & Park Hill Road
Site Code: 200034
Start Date: 03/11/2020



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Water Street & Park Hill Road
Site Code: 200034
Start Date: 03/11/2020

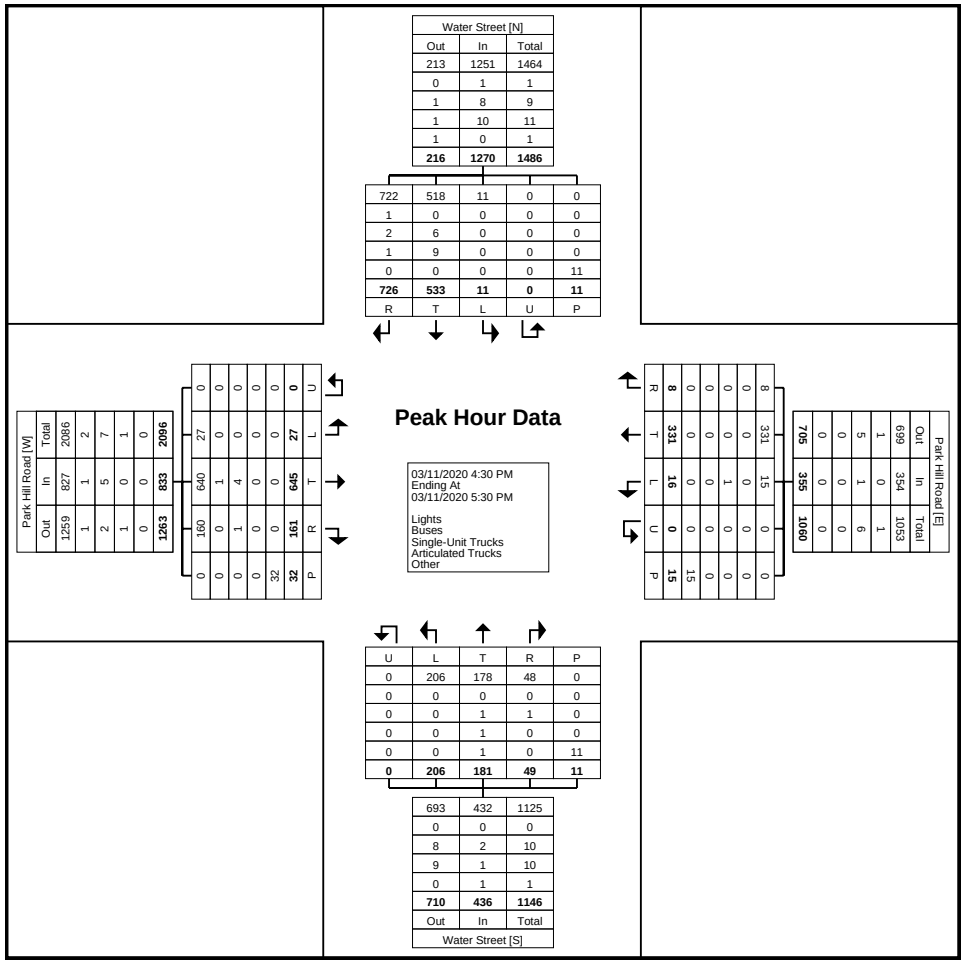
Turning Movement Peak Hour Data (4:30 PM)

Start Time	Park Hill Road Eastbound						Park Hill Road Westbound						Water Street Northbound						Water Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:30 PM	7	171	32	0	5	210	2	91	2	0	6	95	54	47	12	0	3	113	3	130	182	0	0	315	733
4:45 PM	8	178	46	0	8	232	5	91	1	0	3	97	43	48	12	0	1	103	3	134	183	0	2	320	752
5:00 PM	6	156	39	0	8	201	7	95	2	0	2	104	54	52	11	0	3	117	0	140	192	0	1	332	754
5:15 PM	6	140	44	0	11	190	2	54	3	0	4	59	55	34	14	0	4	103	5	129	169	0	8	303	655
Total	27	645	161	0	32	833	16	331	8	0	15	355	206	181	49	0	11	436	11	533	726	0	11	1270	2894
Approach %	3.2	77.4	19.3	0.0	-	-	4.5	93.2	2.3	0.0	-	-	47.2	41.5	11.2	0.0	-	-	0.9	42.0	57.2	0.0	-	-	-
Total %	0.9	22.3	5.6	0.0	-	28.8	0.6	11.4	0.3	0.0	-	12.3	7.1	6.3	1.7	0.0	-	15.1	0.4	18.4	25.1	0.0	-	43.9	-
PHF	0.844	0.906	0.875	0.000	-	0.898	0.571	0.871	0.667	0.000	-	0.853	0.936	0.870	0.875	0.000	-	0.932	0.550	0.952	0.945	0.000	-	0.956	0.960
Lights	27	640	160	0	-	827	15	331	8	0	-	354	206	178	48	0	-	432	11	518	722	0	-	1251	2864
% Lights	100.0	99.2	99.4	-	-	99.3	93.8	100.0	100.0	-	-	99.7	100.0	98.3	98.0	-	-	99.1	100.0	97.2	99.4	-	-	98.5	99.0
Buses	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	2
% Buses	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	0.0	0.1	-	-	0.1	0.1
Single-Unit Trucks	0	4	1	0	-	5	1	0	0	0	-	1	0	1	1	0	-	2	0	6	2	0	-	8	16
% Single-Unit Trucks	0.0	0.6	0.6	-	-	0.6	6.3	0.0	0.0	-	-	0.3	0.0	0.6	2.0	-	-	0.5	0.0	1.1	0.3	-	-	0.6	0.6
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	9	1	0	-	10	11
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.2	0.0	1.7	0.1	-	-	0.8	0.4
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	6.3	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	30	-	-	-	-	-	15	-	-	-	-	-	11	-	-	-	-	-	11	-	-
% Pedestrians	-	-	-	-	93.8	-	-	-	-	-	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: Water Street & Park Hill Road
Site Code: 200034
Start Date: 03/11/2020
Page No: 9



Turning Movement Peak Hour Data Plot (4:30 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Water Street & Simcoe Street
Site Code: 200034
Start Date: 03/11/2020

Turning Movement Data

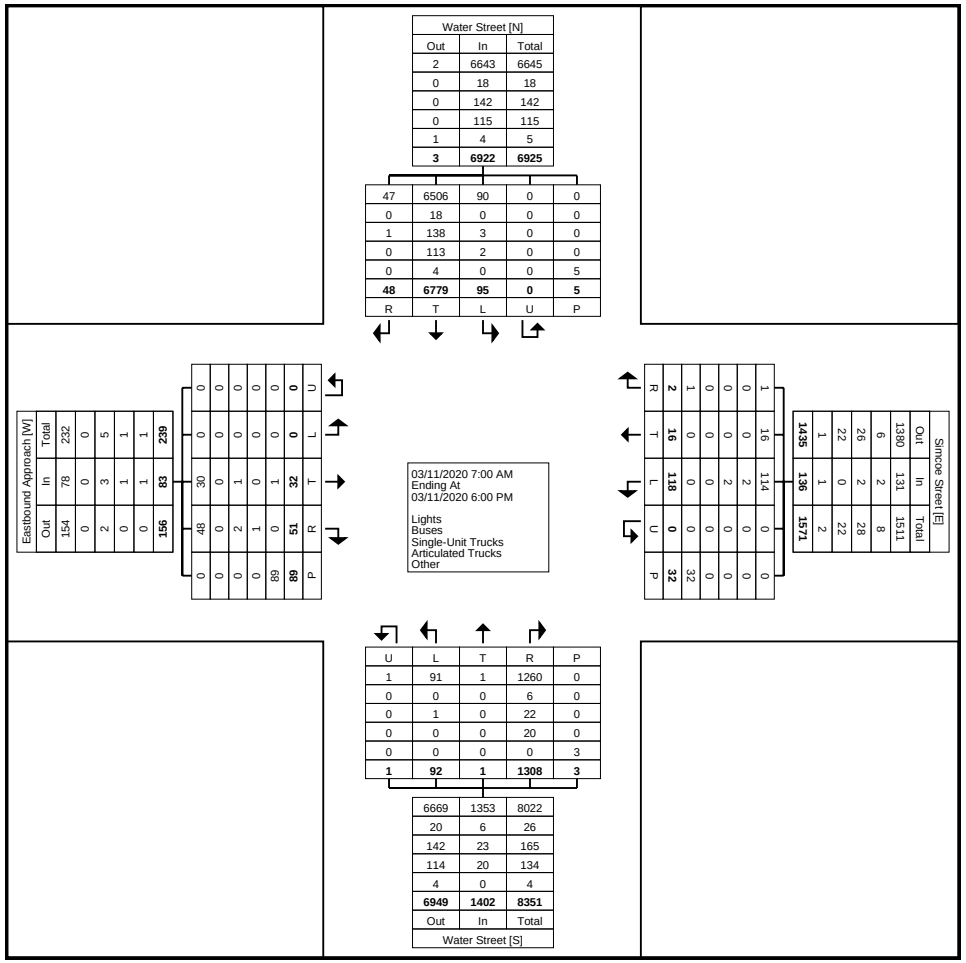
Start Time	Eastbound Approach						Simcoe Street						Water Street						Water Street						
	Eastbound						Westbound						Northbound						Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	24	0	0	24	0	95	2	0	0	97	122
7:15 AM	0	0	0	0	1	0	1	0	0	0	0	1	0	0	39	0	0	39	3	116	0	0	0	119	159
7:30 AM	0	1	1	0	10	2	0	0	0	0	0	0	1	0	66	0	0	67	2	157	2	0	0	161	230
7:45 AM	0	0	1	0	20	1	1	1	0	0	2	2	0	0	37	0	0	37	4	147	3	0	0	154	194
Hourly Total	0	1	2	0	31	3	3	1	0	0	2	4	1	0	166	0	0	167	9	515	7	0	0	531	705
8:00 AM	0	0	1	0	1	1	2	0	0	0	0	2	5	0	36	0	0	41	3	167	1	0	0	171	215
8:15 AM	0	1	2	0	4	3	0	0	0	0	0	0	0	0	54	0	0	54	4	148	0	0	0	152	209
8:30 AM	0	0	2	0	0	2	4	0	0	0	1	4	2	0	55	0	0	57	6	116	0	0	0	122	185
8:45 AM	0	0	2	0	5	2	2	0	0	0	1	2	2	0	44	0	0	46	5	141	1	0	0	147	197
Hourly Total	0	1	7	0	10	8	8	0	0	0	2	8	9	0	189	0	0	198	18	572	2	0	0	592	806
9:00 AM	0	1	2	0	3	3	4	0	0	0	0	4	2	0	39	0	0	41	2	158	0	0	0	160	208
9:15 AM	0	0	0	0	7	0	3	1	1	0	0	5	0	0	30	0	0	30	5	152	2	0	1	159	194
9:30 AM	0	1	1	0	2	2	1	1	0	0	1	2	0	0	29	0	0	29	1	146	2	0	0	149	182
9:45 AM	0	1	2	0	1	3	3	0	0	0	0	3	1	0	30	0	0	31	3	178	1	0	0	182	219
Hourly Total	0	3	5	0	13	8	11	2	1	0	1	14	3	0	128	0	0	131	11	634	5	0	1	650	803
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12:00 PM	0	1	0	0	4	1	7	1	0	0	1	8	4	0	38	0	0	42	5	181	2	0	0	188	239
12:15 PM	0	1	4	0	2	5	3	1	0	0	8	4	7	0	48	0	1	55	1	194	2	0	3	197	261
12:30 PM	0	0	3	0	0	3	3	0	0	0	0	3	0	0	33	0	0	33	4	149	1	0	0	154	193
12:45 PM	0	1	0	0	4	1	4	1	0	0	2	5	4	0	46	0	1	50	3	209	3	0	0	215	271
Hourly Total	0	3	7	0	10	10	17	3	0	0	11	20	15	0	165	0	2	180	13	733	8	0	3	754	964
1:00 PM	0	10	3	0	1	13	4	0	0	0	4	4	5	0	41	0	0	46	2	202	2	0	0	206	269
1:15 PM	0	2	5	0	0	7	6	2	0	0	0	8	1	0	39	0	0	40	1	200	0	0	0	201	256
1:30 PM	0	1	3	0	1	4	5	0	0	0	1	5	0	1	54	1	0	56	3	215	3	0	0	221	286
1:45 PM	0	2	3	0	2	5	3	2	0	0	1	5	3	0	38	0	0	41	2	172	1	0	0	175	226
Hourly Total	0	15	14	0	4	29	18	4	0	0	6	22	9	1	172	1	0	183	8	789	6	0	0	803	1037
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	0	2	0	0	1	2	3	0	0	0	3	3	6	0	34	0	0	40	2	275	0	0	0	277	322
3:15 PM	0	0	1	0	0	1	11	0	0	0	1	11	2	0	34	0	0	36	4	263	0	0	0	267	315
3:30 PM	0	0	1	0	0	1	6	1	0	0	1	7	1	0	39	0	0	40	0	278	1	0	0	279	327
3:45 PM	0	0	2	0	1	2	3	0	0	0	0	3	3	0	48	0	0	51	2	310	0	0	1	312	368
Hourly Total	0	2	4	0	2	6	23	1	0	0	5	24	12	0	155	0	0	167	8	1126	1	0	1	1135	1332
4:00 PM	0	2	1	0	2	3	9	1	0	0	2	10	6	0	30	0	0	36	3	286	1	0	0	290	339
4:15 PM	0	1	3	0	1	4	2	0	0	0	1	2	2	0	36	0	0	38	1	316	2	0	0	319	363
4:30 PM	0	1	0	0	1	1	1	1	0	0	1	2	4	0	49	0	0	53	3	326	4	0	0	333	389

4:45 PM	0	2	5	0	1	7	5	0	0	0	0	5	7	0	53	0	1	60	5	316	1	0	0	322	394
Hourly Total	0	6	9	0	5	15	17	2	0	0	4	19	19	0	168	0	1	187	12	1244	8	0	0	1264	1485
5:00 PM	0	0	0	0	5	0	6	0	1	0	0	7	4	0	54	0	0	58	3	333	4	0	0	340	405
5:15 PM	0	1	1	0	1	2	3	0	0	0	0	3	7	0	34	0	0	41	4	302	2	0	0	308	354
5:30 PM	0	0	2	0	2	2	8	1	0	0	1	9	5	0	38	0	0	43	7	292	2	0	0	301	355
5:45 PM	0	0	0	0	6	0	4	2	0	0	0	6	8	0	39	0	0	47	2	239	3	0	0	244	297
Hourly Total	0	1	3	0	14	4	21	3	1	0	1	25	24	0	165	0	0	189	16	1166	11	0	0	1193	1411
Grand Total	0	32	51	0	89	83	118	16	2	0	32	136	92	1	1308	1	3	1402	95	6779	48	0	5	6922	8543
Approach %	0.0	38.6	61.4	0.0	-	-	86.8	11.8	1.5	0.0	-	-	6.6	0.1	93.3	0.1	-	-	1.4	97.9	0.7	0.0	-	-	-
Total %	0.0	0.4	0.6	0.0	-	1.0	1.4	0.2	0.0	0.0	-	1.6	1.1	0.0	15.3	0.0	-	16.4	1.1	79.4	0.6	0.0	-	81.0	-
Lights	0	30	48	0	-	78	114	16	1	0	-	131	91	1	1260	1	-	1353	90	6506	47	0	-	6643	8205
% Lights	-	93.8	94.1	-	-	94.0	96.6	100.0	50.0	-	-	96.3	98.9	100.0	96.3	100.0	-	96.5	94.7	96.0	97.9	-	-	96.0	96.0
Buses	0	0	0	0	-	0	2	0	0	0	-	2	0	0	6	0	-	6	0	18	0	0	-	18	26
% Buses	-	0.0	0.0	-	-	0.0	1.7	0.0	0.0	-	-	1.5	0.0	0.0	0.5	0.0	-	0.4	0.0	0.3	0.0	-	-	0.3	0.3
Single-Unit Trucks	0	1	2	0	-	3	2	0	0	0	-	2	1	0	22	0	-	23	3	138	1	0	-	142	170
% Single-Unit Trucks	-	3.1	3.9	-	-	3.6	1.7	0.0	0.0	-	-	1.5	1.1	0.0	1.7	0.0	-	1.6	3.2	2.0	2.1	-	-	2.1	2.0
Articulated Trucks	0	0	1	0	-	1	0	0	0	0	-	0	0	0	20	0	-	20	2	113	0	0	-	115	136
% Articulated Trucks	-	0.0	2.0	-	-	1.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.5	0.0	-	1.4	2.1	1.7	0.0	-	-	1.7	1.6
Bicycles on Road	0	1	0	0	-	1	0	0	1	0	-	1	0	0	0	0	-	0	0	4	0	0	-	4	6
% Bicycles on Road	-	3.1	0.0	-	-	1.2	0.0	0.0	50.0	-	-	0.7	0.0	0.0	0.0	0.0	-	0.0	0.0	0.1	0.0	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	4.5	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	20.0	-	-
Pedestrians	-	-	-	-	85	-	-	-	-	-	32	-	-	-	-	-	3	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	95.5	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	80.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Water Street & Simcoe Street
Site Code: 200034
Start Date: 03/11/2020



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: Water Street & Simcoe Street
Site Code: 200034
Start Date: 03/11/2020

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Eastbound Approach						Simcoe Street						Water Street						Water Street						
	Eastbound						Westbound						Northbound						Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
7:30 AM	0	1	1	0	10	2	0	0	0	0	0	0	1	0	66	0	0	67	2	157	2	0	0	161	230
7:45 AM	0	0	1	0	20	1	1	1	0	0	2	2	0	0	37	0	0	37	4	147	3	0	0	154	194
8:00 AM	0	0	1	0	1	1	2	0	0	0	0	2	5	0	36	0	0	41	3	167	1	0	0	171	215
8:15 AM	0	1	2	0	4	3	0	0	0	0	0	0	0	0	54	0	0	54	4	148	0	0	0	152	209
Total	0	2	5	0	35	7	3	1	0	0	2	4	6	0	193	0	0	199	13	619	6	0	0	638	848
Approach %	0.0	28.6	71.4	0.0	-	-	75.0	25.0	0.0	0.0	-	-	3.0	0.0	97.0	0.0	-	-	2.0	97.0	0.9	0.0	-	-	-
Total %	0.0	0.2	0.6	0.0	-	0.8	0.4	0.1	0.0	0.0	-	0.5	0.7	0.0	22.8	0.0	-	23.5	1.5	73.0	0.7	0.0	-	75.2	-
PHF	0.000	0.500	0.625	0.000	-	0.583	0.375	0.250	0.000	0.000	-	0.500	0.300	0.000	0.731	0.000	-	0.743	0.813	0.927	0.500	0.000	-	0.933	0.922
Lights	0	2	4	0	-	6	3	1	0	0	-	4	6	0	189	0	-	195	13	566	5	0	-	584	789
% Lights	-	100.0	80.0	-	-	85.7	100.0	100.0	-	-	-	100.0	100.0	-	97.9	-	-	98.0	100.0	91.4	83.3	-	-	91.5	93.0
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	0	1	0	0	-	1	2
% Buses	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	-	0.5	-	-	0.5	0.0	0.2	0.0	-	-	0.2	0.2
Single-Unit Trucks	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	31	1	0	-	32	33
% Single-Unit Trucks	-	0.0	20.0	-	-	14.3	0.0	0.0	-	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	5.0	16.7	-	-	5.0	3.9
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	3	0	-	3	0	21	0	0	-	21	24
% Articulated Trucks	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	-	1.6	-	-	1.5	0.0	3.4	0.0	-	-	3.3	2.8
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	2.9	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	34	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	97.1	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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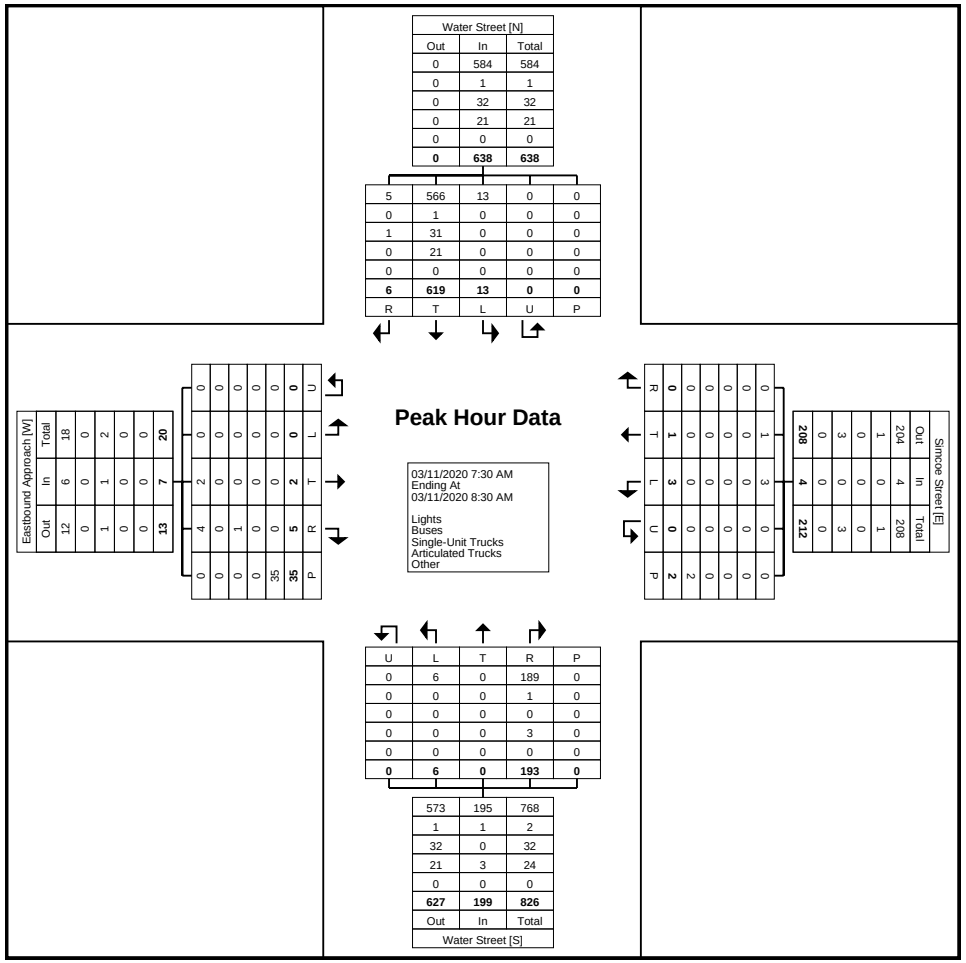
Site Code: 200034
Start Date: 03/11/2020



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Water Street & Simcoe Street
Site Code: 200034
Start Date: 03/11/2020

Turning Movement Peak Hour Data (12:45 PM)

Start Time	Eastbound Approach Eastbound						Simcoe Street Westbound						Water Street Northbound						Water Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:45 PM	0	1	0	0	4	1	4	1	0	0	2	5	4	0	46	0	1	50	3	209	3	0	0	215	271
1:00 PM	0	10	3	0	1	13	4	0	0	0	4	4	5	0	41	0	0	46	2	202	2	0	0	206	269
1:15 PM	0	2	5	0	0	7	6	2	0	0	0	8	1	0	39	0	0	40	1	200	0	0	0	201	256
1:30 PM	0	1	3	0	1	4	5	0	0	0	1	5	0	1	54	1	0	56	3	215	3	0	0	221	286
Total	0	14	11	0	6	25	19	3	0	0	7	22	10	1	180	1	1	192	9	826	8	0	0	843	1082
Approach %	0.0	56.0	44.0	0.0	-	-	86.4	13.6	0.0	0.0	-	-	5.2	0.5	93.8	0.5	-	-	1.1	98.0	0.9	0.0	-	-	-
Total %	0.0	1.3	1.0	0.0	-	2.3	1.8	0.3	0.0	0.0	-	2.0	0.9	0.1	16.6	0.1	-	17.7	0.8	76.3	0.7	0.0	-	77.9	-
PHF	0.000	0.350	0.550	0.000	-	0.481	0.792	0.375	0.000	0.000	-	0.688	0.500	0.250	0.833	0.250	-	0.857	0.750	0.960	0.667	0.000	-	0.954	0.946
Lights	0	13	11	0	-	24	19	3	0	0	-	22	9	1	170	1	-	181	8	782	8	0	-	798	1025
% Lights	-	92.9	100.0	-	-	96.0	100.0	100.0	-	-	-	100.0	90.0	100.0	94.4	100.0	-	94.3	88.9	94.7	100.0	-	-	94.7	94.7
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	2	0	-	2	0	2	0	0	-	2	4
% Buses	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	1.1	0.0	-	1.0	0.0	0.2	0.0	-	-	0.2	0.4
Single-Unit Trucks	0	1	0	0	-	1	0	0	0	0	-	0	1	0	6	0	-	7	1	20	0	0	-	21	29
% Single-Unit Trucks	-	7.1	0.0	-	-	4.0	0.0	0.0	-	-	-	0.0	10.0	0.0	3.3	0.0	-	3.6	11.1	2.4	0.0	-	-	2.5	2.7
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	2	0	-	2	0	21	0	0	-	21	23
% Articulated Trucks	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	1.1	0.0	-	1.0	0.0	2.5	0.0	-	-	2.5	2.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Bicycles on Road	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.1	0.0	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	16.7	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	5	-	-	-	-	-	7	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	83.3	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

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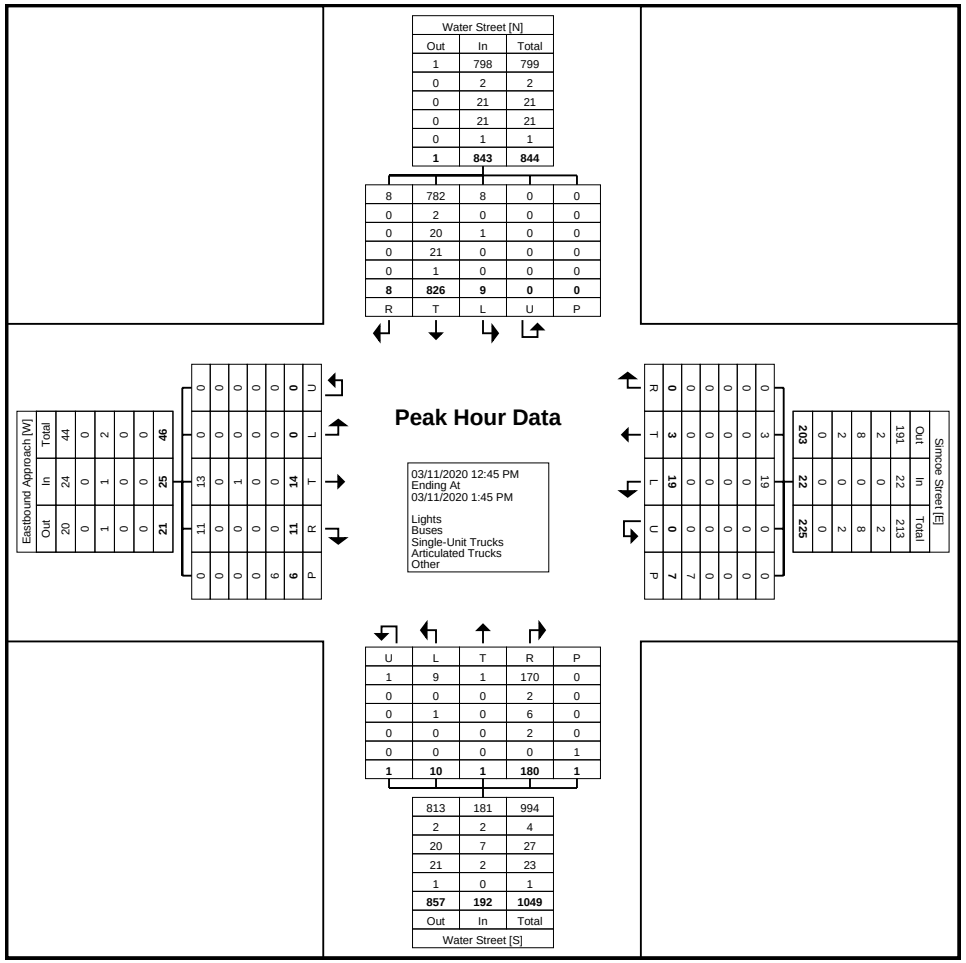
Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Water Street & Simcoe Street
Site Code: 200034
Start Date: 03/11/2020



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Water Street & Simcoe Street
Site Code: 200034
Start Date: 03/11/2020

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Eastbound Approach Eastbound						Simcoe Street Westbound						Water Street Northbound						Water Street Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:15 PM	0	1	3	0	1	4	2	0	0	0	1	2	2	0	36	0	0	38	1	316	2	0	0	319	363
4:30 PM	0	1	0	0	1	1	1	1	0	0	1	2	4	0	49	0	0	53	3	326	4	0	0	333	389
4:45 PM	0	2	5	0	1	7	5	0	0	0	0	5	7	0	53	0	1	60	5	316	1	0	0	322	394
5:00 PM	0	0	0	0	5	0	6	0	1	0	0	7	4	0	54	0	0	58	3	333	4	0	0	340	405
Total	0	4	8	0	8	12	14	1	1	0	2	16	17	0	192	0	1	209	12	1291	11	0	0	1314	1551
Approach %	0.0	33.3	66.7	0.0	-	-	87.5	6.3	6.3	0.0	-	-	8.1	0.0	91.9	0.0	-	-	0.9	98.2	0.8	0.0	-	-	-
Total %	0.0	0.3	0.5	0.0	-	0.8	0.9	0.1	0.1	0.0	-	1.0	1.1	0.0	12.4	0.0	-	13.5	0.8	83.2	0.7	0.0	-	84.7	-
PHF	0.000	0.500	0.400	0.000	-	0.429	0.583	0.250	0.250	0.000	-	0.571	0.607	0.000	0.889	0.000	-	0.871	0.600	0.969	0.688	0.000	-	0.966	0.957
Lights	0	4	8	0	-	12	14	1	1	0	-	16	17	0	188	0	-	205	12	1268	11	0	-	1291	1524
% Lights	-	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0	-	97.9	-	-	98.1	100.0	98.2	100.0	-	-	98.2	98.3
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Buses	-	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	0.1
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	0	11	0	0	-	11	12
% Single-Unit Trucks	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.5	-	-	0.5	0.0	0.9	0.0	-	-	0.8	0.8
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	3	0	-	3	0	9	0	0	-	9	12
% Articulated Trucks	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	1.6	-	-	1.4	0.0	0.7	0.0	-	-	0.7	0.8
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	2
% 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	0.2	0.0	-	-	0.2	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

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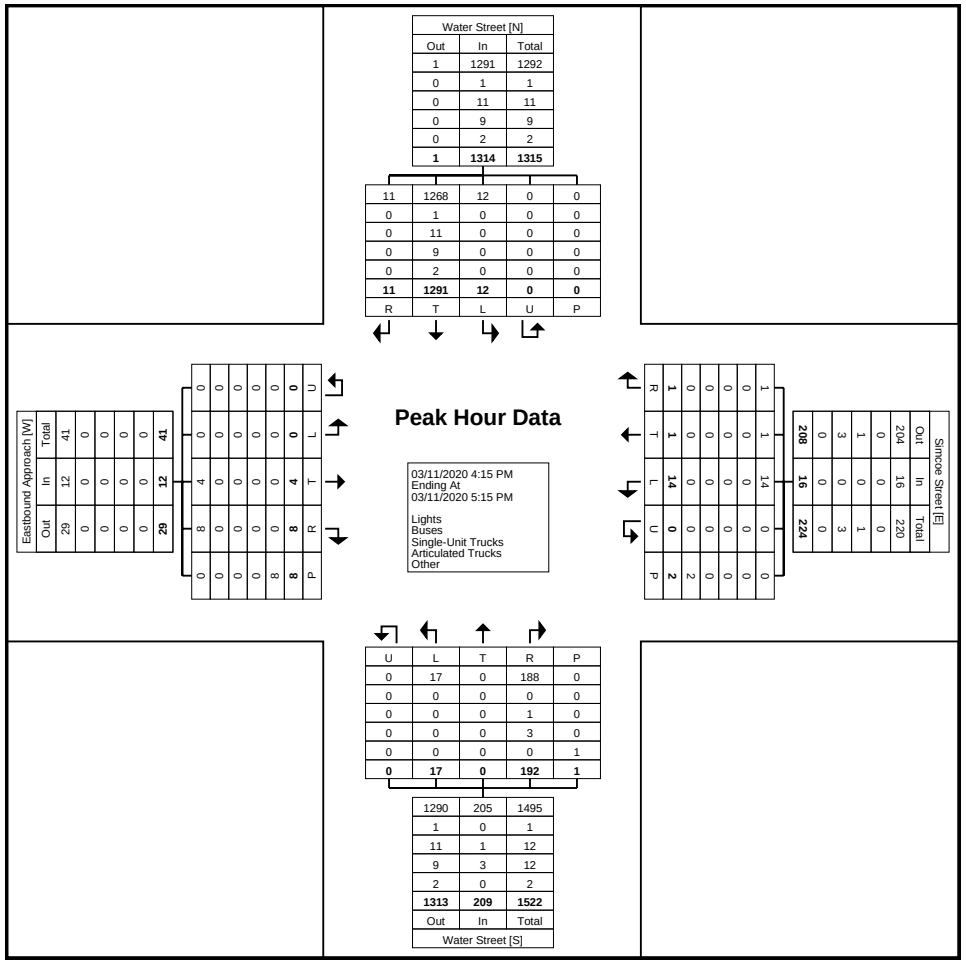

Turning Movement Peak Hour Data Plot (4:15 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Water Street & Simcoe Street
Site Code: 200034
Start Date: 03/11/2020

INT # 600 **AINSLIE STREET at Simcoe Street/Market Street** T08-50/ 117C

Semi-Actuated Operation
Offsets are percentages of the cycle length related to the beginning of Ainsle Street green

Signal Timing in Effect: 6:30-14:30 & 18:00-22:00 Monday to Friday, 7:00-22:00 Sat, 9:00-18:00 Sun

AINSLE STREET				**Offset= 0%**		
Green		45.0	seconds			
Amber		4.0	seconds	Walk	31.0	seconds
All Red		2.0	seconds	FDW	14.0	seconds
Simcoe Street/Market Street						
Green	Min.	8.0				
	Ext.	3.0				
	Max	23.0	seconds			
Amber		4.0	seconds	Walk	7.0	seconds
All Red		2.0	seconds	FDW	16.0	seconds
TOTAL		80.0	seconds			

Signal Timing in Effect: 14:30-18:00 Monday - Friday

AINSLE STREET				**Offset= 0%**		
Green		52.0	seconds			
Amber		4.0	seconds	Walk	38.0	seconds
All Red		2.0	seconds	FDW	14.0	seconds
Simcoe Street/Market Street						
Green	Min.	8.0				
	Ext.	3.0				
	Max	26.0	seconds			
Amber		4.0	seconds	Walk	10.0	seconds
All Red		2.0	seconds	FDW	16.0	seconds
TOTAL		90.0	seconds			

Signal Timing in Effect: All Other Times

AINSLE STREET						
Green		30.0	seconds			
Amber		4.0	seconds	Walk	16.0	seconds
All Red		2.0	seconds	FDW	14.0	seconds
Simcoe Street/Market Street						
Green	Min.	8.0				
	Ext.	3.0				
	Max	18.0	seconds			
Amber		4.0	seconds	Walk	2.0	seconds
All Red		2.0	seconds	FDW	16.0	seconds
TOTAL		60.0	seconds			

Fixed Time Operation
Actuated protected/permissive northbound left-turn phase on Parkhill Road
Eastbound left-turns on Parkhill Road are prohibited
Offsets are percentages of the cycle length related to the beginning of Water Street green

Signal Timing in Effect: 6:30-14:30 & 18:00 - 22:00 Monday to Friday, 7:00-22:00 Sat, 9:00-18:00 Sun

WATER STREET **Offset= 86%**

NBL Green Arrow	Min	5.0	seconds			
	Ext	3.0	seconds			
	Max	8.0	seconds			
NBL Amber Arrow		3.0	seconds			
All Red		1.0	seconds			
Green		24.0	seconds			
Amber		4.0	seconds	Walk	10.0	seconds
All Red		2.0	seconds	FDW	14.0	seconds

Parkhill Road

Green	32.0	seconds		
Amber	4.0	seconds	Walk	16.0 seconds
All Red	2.0	seconds	FDW	16.0 seconds
TOTAL	80.0	seconds		

Signal Timing in Effect: 14:30-18:00 Monday - Friday

WATER STREET **Offset= 58%**

NBL Green Arrow	Min	5.0	seconds			
	Ext	3.0	seconds			
	Max	8.0	seconds			
NBL Amber Arrow		3.0	seconds			
All Red		1.0	seconds			
Green		37.0	seconds			
Amber		4.0	seconds	Walk	23.0	seconds
All Red		2.0	seconds	FDW	14.0	seconds

Parkhill Road

Green	29.0	seconds		
Amber	4.0	seconds	Walk	13.0 seconds
All Red	2.0	seconds	FDW	16.0 seconds
TOTAL	90.0	seconds		

Signal Timing in Effect: All Other Times

WATER STREET

Green	24.0	seconds		
Amber	4.0	seconds	Walk	10.0 seconds
All Red	2.0	seconds	FDW	14.0 seconds

Parkhill Road

Green	24.0	seconds		
Amber	4.0	seconds	Walk	8.0 seconds
All Red	2.0	seconds	FDW	16.0 seconds
TOTAL	60.0	seconds		

- Fixed Time Operation
- Actuated protected/permisive eastbound left-turn phase on Parkhill Road
- Offsets are a percentage of the cycle length and are referenced to the beginning of Ainslie Street green

Signal Timing in Effect: 06:00 -14:30, 18:00 - 22:00 Monday - Friday
07:00 - 22:00 Saturday; 09:00 -18:00 Sunday

AINSLIE STREET				**Offset = 89%**		
Green		24.0	seconds			
Amber		4.0	seconds	Walk	14.0	seconds
All Red		2.0	seconds	FDW	10.0	seconds

Parkhill Road						
EBL Green Arrow	Min	5.0	seconds			
	Ext	3.0	seconds			
	Max	19.0	seconds			
EBL Amber Arrow		3.0	seconds			
All Red		1.0	seconds			
Green		21.0	seconds			
Amber		4.0	seconds	Walk	10.0	seconds
All Red		2.0	seconds	FDW	11.0	seconds
TOTAL		80.0	seconds			

Signal Timing in Effect: 14:30 - 18:00 Monday - Friday

AINSLIE STREET				**Offset = 70%**		
Green		34.0	seconds			
Amber		4.0	seconds	Walk	24.0	seconds
All Red		2.0	seconds	FDW	10.0	seconds

Parkhill Road						
EBL Green Arrow	Min	5.0	seconds			
	Ext	3.0	seconds			
	Max	16.0	seconds			
EBL Amber Arrow		3.0	seconds			
All Red		1.0	seconds			
Green		24.0	seconds			
Amber		4.0	seconds	Walk	13.0	seconds
All Red		2.0	seconds	FDW	11.0	seconds
TOTAL		90.0	seconds			

Signal Timing in Effect:	All Other Times				
AINSLIE STREET			**Offset = 0%**		
Green	29.0	seconds			
Amber	4.0	seconds	Walk	19.0	seconds
All Red	2.0	seconds	FDW	10.0	seconds
Parkhill Road					
Green	29.0	seconds			
Amber	4.0	seconds	Walk	18.0	seconds
All Red	2.0	seconds	FDW	11.0	seconds
TOTAL	70.0	seconds			

Appendix C

Existing Operations Reports

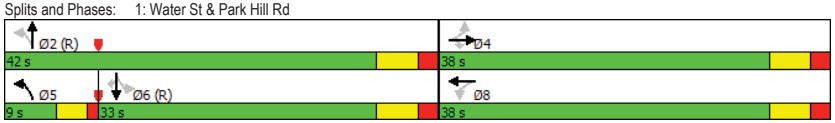
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	907	116	3	224	3	20	191	21	1	322	298
Future Volume (vph)	0	907	116	3	224	3	20	191	21	1	322	298
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	15.0		0.0	25.0		0.0	40.0		0.0
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97	1.00	1.00		0.99	1.00		1.00		0.96
Frt			0.850		0.998			0.985				0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	2943	1324	1501	1265	0	1501	1424	0	1128	1626	1324
Flt Permitted				0.198			0.326			0.625		
Satd. Flow (perm)	0	2943	1284	312	1265	0	509	1424	0	741	1626	1267
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95		1			9				298
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.4			108.0			179.1			83.3	
Travel Time (s)		2.8			7.8			12.9			6.0	
Confl. Peds. (#/hr)	4		8	8		4	14		3	3		14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	0%	16%	2%	0%	1%	5%	33%	4%	0%
Adj. Flow (vph)	0	907	116	3	224	3	20	191	21	1	322	298
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	907	116	3	227	0	20	212	0	1	322	298
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.26	1.29	1.26	1.38	1.38	1.26	1.38	1.38	1.26	1.16	1.29
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type		NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	30.0		30.0	30.0	30.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	42.0		33.0	33.0	33.0
Total Split (%)	47.5%	47.5%	47.5%	47.5%	47.5%		11.3%	52.5%		41.3%	41.3%	41.3%
Maximum Green (s)	32.0	32.0	32.0	32.0	32.0		5.0	36.0		27.0	27.0	27.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0		2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Walk Time (s)	16.0	16.0	16.0	16.0	16.0			10.0		10.0	10.0	10.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0			14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		34.0	34.0	34.0	34.0		36.0	38.0		29.0	29.0	29.0
Actuated g/C Ratio		0.42	0.42	0.42	0.42		0.45	0.48		0.36	0.36	0.36
v/c Ratio		0.73	0.19	0.02	0.42		0.08	0.31		0.00	0.55	0.46
Control Delay		23.3	5.5	14.0	19.1		13.0	13.9		16.0	24.6	4.9
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		23.3	5.5	14.0	19.1		13.0	13.9		16.0	24.6	4.9
LOS		C	A	B	B		B	B		B	C	A
Approach Delay		21.3			19.0			13.8			15.1	
Approach LOS		C			B			B			B	

Intersection Summary

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 41 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 18.4 — Intersection LOS: B
Intersection Capacity Utilization 83.3% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Water St & Park Hill Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	907	116	3	227	20	212	1	322	298
v/c Ratio	0.73	0.19	0.02	0.42	0.08	0.31	0.00	0.55	0.46
Control Delay	23.3	5.5	14.0	19.1	13.0	13.9	16.0	24.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	5.5	14.0	19.1	13.0	13.9	16.0	24.6	4.9
Queue Length 50th (m)	61.3	1.9	0.3	24.5	1.7	19.0	0.1	40.2	0.0
Queue Length 95th (m)	84.0	11.5	1.9	43.6	5.5	34.1	1.1	65.8	15.9
Internal Link Dist (m)	14.4			84.0		155.1		59.3	
Turn Bay Length (m)		10.0	15.0		25.0		40.0		
Base Capacity (vph)	1250	600	132	538	266	681	268	589	649
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	0.73	0.19	0.02	0.42	0.08	0.31	0.00	0.55	0.46

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	907	116	3	224	3	20	191	21	1	322	298
Future Volume (vph)	0	907	116	3	224	3	20	191	21	1	322	298
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Total Lost time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.97	1.00	1.00		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00		1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2943	1284	1497	1265		1496	1425		1126	1626	1267
Flt Permitted		1.00	1.00	0.20	1.00		0.33	1.00		0.63	1.00	1.00
Satd. Flow (perm)		2943	1284	312	1265		514	1425		741	1626	1267
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	907	116	3	224	3	20	191	21	1	322	298
RTOR Reduction (vph)	0	0	55	0	1	0	0	5	0	0	0	190
Lane Group Flow (vph)	0	907	61	3	226	0	20	207	0	1	322	108
Confl. Peds. (#/hr)	4		8	8		4	14		3	3		14
Heavy Vehicles (%)	1%	2%	0%	0%	16%	2%	0%	1%	5%	33%	4%	0%
Turn Type		NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		32.0	32.0	32.0	32.0		36.0	36.0		27.0	27.0	27.0
Effective Green, g (s)		34.0	34.0	34.0	34.0		34.0	38.0		29.0	29.0	29.0
Actuated g/C Ratio		0.42	0.42	0.42	0.42		0.42	0.48		0.36	0.36	0.36
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)		1250	545	132	537		255	676		268	589	459
v/s Ratio Prot		c0.31			0.18		0.00	c0.15			c0.20	
v/s Ratio Perm			0.05	0.01			0.03			0.00		0.09
v/c Ratio		0.73	0.11	0.02	0.42		0.08	0.31		0.00	0.55	0.24
Uniform Delay, d1		19.1	13.9	13.4	16.1		14.5	12.9		16.3	20.3	17.8
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		3.7	0.4	0.3	2.4		0.6	1.2		0.0	3.6	1.2
Delay (s)		22.8	14.3	13.7	18.5		15.1	14.1		16.3	23.9	19.0
Level of Service		C	B	B	B		B	B		B	C	B
Approach Delay (s)		21.9			18.5			14.2			21.5	
Approach LOS		C			B			B			C	

Intersection Summary

HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

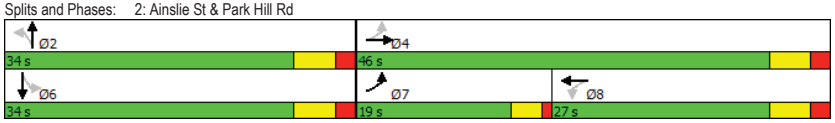
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	534	353	25	10	202	15	15	474	5	5	150	9
Future Volume (vph)	534	353	25	10	202	15	15	474	5	5	150	9
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			1.00			1.00	
Frt		0.990			0.991			0.998			0.993	
Flt Protected	0.950				0.998			0.998			0.998	
Satd. Flow (prot)	1501	1351	0	0	1198	0	0	2750	0	0	1317	0
Flt Permitted	0.463				0.973			0.943			0.980	
Satd. Flow (perm)	728	1351	0	0	1168	0	0	2598	0	0	1293	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			4			1			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.0			89.4			95.3			135.8	
Travel Time (s)		7.8			6.4			6.9			9.8	
Confl. Peds. (#/hr)	7		2	2		7	5		8	8		5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	8%	0%	0%	13%	33%	1%	1%	4%	0%	4%	0%
Adj. Flow (vph)	534	353	25	10	202	15	15	474	5	5	150	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	534	378	0	0	227	0	0	494	0	0	164	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.38	1.38	1.49	1.49	1.49	1.38	1.38	1.38	1.49	1.49	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	5.0	27.0		27.0	27.0		31.0	31.0		31.0	31.0	
Total Split (s)	19.0	46.0		27.0	27.0		34.0	34.0		34.0	34.0	
Total Split (%)	23.8%	57.5%		33.8%	33.8%		42.5%	42.5%		42.5%	42.5%	
Maximum Green (s)	15.0	40.0		21.0	21.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	6.0			6.0			6.0			6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)		10.0		10.0	10.0		14.0	14.0		14.0	14.0	
Flash Dont Walk (s)		11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	38.3	36.3			16.9			17.9			17.9	
Actuated g/C Ratio	0.58	0.55			0.25			0.27			0.27	
v/c Ratio	0.89	0.51			0.76			0.70			0.47	
Control Delay	32.9	13.3			41.3			28.1			25.0	
Queue Delay	4.2	0.5			0.0			0.0			0.0	
Total Delay	37.1	13.8			41.3			28.1			25.0	
LOS	D	B			D			C			C	
Approach Delay		27.4			41.3			28.1			25.0	
Approach LOS		C			D			C			C	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 80			
Actuated Cycle Length: 66.4			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 29.1		Intersection LOS: C	
Intersection Capacity Utilization 90.2%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Ainslie St & Park Hill Rd



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	534	378	227	494	164
v/c Ratio	0.89	0.51	0.76	0.70	0.47
Control Delay	32.9	13.3	41.3	28.1	25.0
Queue Delay	4.2	0.5	0.0	0.0	0.0
Total Delay	37.1	13.8	41.3	28.1	25.0
Queue Length 50th (m)	41.0	27.7	26.5	31.1	17.7
Queue Length 95th (m)	#145.4	62.2	#64.6	48.4	35.3
Internal Link Dist (m)		84.0	65.4	71.3	111.8
Turn Bay Length (m)					
Base Capacity (vph)	597	831	379	1116	557
Starvation Cap Reductn	30	152	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	0.56	0.60	0.44	0.29

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)	534	353	25	10	202	15	15	474	5	5	150	9
Future Volume (vph)	534	353	25	10	202	15	15	474	5	5	150	9
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.99			0.99			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1498	1351			1198			2752			1317	
Flt Permitted	0.46	1.00			0.97			0.94			0.98	
Satd. Flow (perm)	731	1351			1168			2600			1292	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	534	353	25	10	202	15	15	474	5	5	150	9
RTOR Reduction (vph)	0	3	0	0	3	0	0	1	0	0	3	0
Lane Group Flow (vph)	534	375	0	0	224	0	0	493	0	0	161	0
Confl. Peds. (#/hr)	7		2	2		7	5		8	8		5
Heavy Vehicles (%)	0%	8%	0%	0%	13%	33%	1%	1%	4%	0%	4%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.3	36.3			17.0			17.9			17.9	
Effective Green, g (s)	36.3	36.3			17.0			17.9			17.9	
Actuated g/C Ratio	0.55	0.55			0.26			0.27			0.27	
Clearance Time (s)	4.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	578	740			299			703			349	
v/s Ratio Prot	c0.21	0.28										
v/s Ratio Perm	c0.29				0.19			c0.19			0.12	
v/c Ratio	0.92	0.51			0.75			0.70			0.46	
Uniform Delay, d1	12.0	9.4			22.6			21.7			20.1	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	20.6	0.5			9.9			3.2			1.0	
Delay (s)	32.6	9.9			32.5			24.9			21.1	
Level of Service	C	A			C			C			C	
Approach Delay (s)		23.2			32.5			24.9			21.1	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	5	3	1	2	17	6	1003	4	0	162	6
Future Volume (vph)	186	5	3	1	2	17	6	1003	4	0	162	6
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00			1.00				
Frt		0.944			0.885			0.999			0.995	
Flt Protected	0.950				0.998							
Satd. Flow (prot)	1283	1337	0	0	1202	0	0	2783	0	0	1373	0
Flt Permitted	0.744				0.993			0.954				
Satd. Flow (perm)	1005	1337	0	0	1195	0	0	2655	0	0	1373	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			17			1			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.9			70.7			135.8			80.3	
Travel Time (s)		3.9			5.1			9.8			5.8	
Confl. Peds. (#/hr)			6	6					8	8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Adj. Flow (vph)	186	5	3	1	2	17	6	1003	4	0	162	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	8	0	0	20	0	0	1013	0	0	168	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.38	1.38	1.49	1.49	1.49	1.38	1.38	1.38	1.49	1.49	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		51.0	51.0		51.0	51.0	
Total Split (s)	29.0	29.0		29.0	29.0		51.0	51.0		51.0	51.0	
Total Split (%)	36.3%	36.3%		36.3%	36.3%		63.8%	63.8%		63.8%	63.8%	
Maximum Green (s)	23.0	23.0		23.0	23.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		31.0	31.0		31.0	31.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	18.0	18.0			18.0			35.2			35.2	
Actuated g/C Ratio	0.29	0.29			0.29			0.57			0.57	
v/c Ratio	0.63	0.02			0.06			0.67			0.21	
Control Delay	30.3	14.6			10.1			12.4			7.9	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	30.3	14.6			10.1			12.4			7.9	
LOS	C	B			B			B			A	
Approach Delay		29.7			10.1			12.4			7.9	
Approach LOS		C			B			B			A	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 80			
Actuated Cycle Length: 61.4			
Natural Cycle: 80			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 14.3		Intersection LOS: B	
Intersection Capacity Utilization 66.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Ainslie St & Simcoe St/Market St

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	186	8	20	1013	168
v/c Ratio	0.63	0.02	0.06	0.67	0.21
Control Delay	30.3	14.6	10.1	12.4	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	14.6	10.1	12.4	7.9
Queue Length 50th (m)	16.5	0.4	0.3	37.9	8.2
Queue Length 95th (m)	46.2	3.5	5.1	72.4	20.9
Internal Link Dist (m)		29.9	46.7	111.8	56.3
Turn Bay Length (m)	30.0				
Base Capacity (vph)	419	559	508	2083	1078
Starvation Cap Reductn	0	0	0	60	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.01	0.04	0.50	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	5	3	1	2	17	6	1003	4	0	162	6
Future Volume (vph)	186	5	3	1	2	17	6	1003	4	0	162	6
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.99			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.94			0.89			1.00			1.00	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1283	1338			1201			2783			1373	
Flt Permitted	0.74	1.00			0.99			0.95			1.00	
Satd. Flow (perm)	1005	1338			1195			2656			1373	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	186	5	3	1	2	17	6	1003	4	0	162	6
RTOR Reduction (vph)	0	2	0	0	12	0	0	0	0	0	2	0
Lane Group Flow (vph)	186	6	0	0	8	0	0	1013	0	0	166	0
Confl. Peds. (#/hr)			6	6					8	8		
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0			16.0			33.2			33.2	
Effective Green, g (s)	18.0	18.0			18.0			35.2			35.2	
Actuated g/C Ratio	0.29	0.29			0.29			0.58			0.58	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	295	393			351			1527			789	
v/s Ratio Prot		0.00									0.12	
v/s Ratio Perm	c0.19				0.01			c0.38				
v/c Ratio	0.63	0.01			0.02			0.66			0.21	
Uniform Delay, d1	18.7	15.3			15.3			8.9			6.3	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	4.3	0.0			0.0			1.1			0.1	
Delay (s)	23.1	15.3			15.4			10.0			6.4	
Level of Service	C	B			B			B			A	
Approach Delay (s)		22.7			15.4			10.0			6.4	
Approach LOS		C			B			B			A	

Intersection Summary

HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	61.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2	5	3	1	0	6	0	193	13	619	6
Future Volume (vph)	0	2	5	3	1	0	6	0	193	13	619	6
Ideal Flow (vphpl)	1900	1900	1750	1650	1650	1900	1775	1900	1750	1775	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		0.0	0.0		0.0
Storage Lanes	0		1	0		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850						0.850		0.999	
Flt Protected					0.964		0.950			0.950		
Satd. Flow (prot)	0	1691	1103	0	1416	0	1501	0	1298	1501	2943	0
Flt Permitted					0.964		0.950			0.950		
Satd. Flow (perm)	0	1691	1103	0	1416	0	1501	0	1298	1501	2943	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		36.5			50.1			56.2			69.4	
Travel Time (s)		2.6			3.6			4.0			5.0	
Confl. Peds. (#/hr)							35		2	2		35
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	20%	0%	0%	0%	0%	0%	2%	0%	9%	17%
Adj. Flow (vph)	0	2	5	3	1	0	6	0	193	13	619	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	5	0	4	0	6	0	193	13	625	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.16	1.16	1.29	1.38	1.38	1.16	1.26	1.16	1.29	1.26	1.16	1.16
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2	5	3	1	0	6	0	193	13	619	6
Future Volume (Veh/h)	0	2	5	3	1	0	6	0	193	13	619	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	2	5	3	1	0	6	0	193	13	619	6
Pedestrians		35			2							
Lane Width (m)		3.5			3.5							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		3			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								140				
pX, platoon unblocked												
vC, conflicting volume	696	890	348	356	700	2	660			195		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	696	890	348	356	700	2	660			195		
tC, single (s)	7.5	6.5	7.3	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	99	99	100	100	99			99		
cM capacity (veh/h)	311	271	582	551	349	1086	911			1388		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	2	5	4	6	193	13	413	212
Volume Left	0	0	3	6	0	13	0	0
Volume Right	0	5	0	0	193	0	0	6
cSH	271	582	482	911	1700	1388	1700	1700
Volume to Capacity	0.01	0.01	0.01	0.01	0.11	0.01	0.24	0.12
Queue Length 95th (m)	0.2	0.2	0.2	0.2	0.0	0.2	0.0	0.0
Control Delay (s)	18.4	11.2	12.5	9.0	0.0	7.6	0.0	0.0
Lane LOS	C	B	B	A		A		
Approach Delay (s)	13.3		12.5	0.3		0.2		
Approach LOS	B		B					

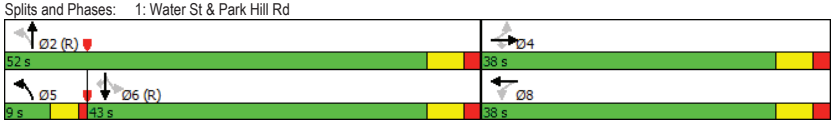
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	645	161	16	331	8	206	181	49	11	533	726
Future Volume (vph)	27	645	161	16	331	8	206	181	49	11	533	726
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	15.0		0.0	25.0		0.0	40.0		0.0
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	0.96	0.99	1.00		0.99	1.00		0.99		0.94
Frt			0.850		0.996			0.968				0.850
Flt Protected		0.998		0.950			0.950			0.950		
Satd. Flow (prot)	0	2967	1311	1416	1461	0	1501	1401	0	1501	1642	1311
Flt Permitted		0.930		0.283			0.199			0.615		
Satd. Flow (perm)	0	2764	1263	419	1461	0	310	1401	0	964	1642	1235
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85		2			23				298
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.4			108.0			179.1			83.3	
Travel Time (s)		2.8			7.8			12.9			6.0	
Confl. Peds. (#/hr)	11		11	11		11	32		15	15		32
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	6%	0%	0%	0%	1%	1%	0%	3%	1%
Adj. Flow (vph)	27	645	161	16	331	8	206	181	49	11	533	726
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	672	161	16	339	0	206	230	0	11	533	726
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.26	1.29	1.26	1.38	1.38	1.26	1.38	1.38	1.26	1.16	1.29
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	43.0		43.0	43.0	43.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	52.0		43.0	43.0	43.0
Total Split (%)	42.2%	42.2%	42.2%	42.2%	42.2%		10.0%	57.8%		47.8%	47.8%	47.8%
Maximum Green (s)	32.0	32.0	32.0	32.0	32.0		5.0	46.0		37.0	37.0	37.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0		2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Walk Time (s)	13.0	13.0	13.0	13.0	13.0			23.0		23.0	23.0	23.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0			14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		34.0	34.0	34.0	34.0		46.0	48.0		39.0	39.0	39.0
Actuated g/C Ratio		0.38	0.38	0.38	0.38		0.51	0.53		0.43	0.43	0.43
v/c Ratio		0.64	0.30	0.10	0.61		1.04	0.30		0.03	0.75	1.03
Control Delay		26.5	11.4	20.3	28.3		98.3	11.8		15.0	29.5	59.5
Queue Delay		0.0	0.0	0.0	2.3		0.0	0.0		0.0	0.0	0.0
Total Delay		26.5	11.4	20.3	30.7		98.3	11.8		15.0	29.5	59.5
LOS		C	B	C	C		F	B		B	C	E
Approach Delay		23.6			30.2			52.6			46.5	
Approach LOS		C			C			D			D	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 41 (46%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 38.8		Intersection LOS: D	
Intersection Capacity Utilization 106.5%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: Water St & Park Hill Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	672	161	16	339	206	230	11	533	726
v/c Ratio	0.64	0.30	0.10	0.61	1.04	0.30	0.03	0.75	1.03
Control Delay	26.5	11.4	20.3	28.3	98.3	11.8	15.0	29.5	59.5
Queue Delay	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	11.4	20.3	30.7	98.3	11.8	15.0	29.5	59.5
Queue Length 50th (m)	51.8	9.0	1.9	48.8	~21.8	19.5	1.1	79.0	~109.5
Queue Length 95th (m)	71.5	23.7	6.6	78.6	#61.1	34.4	4.3	120.9	#179.5
Internal Link Dist (m)	14.4			84.0		155.1		59.3	
Turn Bay Length (m)		10.0	15.0		25.0		40.0		
Base Capacity (vph)	1044	530	158	553	198	757	417	711	704
Starvation Cap Reductn	0	0	0	111	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	0.64	0.30	0.10	0.77	1.04	0.30	0.03	0.75	1.03

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)	27	645	161	16	331	8	206	181	49	11	533	726
Future Volume (vph)	27	645	161	16	331	8	206	181	49	11	533	726
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Total Lost time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes		1.00	1.00	0.99	1.00		1.00	1.00		0.99	1.00	1.00
Frt		1.00	0.85	1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2966	1263	1408	1462		1498	1401		1489	1642	1235
Flt Permitted		0.93	1.00	0.28	1.00		0.20	1.00		0.62	1.00	1.00
Satd. Flow (perm)		2764	1263	420	1462		314	1401		964	1642	1235
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	27	645	161	16	331	8	206	181	49	11	533	726
RTOR Reduction (vph)	0	0	53	0	1	0	0	11	0	0	0	169
Lane Group Flow (vph)	0	672	108	16	338	0	206	219	0	11	533	557
Confl. Peds. (#/hr)	11		11	11		11	32		15	15		32
Heavy Vehicles (%)	0%	1%	1%	6%	0%	0%	0%	1%	1%	0%	3%	1%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		32.0	32.0	32.0	32.0		46.0	46.0		37.0	37.0	37.0
Effective Green, g (s)		34.0	34.0	34.0	34.0		44.0	48.0		39.0	39.0	39.0
Actuated g/C Ratio		0.38	0.38	0.38	0.38		0.49	0.53		0.43	0.43	0.43
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)		1044	477	158	552		192	747		417	711	535
v/s Ratio Prot					0.23		c0.04	0.16			0.32	
v/s Ratio Perm		c0.24	0.09	0.04			0.49			0.01		c0.45
v/c Ratio		0.64	0.23	0.10	0.61		1.07	0.29		0.03	0.75	1.04
Uniform Delay, d1		23.0	19.1	18.1	22.7		27.4	11.6		14.6	21.4	25.5
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		3.1	1.1	1.3	5.0		85.7	1.0		0.1	7.1	50.1
Delay (s)		26.1	20.2	19.4	27.7		113.1	12.6		14.7	28.5	75.6
Level of Service		C	C	B	C		F	B		B	C	E
Approach Delay (s)		24.9			27.3			60.1			55.3	
Approach LOS		C			C			E			E	

Intersection Summary

HCM 2000 Control Delay	43.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	106.5%	ICU Level of Service	G
Analysis Period (min)	15		

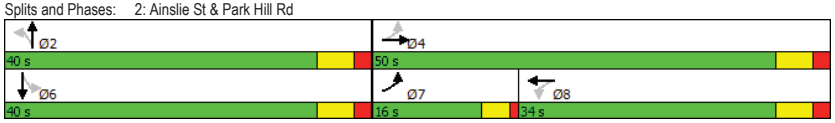
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	418	260	33	26	281	27	35	496	11	7	363	34
Future Volume (vph)	418	260	33	26	281	27	35	496	11	7	363	34
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99			1.00			1.00			1.00	
Frt		0.983			0.989			0.997			0.989	
Flt Protected	0.950				0.996			0.997			0.999	
Satd. Flow (prot)	1471	1423	0	0	1346	0	0	2604	0	0	1309	0
Flt Permitted	0.375				0.955			0.905			0.989	
Satd. Flow (perm)	580	1423	0	0	1289	0	0	2363	0	0	1296	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			5			3			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.0			89.4			95.3			135.8	
Travel Time (s)		7.8			6.4			6.9			9.8	
Confl. Peds. (#/hr)	3		14	14		3	7		14	14		7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%	0%	7%	0%	14%	4%	0%
Adj. Flow (vph)	418	260	33	26	281	27	35	496	11	7	363	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	418	293	0	0	334	0	0	542	0	0	404	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.38	1.38	1.49	1.49	1.49	1.38	1.38	1.38	1.49	1.49	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	5.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	
Total Split (s)	16.0	50.0		34.0	34.0		40.0	40.0		40.0	40.0	
Total Split (%)	17.8%	55.6%		37.8%	37.8%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	12.0	44.0		28.0	28.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	6.0			6.0			6.0			6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)		13.0		13.0	13.0		24.0	24.0		24.0	24.0	
Flash Dont Walk (s)		11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	42.6	40.6			24.2			28.7			28.7	
Actuated g/C Ratio	0.52	0.50			0.30			0.35			0.35	
v/c Ratio	0.96	0.41			0.87			0.65			0.88	
Control Delay	53.5	15.6			51.1			26.5			46.8	
Queue Delay	13.4	0.6			0.0			0.0			0.0	
Total Delay	66.9	16.2			51.1			26.5			46.8	
LOS	E	B			D			C			D	
Approach Delay		46.0			51.1			26.5			46.8	
Approach LOS		D			D			C			D	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 81.5			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 41.7		Intersection LOS: D	
Intersection Capacity Utilization 106.6%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 2: Ainslie St & Park Hill Rd



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	418	293	334	542	404
v/c Ratio	0.96	0.41	0.87	0.65	0.88
Control Delay	53.5	15.6	51.1	26.5	46.8
Queue Delay	13.4	0.6	0.0	0.0	0.0
Total Delay	66.9	16.2	51.1	26.5	46.8
Queue Length 50th (m)	48.6	31.1	54.6	40.8	64.1
Queue Length 95th (m)	#121.3	52.3	#103.1	58.6	#116.5
Internal Link Dist (m)		84.0	65.4	71.3	111.8
Turn Bay Length (m)					
Base Capacity (vph)	437	789	455	1009	556
Starvation Cap Reductn	26	226	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.02	0.52	0.73	0.54	0.73

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)	418	260	33	26	281	27	35	496	11	7	363	34
Future Volume (vph)	418	260	33	26	281	27	35	496	11	7	363	34
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			0.99			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1471	1424			1345			2603			1309	
Flt Permitted	0.37	1.00			0.96			0.91			0.99	
Satd. Flow (perm)	580	1424			1289			2364			1296	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	418	260	33	26	281	27	35	496	11	7	363	34
RTOR Reduction (vph)	0	5	0	0	4	0	0	2	0	0	4	0
Lane Group Flow (vph)	418	288	0	0	330	0	0	540	0	0	400	0
Confl. Peds. (#/hr)	3		14	14		3	7		14	14		7
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%	0%	7%	0%	14%	4%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	40.6	40.6			24.3			28.7			28.7	
Effective Green, g (s)	40.6	40.6			24.3			28.7			28.7	
Actuated g/C Ratio	0.50	0.50			0.30			0.35			0.35	
Clearance Time (s)	4.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	424	711			385			834			457	
v/s Ratio Prot	c0.15	0.20										
v/s Ratio Perm	c0.34				0.26			0.23			c0.31	
v/c Ratio	0.99	0.41			0.86			0.65			0.88	
Uniform Delay, d1	18.8	12.8			26.9			22.1			24.6	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	39.6	0.4			17.0			1.7			16.9	
Delay (s)	58.4	13.1			43.9			23.8			41.5	
Level of Service	E	B			D			C			D	
Approach Delay (s)		39.8			43.9			23.8			41.5	
Approach LOS		D			D			C			D	

Intersection Summary

HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	81.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	106.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	201	6	34	7	5	35	16	930	0	5	368	1
Future Volume (vph)	201	6	34	7	5	35	16	930	0	5	368	1
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99	0.97			0.98						1.00	
Frt		0.872			0.899							
Flt Protected	0.950				0.993			0.999			0.999	
Satd. Flow (prot)	1272	1238	0	0	1196	0	0	2759	0	0	1356	0
Flt Permitted	0.726				0.971			0.947			0.988	
Satd. Flow (perm)	966	1238	0	0	1168	0	0	2615	0	0	1341	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			35							
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.9			70.7			135.8			80.3	
Travel Time (s)		3.9			5.1			9.8			5.8	
Confl. Peds. (#/hr)	7		7	7		7			17	17		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Bus Blockages (#/hr)	2	0	0	0	0	0	0	5	0	0	4	0
Adj. Flow (vph)	201	6	34	7	5	35	16	930	0	5	368	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	201	40	0	0	47	0	0	946	0	0	374	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.28	1.38	1.38	1.49	1.49	1.49	1.38	1.40	1.38	1.49	1.52	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		58.0	58.0		58.0	58.0	
Total Split (s)	32.0	32.0		32.0	32.0		58.0	58.0		58.0	58.0	
Total Split (%)	35.6%	35.6%		35.6%	35.6%		64.4%	64.4%		64.4%	64.4%	
Maximum Green (s)	26.0	26.0		26.0	26.0		52.0	52.0		52.0	52.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	10.0	10.0		10.0	10.0		38.0	38.0		38.0	38.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	20.0	20.0			20.0			34.2			34.2	
Actuated g/C Ratio	0.32	0.32			0.32			0.55			0.55	
v/c Ratio	0.65	0.10			0.12			0.66			0.51	
Control Delay	30.1	8.1			9.0			13.5			12.8	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	30.1	8.1			9.0			13.5			12.8	
LOS	C	A			A			B			B	
Approach Delay		26.5			9.0			13.5			12.8	
Approach LOS		C			A			B			B	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 62.4			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 69.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Ainslie St & Simcoe St/Market St

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	201	40	47	946	374
v/c Ratio	0.65	0.10	0.12	0.66	0.51
Control Delay	30.1	8.1	9.0	13.5	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	8.1	9.0	13.5	12.8
Queue Length 50th (m)	18.7	0.5	0.9	37.6	25.1
Queue Length 95th (m)	49.8	7.1	8.3	72.7	58.0
Internal Link Dist (m)		29.9	46.7	111.8	56.3
Turn Bay Length (m)	30.0				
Base Capacity (vph)	446	591	559	2283	1171
Starvation Cap Reductn	0	0	0	51	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.07	0.08	0.42	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	201	6	34	7	5	35	16	930	0	5	368	1
Future Volume (vph)	201	6	34	7	5	35	16	930	0	5	368	1
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.98			0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.87			0.90			1.00			1.00	
Flt Protected	0.95	1.00			0.99			1.00			1.00	
Satd. Flow (prot)	1266	1243			1197			2759			1356	
Flt Permitted	0.73	1.00			0.97			0.95			0.99	
Satd. Flow (perm)	968	1243			1170			2615			1341	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	201	6	34	7	5	35	16	930	0	5	368	1
RTOR Reduction (vph)	0	23	0	0	24	0	0	0	0	0	0	0
Lane Group Flow (vph)	201	17	0	0	23	0	0	946	0	0	374	0
Confl. Peds. (#/hr)	7		7	7		7			17	17		
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Bus Blockages (#/hr)	2	0	0	0	0	0	0	5	0	0	4	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.9	17.9			17.9			32.1			32.1	
Effective Green, g (s)	19.9	19.9			19.9			34.1			34.1	
Actuated g/C Ratio	0.32	0.32			0.32			0.55			0.55	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	310	398			375			1438			737	
v/s Ratio Prot		0.01										
v/s Ratio Perm	c0.21				0.02			c0.36			0.28	
v/c Ratio	0.65	0.04			0.06			0.66			0.51	
Uniform Delay, d1	18.1	14.5			14.6			9.8			8.7	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	4.6	0.0			0.1			1.1			0.6	
Delay (s)	22.7	14.5			14.7			10.9			9.3	
Level of Service	C	B			B			B			A	
Approach Delay (s)		21.3			14.7			10.9			9.3	
Approach LOS		C			B			B			A	

Intersection Summary

HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	4	8	14	1	0	17	0	192	12	1291	11
Future Volume (vph)	0	4	8	14	1	0	17	0	192	12	1291	11
Ideal Flow (vphpl)	1900	1900	1750	1650	1650	1900	1775	1900	1750	1775	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		0.0	0.0		0.0
Storage Lanes	0		1	0		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850						0.850		0.999	
Flt Protected					0.955		0.950			0.950		
Satd. Flow (prot)	0	1691	1324	0	1402	0	1501	0	1298	1501	3147	0
Flt Permitted					0.955		0.950			0.950		
Satd. Flow (perm)	0	1691	1324	0	1402	0	1501	0	1298	1501	3147	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		36.5			50.1			56.2			69.4	
Travel Time (s)		2.6			3.6			4.0			5.0	
Confl. Peds. (#/hr)			1	1			8		2	2		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	0%
Adj. Flow (vph)	0	4	8	14	1	0	17	0	192	12	1291	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	8	0	15	0	17	0	192	12	1302	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.16	1.16	1.29	1.38	1.38	1.16	1.26	1.16	1.29	1.26	1.16	1.16
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	57.0%	ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	4	8	14	1	0	17	0	192	12	1291	11
Future Volume (Veh/h)	0	4	8	14	1	0	17	0	192	12	1291	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	4	8	14	1	0	17	0	192	12	1291	11
Pedestrians		8			2			1				
Lane Width (m)		3.5			3.5			3.5				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								140				
pX, platoon unblocked												
vC, conflicting volume	1363	1556	660	716	1370	2	1310			194		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1363	1556	660	716	1370	2	1310			194		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	96	98	95	99	100	97			99		
cM capacity (veh/h)	103	108	407	294	141	1086	531			1389		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	4	8	15	17	192	12	861	441
Volume Left	0	0	14	17	0	12	0	0
Volume Right	0	8	0	0	192	0	0	11
cSH	108	407	274	531	1700	1389	1700	1700
Volume to Capacity	0.04	0.02	0.05	0.03	0.11	0.01	0.51	0.26
Queue Length 95th (m)	0.9	0.5	1.4	0.8	0.0	0.2	0.0	0.0
Control Delay (s)	39.5	14.0	18.9	12.0	0.0	7.6	0.0	0.0
Lane LOS	E	B	C	B		A		
Approach Delay (s)	22.5		18.9	1.0		0.1		
Approach LOS	C		C					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

Appendix D

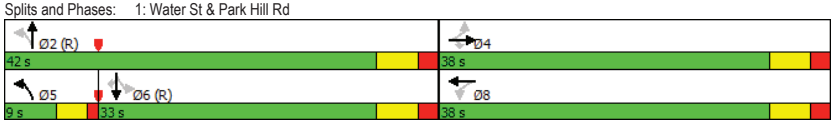
Background Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1014	129	3	284	3	22	212	23	1	357	331
Future Volume (vph)	0	1014	129	3	284	3	22	212	23	1	357	331
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	15.0		0.0	25.0		0.0	40.0		0.0
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97	1.00	1.00		0.99	1.00		1.00		0.96
Frt			0.850		0.998			0.985				0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	2943	1324	1501	1265	0	1501	1425	0	1128	1626	1324
Flt Permitted				0.155			0.289			0.612		
Satd. Flow (perm)	0	2943	1284	244	1265	0	452	1425	0	725	1626	1267
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95		1			9				331
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.4			108.0			179.1			83.3	
Travel Time (s)		2.8			7.8			12.9			6.0	
Confl. Peds. (#/hr)	4		8	8		4	14		3	3		14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	0%	16%	2%	0%	1%	5%	33%	4%	0%
Adj. Flow (vph)	0	1014	129	3	284	3	22	212	23	1	357	331
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1014	129	3	287	0	22	235	0	1	357	331
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.26	1.29	1.26	1.38	1.38	1.26	1.38	1.38	1.26	1.16	1.29
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type		NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	30.0		30.0	30.0	30.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	42.0		33.0	33.0	33.0
Total Split (%)	47.5%	47.5%	47.5%	47.5%	47.5%		11.3%	52.5%		41.3%	41.3%	41.3%
Maximum Green (s)	32.0	32.0	32.0	32.0	32.0		5.0	36.0		27.0	27.0	27.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0		2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Walk Time (s)	16.0	16.0	16.0	16.0	16.0			10.0		10.0	10.0	10.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0			14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		34.0	34.0	34.0	34.0		36.0	38.0		29.0	29.0	29.0
Actuated g/C Ratio		0.42	0.42	0.42	0.42		0.45	0.48		0.36	0.36	0.36
v/c Ratio		0.81	0.21	0.03	0.53		0.09	0.35		0.00	0.61	0.49
Control Delay		26.7	6.2	14.7	21.6		13.2	14.5		16.0	26.1	5.1
Queue Delay		0.0	0.0	0.0	0.6		0.0	0.0		0.0	0.0	0.0
Total Delay		26.7	6.2	14.7	22.2		13.2	14.5		16.0	26.1	5.1
LOS		C	A	B	C		B	B		B	C	A
Approach Delay		24.4			22.1			14.3			16.0	
Approach LOS		C			C			B			B	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 41 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Pretimed			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 20.6		Intersection LOS: C	
Intersection Capacity Utilization 84.2%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Water St & Park Hill Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1014	129	3	287	22	235	1	357	331
v/c Ratio	0.81	0.21	0.03	0.53	0.09	0.35	0.00	0.61	0.49
Control Delay	26.7	6.2	14.7	21.6	13.2	14.5	16.0	26.1	5.1
Queue Delay	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	6.2	14.7	22.2	13.2	14.5	16.0	26.1	5.1
Queue Length 50th (m)	72.4	3.1	0.3	32.9	1.9	21.5	0.1	45.7	0.0
Queue Length 95th (m)	98.8	13.3	2.0	57.2	5.9	38.0	1.1	74.1	16.8
Internal Link Dist (m)	14.4			84.0		155.1		59.3	
Turn Bay Length (m)		10.0	15.0		25.0		40.0		
Base Capacity (vph)	1250	600	103	538	242	681	262	589	670
Starvation Cap Reductn	0	0	0	63	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	0.21	0.03	0.60	0.09	0.35	0.00	0.61	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1014	129	3	284	3	22	212	23	1	357	331
Future Volume (vph)	0	1014	129	3	284	3	22	212	23	1	357	331
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Total Lost time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.97	1.00	1.00		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00		1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2943	1284	1498	1265		1497	1425		1126	1626	1267
Flt Permitted		1.00	1.00	0.15	1.00		0.29	1.00		0.61	1.00	1.00
Satd. Flow (perm)		2943	1284	244	1265		456	1425		726	1626	1267
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1014	129	3	284	3	22	212	23	1	357	331
RTOR Reduction (vph)	0	0	55	0	1	0	0	5	0	0	0	211
Lane Group Flow (vph)	0	1014	74	3	286	0	22	230	0	1	357	120
Confl. Peds. (#/hr)	4		8	8		4	14		3	3		14
Heavy Vehicles (%)	1%	2%	0%	0%	16%	2%	0%	1%	5%	33%	4%	0%
Turn Type		NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		32.0	32.0	32.0	32.0		36.0	36.0		27.0	27.0	27.0
Effective Green, g (s)		34.0	34.0	34.0	34.0		34.0	38.0		29.0	29.0	29.0
Actuated g/C Ratio		0.42	0.42	0.42	0.42		0.42	0.48		0.36	0.36	0.36
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)		1250	545	103	537		232	676		263	589	459
v/s Ratio Prot		c0.34			0.23		0.00	c0.16			c0.22	
v/s Ratio Perm			0.06	0.01			0.04			0.00		0.09
v/c Ratio		0.81	0.14	0.03	0.53		0.09	0.34		0.00	0.61	0.26
Uniform Delay, d1		20.2	14.0	13.4	17.1		14.8	13.2		16.3	20.8	18.0
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		5.8	0.5	0.5	3.8		0.8	1.4		0.0	4.6	1.4
Delay (s)		26.0	14.6	13.9	20.9		15.6	14.5		16.3	25.4	19.3
Level of Service		C	B	B	C		B	B		B	C	B
Approach Delay (s)		24.7			20.8			14.6			22.5	
Approach LOS		C			C			B			C	

Intersection Summary

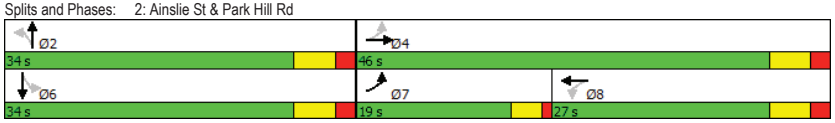
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	593	399	28	11	259	17	17	526	6	6	166	10
Future Volume (vph)	593	399	28	11	259	17	17	526	6	6	166	10
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			1.00			1.00	
Frt		0.990			0.992			0.998			0.993	
Flt Protected	0.950				0.998			0.998			0.998	
Satd. Flow (prot)	1501	1351	0	0	1200	0	0	2750	0	0	1317	0
Flt Permitted	0.408				0.976			0.942			0.977	
Satd. Flow (perm)	642	1351	0	0	1173	0	0	2595	0	0	1289	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			4			1			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.0			89.4			95.3			135.8	
Travel Time (s)		7.8			6.4			6.9			9.8	
Confl. Peds. (#/hr)	7		2	2		7	5		8	8		5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	8%	0%	0%	13%	33%	1%	1%	4%	0%	4%	0%
Adj. Flow (vph)	593	399	28	11	259	17	17	526	6	6	166	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	593	427	0	0	287	0	0	549	0	0	182	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.38	1.38	1.49	1.49	1.49	1.38	1.38	1.38	1.49	1.49	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	5.0	27.0		27.0	27.0		31.0	31.0		31.0	31.0	
Total Split (s)	19.0	46.0		27.0	27.0		34.0	34.0		34.0	34.0	
Total Split (%)	23.8%	57.5%		33.8%	33.8%		42.5%	42.5%		42.5%	42.5%	
Maximum Green (s)	15.0	40.0		21.0	21.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	6.0			6.0			6.0			6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)		10.0		10.0	10.0		14.0	14.0		14.0	14.0	
Flash Dont Walk (s)		11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	41.4	39.4			20.2			20.1			20.1	
Actuated g/C Ratio	0.58	0.55			0.28			0.28			0.28	
v/c Ratio	1.07	0.57			0.86			0.75			0.50	
Control Delay	76.8	15.4			51.9			30.6			26.1	
Queue Delay	6.0	1.2			0.0			0.0			0.0	
Total Delay	82.9	16.6			51.9			30.6			26.1	
LOS	F	B			D			C			C	
Approach Delay		55.1			51.9			30.6			26.1	
Approach LOS		E			D			C			C	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 80			
Actuated Cycle Length: 71.5			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 45.5		Intersection LOS: D	
Intersection Capacity Utilization 100.5%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 2: Ainslie St & Park Hill Rd



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	593	427	287	549	182
v/c Ratio	1.07	0.57	0.86	0.75	0.50
Control Delay	76.8	15.4	51.9	30.6	26.1
Queue Delay	6.0	1.2	0.0	0.0	0.0
Total Delay	82.9	16.6	51.9	30.6	26.1
Queue Length 50th (m)	~60.8	35.5	37.4	37.4	21.1
Queue Length 95th (m)	#178.1	78.2	#92.3	54.3	39.1
Internal Link Dist (m)		84.0	65.4	71.3	111.8
Turn Bay Length (m)					
Base Capacity (vph)	553	763	349	1024	510
Starvation Cap Reductn	8	156	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.09	0.70	0.82	0.54	0.36

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)	593	399	28	11	259	17	17	526	6	6	166	10
Future Volume (vph)	593	399	28	11	259	17	17	526	6	6	166	10
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.99			0.99			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1499	1351			1200			2751			1317	
Flt Permitted	0.41	1.00			0.98			0.94			0.98	
Satd. Flow (perm)	643	1351			1173			2596			1288	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	593	399	28	11	259	17	17	526	6	6	166	10
RTOR Reduction (vph)	0	3	0	0	3	0	0	1	0	0	3	0
Lane Group Flow (vph)	593	424	0	0	284	0	0	548	0	0	179	0
Confl. Peds. (#/hr)	7		2	2		7	5		8	8		5
Heavy Vehicles (%)	0%	8%	0%	0%	13%	33%	1%	1%	4%	0%	4%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	39.4	39.4			20.3			20.1			20.1	
Effective Green, g (s)	39.4	39.4			20.3			20.1			20.1	
Actuated g/C Ratio	0.55	0.55			0.28			0.28			0.28	
Clearance Time (s)	4.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	535	744			333			729			362	
v/s Ratio Prot	c0.23	0.31										
v/s Ratio Perm	c0.38				0.24			c0.21			0.14	
v/c Ratio	1.11	0.57			0.85			0.75			0.49	
Uniform Delay, d1	14.2	10.5			24.2			23.4			21.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	72.1	1.1			18.6			4.4			1.1	
Delay (s)	86.3	11.6			42.8			27.8			22.5	
Level of Service	F	B			D			C			C	
Approach Delay (s)		55.0			42.8			27.8			22.5	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	71.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	6	3	1	2	19	7	1113	4	0	180	7
Future Volume (vph)	206	6	3	1	2	19	7	1113	4	0	180	7
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00			1.00				
Frt		0.950			0.883			0.999			0.995	
Flt Protected	0.950				0.998							
Satd. Flow (prot)	1283	1345	0	0	1200	0	0	2783	0	0	1373	0
Flt Permitted	0.743				0.994			0.954				
Satd. Flow (perm)	1003	1345	0	0	1195	0	0	2655	0	0	1373	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			19			1			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.9			70.7			135.8			80.3	
Travel Time (s)		3.9			5.1			9.8			5.8	
Confl. Peds. (#/hr)			6	6					8	8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Adj. Flow (vph)	206	6	3	1	2	19	7	1113	4	0	180	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	206	9	0	0	22	0	0	1124	0	0	187	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.38	1.38	1.49	1.49	1.49	1.38	1.38	1.38	1.49	1.49	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		51.0	51.0		51.0	51.0	
Total Split (s)	29.0	29.0		29.0	29.0		51.0	51.0		51.0	51.0	
Total Split (%)	36.3%	36.3%		36.3%	36.3%		63.8%	63.8%		63.8%	63.8%	
Maximum Green (s)	23.0	23.0		23.0	23.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		31.0	31.0		31.0	31.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	19.7	19.7			19.7			38.9			38.9	
Actuated g/C Ratio	0.29	0.29			0.29			0.58			0.58	
v/c Ratio	0.70	0.02			0.06			0.73			0.23	
Control Delay	35.7	15.8			10.1			14.2			8.3	
Queue Delay	0.0	0.0			0.0			0.1			0.0	
Total Delay	35.7	15.8			10.1			14.3			8.3	
LOS	D	B			B			B			A	
Approach Delay		34.9			10.1			14.3			8.3	
Approach LOS		C			B			B			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 80	
Actuated Cycle Length: 66.8	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 16.4	Intersection LOS: B
Intersection Capacity Utilization 72.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Ainslie St & Simcoe St/Market St

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	206	9	22	1124	187
v/c Ratio	0.70	0.02	0.06	0.73	0.23
Control Delay	35.7	15.8	10.1	14.2	8.3
Queue Delay	0.0	0.0	0.0	0.1	0.0
Total Delay	35.7	15.8	10.1	14.3	8.3
Queue Length 50th (m)	21.7	0.5	0.3	51.4	10.6
Queue Length 95th (m)	#57.9	3.9	5.5	86.1	23.1
Internal Link Dist (m)		29.9	46.7	111.8	56.3
Turn Bay Length (m)	30.0				
Base Capacity (vph)	383	515	468	1907	987
Starvation Cap Reductn	0	0	0	65	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.02	0.05	0.61	0.19

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)	206	6	3	1	2	19	7	1113	4	0	180	7
Future Volume (vph)	206	6	3	1	2	19	7	1113	4	0	180	7
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.99			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.95			0.88			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1283	1346			1200			2784			1373	
Flt Permitted	0.74	1.00			0.99			0.95			1.00	
Satd. Flow (perm)	1003	1346			1195			2656			1373	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	206	6	3	1	2	19	7	1113	4	0	180	7
RTOR Reduction (vph)	0	2	0	0	13	0	0	0	0	0	2	0
Lane Group Flow (vph)	206	7	0	0	9	0	0	1124	0	0	185	0
Confl. Peds. (#/hr)			6	6					8	8		
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.7	17.7			17.7			36.9			36.9	
Effective Green, g (s)	19.7	19.7			19.7			38.9			38.9	
Actuated g/C Ratio	0.30	0.30			0.30			0.58			0.58	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	296	398			353			1551			801	
v/s Ratio Prot		0.01									0.14	
v/s Ratio Perm	c0.21				0.01			c0.42				
v/c Ratio	0.70	0.02			0.02			0.72			0.23	
Uniform Delay, d1	20.8	16.6			16.6			10.0			6.7	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	6.9	0.0			0.0			1.7			0.1	
Delay (s)	27.7	16.6			16.7			11.7			6.8	
Level of Service	C	B			B			B			A	
Approach Delay (s)		27.3			16.7			11.7			6.8	
Approach LOS		C			B			B			A	

Intersection Summary

HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2	6	3	1	0	7	0	214	14	687	7
Future Volume (vph)	0	2	6	3	1	0	7	0	214	14	687	7
Ideal Flow (vphpl)	1900	1900	1750	1650	1650	1900	1775	1900	1750	1775	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		0.0	0.0		0.0
Storage Lanes	0		1	0		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850						0.850		0.998	
Flt Protected					0.964		0.950			0.950		
Satd. Flow (prot)	0	1691	1103	0	1416	0	1501	0	1298	1501	2940	0
Flt Permitted					0.964		0.950			0.950		
Satd. Flow (perm)	0	1691	1103	0	1416	0	1501	0	1298	1501	2940	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		36.5			50.1			56.2			69.4	
Travel Time (s)		2.6			3.6			4.0			5.0	
Confl. Peds. (#/hr)							35		2	2		35
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	20%	0%	0%	0%	0%	0%	2%	0%	9%	17%
Adj. Flow (vph)	0	2	6	3	1	0	7	0	214	14	687	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2	6	0	4	0	7	0	214	14	694	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.16	1.16	1.29	1.38	1.38	1.16	1.26	1.16	1.29	1.26	1.16	1.16
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.0%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	2	6	3	1	0	7	0	214	14	687	7
Future Volume (Veh/h)	0	2	6	3	1	0	7	0	214	14	687	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	2	6	3	1	0	7	0	214	14	687	7
Pedestrians		35			2							
Lane Width (m)		3.5			3.5							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		3			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								140				
pX, platoon unblocked												
vC, conflicting volume	768	984	382	394	773	2	729			216		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	768	984	382	394	773	2	729			216		
tC, single (s)	7.5	6.5	7.3	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	99	99	100	100	99			99		
cM capacity (veh/h)	275	239	551	515	316	1086	859			1364		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	2	6	4	7	214	14	458	236
Volume Left	0	0	3	7	0	14	0	0
Volume Right	0	6	0	0	214	0	0	7
cSH	239	551	445	859	1700	1364	1700	1700
Volume to Capacity	0.01	0.01	0.01	0.01	0.13	0.01	0.27	0.14
Queue Length 95th (m)	0.2	0.3	0.2	0.2	0.0	0.2	0.0	0.0
Control Delay (s)	20.2	11.6	13.2	9.2	0.0	7.7	0.0	0.0
Lane LOS	C	B	B	A		A		
Approach Delay (s)	13.8		13.2	0.3		0.2		
Approach LOS	B		B					

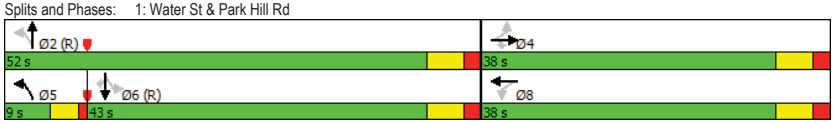
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	747	179	18	390	9	229	201	54	12	592	806
Future Volume (vph)	30	747	179	18	390	9	229	201	54	12	592	806
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	15.0		0.0	25.0		0.0	40.0		0.0
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	0.96	1.00	1.00		0.99	1.00		0.99		0.94
Frt			0.850		0.997			0.968				0.850
Flt Protected		0.998		0.950			0.950			0.950		
Satd. Flow (prot)	0	2967	1311	1416	1463	0	1501	1401	0	1501	1642	1311
Flt Permitted		0.922		0.226			0.151			0.601		
Satd. Flow (perm)	0	2740	1263	335	1463	0	236	1401	0	942	1642	1235
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85		1			23				235
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.4			108.0			179.1			83.3	
Travel Time (s)		2.8			7.8			12.9			6.0	
Confl. Peds. (#/hr)	11		11	11		11	32		15	15		32
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	6%	0%	0%	0%	1%	1%	0%	3%	1%
Adj. Flow (vph)	30	747	179	18	390	9	229	201	54	12	592	806
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	777	179	18	399	0	229	255	0	12	592	806
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.26	1.29	1.26	1.38	1.38	1.26	1.38	1.38	1.26	1.16	1.29
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	43.0		43.0	43.0	43.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	52.0		43.0	43.0	43.0
Total Split (%)	42.2%	42.2%	42.2%	42.2%	42.2%		10.0%	57.8%		47.8%	47.8%	47.8%
Maximum Green (s)	32.0	32.0	32.0	32.0	32.0		5.0	46.0		37.0	37.0	37.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0		2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Walk Time (s)	13.0	13.0	13.0	13.0	13.0			23.0		23.0	23.0	23.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0			14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		34.0	34.0	34.0	34.0		46.0	48.0		39.0	39.0	39.0
Actuated g/C Ratio		0.38	0.38	0.38	0.38		0.51	0.53		0.43	0.43	0.43
v/c Ratio		0.75	0.34	0.14	0.72		1.41	0.34		0.03	0.83	1.21
Control Delay		29.9	12.5	22.1	32.8		240.2	12.3		15.1	34.9	126.9
Queue Delay		0.0	0.0	0.0	5.9		0.0	0.0		0.0	0.0	0.0
Total Delay		29.9	12.5	22.1	38.7		240.2	12.3		15.1	34.9	126.9
LOS		C	B	C	D		F	B		B	C	F
Approach Delay		26.6			38.0			120.1			87.4	
Approach LOS		C			D			F			F	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 41 (46%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Pretimed			
Maximum v/c Ratio: 1.41			
Intersection Signal Delay: 68.1		Intersection LOS: E	
Intersection Capacity Utilization 116.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Water St & Park Hill Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	777	179	18	399	229	255	12	592	806
v/c Ratio	0.75	0.34	0.14	0.72	1.41	0.34	0.03	0.83	1.21
Control Delay	29.9	12.5	22.1	32.8	240.2	12.3	15.1	34.9	126.9
Queue Delay	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	12.5	22.1	38.7	240.2	12.3	15.1	34.9	126.9
Queue Length 50th (m)	63.4	11.3	2.1	60.8	~36.4	22.4	1.2	92.7	~155.0
Queue Length 95th (m)	86.5	27.5	7.5	96.7	#79.6	38.7	4.5	#155.0	#227.4
Internal Link Dist (m)	14.4			84.0		155.1		59.3	
Turn Bay Length (m)		10.0	15.0		25.0		40.0		
Base Capacity (vph)	1035	530	126	553	162	757	408	711	668
Starvation Cap Reductn	0	0	0	105	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	0.75	0.34	0.14	0.89	1.41	0.34	0.03	0.83	1.21

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)	30	747	179	18	390	9	229	201	54	12	592	806
Future Volume (vph)	30	747	179	18	390	9	229	201	54	12	592	806
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Total Lost time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	1.00
Frt		1.00	0.85	1.00	1.00		1.00	0.97		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2966	1263	1409	1462		1499	1401		1489	1642	1235
Flt Permitted		0.92	1.00	0.23	1.00		0.15	1.00		0.60	1.00	1.00
Satd. Flow (perm)		2740	1263	336	1462		238	1401		943	1642	1235
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	747	179	18	390	9	229	201	54	12	592	806
RTOR Reduction (vph)	0	0	53	0	1	0	0	11	0	0	0	133
Lane Group Flow (vph)	0	777	126	18	398	0	229	244	0	12	592	673
Confl. Peds. (#/hr)	11		11	11		11	32		15	15		32
Heavy Vehicles (%)	0%	1%	1%	6%	0%	0%	0%	1%	1%	0%	3%	1%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		32.0	32.0	32.0	32.0		46.0	46.0		37.0	37.0	37.0
Effective Green, g (s)		34.0	34.0	34.0	34.0		44.0	48.0		39.0	39.0	39.0
Actuated g/C Ratio		0.38	0.38	0.38	0.38		0.49	0.53		0.43	0.43	0.43
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)		1035	477	126	552		158	747		408	711	535
v/s Ratio Prot					0.27		c0.05	0.17			0.36	
v/s Ratio Perm		c0.28	0.10	0.05			c0.66			0.01		0.54
v/c Ratio		0.75	0.26	0.14	0.72		1.45	0.33		0.03	0.83	1.26
Uniform Delay, d1		24.3	19.4	18.4	24.0		26.8	11.9		14.6	22.6	25.5
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		5.0	1.4	2.4	8.0		234.0	1.2		0.1	11.0	130.5
Delay (s)		29.3	20.7	20.8	31.9		260.7	13.0		14.8	33.6	156.0
Level of Service		C	C	C	C		F	B		B	C	F
Approach Delay (s)		27.7			31.4			130.2			103.4	
Approach LOS		C			C			F			F	

Intersection Summary

HCM 2000 Control Delay	76.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	116.8%	ICU Level of Service	H
Analysis Period (min)	15		

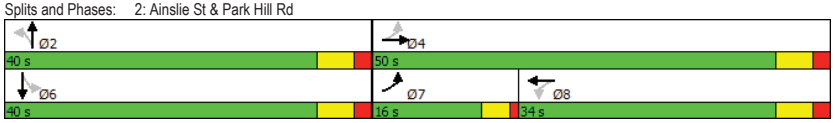
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	464	320	37	29	335	30	39	550	12	8	403	38
Future Volume (vph)	464	320	37	29	335	30	39	550	12	8	403	38
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			1.00			1.00	
Frt		0.984			0.990			0.997			0.989	
Flt Protected	0.950				0.996			0.997			0.999	
Satd. Flow (prot)	1471	1425	0	0	1347	0	0	2604	0	0	1309	0
Flt Permitted	0.337				0.951			0.889			0.987	
Satd. Flow (perm)	521	1425	0	0	1285	0	0	2322	0	0	1293	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			5			3			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.0			89.4			95.3			135.8	
Travel Time (s)		7.8			6.4			6.9			9.8	
Confl. Peds. (#/hr)	3		14	14		3	7		14	14		7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%	0%	7%	0%	14%	4%	0%
Adj. Flow (vph)	464	320	37	29	335	30	39	550	12	8	403	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	464	357	0	0	394	0	0	601	0	0	449	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.38	1.38	1.49	1.49	1.49	1.38	1.38	1.38	1.49	1.49	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	5.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	
Total Split (s)	16.0	50.0		34.0	34.0		40.0	40.0		40.0	40.0	
Total Split (%)	17.8%	55.6%		37.8%	37.8%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	12.0	44.0		28.0	28.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	6.0			6.0			6.0			6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)		13.0		13.0	13.0		24.0	24.0		24.0	24.0	
Flash Dont Walk (s)		11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	46.1	44.1			28.0			32.3			32.3	
Actuated g/C Ratio	0.52	0.50			0.32			0.37			0.37	
v/c Ratio	1.16	0.50			0.96			0.71			0.94	
Control Delay	117.6	17.9			67.4			29.1			57.6	
Queue Delay	0.2	1.8			0.0			0.0			0.0	
Total Delay	117.8	19.7			67.4			29.1			57.6	
LOS	F	B			E			C			E	
Approach Delay		75.2			67.4			29.1			57.6	
Approach LOS		E			E			C			E	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 88.4			
Natural Cycle: 100			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 58.1		Intersection LOS: E	
Intersection Capacity Utilization 118.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Ainslie St & Park Hill Rd



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	464	357	394	601	449
v/c Ratio	1.16	0.50	0.96	0.71	0.94
Control Delay	117.6	17.9	67.4	29.1	57.6
Queue Delay	0.2	1.8	0.0	0.0	0.0
Total Delay	117.8	19.7	67.4	29.1	57.6
Queue Length 50th (m)	~75.2	41.1	69.8	47.1	75.3
Queue Length 95th (m)	#161.6	66.9	#130.3	67.1	#136.3
Internal Link Dist (m)		84.0	65.4	71.3	111.8
Turn Bay Length (m)					
Base Capacity (vph)	400	714	411	896	501
Starvation Cap Reductn	9	211	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.19	0.71	0.96	0.67	0.90

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)	464	320	37	29	335	30	39	550	12	8	403	38
Future Volume (vph)	464	320	37	29	335	30	39	550	12	8	403	38
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			0.99			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1471	1426			1346			2603			1309	
Flt Permitted	0.34	1.00			0.95			0.89			0.99	
Satd. Flow (perm)	522	1426			1285			2322			1293	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	464	320	37	29	335	30	39	550	12	8	403	38
RTOR Reduction (vph)	0	5	0	0	3	0	0	2	0	0	4	0
Lane Group Flow (vph)	464	352	0	0	391	0	0	599	0	0	445	0
Confl. Peds. (#/hr)	3		14	14		3	7		14	14		7
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%	0%	7%	0%	14%	4%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	44.1	44.1			28.1			32.3			32.3	
Effective Green, g (s)	44.1	44.1			28.1			32.3			32.3	
Actuated g/C Ratio	0.50	0.50			0.32			0.37			0.37	
Clearance Time (s)	4.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	389	711			408			848			472	
v/s Ratio Prot	c0.16	0.25										
v/s Ratio Perm	c0.43				0.30			0.26			c0.34	
v/c Ratio	1.19	0.50			0.96			0.71			0.94	
Uniform Delay, d1	20.9	14.7			29.6			24.0			27.2	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	109.5	0.5			33.3			2.7			27.6	
Delay (s)	130.3	15.3			62.9			26.7			54.7	
Level of Service	F	B			E			C			D	
Approach Delay (s)		80.3			62.9			26.7			54.7	
Approach LOS		F			E			C			D	

Intersection Summary

HCM 2000 Control Delay	58.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	118.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	7	38	8	6	39	18	1032	0	6	408	1
Future Volume (vph)	223	7	38	8	6	39	18	1032	0	6	408	1
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99	0.97			0.98						1.00	
Frt		0.873			0.901							
Flt Protected	0.950				0.993			0.999			0.999	
Satd. Flow (prot)	1272	1240	0	0	1198	0	0	2759	0	0	1356	0
Flt Permitted	0.722				0.969			0.946			0.985	
Satd. Flow (perm)	961	1240	0	0	1167	0	0	2612	0	0	1337	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			39							
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.9			70.7			135.8			80.3	
Travel Time (s)		3.9			5.1			9.8			5.8	
Confl. Peds. (#/hr)	7		7	7		7			17	17		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Bus Blockages (#/hr)	2	0	0	0	0	0	0	5	0	0	4	0
Adj. Flow (vph)	223	7	38	8	6	39	18	1032	0	6	408	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	45	0	0	53	0	0	1050	0	0	415	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.28	1.38	1.38	1.49	1.49	1.49	1.38	1.40	1.38	1.49	1.52	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		58.0	58.0		58.0	58.0	
Total Split (s)	32.0	32.0		32.0	32.0		58.0	58.0		58.0	58.0	
Total Split (%)	35.6%	35.6%		35.6%	35.6%		64.4%	64.4%		64.4%	64.4%	
Maximum Green (s)	26.0	26.0		26.0	26.0		52.0	52.0		52.0	52.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	10.0	10.0		10.0	10.0		38.0	38.0		38.0	38.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	21.2	21.2			21.2			38.3			38.3	
Actuated g/C Ratio	0.31	0.31			0.31			0.56			0.56	
v/c Ratio	0.74	0.11			0.14			0.71			0.55	
Control Delay	39.2	9.0			10.0			14.7			13.5	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	39.2	9.0			10.0			14.7			13.5	
LOS	D	A			B			B			B	
Approach Delay		34.1			10.0			14.7			13.5	
Approach LOS		C			B			B			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 67.8	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 75.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Ainslie St & Simcoe St/Market St

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	223	45	53	1050	415
v/c Ratio	0.74	0.11	0.14	0.71	0.55
Control Delay	39.2	9.0	10.0	14.7	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	9.0	10.0	14.7	13.5
Queue Length 50th (m)	24.2	0.6	1.2	48.1	31.3
Queue Length 95th (m)	#70.3	8.3	9.9	84.6	65.7
Internal Link Dist (m)		29.9	46.7	111.8	56.3
Turn Bay Length (m)	30.0				
Base Capacity (vph)	411	552	522	2151	1101
Starvation Cap Reductn	0	0	0	77	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.08	0.10	0.51	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)	223	7	38	8	6	39	18	1032	0	6	408	1
Future Volume (vph)	223	7	38	8	6	39	18	1032	0	6	408	1
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.98			0.99			1.00			1.00	
Flpb, ped/bikes	0.99	1.00			1.00			1.00			1.00	
Frt	1.00	0.87			0.90			1.00			1.00	
Flt Protected	0.95	1.00			0.99			1.00			1.00	
Satd. Flow (prot)	1266	1243			1197			2759			1356	
Flt Permitted	0.72	1.00			0.97			0.95			0.99	
Satd. Flow (perm)	963	1243			1169			2611			1337	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	223	7	38	8	6	39	18	1032	0	6	408	1
RTOR Reduction (vph)	0	26	0	0	27	0	0	0	0	0	0	0
Lane Group Flow (vph)	223	19	0	0	26	0	0	1050	0	0	415	0
Confl. Peds. (#/hr)	7		7	7		7			17	17		
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Bus Blockages (#/hr)	2	0	0	0	0	0	0	5	0	0	4	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.1	19.1			19.1			36.2			36.2	
Effective Green, g (s)	21.1	21.1			21.1			38.2			38.2	
Actuated g/C Ratio	0.31	0.31			0.31			0.57			0.57	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	301	389			366			1482			758	
v/s Ratio Prot		0.02										
v/s Ratio Perm	c0.23				0.02			c0.40			0.31	
v/c Ratio	0.74	0.05			0.07			0.71			0.55	
Uniform Delay, d1	20.7	16.1			16.2			10.5			9.1	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	9.4	0.1			0.1			1.6			0.8	
Delay (s)	30.1	16.2			16.3			12.1			9.9	
Level of Service	C	B			B			B			A	
Approach Delay (s)		27.7			16.3			12.1			9.9	
Approach LOS		C			B			B			A	

Intersection Summary

HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	67.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	4	9	16	1	0	19	0	213	13	1433	12
Future Volume (vph)	0	4	9	16	1	0	19	0	213	13	1433	12
Ideal Flow (vphpl)	1900	1900	1750	1650	1650	1900	1775	1900	1750	1775	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	25.0		0.0	0.0		0.0
Storage Lanes	0		1	0		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850						0.850		0.999	
Flt Protected					0.955		0.950			0.950		
Satd. Flow (prot)	0	1691	1324	0	1402	0	1501	0	1298	1501	3147	0
Flt Permitted					0.955		0.950			0.950		
Satd. Flow (perm)	0	1691	1324	0	1402	0	1501	0	1298	1501	3147	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		36.5			50.1			56.2			69.4	
Travel Time (s)		2.6			3.6			4.0			5.0	
Confl. Peds. (#/hr)			1	1			8		2	2		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	0%
Adj. Flow (vph)	0	4	9	16	1	0	19	0	213	13	1433	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	9	0	17	0	19	0	213	13	1445	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.16	1.16	1.29	1.38	1.38	1.16	1.26	1.16	1.29	1.26	1.16	1.16
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	61.4%	ICU Level of Service B	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	4	9	16	1	0	19	0	213	13	1433	12
Future Volume (Veh/h)	0	4	9	16	1	0	19	0	213	13	1433	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	4	9	16	1	0	19	0	213	13	1433	12
Pedestrians		8			2			1				
Lane Width (m)		3.5			3.5			3.5				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								140				
pX, platoon unblocked												
vC, conflicting volume	1512	1726	732	794	1519	2	1453			215		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1512	1726	732	794	1519	2	1453			215		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	95	98	94	99	100	96			99		
cM capacity (veh/h)	79	85	366	253	113	1086	469			1365		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	4	9	17	19	213	13	955	490
Volume Left	0	0	16	19	0	13	0	0
Volume Right	0	9	0	0	213	0	0	12
cSH	85	366	236	469	1700	1365	1700	1700
Volume to Capacity	0.05	0.02	0.07	0.04	0.13	0.01	0.56	0.29
Queue Length 95th (m)	1.2	0.6	1.8	1.0	0.0	0.2	0.0	0.0
Control Delay (s)	49.7	15.1	21.4	13.0	0.0	7.7	0.0	0.0
Lane LOS	E	C	C	B		A		
Approach Delay (s)	25.7		21.4	1.1		0.1		
Approach LOS	D		C					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

Appendix E

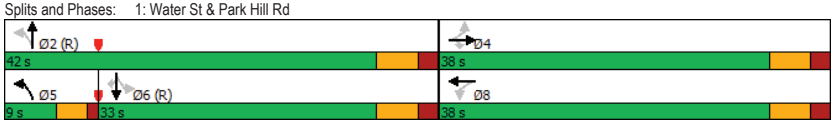
Total Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1025	129	3	284	13	22	216	23	12	370	347
Future Volume (vph)	0	1025	129	3	284	13	22	216	23	12	370	347
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	15.0		0.0	25.0		0.0	40.0		0.0
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97	1.00	1.00		0.99	1.00		1.00		0.96
Frt			0.850		0.993			0.986				0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	2943	1324	1501	1262	0	1501	1426	0	1128	1626	1324
Flt Permitted				0.151			0.276			0.610		
Satd. Flow (perm)	0	2943	1284	238	1262	0	432	1426	0	723	1626	1267
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95		4			9				347
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.4			108.0			179.1			83.3	
Travel Time (s)		2.8			7.8			12.9			6.0	
Confl. Peds. (#/hr)	4		8	8		4	14		3	3		14
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	0%	16%	2%	0%	1%	5%	33%	4%	0%
Adj. Flow (vph)	0	1025	129	3	284	13	22	216	23	12	370	347
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1025	129	3	297	0	22	239	0	12	370	347
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.26	1.29	1.26	1.38	1.38	1.26	1.38	1.38	1.26	1.16	1.29
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type		NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	30.0		30.0	30.0	30.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	42.0		33.0	33.0	33.0
Total Split (%)	47.5%	47.5%	47.5%	47.5%	47.5%		11.3%	52.5%		41.3%	41.3%	41.3%
Maximum Green (s)	32.0	32.0	32.0	32.0	32.0		5.0	36.0		27.0	27.0	27.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0		2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Walk Time (s)	16.0	16.0	16.0	16.0	16.0			10.0		10.0	10.0	10.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0			14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		34.0	34.0	34.0	34.0		36.0	38.0		29.0	29.0	29.0
Actuated g/C Ratio		0.42	0.42	0.42	0.42		0.45	0.48		0.36	0.36	0.36
v/c Ratio		0.82	0.21	0.03	0.55		0.09	0.35		0.05	0.63	0.51
Control Delay		27.1	6.2	14.7	21.9		13.3	14.5		17.3	26.8	5.2
Queue Delay		0.0	0.0	0.0	0.6		0.0	0.0		0.0	0.0	0.0
Total Delay		27.1	6.2	14.7	22.5		13.3	14.5		17.3	26.8	5.2
LOS		C	A	B	C		B	B		B	C	A
Approach Delay		24.8			22.4			14.4			16.4	
Approach LOS		C			C			B			B	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 41 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Pretimed			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 20.9		Intersection LOS: C	
Intersection Capacity Utilization 85.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Water St & Park Hill Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1025	129	3	297	22	239	12	370	347
v/c Ratio	0.82	0.21	0.03	0.55	0.09	0.35	0.05	0.63	0.51
Control Delay	27.1	6.2	14.7	21.9	13.3	14.5	17.3	26.8	5.2
Queue Delay	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	6.2	14.7	22.5	13.3	14.5	17.3	26.8	5.2
Queue Length 50th (m)	73.5	3.1	0.3	34.0	1.9	22.0	1.2	47.9	0.0
Queue Length 95th (m)	100.2	13.3	2.0	59.0	5.9	38.7	4.8	77.4	17.3
Internal Link Dist (m)	14.4			84.0		155.1		59.3	
Turn Bay Length (m)		10.0	15.0		25.0		40.0		
Base Capacity (vph)	1250	600	101	538	234	682	262	589	680
Starvation Cap Reductn	0	0	0	63	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	0.82	0.21	0.03	0.63	0.09	0.35	0.05	0.63	0.51

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1025	129	3	284	13	22	216	23	12	370	347
Future Volume (vph)	0	1025	129	3	284	13	22	216	23	12	370	347
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Total Lost time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.97	1.00	1.00		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85	1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2943	1284	1498	1263		1497	1425		1126	1626	1267
Flt Permitted		1.00	1.00	0.15	1.00		0.28	1.00		0.61	1.00	1.00
Satd. Flow (perm)		2943	1284	237	1263		435	1425		723	1626	1267
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1025	129	3	284	13	22	216	23	12	370	347
RTOR Reduction (vph)	0	0	55	0	2	0	0	5	0	0	0	221
Lane Group Flow (vph)	0	1025	74	3	295	0	22	234	0	12	370	126
Confl. Peds. (#/hr)	4		8	8		4	14		3	3		14
Heavy Vehicles (%)	1%	2%	0%	0%	16%	2%	0%	1%	5%	33%	4%	0%
Turn Type		NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		32.0	32.0	32.0	32.0		36.0	36.0		27.0	27.0	27.0
Effective Green, g (s)		34.0	34.0	34.0	34.0		34.0	38.0		29.0	29.0	29.0
Actuated g/C Ratio		0.42	0.42	0.42	0.42		0.42	0.48		0.36	0.36	0.36
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)		1250	545	100	536		224	676		262	589	459
v/s Ratio Prot		c0.35			0.23		0.00	c0.16			c0.23	
v/s Ratio Perm			0.06	0.01			0.04			0.02		0.10
v/c Ratio		0.82	0.14	0.03	0.55		0.10	0.35		0.05	0.63	0.27
Uniform Delay, d1		20.3	14.0	13.4	17.3		14.9	13.2		16.5	21.0	18.0
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		6.1	0.5	0.6	4.0		0.9	1.4		0.3	5.0	1.5
Delay (s)		26.4	14.6	14.0	21.3		15.8	14.6		16.9	26.1	19.5
Level of Service		C	B	B	C		B	B		B	C	B
Approach Delay (s)		25.1			21.2			14.7			22.8	
Approach LOS		C			C			B			C	

Intersection Summary

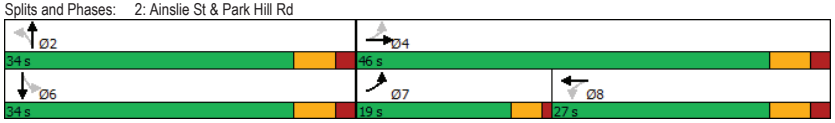
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	604	410	28	11	264	17	22	528	6	6	173	10
Future Volume (vph)	604	410	28	11	264	17	22	528	6	6	173	10
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			1.00			1.00	
Frt		0.990			0.992			0.998			0.993	
Flt Protected	0.950				0.998			0.998			0.998	
Satd. Flow (prot)	1501	1350	0	0	1200	0	0	2750	0	0	1317	0
Flt Permitted	0.402				0.976			0.937			0.977	
Satd. Flow (perm)	633	1350	0	0	1174	0	0	2581	0	0	1289	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			4			1			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.0			89.4			95.3			135.8	
Travel Time (s)		7.8			6.4			6.9			9.8	
Confl. Peds. (#/hr)	7		2	2		7	5		8	8		5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	8%	0%	0%	13%	33%	1%	1%	4%	0%	4%	0%
Adj. Flow (vph)	604	410	28	11	264	17	22	528	6	6	173	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	604	438	0	0	292	0	0	556	0	0	189	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.38	1.38	1.49	1.49	1.49	1.38	1.38	1.38	1.49	1.49	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	5.0	27.0		27.0	27.0		31.0	31.0		31.0	31.0	
Total Split (s)	19.0	46.0		27.0	27.0		34.0	34.0		34.0	34.0	
Total Split (%)	23.8%	57.5%		33.8%	33.8%		42.5%	42.5%		42.5%	42.5%	
Maximum Green (s)	15.0	40.0		21.0	21.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	6.0			6.0			6.0			6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)		10.0		10.0	10.0		14.0	14.0		14.0	14.0	
Flash Dont Walk (s)		11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	41.6	39.5			20.4			20.4			20.4	
Actuated g/C Ratio	0.58	0.55			0.28			0.28			0.28	
v/c Ratio	1.10	0.59			0.87			0.76			0.51	
Control Delay	87.9	15.9			53.5			30.9			26.4	
Queue Delay	0.1	1.3			0.0			0.0			0.0	
Total Delay	88.0	17.2			53.5			30.9			26.4	
LOS	F	B			D			C			C	
Approach Delay		58.3			53.5			30.9			26.4	
Approach LOS		E			D			C			C	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 80			
Actuated Cycle Length: 72			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 47.4		Intersection LOS: D	
Intersection Capacity Utilization 104.2%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 2: Ainslie St & Park Hill Rd



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	604	438	292	556	189
v/c Ratio	1.10	0.59	0.87	0.76	0.51
Control Delay	87.9	15.9	53.5	30.9	26.4
Queue Delay	0.1	1.3	0.0	0.0	0.0
Total Delay	88.0	17.2	53.5	30.9	26.4
Queue Length 50th (m)	~67.3	37.5	38.6	38.1	22.1
Queue Length 95th (m)	#182.7	81.1	#94.3	55.1	40.6
Internal Link Dist (m)		84.0	65.4	71.3	111.8
Turn Bay Length (m)					
Base Capacity (vph)	547	757	347	1010	506
Starvation Cap Reductn	4	152	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.11	0.72	0.84	0.55	0.37

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)	604	410	28	11	264	17	22	528	6	6	173	10
Future Volume (vph)	604	410	28	11	264	17	22	528	6	6	173	10
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.99			0.99			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1499	1351			1200			2750			1317	
Flt Permitted	0.40	1.00			0.98			0.94			0.98	
Satd. Flow (perm)	635	1351			1174			2582			1289	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	604	410	28	11	264	17	22	528	6	6	173	10
RTOR Reduction (vph)	0	3	0	0	3	0	0	1	0	0	3	0
Lane Group Flow (vph)	604	435	0	0	289	0	0	555	0	0	186	0
Confl. Peds. (#/hr)	7		2	2		7	5		8	8		5
Heavy Vehicles (%)	0%	8%	0%	0%	13%	33%	1%	1%	4%	0%	4%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	39.6	39.6			20.5			20.4			20.4	
Effective Green, g (s)	39.6	39.6			20.5			20.4			20.4	
Actuated g/C Ratio	0.55	0.55			0.28			0.28			0.28	
Clearance Time (s)	4.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	530	743			334			731			365	
v/s Ratio Prot	c0.24	0.32										
v/s Ratio Perm	c0.39				0.25			c0.22			0.14	
v/c Ratio	1.14	0.59			0.87			0.76			0.51	
Uniform Delay, d1	14.3	10.8			24.4			23.6			21.6	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	83.7	1.2			20.2			4.6			1.1	
Delay (s)	98.0	11.9			44.6			28.1			22.7	
Level of Service	F	B			D			C			C	
Approach Delay (s)		61.8			44.6			28.1			22.7	
Approach LOS		E			D			C			C	

Intersection Summary

HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

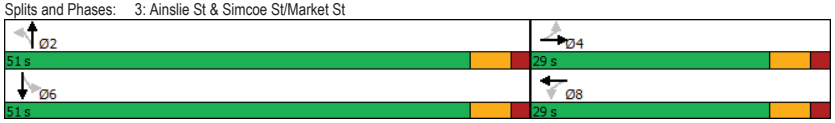
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	247	7	3	1	2	19	20	1113	4	7	187	0
Future Volume (vph)	247	7	3	1	2	19	20	1113	4	7	187	0
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00			1.00			1.00	
Frt		0.955			0.883			0.999				
Flt Protected	0.950				0.998			0.999			0.998	
Satd. Flow (prot)	1283	1352	0	0	1200	0	0	2780	0	0	1377	0
Flt Permitted	0.743				0.994			0.949			0.960	
Satd. Flow (perm)	1003	1352	0	0	1195	0	0	2641	0	0	1324	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			19			1				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.9			70.7			135.8			80.3	
Travel Time (s)		3.9			5.1			9.8			5.8	
Confl. Peds. (#/hr)			6	6					8	8		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Adj. Flow (vph)	247	7	3	1	2	19	20	1113	4	7	187	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	10	0	0	22	0	0	1137	0	0	194	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.38	1.38	1.49	1.49	1.49	1.38	1.38	1.38	1.49	1.49	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		51.0	51.0		51.0	51.0	
Total Split (s)	29.0	29.0		29.0	29.0		51.0	51.0		51.0	51.0	
Total Split (%)	36.3%	36.3%		36.3%	36.3%		63.8%	63.8%		63.8%	63.8%	
Maximum Green (s)	23.0	23.0		23.0	23.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		31.0	31.0		31.0	31.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	22.1	22.1			22.1			39.1			39.1	
Actuated g/C Ratio	0.32	0.32			0.32			0.56			0.56	
v/c Ratio	0.77	0.02			0.06			0.76			0.26	
Control Delay	41.5	16.1			10.2			16.1			9.2	
Queue Delay	0.0	0.0			0.0			0.1			0.0	
Total Delay	41.5	16.1			10.2			16.2			9.2	
LOS	D	B			B			B			A	
Approach Delay		40.5			10.2			16.2			9.2	
Approach LOS		D			B			B			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 80	
Actuated Cycle Length: 69.3	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 76.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Ainslie St & Simcoe St/Market St



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	247	10	22	1137	194
v/c Ratio	0.77	0.02	0.06	0.76	0.26
Control Delay	41.5	16.1	10.2	16.1	9.2
Queue Delay	0.0	0.0	0.0	0.1	0.0
Total Delay	41.5	16.1	10.2	16.2	9.2
Queue Length 50th (m)	29.0	0.6	0.3	63.0	13.7
Queue Length 95th (m)	#74.8	4.3	5.5	88.3	24.7
Internal Link Dist (m)		29.9	46.7	111.8	56.3
Turn Bay Length (m)					
Base Capacity (vph)	368	498	450	1823	913
Starvation Cap Reductn	0	0	0	92	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.02	0.05	0.66	0.21

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)	247	7	3	1	2	19	20	1113	4	7	187	0
Future Volume (vph)	247	7	3	1	2	19	20	1113	4	7	187	0
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.99			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.95			0.88			1.00			1.00	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1283	1352			1200			2782			1377	
Flt Permitted	0.74	1.00			0.99			0.95			0.96	
Satd. Flow (perm)	1003	1352			1196			2642			1324	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	247	7	3	1	2	19	20	1113	4	7	187	0
RTOR Reduction (vph)	0	2	0	0	13	0	0	0	0	0	0	0
Lane Group Flow (vph)	247	8	0	0	9	0	0	1137	0	0	194	0
Confl. Peds. (#/hr)			6	6					8	8		
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.0	20.0			20.0			37.1			37.1	
Effective Green, g (s)	22.0	22.0			22.0			39.1			39.1	
Actuated g/C Ratio	0.32	0.32			0.32			0.57			0.57	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	319	430			380			1494			749	
v/s Ratio Prot		0.01										
v/s Ratio Perm	c0.25				0.01			c0.43			0.15	
v/c Ratio	0.77	0.02			0.02			0.76			0.26	
Uniform Delay, d1	21.3	16.1			16.2			11.4			7.6	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	11.1	0.0			0.0			2.3			0.2	
Delay (s)	32.4	16.2			16.2			13.8			7.8	
Level of Service	C	B			B			B			A	
Approach Delay (s)		31.8			16.2			13.8			7.8	
Approach LOS		C			B			B			A	

Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	69.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	34	36	3	9	5	19	2	214	24	697	25
Future Volume (vph)	5	34	36	3	9	5	19	2	214	24	697	25
Ideal Flow (vphpl)	1900	1900	1750	1650	1650	1900	1775	1900	1750	1775	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	25.0		0.0	0.0		0.0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor												
Frt			0.850		0.960				0.850		0.995	
Flt Protected		0.994			0.991			0.957			0.998	
Satd. Flow (prot)	0	1681	1103	0	1397	0	0	1618	1298	0	2928	0
Flt Permitted		0.994			0.991			0.957			0.998	
Satd. Flow (perm)	0	1681	1103	0	1397	0	0	1618	1298	0	2928	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		36.5			50.1			56.2			69.4	
Travel Time (s)		2.6			3.6			4.0			5.0	
Confl. Peds. (#/hr)							35		2	2		35
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	20%	0%	0%	0%	0%	0%	2%	0%	9%	17%
Adj. Flow (vph)	5	34	36	3	9	5	19	2	214	24	697	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	39	36	0	17	0	0	21	214	0	746	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.16	1.16	1.29	1.38	1.38	1.16	1.26	1.16	1.29	1.26	1.16	1.16
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.7%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	34	36	3	9	5	19	2	214	24	697	25
Future Volume (Veh/h)	5	34	36	3	9	5	19	2	214	24	697	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	5	34	36	3	9	5	19	2	214	24	697	25
Pedestrians		35			2							
Lane Width (m)		3.5			3.5							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		3			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								140				
pX, platoon unblocked												
vC, conflicting volume	842	1048	396	492	847	4	757			218		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	842	1048	396	492	847	4	757			218		
tC, single (s)	7.5	6.5	7.3	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	84	93	99	97	100	98			98		
cM capacity (veh/h)	233	214	539	361	280	1083	839			1361		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	39	36	17	21	214	372	374
Volume Left	5	0	3	19	0	24	0
Volume Right	0	36	5	0	214	0	25
cSH	216	539	377	839	1700	1361	1700
Volume to Capacity	0.18	0.07	0.05	0.02	0.13	0.02	0.22
Queue Length 95th (m)	5.1	1.7	1.1	0.6	0.0	0.4	0.0
Control Delay (s)	25.3	12.2	15.0	8.5	0.0	0.7	0.0
Lane LOS	D	B	B	A		A	
Approach Delay (s)	19.0		15.0	0.8		0.3	
Approach LOS	C		B				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	20	7	5	726	6
Future Volume (vph)	2	20	7	5	726	6
Ideal Flow (vphpl)	1900	1750	1900	1900	1650	1650
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.877				0.999	
Flt Protected	0.995			0.972		
Satd. Flow (prot)	1607	0	0	1790	1598	0
Flt Permitted	0.995			0.972		
Satd. Flow (perm)	1607	0	0	1790	1598	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	28.7			49.8	55.4	
Travel Time (s)	2.1			3.6	4.0	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	20	7	5	726	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	22	0	0	12	732	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.13	1.01	1.01	1.21	1.21
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	20	7	5	726	6
Future Volume (Veh/h)	2	20	7	5	726	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2	20	7	5	726	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				259		
pX, platoon unblocked						
vC, conflicting volume	748	729	732			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748	729	732			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	95	99			
cM capacity (veh/h)	377	423	873			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	22	12	732
Volume Left	2	7	0
Volume Right	20	0	6
cSH	418	873	1700
Volume to Capacity	0.05	0.01	0.43
Queue Length 95th (m)	1.3	0.2	0.0
Control Delay (s)	14.1	5.4	0.0
Lane LOS	B	A	
Approach Delay (s)	14.1	5.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	273	0	0	17	0	0
Future Volume (vph)	273	0	0	17	0	0
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3039	0	0	1600	1711	0
Flt Permitted						
Satd. Flow (perm)	3039	0	0	1600	1711	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.1			53.9	33.0	
Travel Time (s)	3.6			3.9	2.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	273	0	0	17	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	273	0	0	17	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 12.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	273	0	0	17	0	0
Future Volume (Veh/h)	273	0	0	17	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	273	0	0	17	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				54		
pX, platoon unblocked						
vC, conflicting volume			273		290	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			273		290	136
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1287		677	887

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	182	91	17	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1287	1700
Volume to Capacity	0.11	0.05	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	12.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	235	0	0	736
Future Volume (vph)	0	0	235	0	0	736
Ideal Flow (vphpl)	1765	1765	1650	1650	1775	1775
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1711	0	1600	0	0	3270
Flt Permitted						
Satd. Flow (perm)	1711	0	1600	0	0	3270
Link Speed (k/h)	50		50			50
Link Distance (m)	33.5		83.3			56.2
Travel Time (s)	2.4		6.0			4.0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	235	0	0	736
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	235	0	0	736
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		3.5			3.5
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.12	1.12	1.21	1.21	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	235	0	0	736
Future Volume (Veh/h)	0	0	235	0	0	736
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	235	0	0	736
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			83			
pX, platoon unblocked	0.92	0.92			0.92	
vC, conflicting volume	603	235			235	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	530	132			132	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	443	826			1342	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	0	235	245	491
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1342	1700
Volume to Capacity	0.00	0.14	0.00	0.29
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS	A			

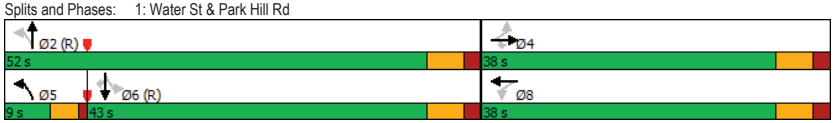
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	747	179	18	390	27	229	209	54	20	603	819
Future Volume (vph)	48	747	179	18	390	27	229	209	54	20	603	819
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	15.0		0.0	25.0		0.0	40.0		0.0
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	0.96	1.00	1.00		0.99	1.00		0.99		0.94
Frt			0.850		0.990			0.969				0.850
Flt Protected		0.997		0.950			0.950			0.950		
Satd. Flow (prot)	0	2965	1311	1416	1450	0	1501	1402	0	1501	1642	1311
Flt Permitted		0.833		0.217			0.142			0.597		
Satd. Flow (perm)	0	2476	1263	322	1450	0	222	1402	0	936	1642	1235
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85		4			22				234
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.4			108.0			179.1			83.3	
Travel Time (s)		2.8			7.8			12.9			6.0	
Confl. Peds. (#/hr)	11		11	11		11	32		15	15		32
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	6%	0%	0%	0%	1%	1%	0%	3%	1%
Adj. Flow (vph)	48	747	179	18	390	27	229	209	54	20	603	819
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	795	179	18	417	0	229	263	0	20	603	819
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.26	1.29	1.26	1.38	1.38	1.26	1.38	1.38	1.26	1.16	1.29
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	43.0		43.0	43.0	43.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	52.0		43.0	43.0	43.0
Total Split (%)	42.2%	42.2%	42.2%	42.2%	42.2%		10.0%	57.8%		47.8%	47.8%	47.8%
Maximum Green (s)	32.0	32.0	32.0	32.0	32.0		5.0	46.0		37.0	37.0	37.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0		2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Walk Time (s)	13.0	13.0	13.0	13.0	13.0			23.0		23.0	23.0	23.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0			14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		34.0	34.0	34.0	34.0		46.0	48.0		39.0	39.0	39.0
Actuated g/C Ratio		0.38	0.38	0.38	0.38		0.51	0.53		0.43	0.43	0.43
v/c Ratio		0.85	0.34	0.15	0.76		1.47	0.35		0.05	0.85	1.23
Control Delay		36.2	12.5	22.4	34.8		263.6	12.5		15.3	36.3	135.8
Queue Delay		0.0	0.0	0.0	8.1		0.0	0.0		0.0	0.0	0.0
Total Delay		36.2	12.5	22.4	42.9		263.6	12.5		15.3	36.3	135.8
LOS		D	B	C	D		F	B		B	D	F
Approach Delay		31.8			42.1			129.4			92.5	
Approach LOS		C			D			F			F	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 41 (46%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Pretimed			
Maximum v/c Ratio: 1.47			
Intersection Signal Delay: 73.7		Intersection LOS: E	
Intersection Capacity Utilization 120.0%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Water St & Park Hill Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	795	179	18	417	229	263	20	603	819
v/c Ratio	0.85	0.34	0.15	0.76	1.47	0.35	0.05	0.85	1.23
Control Delay	36.2	12.5	22.4	34.8	263.6	12.5	15.3	36.3	135.8
Queue Delay	0.0	0.0	0.0	8.1	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	12.5	22.4	42.9	263.6	12.5	15.3	36.3	135.8
Queue Length 50th (m)	68.4	11.3	2.1	64.3	~37.7	23.3	2.0	95.4	~160.3
Queue Length 95th (m)	#102.9	27.5	7.5	#110.9	#81.1	40.3	6.4	#159.2	#233.1
Internal Link Dist (m)	14.4			84.0		155.1		59.3	
Turn Bay Length (m)		10.0	15.0		25.0		40.0		
Base Capacity (vph)	935	530	121	550	156	758	405	711	667
Starvation Cap Reductn	0	0	0	99	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	0.85	0.34	0.15	0.92	1.47	0.35	0.05	0.85	1.23

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)	48	747	179	18	390	27	229	209	54	20	603	819
Future Volume (vph)	48	747	179	18	390	27	229	209	54	20	603	819
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Total Lost time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	1.00
Frt		1.00	0.85	1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2963	1263	1410	1451		1499	1403		1489	1642	1235
Flt Permitted		0.83	1.00	0.22	1.00		0.14	1.00		0.60	1.00	1.00
Satd. Flow (perm)		2477	1263	322	1451		224	1403		936	1642	1235
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	747	179	18	390	27	229	209	54	20	603	819
RTOR Reduction (vph)	0	0	53	0	2	0	0	10	0	0	0	133
Lane Group Flow (vph)	0	795	126	18	415	0	229	253	0	20	603	686
Confl. Peds. (#/hr)	11		11	11		11	32		15	15		32
Heavy Vehicles (%)	0%	1%	1%	6%	0%	0%	0%	1%	1%	0%	3%	1%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		32.0	32.0	32.0	32.0		46.0	46.0		37.0	37.0	37.0
Effective Green, g (s)		34.0	34.0	34.0	34.0		44.0	48.0		39.0	39.0	39.0
Actuated g/C Ratio		0.38	0.38	0.38	0.38		0.49	0.53		0.43	0.43	0.43
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)		935	477	121	548		152	748		405	711	535
v/s Ratio Prot					0.29		c0.05	0.18			0.37	
v/s Ratio Perm		c0.32	0.10	0.06			c0.69			0.02		0.56
v/c Ratio		0.85	0.26	0.15	0.76		1.51	0.34		0.05	0.85	1.28
Uniform Delay, d1		25.7	19.4	18.5	24.4		26.6	12.0		14.8	22.8	25.5
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		9.6	1.4	2.6	9.4		259.0	1.2		0.2	12.0	141.1
Delay (s)		35.2	20.7	21.0	33.8		285.5	13.2		15.0	34.9	166.6
Level of Service		D	C	C	C		F	B		B	C	F
Approach Delay (s)		32.6			33.3			139.9			109.4	
Approach LOS		C			C			F			F	

Intersection Summary

HCM 2000 Control Delay	81.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	120.0%	ICU Level of Service	H
Analysis Period (min)	15		

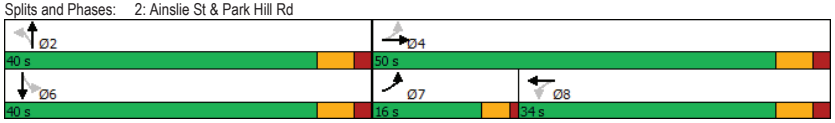
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	464	328	37	29	344	30	48	553	12	8	408	38
Future Volume (vph)	464	328	37	29	344	30	48	553	12	8	408	38
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			1.00			1.00	
Frt		0.985			0.990			0.997			0.989	
Flt Protected	0.950				0.996			0.996			0.999	
Satd. Flow (prot)	1471	1427	0	0	1347	0	0	2604	0	0	1309	0
Flt Permitted	0.328				0.952			0.858			0.987	
Satd. Flow (perm)	507	1427	0	0	1286	0	0	2243	0	0	1293	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			5			2			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.0			89.4			95.3			135.8	
Travel Time (s)		7.8			6.4			6.9			9.8	
Confl. Peds. (#/hr)	3		14	14		3	7		14	14		7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%	0%	7%	0%	14%	4%	0%
Adj. Flow (vph)	464	328	37	29	344	30	48	553	12	8	408	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	464	365	0	0	403	0	0	613	0	0	454	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.38	1.38	1.49	1.49	1.49	1.38	1.38	1.38	1.49	1.49	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	5.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	
Total Split (s)	16.0	50.0		34.0	34.0		40.0	40.0		40.0	40.0	
Total Split (%)	17.8%	55.6%		37.8%	37.8%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	12.0	44.0		28.0	28.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	6.0			6.0			6.0			6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)		13.0		13.0	13.0		24.0	24.0		24.0	24.0	
Flash Dont Walk (s)		11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	46.0	44.0			28.0			32.6			32.6	
Actuated g/C Ratio	0.52	0.50			0.32			0.37			0.37	
v/c Ratio	1.18	0.51			0.98			0.74			0.95	
Control Delay	125.0	18.2			73.2			30.7			58.8	
Queue Delay	0.2	2.0			0.0			0.0			0.0	
Total Delay	125.2	20.2			73.2			30.7			58.8	
LOS	F	C			E			C			E	
Approach Delay		79.0			73.2			30.7			58.8	
Approach LOS		E			E			C			E	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 88.6			
Natural Cycle: 110			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 61.1		Intersection LOS: E	
Intersection Capacity Utilization 125.5%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Ainslie St & Park Hill Rd



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	464	365	403	613	454
v/c Ratio	1.18	0.51	0.98	0.74	0.95
Control Delay	125.0	18.2	73.2	30.7	58.8
Queue Delay	0.2	2.0	0.0	0.0	0.0
Total Delay	125.2	20.2	73.2	30.7	58.8
Queue Length 50th (m)	~76.5	42.4	72.1	49.1	76.7
Queue Length 95th (m)	#162.6	68.7	#134.2	70.3	#138.7
Internal Link Dist (m)		84.0	65.4	71.3	111.8
Turn Bay Length (m)					
Base Capacity (vph)	393	713	410	862	500
Starvation Cap Reductn	7	211	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.20	0.73	0.98	0.71	0.91

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)	464	328	37	29	344	30	48	553	12	8	408	38
Future Volume (vph)	464	328	37	29	344	30	48	553	12	8	408	38
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			0.99			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1471	1427			1346			2604			1309	
Flt Permitted	0.33	1.00			0.95			0.86			0.99	
Satd. Flow (perm)	507	1427			1286			2242			1293	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	464	328	37	29	344	30	48	553	12	8	408	38
RTOR Reduction (vph)	0	5	0	0	3	0	0	1	0	0	4	0
Lane Group Flow (vph)	464	360	0	0	400	0	0	612	0	0	450	0
Confl. Peds. (#/hr)	3		14	14		3	7		14	14		7
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%	0%	7%	0%	14%	4%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	44.0	44.0			28.0			32.6			32.6	
Effective Green, g (s)	44.0	44.0			28.0			32.6			32.6	
Actuated g/C Ratio	0.50	0.50			0.32			0.37			0.37	
Clearance Time (s)	4.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	382	708			406			824			475	
v/s Ratio Prot	c0.16	0.25										
v/s Ratio Perm	c0.44				0.31			0.27			c0.35	
v/c Ratio	1.21	0.51			0.98			0.74			0.95	
Uniform Delay, d1	20.9	15.0			30.1			24.3			27.2	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	118.4	0.6			40.2			3.6			28.2	
Delay (s)	139.2	15.6			70.3			28.0			55.4	
Level of Service	F	B			E			C			E	
Approach Delay (s)		84.8			70.3			28.0			55.4	
Approach LOS		F			E			C			E	

Intersection Summary

HCM 2000 Control Delay	61.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	88.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	125.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	255	8	38	8	7	39	21	1032	0	6	413	1
Future Volume (vph)	255	8	38	8	7	39	21	1032	0	6	413	1
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99	0.97			0.98						1.00	
Frt		0.876			0.902							
Flt Protected	0.950				0.993			0.999			0.999	
Satd. Flow (prot)	1272	1244	0	0	1197	0	0	2758	0	0	1356	0
Flt Permitted	0.722				0.971			0.943			0.985	
Satd. Flow (perm)	961	1244	0	0	1168	0	0	2604	0	0	1337	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			39							
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.9			70.7			135.8			80.3	
Travel Time (s)		3.9			5.1			9.8			5.8	
Confl. Peds. (#/hr)	7		7	7		7			17	17		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Bus Blockages (#/hr)	2	0	0	0	0	0	0	5	0	0	4	0
Adj. Flow (vph)	255	8	38	8	7	39	21	1032	0	6	413	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	255	46	0	0	54	0	0	1053	0	0	420	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.28	1.38	1.38	1.49	1.49	1.49	1.38	1.40	1.38	1.49	1.52	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		58.0	58.0		58.0	58.0	
Total Split (s)	32.0	32.0		32.0	32.0		58.0	58.0		58.0	58.0	
Total Split (%)	35.6%	35.6%		35.6%	35.6%		64.4%	64.4%		64.4%	64.4%	
Maximum Green (s)	26.0	26.0		26.0	26.0		52.0	52.0		52.0	52.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	10.0	10.0		10.0	10.0		38.0	38.0		38.0	38.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	23.2	23.2			23.2			38.5			38.5	
Actuated g/C Ratio	0.33	0.33			0.33			0.55			0.55	
v/c Ratio	0.80	0.11			0.13			0.74			0.57	
Control Delay	44.0	9.1			10.0			16.0			14.5	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	44.0	9.1			10.0			16.1			14.5	
LOS	D	A			B			B			B	
Approach Delay		38.7			10.0			16.1			14.5	
Approach LOS		D			B			B			B	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 69.9			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 19.3		Intersection LOS: B	
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Ainslie St & Simcoe St/Market St

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	255	46	54	1053	420
v/c Ratio	0.80	0.11	0.13	0.74	0.57
Control Delay	44.0	9.1	10.0	16.0	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	9.1	10.0	16.1	14.5
Queue Length 50th (m)	30.1	0.7	1.3	56.1	36.9
Queue Length 95th (m)	#84.9	8.5	10.1	85.2	66.8
Internal Link Dist (m)		29.9	46.7	111.8	56.3
Turn Bay Length (m)					
Base Capacity (vph)	398	537	506	2077	1066
Starvation Cap Reductn	0	0	0	92	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.09	0.11	0.53	0.39

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)	255	8	38	8	7	39	21	1032	0	6	413	1
Future Volume (vph)	255	8	38	8	7	39	21	1032	0	6	413	1
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.98			0.99			1.00			1.00	
Flpb, ped/bikes	0.99	1.00			1.00			1.00			1.00	
Frt	1.00	0.88			0.90			1.00			1.00	
Flt Protected	0.95	1.00			0.99			1.00			1.00	
Satd. Flow (prot)	1266	1247			1197			2758			1356	
Flt Permitted	0.72	1.00			0.97			0.94			0.99	
Satd. Flow (perm)	962	1247			1171			2604			1337	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	255	8	38	8	7	39	21	1032	0	6	413	1
RTOR Reduction (vph)	0	25	0	0	26	0	0	0	0	0	0	0
Lane Group Flow (vph)	255	21	0	0	28	0	0	1053	0	0	420	0
Confl. Peds. (#/hr)	7		7	7		7			17	17		
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Bus Blockages (#/hr)	2	0	0	0	0	0	0	5	0	0	4	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.1	21.1			21.1			36.4			36.4	
Effective Green, g (s)	23.1	23.1			23.1			38.4			38.4	
Actuated g/C Ratio	0.33	0.33			0.33			0.55			0.55	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	319	414			389			1438			738	
v/s Ratio Prot		0.02										
v/s Ratio Perm	c0.27				0.02			c0.40			0.31	
v/c Ratio	0.80	0.05			0.07			0.73			0.57	
Uniform Delay, d1	21.1	15.7			15.9			11.7			10.1	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	13.1	0.1			0.1			2.0			1.0	
Delay (s)	34.2	15.8			15.9			13.6			11.2	
Level of Service	C	B			B			B			B	
Approach Delay (s)		31.4			15.9			13.6			11.2	
Approach LOS		C			B			B			B	

Intersection Summary

HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	69.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	29	33	16	2	3	54	9	213	21	1441	44
Future Volume (vph)	4	29	33	16	2	3	54	9	213	21	1441	44
Ideal Flow (vphpl)	1900	1900	1750	1650	1650	1900	1775	1900	1750	1775	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		15.0	0.0		0.0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor												
Frt			0.850		0.981				0.850		0.996	
Flt Protected		0.994			0.963			0.959			0.999	
Satd. Flow (prot)	0	1681	1324	0	1387	0	0	1622	1298	0	3137	0
Flt Permitted		0.994			0.963			0.959			0.999	
Satd. Flow (perm)	0	1681	1324	0	1387	0	0	1622	1298	0	3137	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		36.5			50.1			56.2			69.4	
Travel Time (s)		2.6			3.6			4.0			5.0	
Confl. Peds. (#/hr)			1	1			8		2	2		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	0%
Adj. Flow (vph)	4	29	33	16	2	3	54	9	213	21	1441	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	33	0	21	0	0	63	213	0	1506	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.16	1.16	1.29	1.38	1.38	1.16	1.26	1.16	1.29	1.26	1.16	1.16
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	76.3%	ICU Level of Service D	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	29	33	16	2	3	54	9	213	21	1441	44
Future Volume (Veh/h)	4	29	33	16	2	3	54	9	213	21	1441	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	29	33	16	2	3	54	9	213	21	1441	44
Pedestrians		8			2			1				
Lane Width (m)		3.5			3.5			3.5				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								140				
pX, platoon unblocked												
vC, conflicting volume	1634	1845	752	930	1654	11	1493			224		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1634	1845	752	930	1654	11	1493			224		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	55	91	87	98	100	88			98		
cM capacity (veh/h)	59	65	355	120	85	1072	453			1354		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	33	33	21	63	213	742	764
Volume Left	4	0	16	54	0	21	0
Volume Right	0	33	3	0	213	0	44
cSH	64	355	131	453	1700	1354	1700
Volume to Capacity	0.51	0.09	0.16	0.12	0.13	0.02	0.45
Queue Length 95th (m)	16.5	2.4	4.4	3.2	0.0	0.4	0.0
Control Delay (s)	109.2	16.2	37.6	12.3	0.0	0.4	0.0
Lane LOS	F	C	E	B		A	
Approach Delay (s)	62.7		37.6	2.8		0.2	
Approach LOS	F		E				

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1	16	12	4	1490	10
Future Volume (vph)	1	16	12	4	1490	10
Ideal Flow (vphpl)	1900	1750	1900	1900	1650	1650
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.873				0.999	
Flt Protected	0.997			0.964		
Satd. Flow (prot)	1603	0	0	1776	1598	0
Flt Permitted	0.997			0.964		
Satd. Flow (perm)	1603	0	0	1776	1598	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	28.7			49.8	55.4	
Travel Time (s)	2.1			3.6	4.0	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	16	12	4	1490	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	0	16	1500	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.13	1.01	1.01	1.21	1.21
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 101.0%		ICU Level of Service G	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	16	12	4	1490	10
Future Volume (Veh/h)	1	16	12	4	1490	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	16	12	4	1490	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				259		
pX, platoon unblocked						
vC, conflicting volume	1523	1495	1500			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1523	1495	1500			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	89	97			
cM capacity (veh/h)	127	151	447			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	16	1500
Volume Left	1	12	0
Volume Right	16	0	10
cSH	149	447	1700
Volume to Capacity	0.11	0.03	0.88
Queue Length 95th (m)	3.0	0.7	0.0
Control Delay (s)	32.2	10.0	0.0
Lane LOS	D	B	
Approach Delay (s)	32.2	10.0	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	264	0	0	21	0	0
Future Volume (vph)	264	0	0	21	0	0
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3039	0	0	1600	1711	0
Flt Permitted						
Satd. Flow (perm)	3039	0	0	1600	1711	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.1			53.9	33.0	
Travel Time (s)	3.6			3.9	2.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	264	0	0	21	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	264	0	0	21	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 11.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	264	0	0	21	0	0
Future Volume (Veh/h)	264	0	0	21	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	264	0	0	21	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				54		
pX, platoon unblocked						
vC, conflicting volume			264		285	132
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			264		285	132
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1297		682	893

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	176	88	21	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1297	1700
Volume to Capacity	0.10	0.05	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	276	0	0	1489
Future Volume (vph)	0	0	276	0	0	1489
Ideal Flow (vphpl)	1765	1765	1650	1650	1775	1775
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1711	0	1600	0	0	3270
Flt Permitted						
Satd. Flow (perm)	1711	0	1600	0	0	3270
Link Speed (k/h)	50		50			50
Link Distance (m)	33.5		83.3			56.2
Travel Time (s)	2.4		6.0			4.0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	276	0	0	1489
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	276	0	0	1489
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		3.5			3.5
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.12	1.12	1.21	1.21	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	276	0	0	1489
Future Volume (Veh/h)	0	0	276	0	0	1489
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	276	0	0	1489
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			83			
pX, platoon unblocked	0.95	0.95			0.95	
vC, conflicting volume	1020	276			276	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	994	209			209	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	229	756			1289	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	0	276	496	993
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1289	1700
Volume to Capacity	0.00	0.16	0.00	0.58
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS	A			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix F

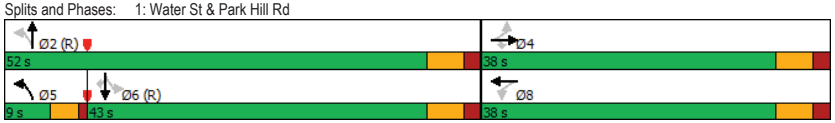
Event Scenario Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	747	179	18	390	41	229	230	54	20	607	823
Future Volume (vph)	91	747	179	18	390	41	229	230	54	20	607	823
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	15.0		0.0	25.0		0.0	40.0		0.0
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	0.96	1.00	1.00		0.99	1.00		0.99		0.94
Frt			0.850		0.986			0.971				0.850
Flt Protected		0.995		0.950			0.950			0.950		
Satd. Flow (prot)	0	2960	1311	1416	1443	0	1501	1406	0	1501	1642	1311
Flt Permitted		0.708		0.196			0.138			0.586		
Satd. Flow (perm)	0	2105	1263	291	1443	0	216	1406	0	919	1642	1235
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85		7			20				234
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		38.4			108.0			179.1			83.3	
Travel Time (s)		2.8			7.8			12.9			6.0	
Confl. Peds. (#/hr)	11		11	11		11	32		15	15		32
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	6%	0%	0%	0%	1%	1%	0%	3%	1%
Adj. Flow (vph)	91	747	179	18	390	41	229	230	54	20	607	823
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	838	179	18	431	0	229	284	0	20	607	823
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.26	1.29	1.26	1.38	1.38	1.26	1.38	1.38	1.26	1.16	1.29
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	43.0		43.0	43.0	43.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0		9.0	52.0		43.0	43.0	43.0
Total Split (%)	42.2%	42.2%	42.2%	42.2%	42.2%		10.0%	57.8%		47.8%	47.8%	47.8%
Maximum Green (s)	32.0	32.0	32.0	32.0	32.0		5.0	46.0		37.0	37.0	37.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0		2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Walk Time (s)	13.0	13.0	13.0	13.0	13.0			23.0		23.0	23.0	23.0
Flash Dont Walk (s)	16.0	16.0	16.0	16.0	16.0			14.0		14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		34.0	34.0	34.0	34.0		46.0	48.0		39.0	39.0	39.0
Actuated g/C Ratio		0.38	0.38	0.38	0.38		0.51	0.53		0.43	0.43	0.43
v/c Ratio		1.05	0.34	0.17	0.79		1.50	0.37		0.05	0.85	1.23
Control Delay		76.3	12.5	23.4	36.5		276.0	13.1		15.4	36.8	138.3
Queue Delay		0.0	0.0	0.0	11.0		0.0	0.0		0.0	0.0	0.0
Total Delay		76.3	12.5	23.4	47.5		276.0	13.1		15.4	36.8	138.3
LOS		E	B	C	D		F	B		B	D	F
Approach Delay		65.1			46.5			130.4			94.1	
Approach LOS		E			D			F			F	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 41 (46%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Pretimed	
Maximum v/c Ratio: 1.50	
Intersection Signal Delay: 84.7	Intersection LOS: F
Intersection Capacity Utilization 122.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Water St & Park Hill Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	838	179	18	431	229	284	20	607	823
v/c Ratio	1.05	0.34	0.17	0.79	1.50	0.37	0.05	0.85	1.23
Control Delay	76.3	12.5	23.4	36.5	276.0	13.1	15.4	36.8	138.3
Queue Delay	0.0	0.0	0.0	11.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	12.5	23.4	47.5	276.0	13.1	15.4	36.8	138.3
Queue Length 50th (m)	~88.6	11.3	2.1	67.1	~38.3	26.1	2.0	96.4	~161.9
Queue Length 95th (m)	#126.3	27.5	7.7	#116.9	#81.8	44.2	6.4	#161.1	#234.7
Internal Link Dist (m)	14.4			84.0		155.1		59.3	
Turn Bay Length (m)		10.0	15.0		25.0		40.0		
Base Capacity (vph)	795	530	109	549	153	759	398	711	667
Starvation Cap Reductn	0	0	0	97	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	1.05	0.34	0.17	0.95	1.50	0.37	0.05	0.85	1.23

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)	91	747	179	18	390	41	229	230	54	20	607	823
Future Volume (vph)	91	747	179	18	390	41	229	230	54	20	607	823
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Total Lost time (s)		4.0	4.0	4.0	4.0		6.0	4.0		4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00	0.94
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	1.00
Frt		1.00	0.85	1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		2957	1263	1410	1442		1499	1406		1490	1642	1235
Flt Permitted		0.71	1.00	0.20	1.00		0.14	1.00		0.59	1.00	1.00
Satd. Flow (perm)		2106	1263	291	1442		218	1406		918	1642	1235
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	91	747	179	18	390	41	229	230	54	20	607	823
RTOR Reduction (vph)	0	0	53	0	4	0	0	9	0	0	0	133
Lane Group Flow (vph)	0	838	126	18	427	0	229	275	0	20	607	690
Confl. Peds. (#/hr)	11		11	11		11	32		15	15		32
Heavy Vehicles (%)	0%	1%	1%	6%	0%	0%	0%	1%	1%	0%	3%	1%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		32.0	32.0	32.0	32.0		46.0	46.0		37.0	37.0	37.0
Effective Green, g (s)		34.0	34.0	34.0	34.0		44.0	48.0		39.0	39.0	39.0
Actuated g/C Ratio		0.38	0.38	0.38	0.38		0.49	0.53		0.43	0.43	0.43
Clearance Time (s)		6.0	6.0	6.0	6.0		4.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)		795	477	109	544		149	749		397	711	535
v/s Ratio Prot					0.30		c0.05	0.20			0.37	
v/s Ratio Perm		c0.40	0.10	0.06			c0.70			0.02		0.56
v/c Ratio		1.05	0.26	0.17	0.78		1.54	0.37		0.05	0.85	1.29
Uniform Delay, d1		28.0	19.4	18.6	24.8		26.4	12.2		14.8	22.9	25.5
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		47.1	1.4	3.2	10.8		272.3	1.4		0.2	12.4	144.3
Delay (s)		75.1	20.7	21.8	35.6		298.7	13.6		15.0	35.4	169.8
Level of Service		E	C	C	D		F	B		B	D	F
Approach Delay (s)		65.5			35.0			140.8			111.4	
Approach LOS		E			D			F			F	

Intersection Summary

HCM 2000 Control Delay	92.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	122.8%	ICU Level of Service	H
Analysis Period (min)	15		

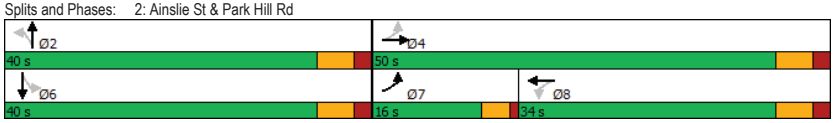
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	464	328	37	29	350	49	56	576	12	12	410	38
Future Volume (vph)	464	328	37	29	350	49	56	576	12	12	410	38
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			1.00			1.00	
Frt		0.985			0.985			0.997			0.989	
Flt Protected	0.950				0.997			0.996			0.999	
Satd. Flow (prot)	1471	1427	0	0	1341	0	0	2606	0	0	1308	0
Flt Permitted	0.306				0.954			0.832			0.978	
Satd. Flow (perm)	473	1427	0	0	1282	0	0	2176	0	0	1281	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			8			2			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.0			89.4			95.3			135.8	
Travel Time (s)		7.8			6.4			6.9			9.8	
Confl. Peds. (#/hr)	3		14	14		3	7		14	14		7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%	0%	7%	0%	14%	4%	0%
Adj. Flow (vph)	464	328	37	29	350	49	56	576	12	12	410	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	464	365	0	0	428	0	0	644	0	0	460	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.26	1.38	1.38	1.49	1.49	1.49	1.38	1.38	1.38	1.49	1.49	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	1.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	5.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	
Total Split (s)	16.0	50.0		34.0	34.0		40.0	40.0		40.0	40.0	
Total Split (%)	17.8%	55.6%		37.8%	37.8%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	12.0	44.0		28.0	28.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	4.0	6.0			6.0			6.0			6.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)		13.0		13.0	13.0		24.0	24.0		24.0	24.0	
Flash Dont Walk (s)		11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	46.0	44.0			28.0			33.0			33.0	
Actuated g/C Ratio	0.52	0.49			0.31			0.37			0.37	
v/c Ratio	1.23	0.51			1.05			0.80			0.96	
Control Delay	144.2	18.3			89.6			33.7			61.7	
Queue Delay	0.0	2.1			0.0			0.0			0.0	
Total Delay	144.2	20.4			89.6			33.7			61.7	
LOS	F	C			F			C			E	
Approach Delay		89.7			89.6			33.7			61.7	
Approach LOS		F			F			C			E	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 89.1			
Natural Cycle: 110			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 69.0		Intersection LOS: E	
Intersection Capacity Utilization 128.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Ainslie St & Park Hill Rd



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	464	365	428	644	460
v/c Ratio	1.23	0.51	1.05	0.80	0.96
Control Delay	144.2	18.3	89.6	33.7	61.7
Queue Delay	0.0	2.1	0.0	0.0	0.0
Total Delay	144.2	20.4	89.6	33.7	61.7
Queue Length 50th (m)	~79.8	42.4	~85.5	53.3	78.5
Queue Length 95th (m)	#165.1	68.7	#144.6	76.2	#142.3
Internal Link Dist (m)		84.0	65.4	71.3	111.8
Turn Bay Length (m)					
Base Capacity (vph)	378	710	408	832	492
Starvation Cap Reductn	1	211	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.23	0.73	1.05	0.77	0.93

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)	464	328	37	29	350	49	56	576	12	12	410	38
Future Volume (vph)	464	328	37	29	350	49	56	576	12	12	410	38
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	6.0			6.0			6.0			6.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.98			0.98			1.00			0.99	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1471	1427			1339			2604			1307	
Flt Permitted	0.31	1.00			0.95			0.83			0.98	
Satd. Flow (perm)	474	1427			1282			2175			1280	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	464	328	37	29	350	49	56	576	12	12	410	38
RTOR Reduction (vph)	0	5	0	0	5	0	0	1	0	0	4	0
Lane Group Flow (vph)	464	360	0	0	423	0	0	643	0	0	456	0
Confl. Peds. (#/hr)	3		14	14		3	7		14	14		7
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%	0%	7%	0%	14%	4%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	44.0	44.0			28.0			33.0			33.0	
Effective Green, g (s)	44.0	44.0			28.0			33.0			33.0	
Actuated g/C Ratio	0.49	0.49			0.31			0.37			0.37	
Clearance Time (s)	4.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	368	705			403			806			474	
v/s Ratio Prot	c0.17	0.25										
v/s Ratio Perm	c0.45				0.33			0.30			c0.36	
v/c Ratio	1.26	0.51			1.05			0.80			0.96	
Uniform Delay, d1	20.8	15.2			30.5			25.0			27.4	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	137.6	0.6			58.1			5.5			31.7	
Delay (s)	158.3	15.9			88.6			30.5			59.1	
Level of Service	F	B			F			C			E	
Approach Delay (s)		95.6			88.6			30.5			59.1	
Approach LOS		F			F			C			E	

Intersection Summary

HCM 2000 Control Delay	69.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	128.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	267	8	44	8	10	39	63	1032	0	6	413	1
Future Volume (vph)	267	8	44	8	10	39	63	1032	0	6	413	1
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99	0.97			0.99						1.00	
Frt		0.873			0.908							
Flt Protected	0.950				0.993			0.997			0.999	
Satd. Flow (prot)	1272	1240	0	0	1198	0	0	2751	0	0	1356	0
Flt Permitted	0.720				0.972			0.903			0.985	
Satd. Flow (perm)	958	1240	0	0	1171	0	0	2491	0	0	1337	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		44			39							
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		53.9			70.7			135.8			80.3	
Travel Time (s)		3.9			5.1			9.8			5.8	
Confl. Peds. (#/hr)	7		7	7		7			17	17		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Bus Blockages (#/hr)	2	0	0	0	0	0	0	5	0	0	4	0
Adj. Flow (vph)	267	8	44	8	10	39	63	1032	0	6	413	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	52	0	0	57	0	0	1095	0	0	420	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.28	1.38	1.38	1.49	1.49	1.49	1.38	1.40	1.38	1.49	1.52	1.49
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		58.0	58.0		58.0	58.0	
Total Split (s)	32.0	32.0		32.0	32.0		58.0	58.0		58.0	58.0	
Total Split (%)	35.6%	35.6%		35.6%	35.6%		64.4%	64.4%		64.4%	64.4%	
Maximum Green (s)	26.0	26.0		26.0	26.0		52.0	52.0		52.0	52.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	10.0	10.0		10.0	10.0		38.0	38.0		38.0	38.0	
Flash Dont Walk (s)	16.0	16.0		16.0	16.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	24.8	24.8			24.8			42.2			42.2	
Actuated g/C Ratio	0.33	0.33			0.33			0.56			0.56	
v/c Ratio	0.85	0.12			0.14			0.78			0.56	
Control Delay	51.1	9.2			11.1			18.1			14.3	
Queue Delay	0.0	0.0			0.0			0.1			0.0	
Total Delay	51.1	9.2			11.1			18.2			14.3	
LOS	D	A			B			B			B	
Approach Delay		44.3			11.1			18.2			14.3	
Approach LOS		D			B			B			B	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 75.2			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 21.5		Intersection LOS: C	
Intersection Capacity Utilization 105.2%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Ainslie St & Simcoe St/Market St

Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	267	52	57	1095	420
v/c Ratio	0.85	0.12	0.14	0.78	0.56
Control Delay	51.1	9.2	11.1	18.1	14.3
Queue Delay	0.0	0.0	0.0	0.1	0.0
Total Delay	51.1	9.2	11.1	18.2	14.3
Queue Length 50th (m)	35.7	0.8	1.8	68.5	40.8
Queue Length 95th (m)	#93.3	9.3	11.1	94.7	66.3
Internal Link Dist (m)		29.9	46.7	111.8	56.3
Turn Bay Length (m)					
Base Capacity (vph)	366	501	472	1837	986
Starvation Cap Reductn	0	0	0	114	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.73	0.10	0.12	0.64	0.43

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)	267	8	44	8	10	39	63	1032	0	6	413	1
Future Volume (vph)	267	8	44	8	10	39	63	1032	0	6	413	1
Ideal Flow (vphpl)	1775	1650	1650	1550	1550	1550	1650	1650	1650	1550	1550	1550
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.97			0.99			1.00			1.00	
Flpb, ped/bikes	0.99	1.00			1.00			1.00			1.00	
Frt	1.00	0.87			0.91			1.00			1.00	
Flt Protected	0.95	1.00			0.99			1.00			1.00	
Satd. Flow (prot)	1265	1242			1197			2751			1356	
Flt Permitted	0.72	1.00			0.97			0.90			0.98	
Satd. Flow (perm)	959	1242			1172			2491			1336	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	267	8	44	8	10	39	63	1032	0	6	413	1
RTOR Reduction (vph)	0	29	0	0	26	0	0	0	0	0	0	0
Lane Group Flow (vph)	267	23	0	0	31	0	0	1095	0	0	420	0
Confl. Peds. (#/hr)	7		7	7		7			17	17		
Heavy Vehicles (%)	17%	4%	0%	0%	14%	0%	2%	0%	33%	0%	0%	0%
Bus Blockages (#/hr)	2	0	0	0	0	0	0	5	0	0	4	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.7	22.7			22.7			40.1			40.1	
Effective Green, g (s)	24.7	24.7			24.7			42.1			42.1	
Actuated g/C Ratio	0.33	0.33			0.33			0.56			0.56	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	316	410			387			1402			751	
v/s Ratio Prot		0.02										
v/s Ratio Perm	c0.28				0.03			c0.44			0.31	
v/c Ratio	0.84	0.05			0.08			0.78			0.56	
Uniform Delay, d1	23.3	17.1			17.2			12.8			10.4	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	18.3	0.1			0.1			2.9			0.9	
Delay (s)	41.6	17.1			17.3			15.7			11.3	
Level of Service	D	B			B			B			B	
Approach Delay (s)		37.6			17.3			15.7			11.3	
Approach LOS		D			B			B			B	

Intersection Summary

HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	74.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	29	33	24	2	3	54	9	220	131	1441	44
Future Volume (vph)	4	29	33	24	2	3	54	9	220	131	1441	44
Ideal Flow (vphpl)	1900	1900	1750	1650	1650	1900	1775	1900	1750	1775	1900	1900
Storage Length (m)	0.0		0.0	15.0		0.0	25.0		15.0	0.0		0.0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor												
Frt			0.850		0.986				0.850		0.996	
Flt Protected		0.994			0.960			0.959			0.996	
Satd. Flow (prot)	0	1681	1324	0	1390	0	0	1622	1298	0	3131	0
Flt Permitted		0.994			0.960			0.959			0.996	
Satd. Flow (perm)	0	1681	1324	0	1390	0	0	1622	1298	0	3131	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		36.5			50.1			56.2			69.4	
Travel Time (s)		2.6			3.6			4.0			5.0	
Confl. Peds. (#/hr)			1	1			8		2	2		8
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	0%
Adj. Flow (vph)	4	29	33	24	2	3	54	9	220	131	1441	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	33	0	29	0	0	63	220	0	1616	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.16	1.16	1.29	1.38	1.38	1.16	1.26	1.16	1.29	1.26	1.16	1.16
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	80.4%	ICU Level of Service D	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	29	33	24	2	3	54	9	220	131	1441	44
Future Volume (Veh/h)	4	29	33	24	2	3	54	9	220	131	1441	44
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	4	29	33	24	2	3	54	9	220	131	1441	44
Pedestrians		8			2			1				
Lane Width (m)		3.5			3.5			3.5				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								140				
pX, platoon unblocked												
vC, conflicting volume	1854	2072	752	1150	1874	11	1493			231		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1854	2072	752	1150	1874	11	1493			231		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	33	91	57	97	100	88			90		
cM capacity (veh/h)	38	43	355	55	57	1072	453			1347		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	33	33	29	63	220	852	764
Volume Left	4	0	24	54	0	131	0
Volume Right	0	33	3	0	220	0	44
cSH	42	355	62	453	1700	1347	1700
Volume to Capacity	0.78	0.09	0.47	0.12	0.13	0.10	0.45
Queue Length 95th (m)	23.9	2.4	14.7	3.2	0.0	2.6	0.0
Control Delay (s)	220.0	16.2	107.5	12.3	0.0	2.4	0.0
Lane LOS	F	C	F	B		A	
Approach Delay (s)	118.1		107.5	2.7		1.2	
Approach LOS	F		F				

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1	16	12	4	1600	10
Future Volume (vph)	1	16	12	4	1600	10
Ideal Flow (vphpl)	1900	1750	1900	1900	1650	1650
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.873				0.999	
Flt Protected	0.997			0.964		
Satd. Flow (prot)	1603	0	0	1776	1598	0
Flt Permitted	0.997			0.964		
Satd. Flow (perm)	1603	0	0	1776	1598	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	28.7			49.8	55.4	
Travel Time (s)	2.1			3.6	4.0	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	16	12	4	1600	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	17	0	0	16	1610	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.13	1.01	1.01	1.21	1.21
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 107.7%		ICU Level of Service G	
Analysis Period (min) 15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	16	12	4	1600	10
Future Volume (Veh/h)	1	16	12	4	1600	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	16	12	4	1600	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				259		
pX, platoon unblocked						
vC, conflicting volume	1633	1605	1610			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1633	1605	1610			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	88	97			
cM capacity (veh/h)	108	130	405			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	16	1610
Volume Left	1	12	0
Volume Right	16	0	10
cSH	128	405	1700
Volume to Capacity	0.13	0.03	0.95
Queue Length 95th (m)	3.6	0.7	0.0
Control Delay (s)	37.3	10.7	0.0
Lane LOS	E	B	
Approach Delay (s)	37.3	10.7	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	107.7%	ICU Level of Service	G
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	271	110	45	21	8	11
Future Volume (vph)	271	110	45	21	8	11
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Frt	0.957				0.922	
Flt Protected				0.967	0.979	
Satd. Flow (prot)	2909	0	0	1547	1545	0
Flt Permitted				0.967	0.979	
Satd. Flow (perm)	2909	0	0	1547	1545	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.1			53.9	33.0	
Travel Time (s)	3.6			3.9	2.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	271	110	45	21	8	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	381	0	0	66	19	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.21	1.21	1.21	1.21	1.12	1.12
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	271	110	45	21	8	11
Future Volume (Veh/h)	271	110	45	21	8	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	271	110	45	21	8	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				54		
pX, platoon unblocked						
vC, conflicting volume			381		437	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			381		437	190
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		98	99
cM capacity (veh/h)			1174		527	819

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	181	200	66	19
Volume Left	0	0	45	8
Volume Right	0	110	0	11
cSH	1700	1700	1174	664
Volume to Capacity	0.11	0.12	0.04	0.03
Queue Length 95th (m)	0.0	0.0	1.0	0.7
Control Delay (s)	0.0	0.0	5.7	10.6
Lane LOS			A	B
Approach Delay (s)	0.0		5.7	10.6
Approach LOS				B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	7	276	78	0	1497
Future Volume (vph)	0	7	276	78	0	1497
Ideal Flow (vphpl)	1765	1765	1650	1650	1775	1775
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95
Frt		0.865	0.970			
Flt Protected						
Satd. Flow (prot)	0	1480	1552	0	0	3270
Flt Permitted						
Satd. Flow (perm)	0	1480	1552	0	0	3270
Link Speed (k/h)	50		50			50
Link Distance (m)	33.5		83.3			56.2
Travel Time (s)	2.4		6.0			4.0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	7	276	78	0	1497
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	7	354	0	0	1497
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.5			3.5
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.12	1.12	1.21	1.21	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.6%		ICU Level of Service A	
Analysis Period (min) 15			

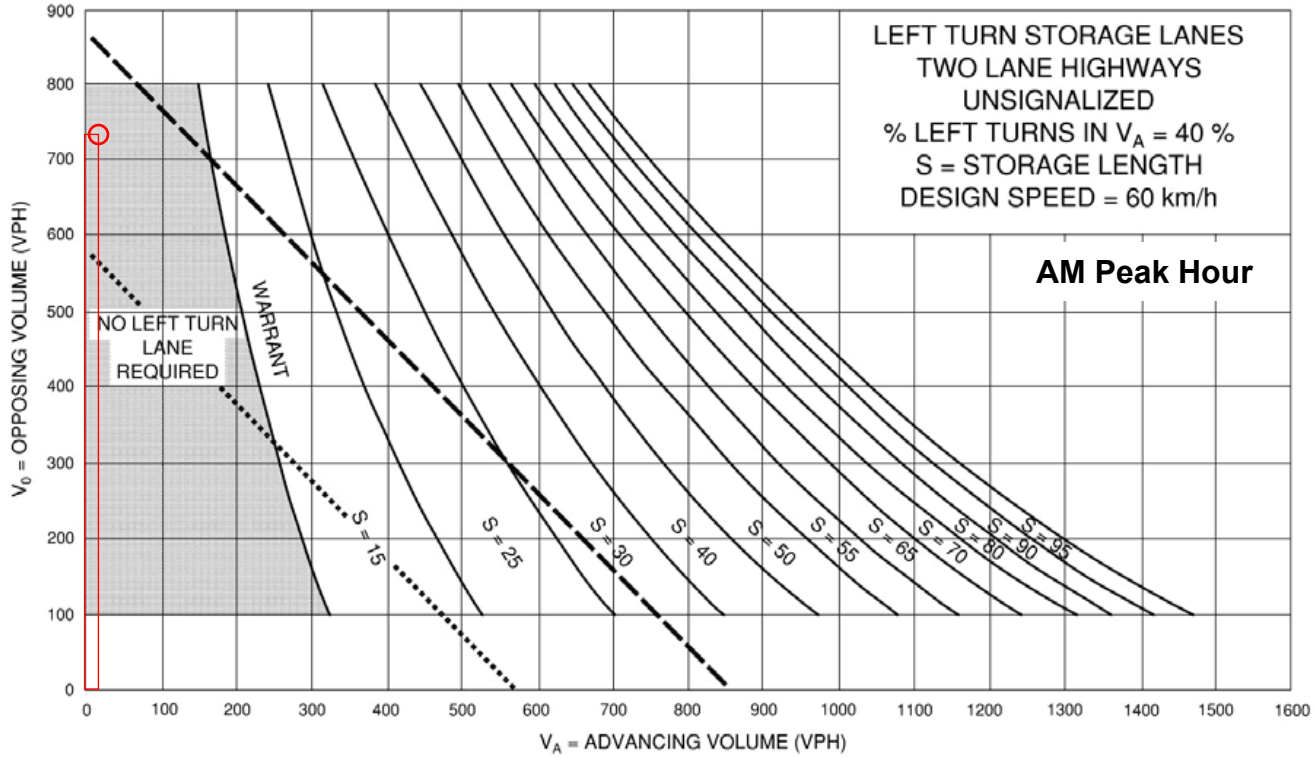
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	7	276	78	0	1497
Future Volume (Veh/h)	0	7	276	78	0	1497
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	7	276	78	0	1497
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			83			
pX, platoon unblocked	0.93	0.93			0.93	
vC, conflicting volume	1064	315			354	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1031	226			268	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	213	723			1202	

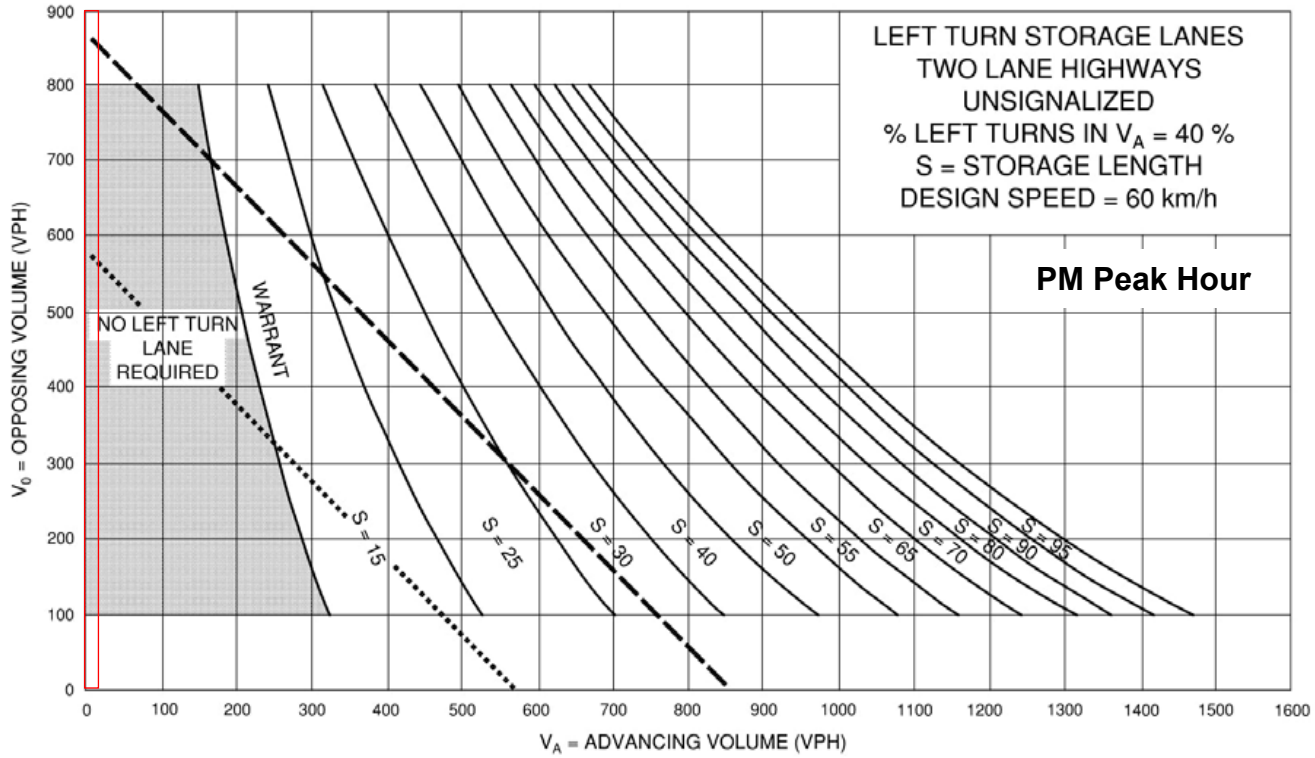
Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	7	354	748	748
Volume Left	0	0	0	0
Volume Right	7	78	0	0
cSH	723	1700	1700	1700
Volume to Capacity	0.01	0.21	0.44	0.44
Queue Length 95th (m)	0.2	0.0	0.0	0.0
Control Delay (s)	10.0	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	10.0	0.0	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G

Left-Turn Lane Nomographs

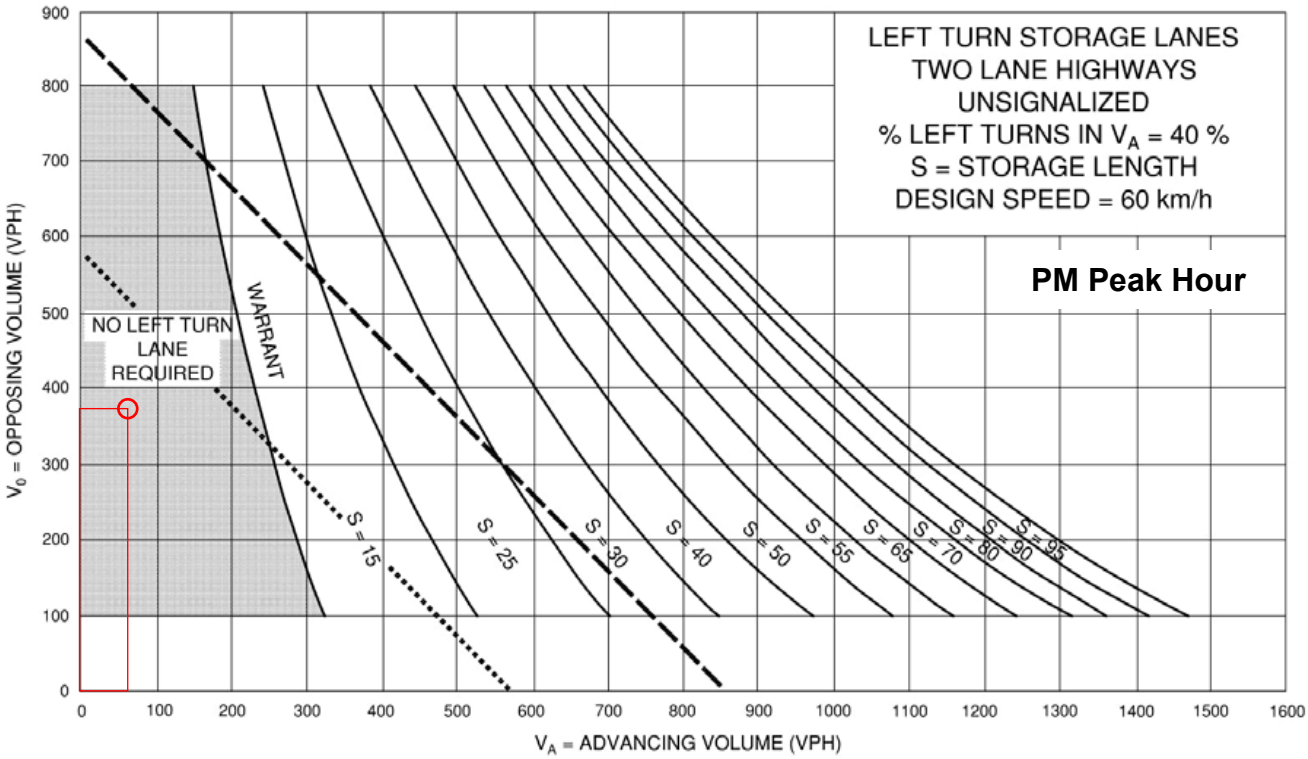




paradigm TRANSPORTATION SOLUTIONS LIMITED

Northbound
Water Street at Site Access (North)
Total 2027

Figure 1



Eastbound
Simcoe Street at Parking Garage
Total 2027

130 Water Street North, Cambridge TIS
200034

Figure 2

Appendix H

Traffic Signal Warrants

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

Horizon Year: Total 2027
Region/City/Township: Cambridge, Region of Waterloo

Major Street: Water Street
Minor Street: Simcoe Street

North/South?: N

Number of Approach Lanes: 2 or more
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

	Major Street						Minor Street						
	Water Street						Simcoe Street						
	Eastbound			Westbound			Northbound			Southbound			Peds Crossing
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Main Road
AM Peak Hour	5	34	36	3	9	5	19	2	214	24	697	25	10
PM Peak Hour	4	29	33	16	2	3	54	9	213	21	1441	44	10
Average Hourly Volume	2	16	17	5	3	2	18	3	107	11	535	17	5

Warrant	AHV
1A - All	736
1B - Minor	691
2A - Major	45
2B - Cross	569

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	736
					% Fulfilled	81.7%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
					X	
	Minor Street Approaches	120	170	120	170	691
					% Fulfilled	406.3%

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	45
					% Fulfilled	5.0%

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	569
					% Fulfilled	758.7%

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

Horizon Year: Total 2027 (Event Scenario)
Region/City/Township: Cambridge, Region of Waterloo

Major Street: Water Street
Minor Street: Simcoe Street

North/South?: N

Number of Approach Lanes: 2 or more
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

	Major Street						Minor Street						
	Water Street						Simcoe Street						
	Eastbound			Westbound			Northbound			Southbound			Peds Crossing
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Main Road
AM Peak Hour	5	34	36	3	9	5	19	2	214	64	697	25	10
PM Peak Hour	4	29	33	24	2	3	54	9	220	131	1441	44	500
Average Hourly Volume	2	16	17	7	3	2	18	3	109	49	535	17	128

Warrant	AHV
1A - All	777
1B - Minor	730
2A - Major	47
2B - Cross	729

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	777
					% Fulfilled	86.3%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
					X	
	Minor Street Approaches	120	170	120	170	730
					% Fulfilled	429.4%

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	47
					% Fulfilled	5.2%

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	729
					% Fulfilled	972.0%

Appendix I

TDM Checklist

Region of Waterloo

Travel Demand Management (TDM) Implementation Checklist

Version 9/18/2013

Appendix I

Case Study:	130 Water Street North, Cambridge	**Site Context:**	
TDM Checklist No:		**ZBL Parking Requirement:**	298
Date:	March 24, 2020	**Applicable Parking Reduction:**	

The Transportation Demand Management (TDM) Checklist and Parking Management Worksheet are not designed for residential properties, but can be used to inform mixed-use developments.

TABLE A		**Site Access**				
In creating an environment that supports pedestrian and cycling activity, the public realm must be accessible, safe, and comfortable to encourage movement on the street and in the surrounding area(s). These facilities and features should encourage walking and cycling.						
Points		**Features**			**Yes**	**N/A**
A1	**2**	Development incorporates functional building entrances that are oriented to public space or to locations where pedestrians and transit users arrive from such as a street, square, park or plaza.			**Yes**	
A2	**1**	External to site: Continuous sidewalks (consistent with AODA Accessible Built Environment Standard) are provided along both sides of all adjacent public streets (over and above requirement) AND Internal to site: Pedestrian walkways (consistent with AODA Accessible Built Environment Standard e.g.1.8m min width) are provided through large parking areas to link the building with the public street sidewalk system			**Yes**	
A3	**3**	Non-residential: development provides secure bike storage for 5% of the building occupants. Consistent with LEED requirements.			**Yes**	
A4	**4**	Shower and change facilities for employees provided on-site consistent with LEED requirements.				
A5	**2**	Provision of active uses at-grade along street frontages (e.g. retail).			**Yes**	
Category Max =		10	**Total Points Applicable =**	10	**Score =**	8

TABLE B		**Public Transportation Access**				
The availability and proximity of convenient public transit service with direct pedestrian linkages to the building will provide viable travel options for employees, visitors and residents.						
Points		**Features**			**Yes**	**N/A**
B1	**1**	Bus shelters with seating are provided at the transit stop immediately adjacent to the development in consultation with Transportation Planning at the Region of Waterloo			**Yes**	
B2	**1**	Information regarding public transit routes, schedules and fares are provided in an accessible and visible location on site and in adjacent bus stops				
B3a	**5**	Located within 800m of a Rapid Transit Station				
B3b	**3**	Located within 600 m of a bus service with headways of 15 min or less or is located in a designated mixed use corridor or node. **Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.**			**Yes**	
B3c	**1**	Located within 400 m of a bus service with headways of 16 min to 30 min. **Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.**				
Category Max =		5	**Total Points Applicable =**	5	**Score =**	4

TABLE C		**Parking**		
Vehicle parking facilities can affect the character, travel mode and cost of a development. Reducing parking supply to match expected demand can a have a positive influence on the selection of alternative travel modes.				
Points		**Features**	**Yes**	**N/A**
C1	**24**	Utilizes reduced parking supply consistent with the TDM Parking Management Worksheet. Contact your Area Municipal planning authority to determine whether the Worksheet is applicable to your development. **Note: Points are awarded for either C1, C2, or C3 only. Please choose whichever applies with the highest value.**		
C2	**24**	Includes allowances for shared parking in mixed-use zones. **Note: Points are awarded for C1, C2, or C3 only. Please choose whichever applies after consulting with the Area Municipal planning authority.**		
C3	**15**	Provides no more than the minimum number of parking spaces, as required by applicable Zoning By-Law. **Note: Points are awarded for either C1, C2, or C3 only. Please choose whichever applies.**		
C4	**10**	Implements paid parking on part or all of the site (e.g. parking permits, paid parking zones near main entrances)		
C5	**3**	Provides priority parking for carpooling/vanpooling participants equivalent to 5% of employee spaces		
C6	**5**	Commercial Uses: Provide car-share spaces equivalent to 2% of building occupants		
C7	**3**	Parking is not located on major street frontage or between a road right of way and the building facade.	**Yes**	
C8	**5**	25% to 50% of parking is located underground or in a structure		

C9	10	50% to 75% of parking is located underground or in a structure				
C10	15	75% of parking or more is located underground or in a structure			Yes	
C11	3	Parking spaces provided off-site on a lot within 300 metres of the lot containing such use.				
Category Max =		25	Total Points Applicable =	25	Score =	18

Region of Waterloo TDM Checklist v2.0 **FORM-1**

Case Study: 130 Water Street North, Cambridge **Checklist No:** 0
Date: March 24, 2020 **Site Context:** 0

TABLE D		Trip Reduction Incentives		
A formal TDM plan will identify specific initiatives that will be initiated in order to encourage reduced single occupant vehicle travel.				
Points		Features		N/A
D1	2	The building owner/occupant will make available a ride matching service for car/vanpooling		
D2	2	The building owner/occupant will make available emergency ride home options		
D3	5	The building owner/occupant will make available subsidized transit passes for all occupants for a period of two years		
D4	5	The building owner/occupant agrees to charge for parking as an unbundled cost to occupants	Yes	
D5	2	The building owner/occupant agrees to provide reduced cost parking for users of car/van pool, bicycle, moped/motorcycle spaces		
D6	10	The building owner/occupant has prepared a TDM plan to the satisfaction of the Region of Waterloo and the Area Municipality that targets a 10% reduction in peak hour trips using forecast trip generation with status quo travel characteristics		
D7	5	The employer has provided flexible working hours, telework or shift work arrangements.		
D8	14	The development agrees to join Travelwise (TMA) that provides the same services outlined under items D1, D2, D6		
D9	5	The building owner/occupant will make available car sharing services		
D10	2	The development includes mixed uses (i.e. retail, commercial or food services, daycares, or other complementary uses) on-site or located within 400 metres.	Yes	
Category Max =		25	Total Points Applicable = 25	Score = 7

TABLE E	Checklist Summary			
For each item, a "Yes" answer is equivalent to the points as indicated in the section. N/A sections should be explained in an attachment to this table. The score for each section is reflected as a percentage and calculated by dividing the points by the "Total Applicable".				
Category	Minimum Requirement	Total Applicable	Points Scored	Comments
Pedestrian & Cyclist Orientation	24	10	8	
Public Transit Access		5	4	
Parking		25	18	
SUB-TOTAL		**40**	**30**	
Trip Reduction Incentives		*25*	*7*	
OVERALL TOTAL		***65***	**37**	

TABLE F	Scoring Summary		
FINAL SCORE	RATING (check one)		
50 - 65	****		TDM SUPPORTIVE DEVELOPMENT
40 -49	***		
30 - 39	**	X	
24 - 29	*		
0 - 23			Non-TDM Supportive Development (Review and upgrade TDM elements to pass)

Comments: