1284 Main Street East
Hamilton, ON
Transportation Impact Analysis

Paradigm Transportation Solutions Limited

November 2022
220238

ptsl.com

Project Summary

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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Analysis (TIA) study for a residential development in the City of Hamilton.

This study determines the impacts of the development traffic on the surrounding road network and identifies the impacts associated with site-generated traffic.

Development Concept

The subject site is at 1284 Main Street East in the City of Hamilton. The property owner proposes redeveloping the lands as a multi-family site comprised of high-rise towers and townhouse components. The development program proposes 715 new residential high-rise dwelling units, 173 new townhouse units, and 87 residential retrofit units added to the existing structure.

Vehicle access to the site is presented through access to Maple Avenue across from Houghton Avenue.

The development is assumed to be built in phases, with Phase 1 opening in 2027 and the full build-out by 2032.

Conclusions

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

- **Trip Generation:** The Site's trip generation is estimated to be approximately 296 AM peak hour trips and 361 PM peak hour trips.
- **Background Traffic Conditions:** Background traffic growth results in increased congestion in the study area during the PM peak hour. By 2032, the traffic growth along Main Street East is expected to result in northbound and southbound stop-controlled movements at Wexford Avenue North to operate in the LOS D range during the PM peak hour. The v/c ratio for the northbound and southbound movements is forecast to be relatively low in the 0.10 to 0.16 range.
- **Total Traffic Conditions:** All study area intersections are forecast to operate within similar service levels as documented under the background scenario.

In 2027, the addition of the phase 1 site traffic is forecast to result in operations of the northbound movement at Main Street East at Wexford Avenue North to degrade from LOS D to LOS E. The v/c ratio for the southbound movement is forecast to be relatively low at 0.15. The site access is forecast to operate with delays in the LOS A/B range, with delays not exceeding 15 seconds.

In 2032, the addition of the full build-out site traffic is forecast to result in operations of the southbound movement at Main Street East at Wexford Avenue North to degrade from LOS E to LOS F. The v/c ratio for the southbound movement is forecast to be relatively low at 0.29.

With the exception of the southbound movement at Main Street East at Wexford Avenue North, the site traffic is forecast to add less than 10 seconds of delay to intersection movements.

In the 2027 and 2032 scenarios, the site access is forecast to operate with delays in the LOS B range or better, with delays not exceeding 15 seconds.

Recommendations

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

- 49 short-term bicycle parking spots be included in the development.
- The City continues to monitor traffic operations at study area signalized intersections and adjusts signal timings as needed.

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Tables

1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Analysis (TIA) study for a residential development in the City of Hamilton. **Figure 1.1** illustrates the location of the subject site.

This study determines the impacts of the additional traffic generated by the subject site on the surrounding road network and the remedial measures necessary to accommodate future traffic satisfactorily. The scope of this study includes:

- Determine and assess the current study area traffic conditions;
- Forecast the additional traffic generated by the proposed development;
- Analyze the impacts of the additional traffic on the study area intersections for the opening year (2027) and full build-out year (2032); and
- Recommend any necessary remedial measures to mitigate the traffic impacts.

Appendix A contains the pre-study consultation material with the City of Hamilton. The study follows the City's Transportation Impact Study Guidelines[1].

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

1.2 Study Area

The study area intersections assessed in this study include:

- Main Street East and Graham Avenue North (signalized);
- Main Street East and Houghton Avenue North (unsignalized);
- Main Street East and Wexford Avenue North (unsignalized);
- Maple Avenue and Graham Avenue South (unsignalized);
- Maple Avenue and Houghton Avenue South (unsignalized); and
- Maple Avenue and Wexford Avenue North (unsignalized).

NTS
Source: Hamilton Base Map

Subject Site Location

1284 Main Street E Hamilton
220238

Figure 1.1

2 Existing Conditions

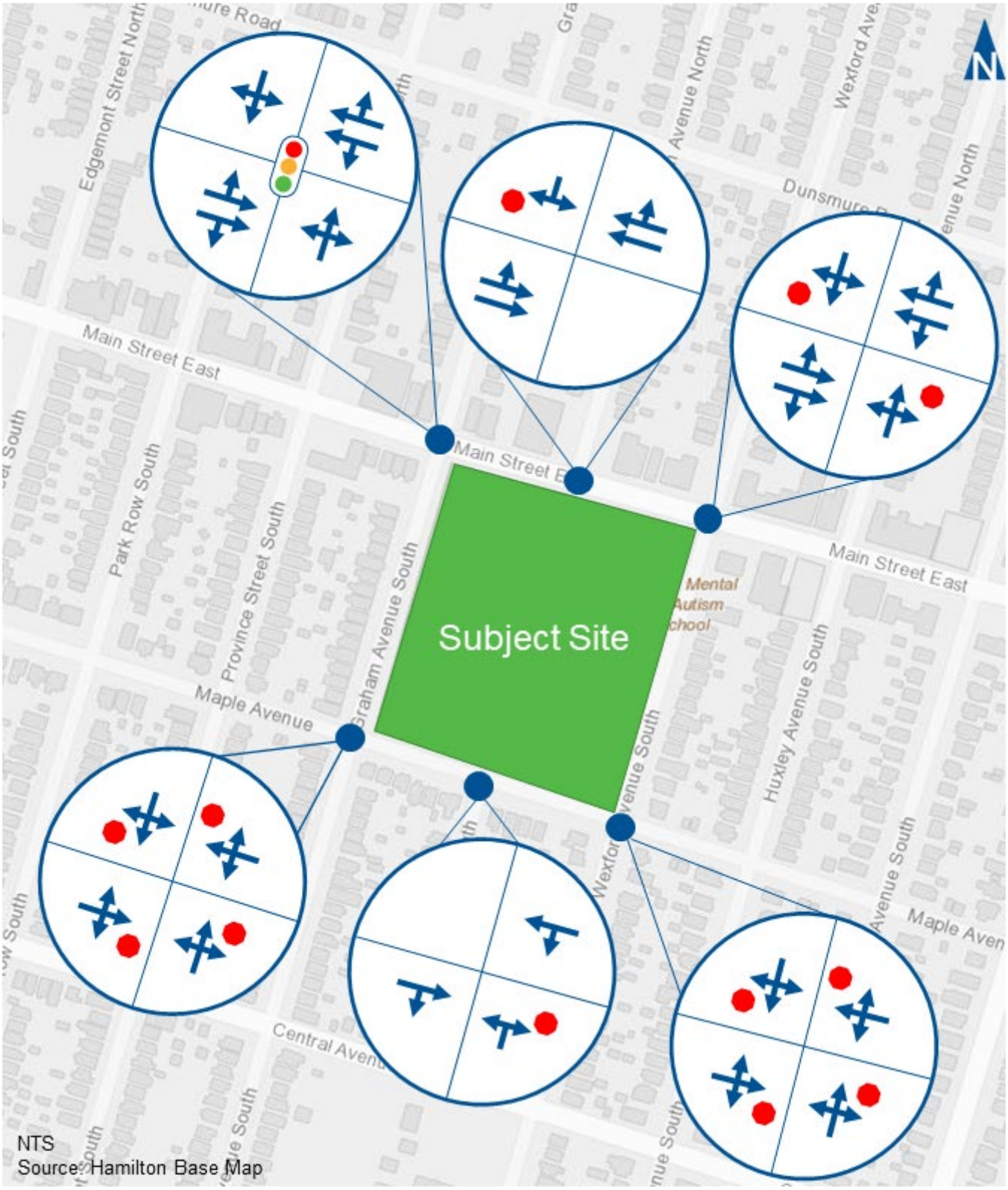
2.1 Roadway Characteristics

The City of Hamilton[2] roadways of interest within the study include:

- **Main Street East (Highway 8)** is an east-west major arterial with a four-lane cross-section (two lanes per direction). When flashing beacons are activated, the posted speed limit is 50 km/h reduced to 40 km/h. There are no on-street cycle lanes on either side of the roadway, while sidewalks are provided on both sides within the study area.
- **Graham Avenue North/South** is a north-south local road with a two-lane cross-section. The posted speed limit is 40 km/h. Sidewalks are present on both sides of the road. Graham Avenue is identified as a "Cautionary Unsigned Bicycle Route"[3]. No on-street cycle lanes are provided on either side of the roadway.
- **Houghton Avenue North/South** is a north-south local road with a two-lane cross-section. The posted speed limit is 40 km/h. Sidewalks are present on both sides of the road. No on-street cycle lanes are provided on either side of the roadway.
- **Wexford Avenue North/South** is a north-south local road with a two-lane cross-section. The posted speed limit is 40 km/h. Sidewalks are present on both sides of the road. No on-street cycle lanes are provided on either side of the roadway.
- **Maple Avenue** is an east-west local road with a two-lane cross-section. The posted speed limit is 40 km/h. Sidewalks are present on the south side of the roads between Graham Avenue South and Wexford Avenue South and both sides of the road beyond Graham Avenue South and Wexford Avenue South. No on-street cycle lanes are provided on either side of the roadway.

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

[2] Urban Hamilton Official Plan, Schedule C Functional Road Classification, August 16, 2013
[3] City of Hamilton Cycling Routes & Maps, 2022



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Existing Lane Configuration & Traffic Control

1284 Main Street E Hamilton
220238

Figure 2.1

2.2 Transit Service

Hamilton Street Railway (HSR)[4] is the public transit operator in the City of Hamilton. **Figure 2.2** illustrates the existing transit network relative to the subject site's location. The following routes provide direct connections to the subject site:

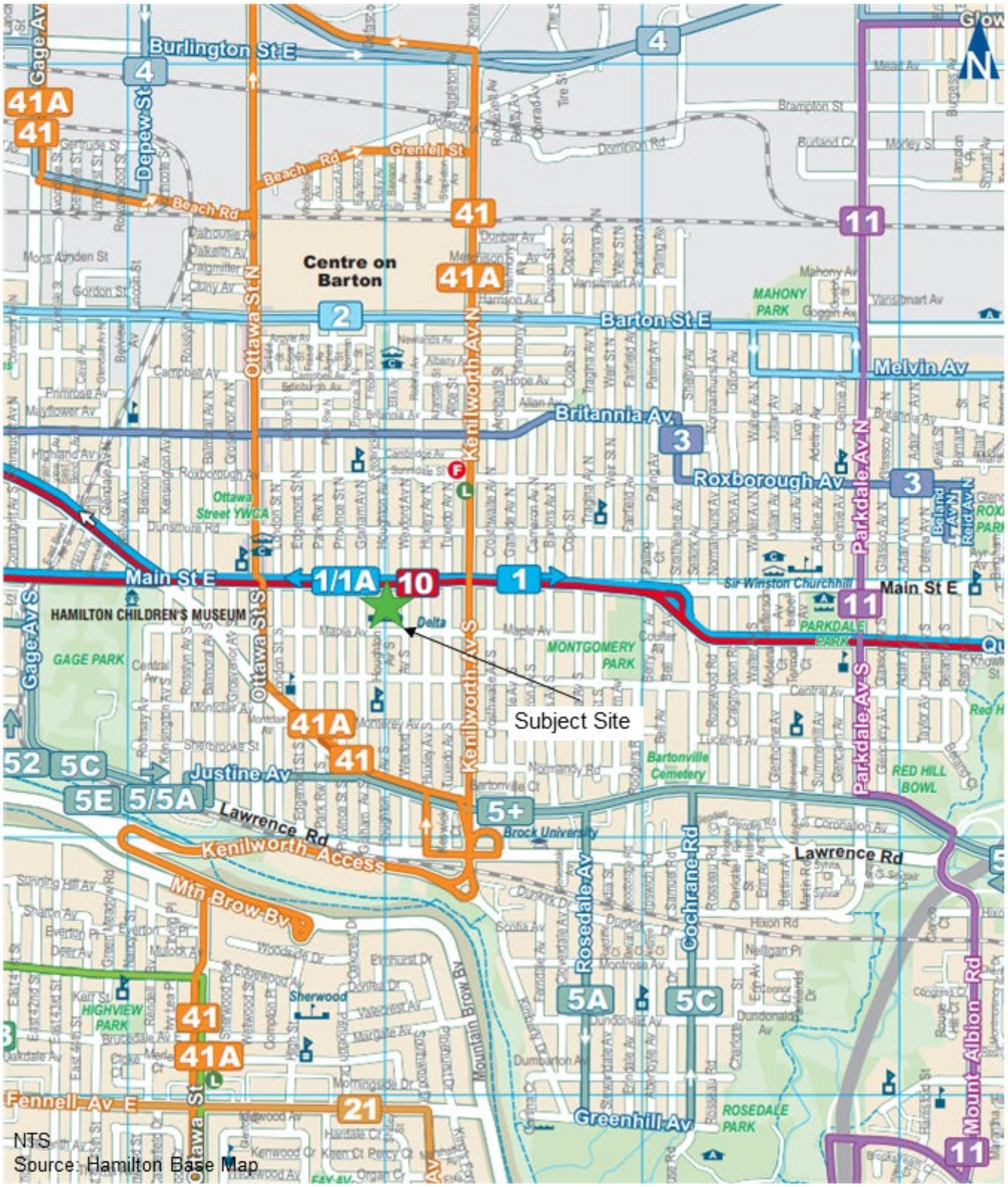
- **Route 1/1A (King)** provides service between University Plaza and Eastgate Square along Main Street and King Street. The route runs at all-day 15-minute headways or better on weekdays, 20-minute headways Saturdays, and 30-minute headways on Sundays. Service is provided weekdays between 4:23 AM and 2:12 AM, Saturdays 5:00 AM-2:20 AM, and Sundays 5:00 AM-1:07 AM.
- **Route 10 (B-Line Express**) provides service along Main Street and King Street between University Plaza and Eastgate Square. The route runs at all-day 20-minute headways or better on weekdays and Saturdays. Service is provided weekdays between 5:38 AM and 10:27 PM and Saturdays 8:00 AM-10:16 PM.

The closest bus stops are located less than 100 m (2-minute walk) away at the intersection of Main Street East and Graham Avenue North.

The City of Hamilton's 10-Year Local Transit Strategy[5] aims to address increases in ridership by introducing additional bus service on the BLAST (five separate rapid transit corridors) corridors. **Figure 2.3** illustrates the proposed Rapid Transit corridor relative to the Site's location.

The BLAST network is estimated to be completed by the Year 2041. One of these corridors (the "B" in the BLAST plan) is planned for Main Street East. The preliminary route shows connections between University Plaza and the Gateway. The "T" route is planned along Kenilworth Avenue from Centre Mall to Mohawk Road and the Meadowlands. These routes will provide high-order transit service near the subject site when completed.

[4] HSR Bus Schedules & Fares | City of Hamilton, Ontario, Canada
[5] City of Hamilton – Ten Year (2015 to 2024) Local Transit Strategy 2015



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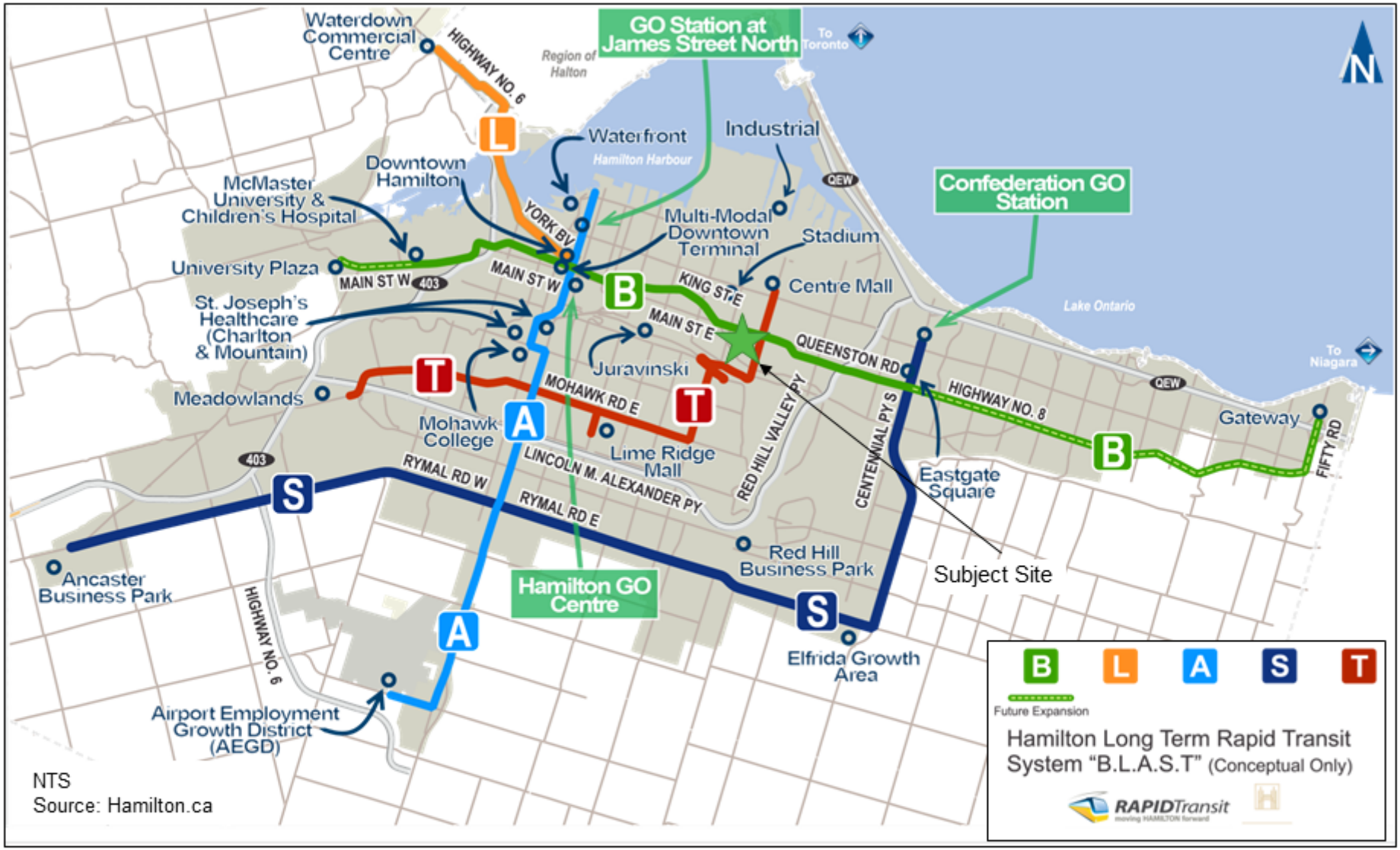
Existing Transit Network

1284 Main Street E Hamilton
220238

Figure 2.2



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Proposed Rapid Transit Corridor

1238 Main Street E Hamilton
220238

Figure 2.3

2.3 Pedestrian and Cycling Environment

The City's pedestrian infrastructure within the study area consists of sidewalks on both sides of the road along all study area roads.

The City's cycling infrastructure consists of on-street and off-street facilities. On-street routes include bicycle lanes, signed bicycle routes, and paved shoulders. Off-street facilities are in the form of multi-use pathways. There are currently no dedicated bike lanes in the study area.

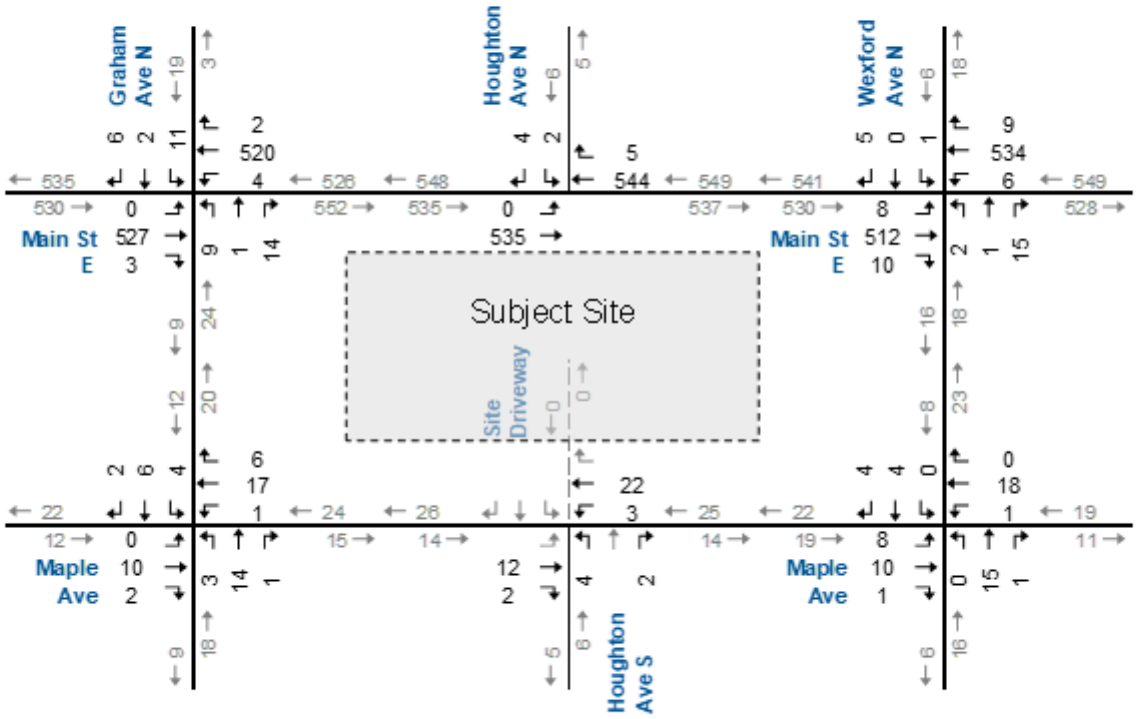
2.4 Traffic Volumes

Turning Movement Counts (TMC) are used to assess intersection operations and quantify vehicle movement. Existing traffic counts at an intersection or road section form the foundation for analysis. The traffic counts are usually collected during peak periods at an intersection to complete the level of service analysis. Turning movement counts were collected on July 26, 2022, by Paradigm.

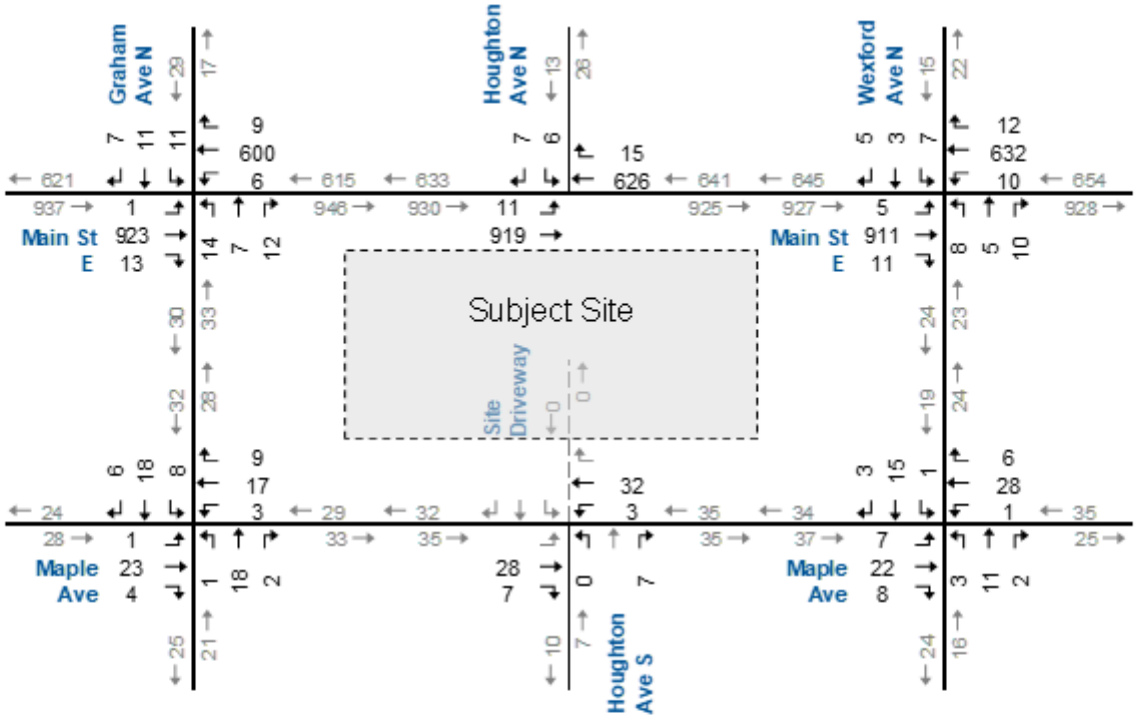
Figure 2.4 illustrates the 2022 Base Year AM and PM peak hour traffic volumes for the study area intersections.

Appendix B contains the turning movement count and existing signal timing data.

AM Peak Hour



PM Peak Hour



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Base Year Traffic Volumes

1284 Main Street E Hamilton
220238

Figure 2.4

2.5 Traffic Operations

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

The highest possible rating is LOS A, where the average total delay is equal to or less than 10 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 1.00, 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 determining road improvement needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on delays.

The operations of intersections in the study area were evaluated with the existing turning movement volumes and signal timing plans using Synchro 11 with HCM 2000 Edition.

The intersection analysis considered three different measures of performance:

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

The City's TIS guidelines identify critical movement thresholds for intersections as follows:

- Signalized
  - Volume to capacity ratios for through movements or shared through/turning movements is greater than or equal to 0.85;
  - Volume to capacity ratios for exclusive turning movements is greater than or equal to 0.90;
  - Queue lengths for individual movements are projected to exceed the available turning lane storage – queue lengths estimated using Synchro.
- Unsignalized

- Delays classified as LOS D-F;
- Queue lengths for individual movements are projected to exceed the available turning lane storage – queue lengths estimated using Synchro.

The operations of the study area intersections were evaluated under existing traffic volumes and the existing signal timings provided by the City using Synchro 10.

Table 2.1 summarizes the analysis results for the existing weekday AM and PM peak hour intersection operations. There are no critical movements in the base year operations.

Appendix C contains the detailed Synchro 10 reports.

TABLE 2.1: BASE YEAR 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	1 - Main Street E & Graham Avenue N	TCS	LOS	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
			Delay	<	14	>	**14**	<	14	>	**14**	<	17	>	**17**	<	17	>	**17**	**14**
			V/C	<	0.35	>		<	0.36	>		<	0.03	>		<	0.03	>		**0.21**
			Q	<	44	>		<	45	>		<	7	>		<	6	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	2 - Main Street E & Houghton Avenue N	TWSC	LOS	<	A	>	**A**	<	A	>	**A**					<	B	>	**B**	
			Delay	<	0	>	**0**	<	0	>	**0**					<	12	>	**12**	
			V/C	<	0.23	>		<	0.23	>						<	0.01	>		
			Q	<	0	>		<	0	>						<	0	>		
			Ex	<		>		<		>						<		>		
			Avail.	<		>		<		>						<		>		
	3 - Main Street E & Wexford Avenue N	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	B	>	**B**	<	B	>	**B**	
			Delay	<	0	>	**0**	<	0	>	**0**	<	11	>	**11**	<	12	>	**12**	
			V/C	<	0.17	>		<	0.18	>		<	0.03	>		<	0.01	>		
			Q	<	0	>		<	0	>		<	1	>		<	0	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	4 - Maple Avenue & Graham Avenue S	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	
			V/C	<	0.01	>		<	0.03	>		<	0.02	>		<	0.02	>		
			Q	<	11	>		<	13	>		<	12	>		<	10	>		
			Ex	<		>		<		>		<		>		<		>		
			Avail.	<		>		<		>		<		>		<		>		
	5 - Maple Avenue & Wexford Avenue S	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	
			V/C	<	0.02	>		<	0.02	>		<	0.02	>		<	0.01	>		
			Q	<	11	>		<	12	>		<	11	>		<	8	>		
			Ex	<		>		<		>		<		>		<		>		
			Avail.	<		>		<		>		<		>		<		>		
	6 - Maple Avenue & Houghton Avenue S	TWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**					
			Delay	<	0	>	**0**	<	1	>	**1**	<	9	>	**9**					
			V/C	<	0.01	>		<	0.00	>		<	0.01	>						
			Q	<	0	>		<	0	>		<	0	>						
			Ex	<		>		<		>		<		>						
			Avail.	<		>		<		>		<		>						
PM Peak Hour	1 - Main Street E & Graham Avenue N	TCS	LOS	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
			Delay	<	18	>	**18**	<	15	>	**15**	<	18	>	**18**	<	17	>	**17**	**16**
			V/C	<	0.59	>		<	0.39	>		<	0.04	>		<	0.04	>		**0.35**
			Q	<	82	>		<	49	>		<	9	>		<	8	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	2 - Main Street E & Houghton Avenue N	TWSC	LOS	<	A	>	**A**	<	A	>	**A**					<	C	>	**C**	
			Delay	<	1	>	**0**	<	0	>	**0**					<	15	>	**15**	
			V/C	<	0.38	>		<	0.26	>						<	0.04	>		
			Q	<	0	>		<	0	>						<	1	>		
			Ex	<		>		<		>						<		>		
			Avail.	<		>		<		>						<		>		
	3 - Main Street E & Wexford Avenue N	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	C	>	**C**	<	C	>	**C**	
			Delay	<	0	>	**0**	<	0	>	**0**	<	24	>	**24**	<	23	>	**23**	
			V/C	<	0.29	>		<	0.21	>		<	0.11	>		<	0.07	>		
			Q	<	0	>		<	0	>		<	3	>		<	2	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	4 - Maple Avenue & Graham Avenue S	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	
			V/C	<	0.03	>		<	0.03	>		<	0.03	>		<	0.04	>		
			Q	<	13	>		<	13	>		<	12	>		<	14	>		
			Ex	<		>		<		>		<		>		<		>		
			Avail.	<		>		<		>		<		>		<		>		
	5 - Maple Avenue & Wexford Avenue S	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	
			V/C	<	0.04	>		<	0.04	>		<	0.02	>		<	0.02	>		
			Q	<	13	>		<	14	>		<	12	>		<	12	>		
			Ex	<		>		<		>		<		>		<		>		
			Avail.	<		>		<		>		<		>		<		>		
	6 - Maple Avenue & Houghton Avenue S	TWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**					
			Delay	<	0	>	**0**	<	1	>	**1**	<	9	>	**9**					
			V/C	<	0.02	>		<	0.00	>		<	0.01	>						
			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
Ex. - Existing Available Storage
Avail. - Available Storage

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

RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

3 Development Concept

3.1 Site Description

The subject site is at 1284 Main Street East in the City of Hamilton. The property owner proposes redeveloping the lands as a multi-family site comprised of high-rise towers and townhouse components. The development program proposes 715 new residential high-rise dwelling units, 173 new townhouse units, and 87 residential retrofit units added to the existing structure.

Vehicle access to the Site is presented through access to Maple Avenue across from Houghton Avenue.

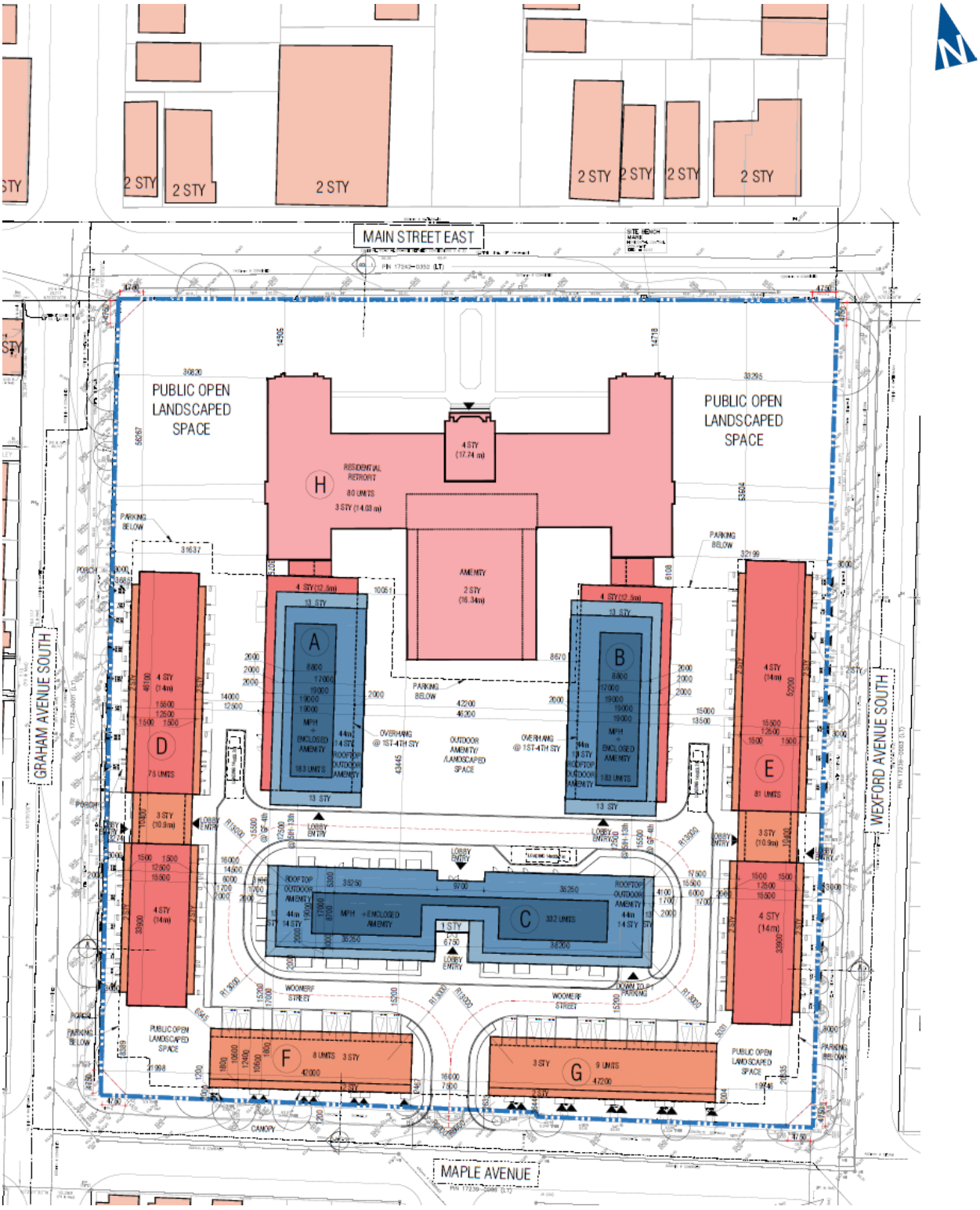
The development is assumed to be in phases, with Phase 1 opening in 2027 and the full build-out by 2032.

Table 3.1 summarizes the development land uses for each phase.

TABLE 3.1: DEVELOPMENT LAND USES

Phase	High-Rise Units	Townhouse/Retrofit Units
1	376	260
2	339	--
Total	**975**	

Figure 3.1 illustrates the site concept plan.



NTS

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Site Concept Plan

1284 Main Street E Hamilton
220238

Figure 3.1

3.2 Development Trip Generation

The following land use codes from the Institute of Transportation Engineers (ITE) Trip Generation 11th Edition[6] were used to estimate the weekday AM and PM peak hour traffic volumes that the Development will generate:

- Multifamily Housing (High-Rise) (LUC 222); and
- Multifamily Housing (Low-Rise) (LUC 220).

Data for the peak hour of adjacent street traffic were used to estimate trip generation. **Table 3.2** and **Table 3.3** summarizes the trip generation for the site for phase 1 and complete build-out scenarios. The site's full build-out trip generation is estimated to be approximately 296 AM peak hour trips and 361 PM peak hour trips. To remain conservative, no reductions in alternative modes of transportation have been applied.

TABLE 3.2: TRIP GENERATION – OPENING YEAR

ITE Land Use Code / Number of Units	AM Peak Hour				PM Peak Hour			
	Rate	In	Out	Sum	Rate	In	Out	Sum
222 - Multifamily Housing (High-Rise) - 376 Units	0.27	35	67	**102**	0.32	74	47	**121**
220 - Multifamily Housing (Low-Rise) - 260 Units	Eqn.	25	78	**103**	Eqn.	83	49	**132**
TOTAL	--	60	145	**205**	--	157	96	**253**

Equations

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

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

TABLE 3.3: TRIP GENERATION – FULL BUILD-OUT

ITE Land Use Code / Number of Units	AM Peak Hour				PM Peak Hour			
	Rate	In	Out	Sum	Rate	In	Out	Sum
222 - Multifamily Housing (High-Rise) - 715 Units	0.27	66	127	**193**	0.32	140	89	**229**
220 - Multifamily Housing (Low-Rise) - 260 Units	Eqn.	25	78	**103**	Eqn.	83	49	**132**
TOTAL	--	91	205	**296**	--	223	138	**361**

Equations

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

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

[6] Trip Generation Manual 10th Edition + Supplement Institute of Transportation Engineers Washington DC 2020

The estimated distribution was developed using the Transportation Tomorrow Survey[7] (TTS) data for the zone containing the subject site and the existing distribution at the study area intersections. The surrounding area includes mid and low-rise residential land use, which represents the proposed site land use. The trip distribution is shown in **Table 3.4**. TTS data can be found in **Appendix D**.

Figure 3.2 and **Figure 3.3** contain the phase 1 and full build-out AM and PM peak hour trip assignment to the adjacent road network.

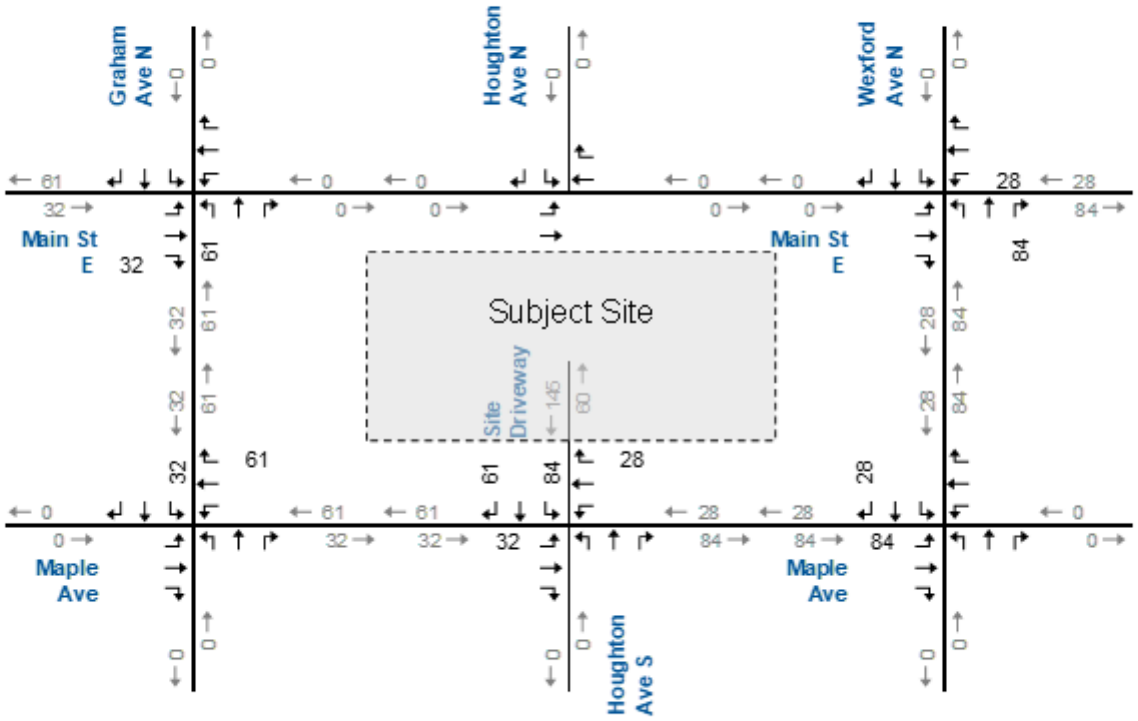
Future background and total traffic analysis was conducted with a previous iteration of the site plan which included additional residential units. As such, the future background and total traffic analysis provides a conservative estimate for subject site traffic.

TABLE 3.4: TRIP DISTRIBUTION

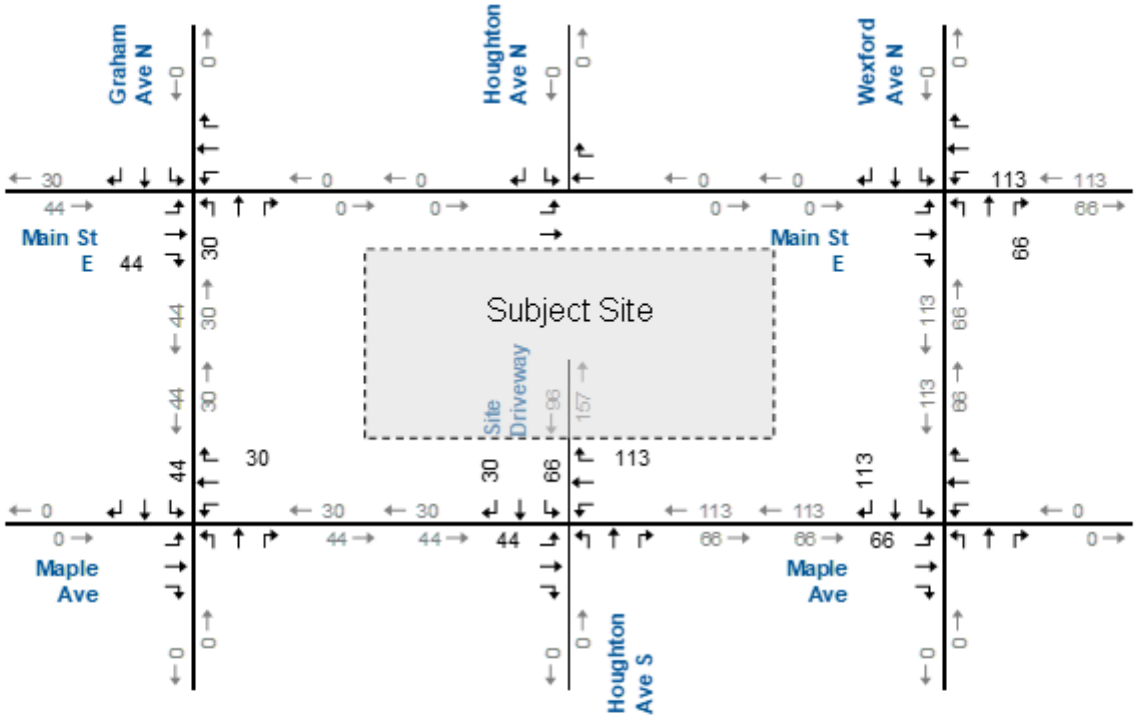
From/To	AM		PM	
	Inbound	Outbound	Inbound	Outbound
East via Main Street East	47%	58%	72%	69%
West via Main Street East	53%	42%	28%	31%
TOTAL	**100%**	**100%**	**100%**	**100%**

[7] Transportation Tomorrow Survey 2016, University of Toronto Data Management Group.

AM Peak Hour



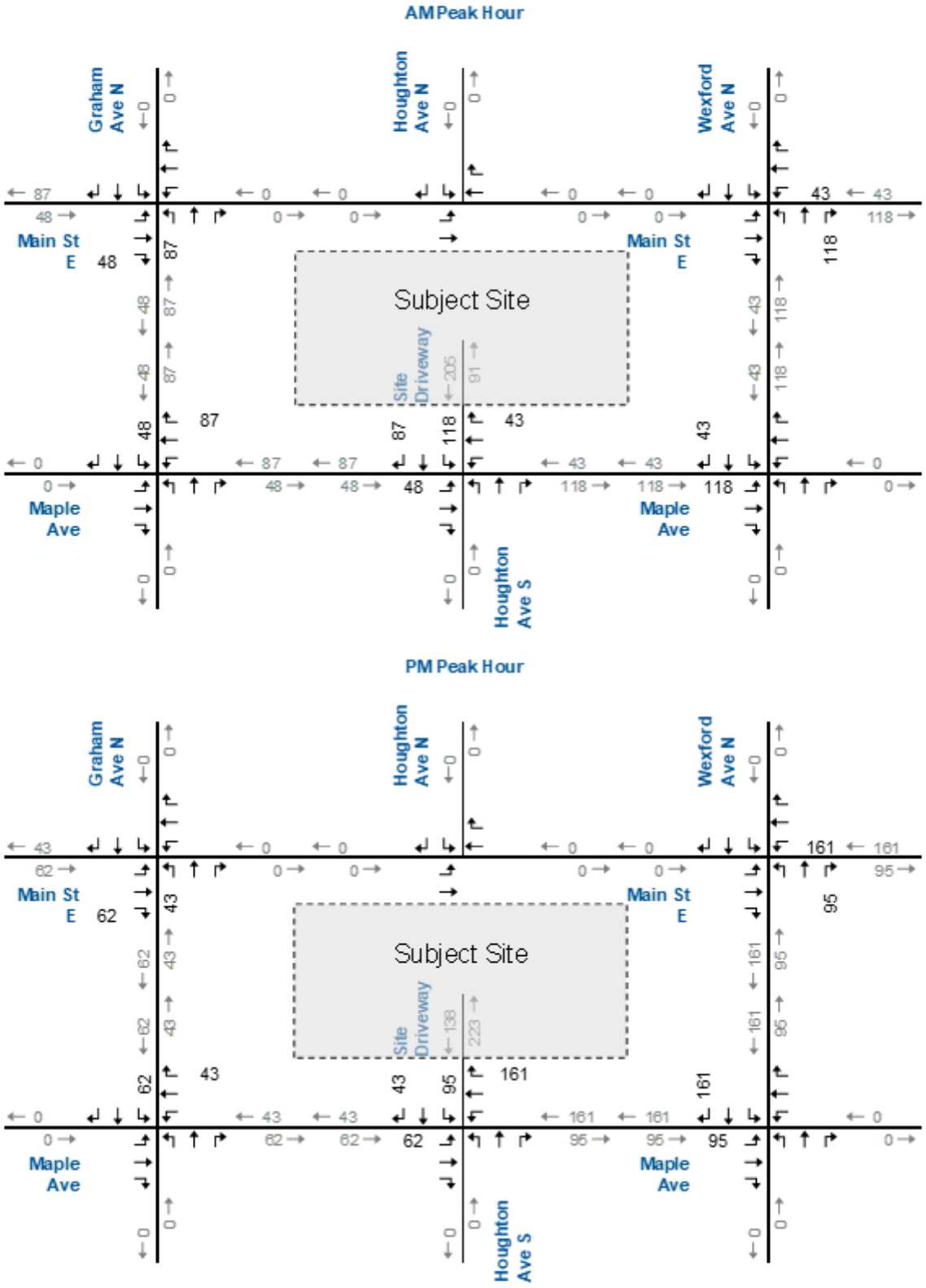
PM Peak Hour



Site Generated Traffic Volumes Opening Year

1284 Main Street E Hamilton
220238

Figure 3.2



Site Generated Traffic Volumes
Full Build-Out

1284 Main Street E Hamilton
220238

Figure 3.3

4 Evaluation of Future Traffic Conditions

The assessment of future conditions in this section includes the following components necessary to assess the traffic implications on the adjacent road network:

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

4.1 Forecast Traffic Volumes

Two horizon years are assessed in this study:

- Opening year (2027)
- Full Build-Out year (2032)

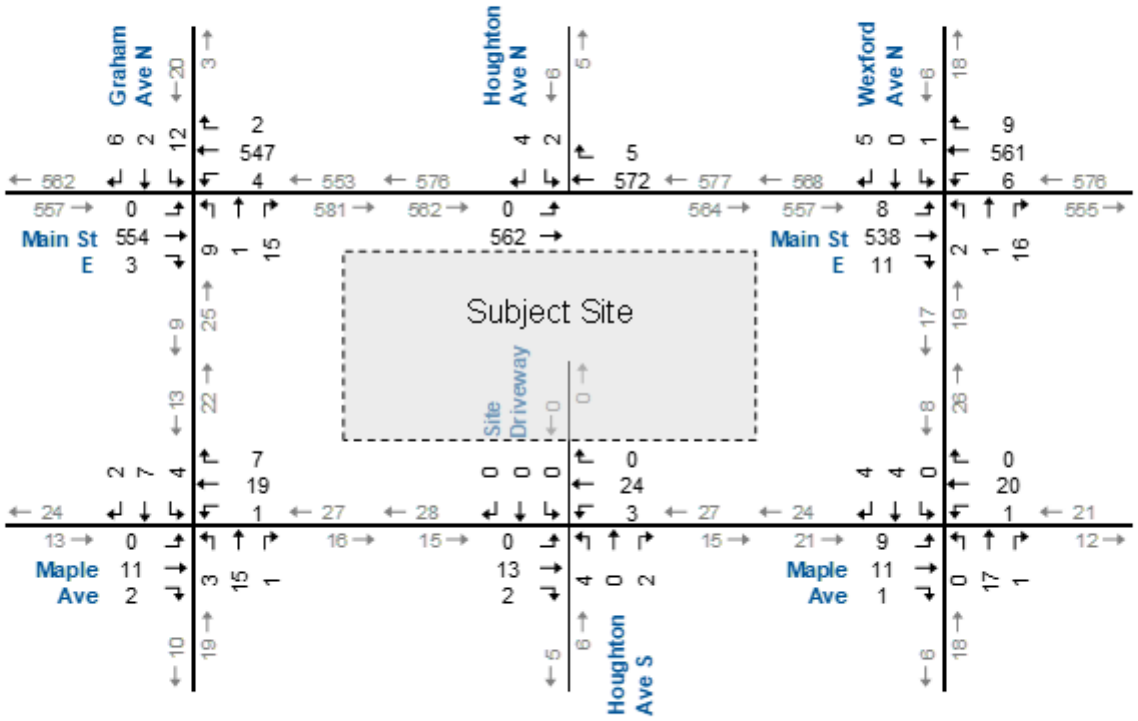
The future horizon traffic volumes are estimated to consist of:

- Increased non-site traffic (generalized background traffic growth) is estimated to be 1.0% per annum along Main Street East and 2.0% per annum for other streets as directed by the City;
- Traffic generated by the subject site.

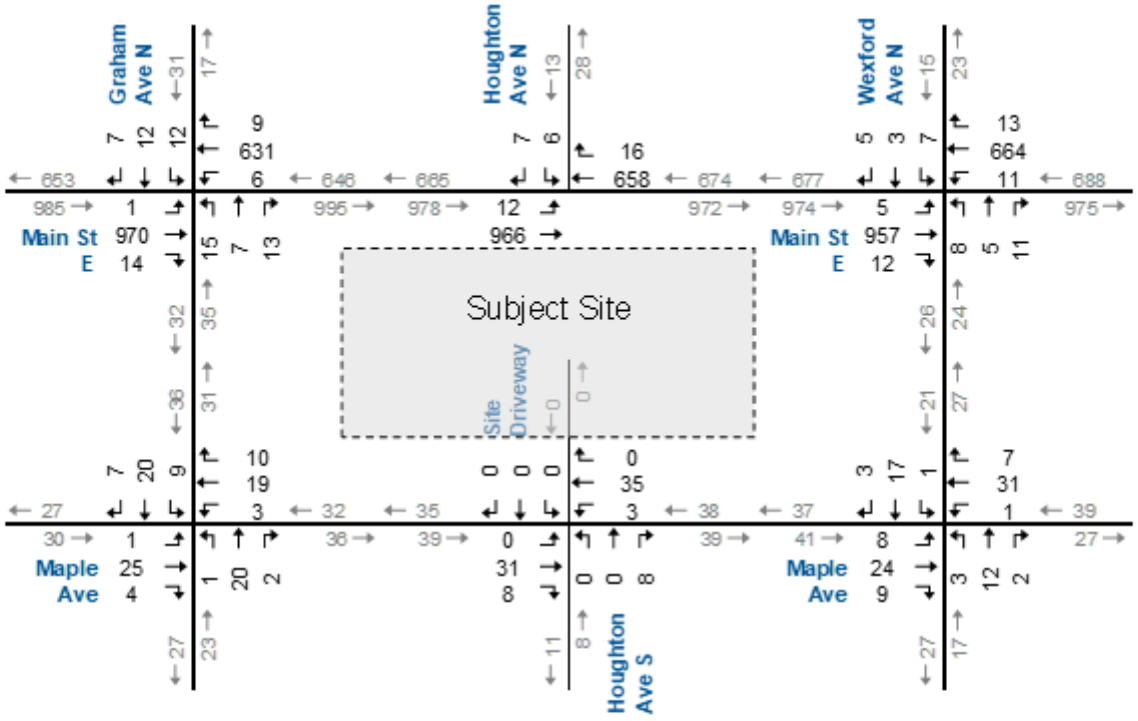
Figures 4.1 to 4.2 illustrate the forecast opening year and full build-out year background traffic volumes, respectively.

Figures 4.3 to 4.4 illustrate the forecast opening year and full build-out year total traffic volumes, respectively.

AM Peak Hour



PM Peak Hour



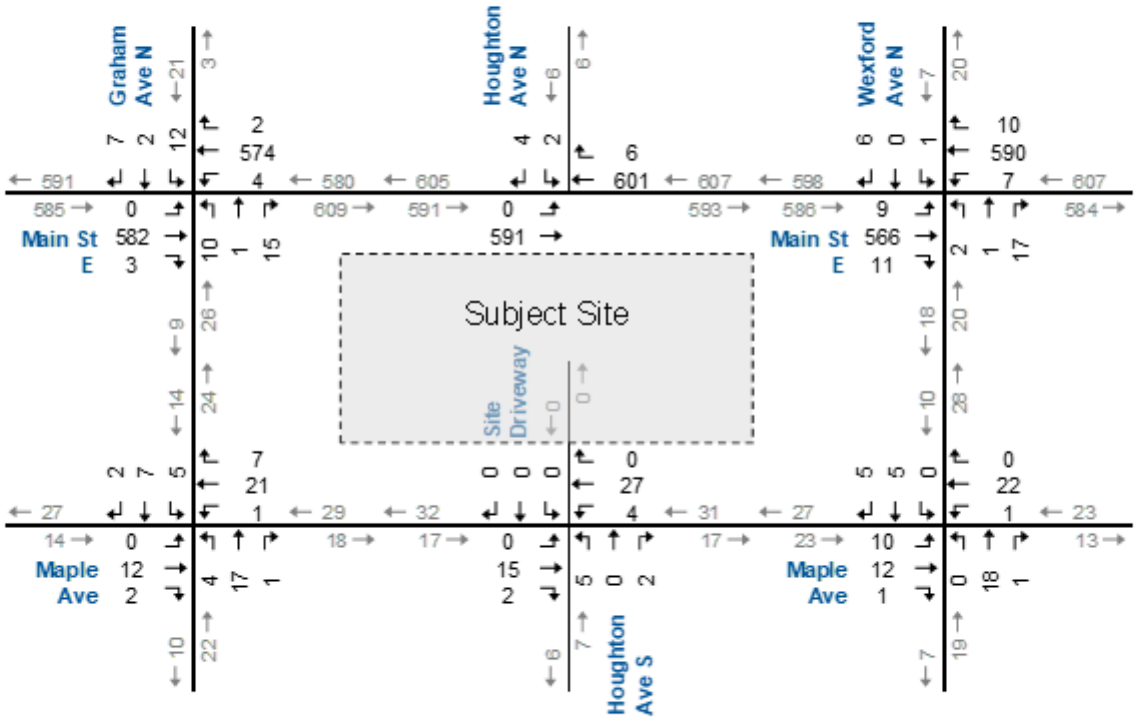
paradigm TRANSPORTATION SOLUTIONS LIMITED

Background Traffic Volumes Opening Year

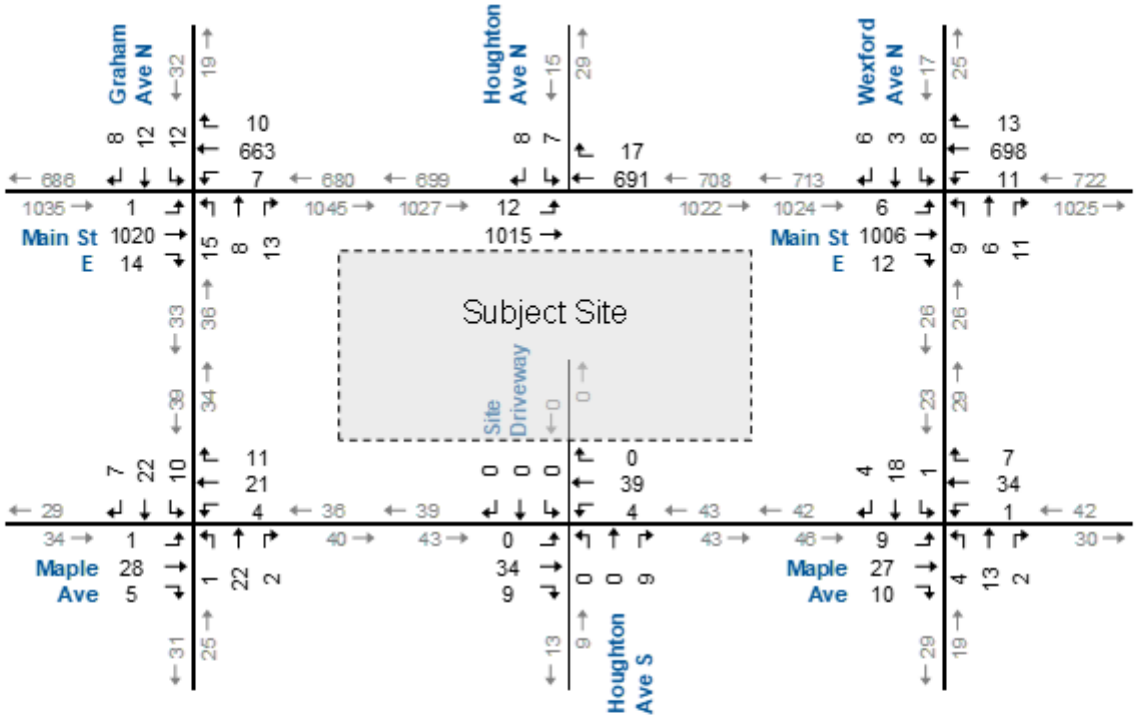
1284 Main Street E Hamilton
220238

Figure 4.1

AM Peak Hour



PM Peak Hour

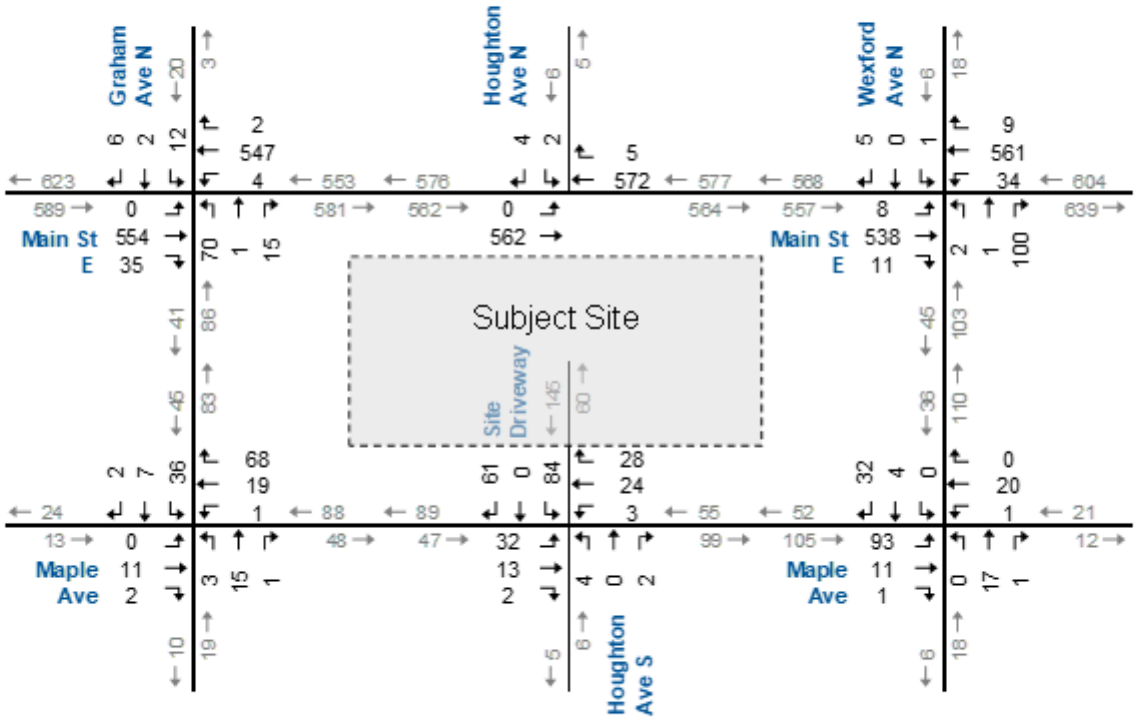


Background Traffic Volumes
Full Build-Out

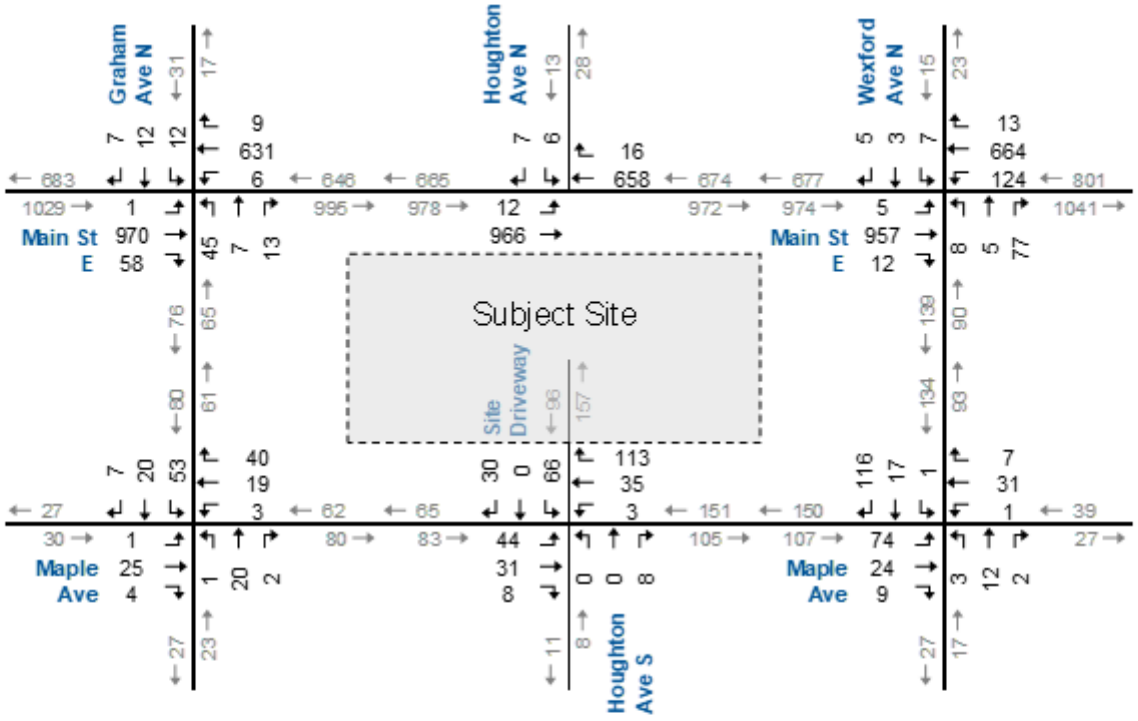
1284 Main Street E Hamilton
220238

Figure 4.2

AM Peak Hour



PM Peak Hour

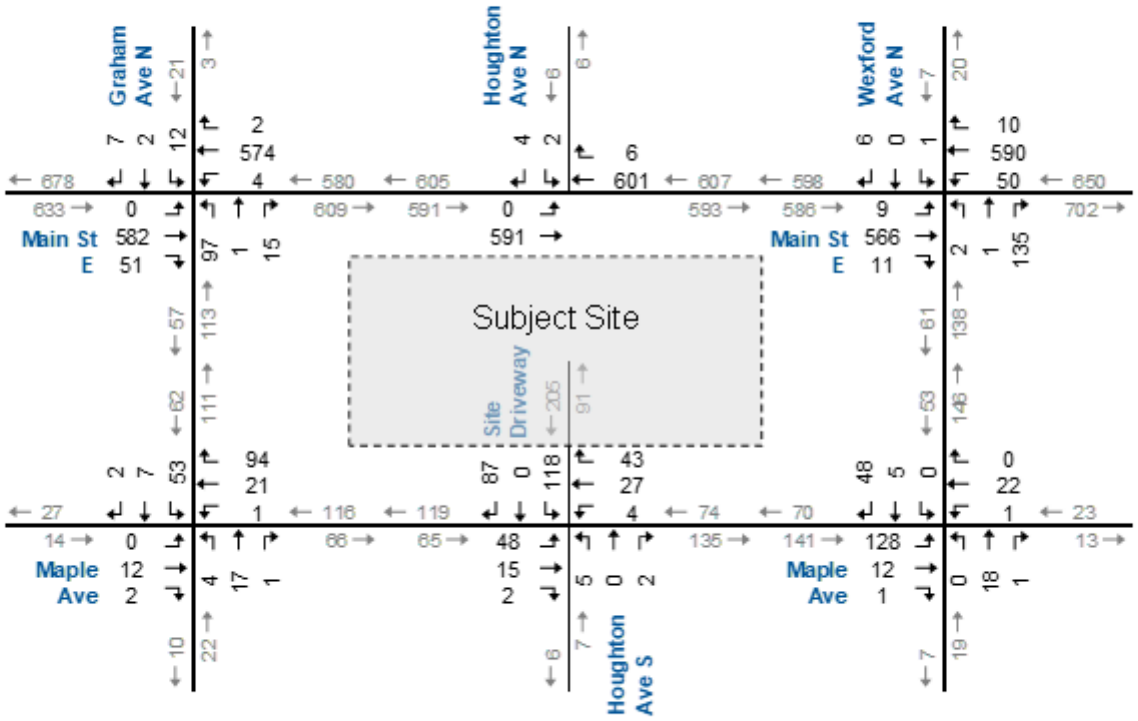


Total Traffic Volumes Opening Year

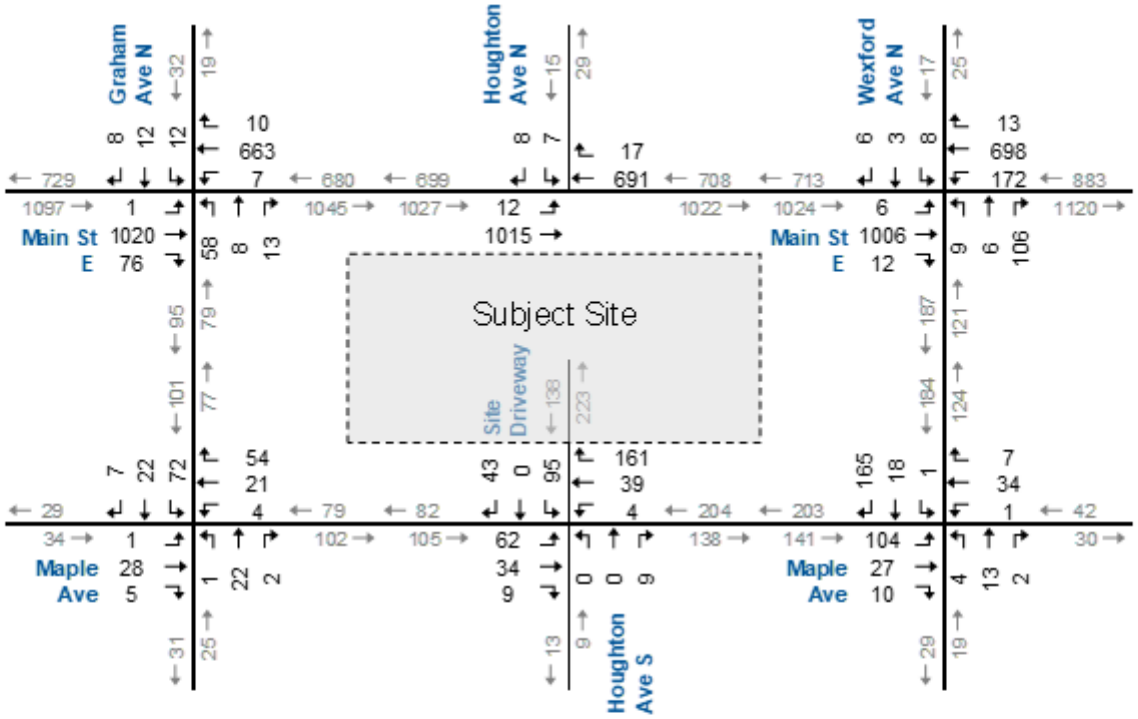
1284 Main Street E Hamilton
220238

Figure 4.3

AM Peak Hour



PM Peak Hour



Total Traffic Volumes
Full Build-Out

1284 Main Street E Hamilton
220238

Figure 4.4

4.2 Background Traffic Operations

4.2.1 Opening Year Background Traffic Operations

The study area intersection operations analysis for the background traffic scenario followed the same methodology used for the existing traffic conditions, including the current signal timings. **Table 4.1** details the level of service conditions, and the critical movements are summarized below:

PM Peak Hour

- Main Street East at Wexford Avenue North (unsignalized)
  - The northbound approach is forecast to operate with delays in the LOS D range.

Appendix E contains the detailed Synchro 10 reports.

Localized congestion is forecast to occur in the study area during the PM peak hour. Northbound movement at Main Street East at Wexford Avenue North is forecast to experience delays in the LOS D range due to growth in traffic along Main Street East.

TABLE 4.1: OPENING YEAR BACKGROUND 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	1 - Main Street E & Graham Avenue N	TCS	LOS	<	B	>	B	<	B	>	B	<	B	>	B	<	B	>	B	B
			Delay	<	14	>	14	<	15	>	15	<	17	>	17	<	17	>	17	15
			V/C	<	0.36	>		<	0.38	>		<	0.03	>		<	0.03	>		0.22
			Q	<	47	>		<	47	>		<	7	>		<	7	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	2 - Main Street E & Houghton Avenue N	TWSC	LOS	<	A	>	A	<	A	>	A					<	B	>	B	
			Delay	<	0	>	0	<	0	>	0					<	12	>	12	
			V/C	<	0.24	>		<	0.25	>						<	0.01	>		
			Q	<	0	>		<	0	>						<	0	>		
			Ex	<		>		<		>						<		>		
			Avail.	<		>		<		>						<		>		
	3 - Main Street E & Wexford Avenue N	AWSC	LOS	<	A	>	A	<	A	>	A	<	B	>	B	<	B	>	B	
			Delay	<	0	>	0	<	0	>	0	<	11	>	11	<	12	>	12	
			V/C	<	0.18	>		<	0.19	>		<	0.03	>		<	0.01	>		
			Q	<	0	>		<	0	>		<	1	>		<	0	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	4 - Maple Avenue & Graham Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			V/C	<	0.02	>		<	0.03	>		<	0.02	>		<	0.02	>		
			Q	<	10	>		<	12	>		<	12	>		<	11	>		
			Ex	<		>		<		>		<		>		<		>		
			Avail.	<		>		<		>		<		>		<		>		
	5 - Maple Avenue & Wexford Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			V/C	<	0.03	>		<	0.03	>		<	0.02	>		<	0.01	>		
			Q	<	12	>		<	12	>		<	11	>		<	8	>		
			Ex	<		>		<		>		<		>		<		>		
			Avail.	<		>		<		>		<		>		<		>		
	6 - Maple Avenue & Houghton Avenue S	TWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A					
			Delay	<	0	>	0	<	1	>	1	<	9	>	9					
			V/C	<	0.01	>		<	0.00	>		<	0.01	>						
			Q	<	0	>		<	0	>		<	0	>						
			Ex	<		>		<		>		<		>						
			Avail.	<		>		<		>		<		>						
PM Peak Hour	1 - Main Street E & Graham Avenue N	TCS	LOS	<	B	>	B	<	B	>	B	<	B	>	B	<	B	>	B	B
			Delay	<	18	>	18	<	15	>	15	<	18	>	18	<	18	>	18	17
			V/C	<	0.62	>		<	0.41	>		<	0.05	>		<	0.05	>		0.37
			Q	<	88	>		<	52	>		<	9	>		<	9	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	2 - Main Street E & Houghton Avenue N	TWSC	LOS	<	A	>	A	<	A	>	A					<	C	>	C	
			Delay	<	1	>	0	<	0	>	0					<	16	>	16	
			V/C	<	0.40	>		<	0.27	>						<	0.04	>		
			Q	<	0	>		<	0	>						<	1	>		
			Ex	<		>		<		>						<		>		
			Avail.	<		>		<		>						<		>		
	3 - Main Street E & Wexford Avenue N	AWSC	LOS	<	A	>	A	<	A	>	A	<	D	>	D	<	C	>	C	
			Delay	<	0	>	0	<	1	>	0	<	25	>	25	<	25	>	25	
			V/C	<	0.31	>		<	0.22	>		<	0.13	>		<	0.08	>		
			Q	<	0	>		<	0	>		<	3	>		<	2	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	4 - Maple Avenue & Graham Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			V/C	<	0.04	>		<	0.04	>		<	0.03	>		<	0.04	>		
			Q	<	13	>		<	13	>		<	13	>		<	14	>		
			Ex	<		>		<		>		<		>		<		>		
			Avail.	<		>		<		>		<		>		<		>		
	5 - Maple Avenue & Wexford Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			V/C	<	0.05	>		<	0.05	>		<	0.02	>		<	0.02	>		
			Q	<	13	>		<	14	>		<	12	>		<	12	>		
			Ex	<		>		<		>		<		>		<		>		
			Avail.	<		>		<		>		<		>		<		>		
	6 - Maple Avenue & Houghton Avenue S	TWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A					
			Delay	<	0	>	0	<	1	>	1	<	9	>	9					
			V/C	<	0.03	>		<	0.00	>		<	0.01	>						
			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
Ex. - Existing Available Storage
Avail. - Available Storage

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

RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

4.2.2 Full Build-Out Background Traffic Operations

The study area intersection operations analysis for the background traffic scenario followed the same methodology used for the existing traffic conditions, including the current signal timings. **Table 4.2** details the level of service conditions, and the critical movements are summarized below:

PM Peak Hour

- Main Street East at Wexford Avenue North (unsignalized)
  - The northbound approach is forecast to operate with delays in the LOS D range.
  - The southbound approach is forecast to operate with delays in the LOS D range.

Appendix E contains the detailed Synchro 10 reports.

Background traffic growth results in increased congestion in the study area during the PM peak hour. By 2032, the traffic growth along Main Street East is expected to result in northbound and southbound stop-controlled movements at Wexford Avenue North to operate in the LOS D range during the PM peak hour. The v/c ratio for the northbound and southbound movements is forecast to be relatively low in the 0.10 to 0.16 range.

TABLE 4.2: FULL BUILD-OUT BACKGROUND 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	1 - Main Street E & Graham Avenue N	TCS	LOS	<	B	>	B	<	B	>	B	<	B	>	B	<	B	>	B	B
			Delay	<	15	>	15	<	15	>	15	<	17	>	17	<	17	>	17	15
			V/C	<	0.38	>		<	0.39	>		<	0.03	>		<	0.03	>		0.24
			Q	<	50	>		<	50	>		<	7	>		<	7	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	2 - Main Street E & Houghton Avenue N	TWSC	LOS	<	A	>	A	<	A	>	A					<	B	>	B	
			Delay	<	0	>	0	<	0	>	0					<	13	>	13	
			V/C	<	0.25	>		<	0.26	>						<	0.01	>		
			Q	<	0	>		<	0	>						<	0	>		
			Ex	<	--	>		<	--	>						<	--	>		
			Avail.	<	--	>		<	--	>						<	--	>		
	3 - Main Street E & Wexford Avenue N	AWSC	LOS	<	A	>	A	<	A	>	A	<	B	>	B	<	B	>	B	
			Delay	<	0	>	0	<	0	>	0	<	11	>	11	<	12	>	12	
			V/C	<	0.19	>		<	0.20	>		<	0.03	>		<	0.02	>		
			Q	<	0	>		<	0	>		<	1	>		<	0	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	4 - Maple Avenue & Graham Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			V/C	<	0.02	>		<	0.04	>		<	0.03	>		<	0.02	>		
			Q	<	10	>		<	13	>		<	13	>		<	11	>		
			Ex	<	--	>		<	--	>		<	--	>		<		>		
			Avail.	<	--	>		<	--	>		<	--	>		<		>		
	5 - Maple Avenue & Wexford Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			V/C	<	0.03	>		<	0.03	>		<	0.02	>		<	0.01	>		
			Q	<	12	>		<	13	>		<	12	>		<	9	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	6 - Maple Avenue & Houghton Avenue S	TWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A					
			Delay	<	0	>	0	<	1	>	1	<	9	>	9					
			V/C	<	0.01	>		<	0.00	>		<	0.01	>						
			Q	<	0	>		<	0	>		<	0	>						
			Ex	<	--	>		<	--	>		<	--	>						
			Avail.	<	--	>		<	--	>		<	--	>						
PM Peak Hour	1 - Main Street E & Graham Avenue N	TCS	LOS	<	B	>	B	<	B	>	B	<	B	>	B	<	B	>	B	B
			Delay	<	19	>	19	<	15	>	15	<	18	>	18	<	18	>	18	17
			V/C	<	0.65	>		<	0.43	>		<	0.05	>		<	0.05	>		0.39
			Q	<	95	>		<	55	>		<	9	>		<	9	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	2 - Main Street E & Houghton Avenue N	TWSC	LOS	<	A	>	A	<	A	>	A					<	C	>	C	
			Delay	<	1	>	0	<	0	>	0					<	17	>	17	
			V/C	<	0.42	>		<	0.29	>						<	0.05	>		
			Q	<	0	>		<	0	>						<	1	>		
			Ex	<	--	>		<	--	>						<	--	>		
			Avail.	<	--	>		<	--	>						<	--	>		
	3 - Main Street E & Wexford Avenue N	AWSC	LOS	<	A	>	A	<	A	>	A	<	D	>	D	<	D	>	D	
			Delay	<	0	>	0	<	1	>	0	<	30	>	30	<	27	>	27	
			V/C	<	0.32	>		<	0.23	>		<	0.16	>		<	0.10	>		
			Q	<	0	>		<	0	>		<	5	>		<	3	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	4 - Maple Avenue & Graham Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			V/C	<	0.04	>		<	0.04	>		<	0.03	>		<	0.05	>		
			Q	<	14	>		<	13	>		<	13	>		<	14	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	5 - Maple Avenue & Wexford Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	7	>	7	
			V/C	<	0.05	>		<	0.05	>		<	0.02	>		<	0.03	>		
			Q	<	14	>		<	14	>		<	12	>		<	13	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	6 - Maple Avenue & Houghton Avenue S	TWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A					
			Delay	<	0	>	0	<	1	>	1	<	9	>	9					
			V/C	<	0.03	>		<	0.00	>		<	0.01	>						
			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
Ex. - Existing Available Storage
Avail. - Available Storage

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

RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

4.3 Total Traffic Operations

4.3.1 Opening Year Total Traffic Operations

The study area intersection operations analysis for the future total traffic scenario followed the same methodology used for the background traffic conditions. **Table 4.3** details the service conditions for the weekday AM and PM peak hours.

All study area intersections are forecast to operate within similar service levels as documented under the background scenario. The following summarizes the operations.

PM Peak Hour

- Main Street East at Wexford Avenue North (unsignalized)
  - The northbound approach is forecast to operate with delays in the LOS E range.

Appendix F contains the detailed Synchro 10 reports.

Similar to the background operations, localized congestion is forecast to occur in the study area during the PM peak hour. The addition of the site traffic is forecast to result in operations of the northbound movement at Main Street East at Wexford Avenue North to degrade from LOS D to LOS E. The v/c ratio for the southbound movement is forecast to be relatively low at 0.15.

Overall, the site traffic is forecast to add less than 20 seconds of delay to intersection movements.

The site access is forecast to operate with delays in the LOS A/B range, with delays not exceeding 15 seconds.

TABLE 4.3: OPENING YEAR TOTAL OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	Overall
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - Main Street E & Graham Avenue N	TCS	LOS	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
			Delay	<	15	>	**15**	<	15	>	**15**	<	19	>	**19**	<	17	>	**17**	**15**
			V/C	<	0.39	>		<	0.38	>		<	0.16	>		<	0.03	>		**0.29**
			Q	<	50	>		<	47	>		<	20	>		<	7	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	2 - Main Street E & Houghton Avenue N	TWSC	LOS	<	A	>	**A**	<	A	>	**A**					<	B	>	**B**	
			Delay	<	0	>	**0**	<	0	>	**0**					<	12	>	**12**	
			V/C	<	0.24	>		<	0.25	>						<	0.01	>		
			Q	<	0	>		<	0	>						<	0	>		
			Ex	<	--	>		<	--	>						<	--	>		
			Avail.	<	--	>		<	--	>						<	--	>		
	3 - Main Street E & Wexford Avenue N	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	B	>	**B**	
			Delay	<	0	>	**0**	<	1	>	**1**	<	10	>	**10**	<	13	>	**13**	
			V/C	<	0.18	>		<	0.19	>		<	0.13	>		<	0.01	>		
			Q	<	0	>		<	1	>		<	4	>		<	0	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	4 - Maple Avenue & Graham Avenue S	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	8	>	**8**	
			V/C	<	0.02	>		<	0.10	>		<	0.02	>		<	0.06	>		
			Q	<	10	>		<	12	>		<	12	>		<	14	>		
			Ex	<	--	>		<	--	>		<	--	>		<		>		
			Avail.	<	--	>		<	--	>		<	--	>		<		>		
	5 - Maple Avenue & Wexford Avenue S	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	8	>	**8**	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	
			V/C	<	0.14	>		<	0.03	>		<	0.02	>		<	0.04	>		
			Q	<	13	>		<	12	>		<	12	>		<	13	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	6 - Maple Avenue & Houghton Avenue S/Site Access	TWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	5	>	**5**	<	1	>	**1**	<	10	>	**10**	<	10	>	**10**	
			V/C	<	0.02	>		<	0.00	>		<	0.01	>		<	0.18	>		
			Q	<	1	>		<	0	>		<	0	>		<	5	>		
			Ex	<	--	>		<	--	>		<	--	>		<		>		
			Avail.	<	--	>		<	--	>		<	--	>		<		>		
PM Peak Hour	1 - Main Street E & Graham Avenue N	TCS	LOS	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	<	B	>	**B**	**B**
			Delay	<	19	>	**19**	<	15	>	**15**	<	18	>	**18**	<	18	>	**18**	**17**
			V/C	<	0.64	>		<	0.41	>		<	0.10	>		<	0.05	>		**0.41**
			Q	<	93	>		<	52	>		<	15	>		<	9	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	2 - Main Street E & Houghton Avenue N	TWSC	LOS	<	A	>	**A**	<	A	>	**A**					<	C	>	**C**	
			Delay	<	1	>	**0**	<	0	>	**0**					<	16	>	**16**	
			V/C	<	0.40	>		<	0.27	>						<	0.04	>		
			Q	<	0	>		<	0	>						<	1	>		
			Ex	<	--	>		<	--	>						<	--	>		
			Avail.	<	--	>		<	--	>						<	--	>		
	3 - Main Street E & Wexford Avenue N	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	C	>	**C**	<	E	>	**E**	
			Delay	<	0	>	**0**	<	4	>	**2**	<	21	>	**21**	<	48	>	**48**	
			V/C	<	0.31	>		<	0.22	>		<	0.30	>		<	0.15	>		
			Q	<	0	>		<	4	>		<	10	>		<	4	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	4 - Maple Avenue & Graham Avenue S	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	7	>	**7**	<	7	>	**7**	<	7	>	**7**	<	8	>	**8**	
			V/C	<	0.04	>		<	0.07	>		<	0.03	>		<	0.11	>		
			Q	<	13	>		<	13	>		<	12	>		<	14	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	5 - Maple Avenue & Wexford Avenue S	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	8	>	**8**	<	8	>	**8**	<	8	>	**8**	<	7	>	**7**	
			V/C	<	0.14	>		<	0.05	>		<	0.02	>		<	0.15	>		
			Q	<	13	>		<	14	>		<	12	>		<	16	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	6 - Maple Avenue & Houghton Avenue S/Site Access	TWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	B	>	**B**	
			Delay	<	4	>	**4**	<	0	>	**0**	<	9	>	**9**	<	11	>	**11**	
			V/C	<	0.03	>		<	0.00	>		<	0.01	>		<	0.14	>		
			Q	<	1	>		<	0	>		<	0	>		<	4	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		

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

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

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

RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

4.3.2 Full Build-Out Total Traffic Operations

The study area intersection operations analysis for the future total traffic scenario followed the same methodology used for the background traffic conditions. **Table 4.4** details the level of service conditions for the weekday AM and PM peak hours.

All study area intersections are forecast to operate within similar service levels as documented under the background scenario. The following summarizes the operations.

PM Peak Hour

- Main Street East at Wexford Avenue North (unsignalized)
  - The northbound approach is forecast to operate with delays in the LOS D range.
  - The southbound approach is forecast to operate with delays in the LOS F range.

Appendix F contains the detailed Synchro 10 reports.

Background traffic growth results in increased congestion in the study area during the PM peak hour, particularly for the northbound and southbound stop-controlled movements at Main Street East at Wexford Avenue North.

In the background scenario, the northbound and southbound movements were forecast to operate in the LOS D/E range. The addition of the site traffic is forecast to result in operations of the southbound movement to degrade from LOS E to LOS F. The v/c ratio for the southbound movement is forecast to be relatively low at 0.29.

With the exception of the southbound movement at Main Street East at Wexford Avenue North, the site traffic is forecast to add less than 10 seconds of delay to intersection movements.

The site access is forecast to operate with delays in the LOS B range, with delays not exceeding 15 seconds.

TABLE 4.4: FULL BUILD-OUT TOTAL 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	1 - Main Street E & Graham Avenue N	TCS	LOS	<	B	>	B	<	B	>	B	<	B	>	B	<	B	>	B	B
			Delay	<	15	>	15	<	15	>	15	<	20	>	20	<	17	>	17	15
			V/C	<	0.41	>		<	0.39	>		<	0.22	>		<	0.03	>		0.33
			Q	<	54	>		<	50	>		<	27	>		<	7	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	2 - Main Street E & Houghton Avenue N	TWSC	LOS	<	A	>	A	<	A	>	A					<	B	>	B	
			Delay	<	0	>	0	<	0	>	0					<	13	>	13	
			V/C	<	0.25	>		<	0.26	>						<	0.01	>		
			Q	<	0	>		<	0	>						<	0	>		
			Ex	<	--	>		<	--	>						<	--	>		
			Avail.	<	--	>		<	--	>						<	--	>		
	3 - Main Street E & Wexford Avenue N	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	B	>	B	
			Delay	<	0	>	0	<	2	>	1	<	10	>	10	<	14	>	14	
			V/C	<	0.19	>		<	0.20	>		<	0.17	>		<	0.02	>		
			Q	<	0	>		<	1	>		<	5	>		<	1	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	4 - Maple Avenue & Graham Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	8	>	8	
			V/C	<	0.02	>		<	0.13	>		<	0.03	>		<	0.09	>		
			Q	<	11	>		<	13	>		<	12	>		<	14	>		
			Ex	<	--	>		<	--	>		<	--	>		<		>		
			Avail.	<	--	>		<	--	>		<	--	>		<		>		
	5 - Maple Avenue & Wexford Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	7	>	7	<	8	>	8	<	7	>	7	
			V/C	<	0.20	>		<	0.03	>		<	0.03	>		<	0.07	>		
			Q	<	13	>		<	13	>		<	12	>		<	14	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	6 - Maple Avenue & Houghton Avenue S/Site Access	TWSC	LOS	<	A	>	A	<	A	>	A	<	B	>	B	<	B	>	B	
			Delay	<	5	>	5	<	0	>	0	<	11	>	11	<	11	>	11	
			V/C	<	0.03	>		<	0.00	>		<	0.02	>		<	0.27	>		
			Q	<	1	>		<	0	>		<	0	>		<	9	>		
			Ex	<	--	>		<	--	>		<	--	>		<		>		
			Avail.	<	--	>		<	--	>		<	--	>		<		>		
PM Peak Hour	1 - Main Street E & Graham Avenue N	TCS	LOS	<	B	>	B	<	B	>	B	<	B	>	B	<	B	>	B	B
			Delay	<	20	>	20	<	15	>	15	<	18	>	18	<	18	>	18	18
			V/C	<	0.69	>		<	0.43	>		<	0.13	>		<	0.05	>		0.45
			Q	<	103	>		<	55	>		<	18	>		<	9	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	2 - Main Street E & Houghton Avenue N	TWSC	LOS	<	A	>	A	<	A	>	A					<	C	>	C	
			Delay	<	1	>	0	<	0	>	0					<	16	>	16	
			V/C	<	0.42	>		<	0.29	>						<	0.04	>		
			Q	<	0	>		<	0	>						<	1	>		
			Ex	<	--	>		<	--	>						<	--	>		
			Avail.	<	--	>		<	--	>						<	--	>		
	3 - Main Street E & Wexford Avenue N	AWSC	LOS	<	A	>	A	<	A	>	A	<	D	>	D	<	F	>	F	
			Delay	<	0	>	0	<	6	>	3	<	32	>	32	<	85	>	85	
			V/C	<	0.32	>		<	0.23	>		<	0.50	>		<	0.29	>		
			Q	<	0	>		<	7	>		<	21	>		<	8	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	4 - Maple Avenue & Graham Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	7	>	7	<	7	>	7	<	7	>	7	<	8	>	8	
			V/C	<	0.04	>		<	0.10	>		<	0.03	>		<	0.14	>		
			Q	<	14	>		<	13	>		<	14	>		<	14	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	5 - Maple Avenue & Wexford Avenue S	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	9	>	9	<	8	>	8	<	8	>	8	<	8	>	8	
			V/C	<	0.19	>		<	0.06	>		<	0.03	>		<	0.21	>		
			Q	<	13	>		<	14	>		<	12	>		<	19	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		
	6 - Maple Avenue & Houghton Avenue S/Site Access	TWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	B	>	B	
			Delay	<	5	>	5	<	0	>	0	<	9	>	9	<	12	>	12	
			V/C	<	0.05	>		<	0.00	>		<	0.01	>		<	0.22	>		
			Q	<	1	>		<	0	>		<	0	>		<	7	>		
			Ex	<	--	>		<	--	>		<	--	>		<	--	>		
			Avail.	<	--	>		<	--	>		<	--	>		<	--	>		

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

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

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

RBT - Roundabout
< - Shared Left-turn
> - Shared Right-turn

5 Remedial Measures

This chapter contains an analysis to identify whether improvement measures are required within the study area.

5.1 Assessment of Impacts

The analysis shows congestion is forecast to occur at Main Street East and Wexford Avenue North intersection in the background, total opening year, and complete build-out scenarios. Delays for the northbound and southbound movements at Wexford Avenue North are attributed to the growth in traffic along Main Street East. By the 2032 PM peak hour, background traffic along Main Street is forecast to reach roughly 1,000 eastbound and 700 westbound vehicles. While upstream and downstream signalized intersections may provide some gaps in the eastbound/westbound traffic flow, the northbound and southbound movements are forecast to experience 25 seconds or more delays by 2032. With the addition of site traffic, southbound movement delays are forecast to be greater than 80 seconds (LOS F) in the 2032 PM peak hour due to growth in the conflicting northbound traffic movements. However, southbound vehicles impacted by the increased delay are forecast to be less than 20 vehicles in the 2032 PM peak hour.

Though delays are forecast for the southbound movement, remedial measures are not recommended. Plans of reconstruction of Main Street East for the light rail transit (LRT) will restrict movements from side streets to right-in/right-out. Restricting the movements will decrease the expected delay for southbound movements.

5.2 Light Rail Transit Scenario

5.2.1 Network Changes

The B-Line rapid transit line will run along Main Street/King Street between McMaster University and Queenston, with extensions to the east and west in later phases[8]. Main Street East will be reconstructed to accommodate the LRT.

Main Street East is proposed to be converted to one lane in each direction with eastbound and westbound LRT tracks in the centre of the roadway. Side streets along Main Street East are restricted to right-in/right-out movements. Certain intersections along Main Street East,

[8] City of Hamilton and Metrolinx, Hamilton Light Rail Transit Environmental Project Report Addendum, 2017

such as Kenilworth Avenue South and Ottawa Street, will permit U-turns to allow vehicles to travel eastbound or westbound.

5.2.2 Trip Distribution Impacts

As directed by the City of Hamilton, this section explores the impact on the site trip distribution following the implementation of the LRT along Main Street East. Due to the levels of assumptions and projections to traffic data that are still to be determined along the Main Street East corridor, no operational analysis is required by the City[9].

With the right-in/right-out along Main Street East, some vehicles from Kenilworth Avenue South will likely utilize Maple Avenue to access the Site, while others will perform a U-turn at Ottawa Street. The numerous all-way stop controlled intersections along Maple Avenue should deter excessive neighbourhood traffic infiltration.

Vehicles going to Ottawa Street are assumed to use Kenilworth Avenue for a U-turn maneuver to go westbound along Main Street East. Due to the several all-way stops required to travel between Ottawa Street and the subject site along Maple Avenue, it is assumed a negligible volume of vehicles will choose this route.

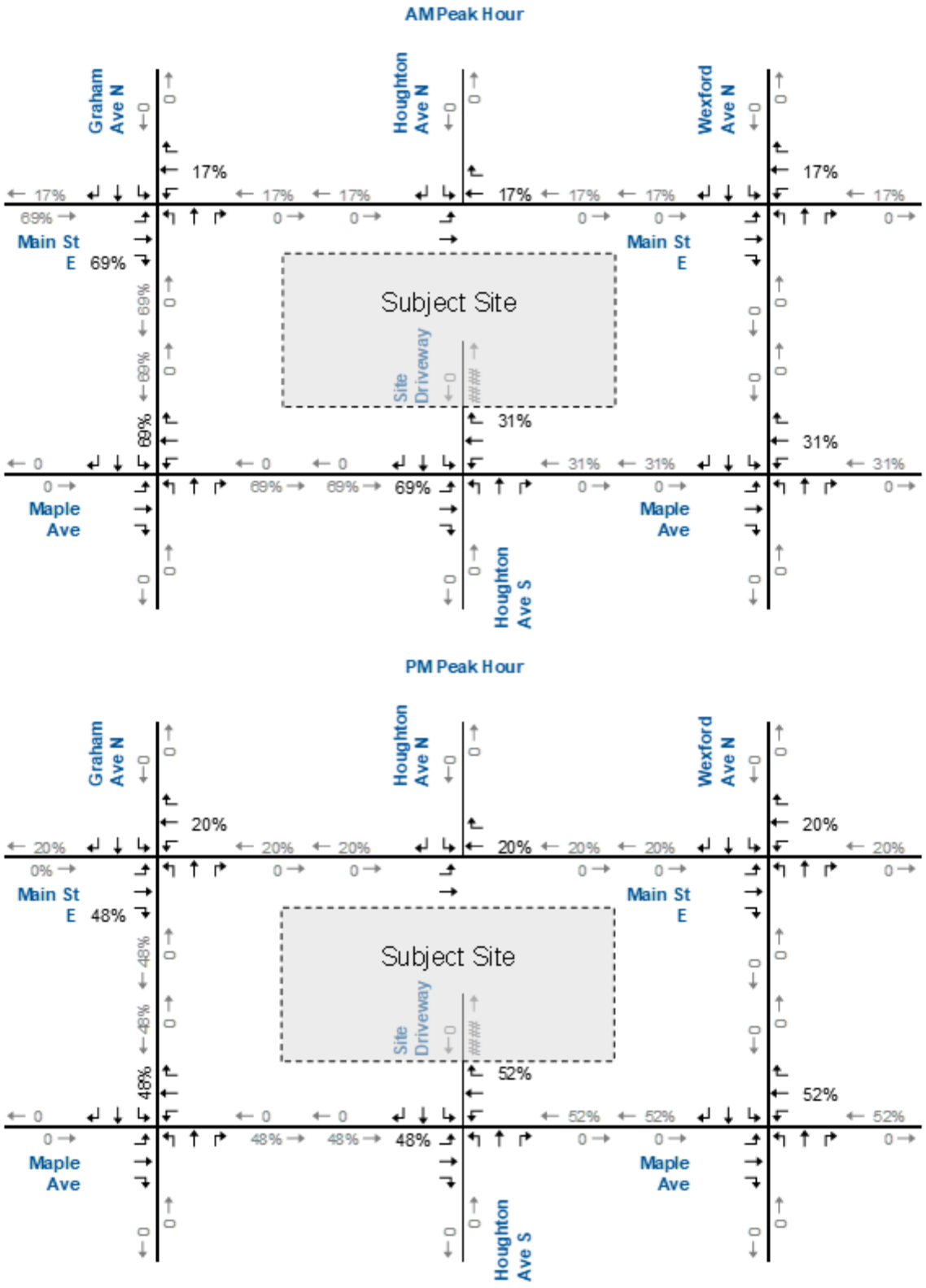
Table 5.1 summarizes the trip distribution with and without the LRT.

Figure 5.1 and **Figure 5.2** illustrates the inbound and outbound trip distributions for the full build-out scenario, respectively. **Figure 5.3** and **Figure 5.4** shows the inbound and outbound trip assignments for the full build-out scenario, respectively.

TABLE 5.1: TRIP DISTRIBUTION COMPARISON

From/To	Without LRT				With LRT			
	AM		PM		AM		PM	
	In	Out	In	Out	In	Out	In	Out
East via Main Street East	47%	58%	72%	69%	17%	58%	20%	62%
West via Main Street East	53%	42%	28%	31%	52%	42%	28%	31%
East via Maple Avenue	--	--	--	--	31%	0%	52%	7%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

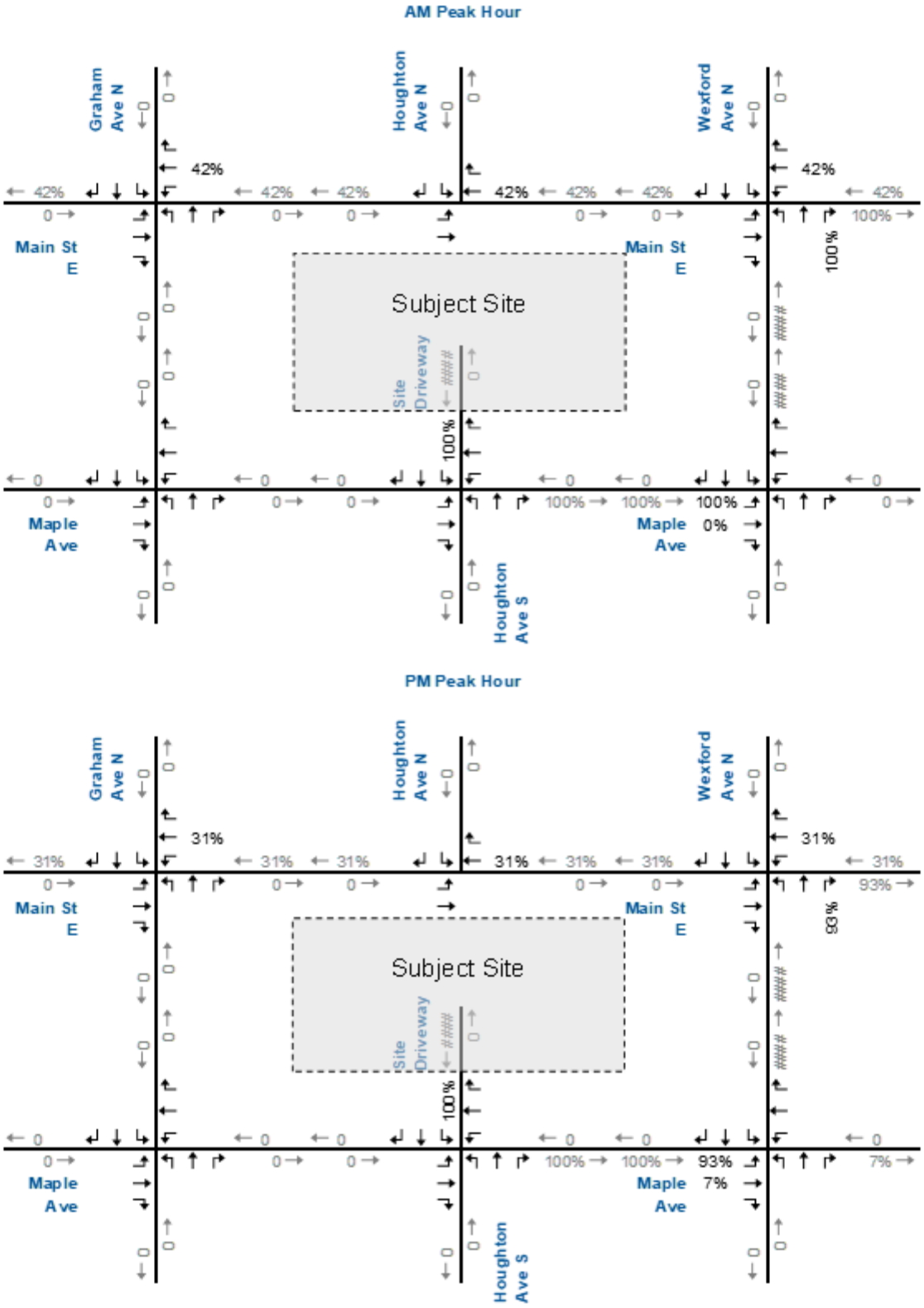
[9] Appendix A – Terms of Reference



Site Traffic with LRT Inbound Trip Distribution

1284 Main Street E Hamilton
220238

Figure 5.1

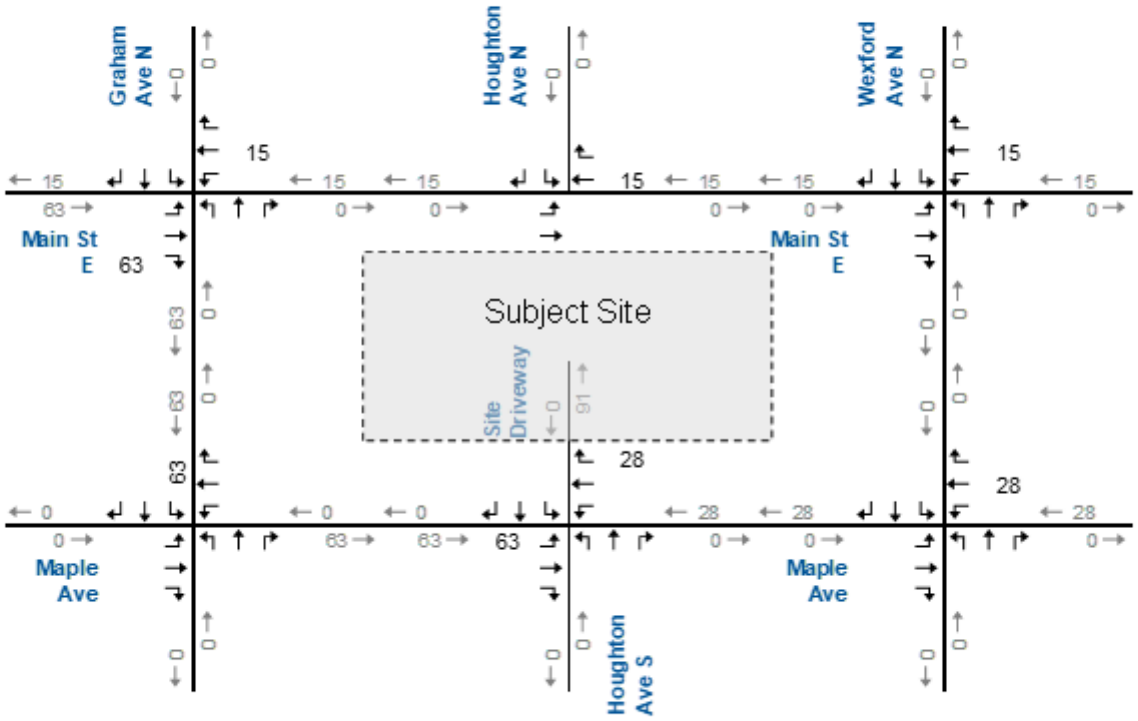


Site Traffic with LRT Outbound Trip Distribution

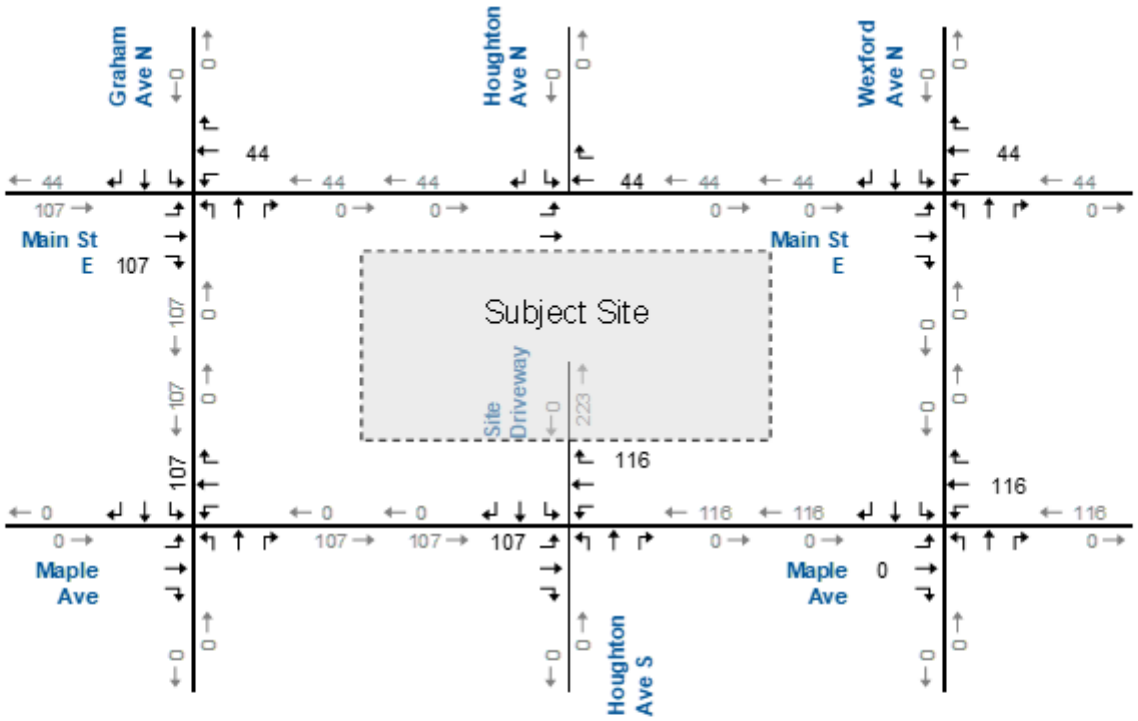
1284 Main Street E Hamilton
220238

Figure 5.2

AM Peak Hour



PM Peak Hour

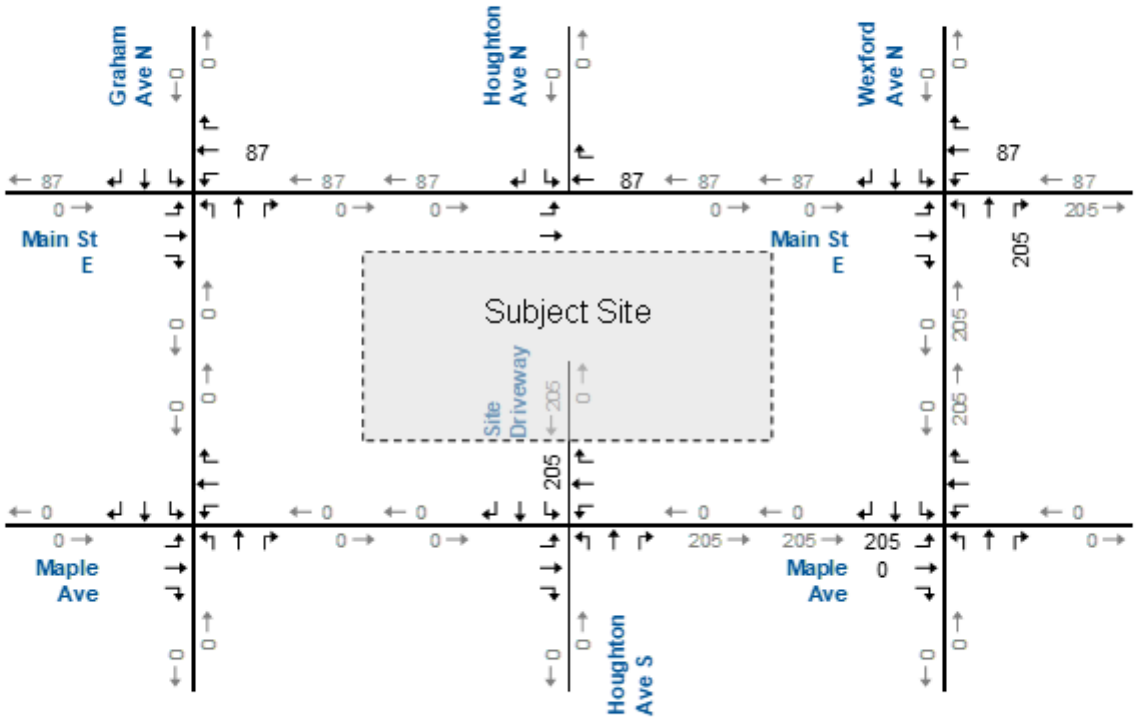


Site Traffic with LRT Inbound Trip Assignment

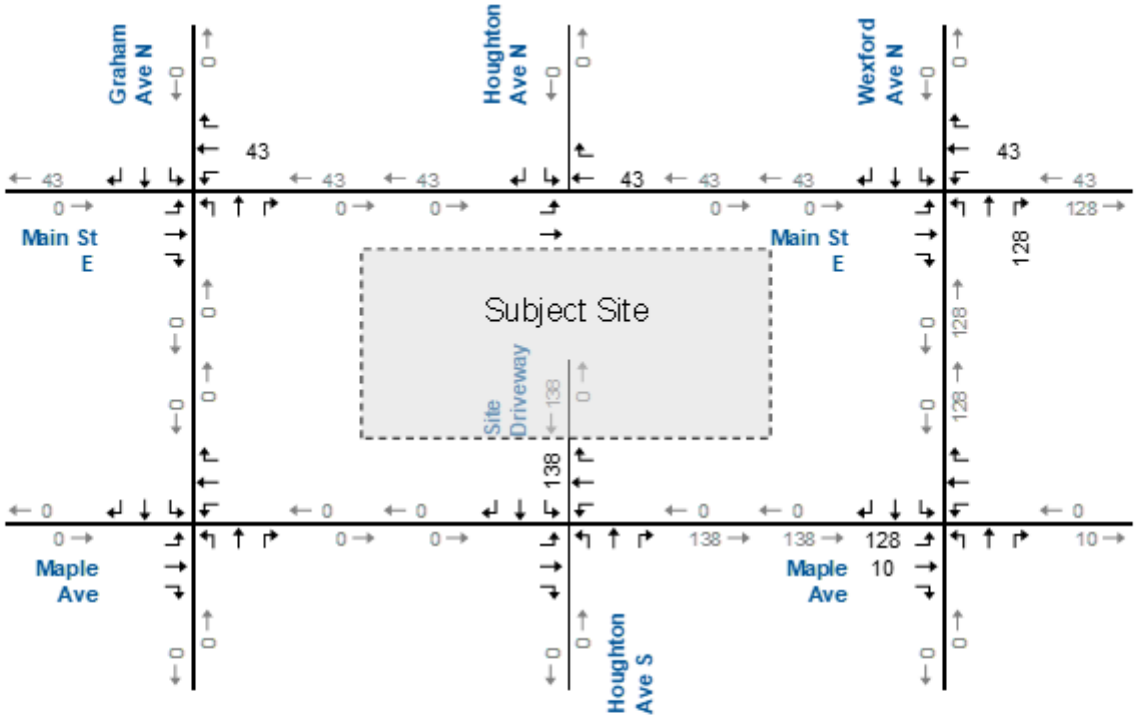
1284 Main Street E Hamilton
220238

Figure 5.3

AM Peak Hour



PM Peak Hour



paradigm TRANSPORTATION SOLUTIONS LIMITED

Site Traffic with LRT Outbound Trip Assignment

1284 Main Street E Hamilton
220238

Figure 5.4

5.3 Neighbourhood Traffic Infiltration

The City has noted that due to the location of the proposed development within a low-density residential neighbourhood, the Applicant shall provide funds for the purpose of potentially implementing traffic calming measures within the neighbourhood at locations selected by City staff at a future time following review of this study.

The amount of neighbourhood traffic infiltration is expected to be minimal with some infiltration dependent on the implementation of the LRT. Without the LRT, traffic accessing the site is expected to use Graham Avenue South and Wexford Avenue South. With the LRT, low volumes of site traffic is expected to travel along Maple Avenue to access the site.

Overall, the subject site traffic is expected to have minimal impact on neighbourhood intersections outside of the immediate study area.

6 Transportation Demand Management

A Transportation Demand Management Plan (TDMP) is a strategy using policies, programs, services, and products that result in more efficient use of transportation resources. A TDMP is designed to assist people and organizations in getting where they are going by being environmentally, economically, and socially responsible for their transportation actions.

6.1 Cycling

The City's Zoning By-Law 05-200 for the zone TOC1 requires the following bicycle parking rates:

- 5 short term per multiple dwelling (Multiple Dwelling – shall mean a building or part thereof containing three or more dwelling units but shall not include a street townhouse dwelling or semi-detached dwelling); and
- 0.5 long term per multiple dwelling unit.

The City's TDM Guide for Development[10] (Residential) prescribes the following rates:

- Long-Term Bicycle Parking: 0.50 to 1.25 spaces per unit; and
- Short-Term Bicycle Parking: 0.05 to 0.20 spaces per unit.

The development proposes providing 1,137 parking spaces for 975 units. The development also includes 490 long-term bicycle parking spaces.

Based on the guidelines noted above and the proposed development parking, 49 short-term bicycle parking spaces should be provided on site.

6.2 Walking

The proposed site plan includes sidewalk connections linking the Site to the municipal sidewalk on Main Street East, Graham Avenue South, Wexford Avenue South, and Maple Avenue Sidewalks are also provided throughout the Site to provide a comprehensive network of pedestrian connections and allow for an enhanced pedestrian experience for all site users.

[10] IBI Group, TDM for Development, June 2015.

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

6.3 Transit

No additional transit-related infrastructure is proposed as part of this development application. The existing transit stops located immediately north of the Site at Main Street East and Graham Avenue North are expected to continue serving the area. When the B-Line LRT is implemented, the closest stop will be Main Street East at Kenilworth Avenue, approximately 250 m (4-minute walk) east of the Site. It is likely that through regular internal reviews, HSR will monitor the amenities provided at transit stops throughout the City and, based on demand, will address the need for additional amenities.

The developer will consider placing short term bicycle parking near the transit stops to encourage and support transit service.

6.4 Parking

The City's TDM Guide provides guidelines indicating that no more than the minimum number of required parking spaces outlined in the Zoning by-law should be provided to encourage residents and visitors to utilize other modes of travel.

The proposed parking for the development is 1,137 parking spaces for 975 residential units, with a parking rate of 1.17 per unit. The proposed parking is within the recommended by-law rate of 1.0 – 1.25 spaces per unit.

The close proximity to frequent transit service along Main Street will aid in reducing parking demand for the subject site.

6.5 Travel Planning / Educations / Promotion

The developer should consider increasing awareness of sustainable transportation opportunities for residents and visitors of the development. A travel plan will engage and educate residents on the available sustainable modes of travel and how to overcome obstacles that may be perceived. Residents should be provided with a welcome package that outlines the available transit routes and active transportation options, such as the availability of bicycle parking.

General education of all modes of transportation, including their benefits and how to make the best use of them, are a vital component of TDM's success.

The strategies require cooperation and coordination with several partners, including transit providers, building owners, area municipalities, and residents.

By educating about sustainable modes of travel and providing travel demand management tools and incentives, TDM can be further integrated within the development to promote all modes of transportation.

The developer will consider adding wayfinding signage in the subject site to direct residents to active transportation facilities and transit stops. The addition of wayfinding signage will increase awareness of the sustainable transportation opportunities in the surrounding area.

6.6 Projected Trip Reductions

Table 6.1 summarizes the City's Staff Evaluation form for TDM measures outlined above. The form indicates the development has zero (0) measures provided to the "High Level of Provision," and up to seventeen (12) measures offered to the "Modest Level of Provision." This suggests the development is average for supporting TDM initiatives.

The development is expected to generate 296 AM peak hour trips and 361 PM peak hour trips.

However, the proposed on-site pedestrian network and access to transit will improve the pedestrian realm and support non-automotive uses (pedestrians, cyclists, and transit users). General education of all modes of transportation, including their benefits and how to make the best use of them, are a crucial component of TDM success. Increasing awareness of sustainable transportation opportunities for residents can assist in lowering the development's parking demand and, ultimately, the development's transportation impacts.

TABLE 6.1 TDM CHECKLIST

Project Name: 1284 Main Street East
Property Address: 1284 Main Street East
Applicant Name:

Land Use: Residential Townhomes/High-rise
Application Type: Residential

Located on existing transit or AT network? Y X N

Use the following checklist to assess how well each TDM initiative is addressed in the development application (note instances where initiatives are not applicable). For each category, initiatives are listed from "high" to "low" TDM impact.

Category	TDM Initiative	Not Applicable	Modest* level of provision	High* level of provision
Cycling	Bicycle network implementation		X	
	Secure, indoor bicycle parking		X	
	End-of-trip amenities (e.g. showers, change rooms)	X		
	Visible, well-lit, short-term bicycle parking (above minimum)		X	
Walking	Safe and attractive walkways		X	
	Pedestrian amenities on-site (benches, landscaping, lighting)		X	
	Pathway connections between school and neighbourhood	X		
	Student pick-up/drop-off away from main entrances	X		
Transit	Implement transit priority measures			
	Weather-protected waiting areas			
	Enhanced walking routes to transit			
	Bicycle parking at or near transit stops		X	
	On-site transit information		X	
Parking	No more than the minimum required spaces			
	Paid parking/Unbundle parking		X	
	Shared parking (nearby development/on-street)			
	Reduced parking for car share vehicle parking			
	Cash-in-lieu of parking			
	Reduced parking based on proximity to transit		X	
Carpool	Preferential carpool parking spaces	X		
Carshare/ Bikeshare	On-site carshare vehicles(s)			
	On-site bikeshare facility			
Wayfinding and Travel Planning	Travel planning resources		X	
	Wayfinding signage		X	
	Support development of School Travel Plans	X		
Education/ Promotion, Incentives	Membership in a TMA/Smart Commute	X		
	Subsidized transit passes, carshare memberships, and/or bikeshare memberships			
	Contributing to building TDM brand		X	

***Definitions for "Modest" and "High" are relative to a typical development of the same type and will be further bench marked through annual review. **Staff comments to be provided on the following page.**

Project Name: 1284 Main Street East

Checklist evaluation:

# measures N/A:	6		< 50% modest provision **= below average ***
# measures modest provision:	12	55%	> 50% modest provision **= average***
# measures high provision:	0	0%	> 10% high provision **= above average***

7 Conclusions and Recommendations

7.1 Conclusions

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

- **Trip Generation:** The Site's trip generation is estimated to be approximately 296 AM peak hour trips and 361 PM peak hour trips.
- **Background Traffic Conditions:** Background traffic growth results in increased congestion in the study area during the PM peak hour. By 2032, the traffic growth along Main Street East is expected to result in northbound and southbound stop-controlled movements at Wexford Avenue North to operate in the LOS D range during the PM peak hour. The v/c ratio for the northbound and southbound movements is forecast to be relatively low in the 0.10 to 0.16 range.
- **Total Traffic Conditions:** All study area intersections are forecast to operate within similar service levels as documented under the background scenario.

  In 2027, the addition of the phase 1 site traffic is forecast to result in operations of the northbound movement at Main Street East at Wexford Avenue North to degrade from LOS D to LOS E. The v/c ratio for the southbound movement is forecast to be relatively low at 0.15. The site access is forecast to operate with delays in the LOS A/B range, with delays not exceeding 15 seconds.

  In 2032, the addition of the full build-out site traffic is forecast to result in operations of the southbound movement at Main Street East at Wexford Avenue North to degrade from LOS E to LOS F. The v/c ratio for the southbound movement is forecast to be relatively low at 0.29.

  With the exception of the southbound movement at Main Street East at Wexford Avenue North, the site traffic is forecast to add less than 10 seconds of delay to intersection movements.

  In the 2027 and 2032 scenarios, the site access is forecast to operate with delays in the LOS B range or better, with delays not exceeding 15 seconds.

7.2 Recommendations

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

- 49 short-term bicycle parking spots be included in the development.
- The City continues to monitor traffic operations at study area signalized intersections and adjusts signal timings as needed.

Appendix A

Terms of Reference

Greg Lue

From: Transportation Planning <Transportation.Planning@hamilton.ca>
Sent: July 11, 2022 11:39 AM
To: Greg Lue
Cc: Adam Makarewicz
Subject: RE: 220238 - 1284 Main Street E Hamilton TIS - Terms of Reference

Hi Greg,

Transportation Planning approves of the scope of work with revisions indicated in red. Please feel free to reach out to tplanning@hamilton.ca if you have any additional questions or concerns. Thank you,

Matthew Radaelli
Project Manager, Transportation Planning – Development Approvals
On Behalf of Transportation Planning
COVID-19 UPDATE: Flexibility and patience is asked of ourselves, clients, contractors and customers working with the City of Hamilton. Most staff are working remotely with limited access to voicemail, so please send emails. All in-person meetings that are required will be become conference calls or another form of virtual meetings. The City is making adjustments to ensure staff are connected to office tools and project files while we protect ourselves and our communities during this time. Please note that while we are trying to maintain time frames for comments on applications and dealing with responding information, we may not always achieve these goals.

From: Greg Lue <glue@ptsl.com>
Sent: June 27, 2022 3:40 PM
To: Transportation Planning <Transportation.Planning@hamilton.ca>
Cc: Adam Makarewicz <amakarewicz@ptsl.com>
Subject: 220238 - 1284 Main Street E Hamilton TIS - Terms of Reference

Hi all,

Paradigm Transportations Solutions Limited has been retained to conduct a Transportation Impact Analysis for a proposed redevelopment at 1284 Main Street East in Hamilton. The property owner proposes redeveloping the lands as a multi-family site comprised of high-rise towers and townhouse components. The development program proposes 610 new residential dwelling units. A total of 746 parking spaces are offered (1.22 spaces per unit). Vehicle access to the site is presented through an access to Maple Avenue across from Houghton Avenue. Given the density proposed, we have assumed the development will be phased through two stages of development.

Proposed Terms of Reference

Study Area Intersections

- Main Street East at Graham Avenue South (signalized);
- Main Street East at Wexford Avenue South (signalized); Please note this intersection is currently unsignalized.
- Main Street East at Houghton Avenue (signalized); Please note this intersection is currently unsignalized.
- Maple Avenue at Graham Avenue South (unsignalized);
- Maple Avenue at Wexford Avenue South (unsignalized);
- One site access. Please confirm the proposed site access will create the fourth leg at the unsignalized intersection of Maple Ave & Houghton Ave S.

Existing Data

We will reach out to trafficops@hamilton.ca for existing count data. If recent traffic count data is not available, does the city have an issue with older counts being used and grown to a 2022 base year using a 2% per annum

growth rate? The consultant is required to conduct new traffic counts within the study area in order to verify new trends in the area following the COVID-19 pandemic.

Horizon Years

2022 Base Year

Opening Day and Full Build-Out. Without setting precedent for the purposes of this TIS, LRT conditions along Main Street East will not be assumed to be completed under full build-out or 5-year post build-out conditions. Please see comments below regarding LRT 'review' scenario.

Analysis Periods

Weekday AM peak hour

Weekday PM peak hour

Analysis

Synchro 10

HCM 6th Edition

SimTraffic Queueing (five 60-min iterations)

Background Traffic

Generalized growth rate 2% per annum. Please utilize a 1% annual growth rate for Main Street East. All other streets within the study area require a 2% annual growth rate accordingly.

Traffic generated by any in stream developments in the area. Can you comment on this and provide any relevant studies or inputs to estimate the traffic for the site(s)? Background growth rates will be utilized to account for any background development within the greater surrounding area of the subject site.

Future Network

LRT EA shows right-in/right out restrictions along Main St E at study area intersections. Please note for the purposes of this TIS the consultant shall be required to provide a section of the report indicating the projected trip distribution to/from the subject site following implementation of LRT along Main Street East (a section of the TIS should be provided with tables/figures indicating the modifications to trip distribution accordingly considering the right-in/right-out restrictions along Main Street East. It is noted that the intersection of Main Street East & Kenilworth Avenue South will allow for U-turn movements for vehicles to travel westbound). No operational analysis is required at this time due to the various levels of assumptions and projections to traffic data that are still to be determined along the Main Street East corridor.

What does the City recommend to be used for the future road network configuration and LRT assumptions? See above.

Site Traffic Estimates

ITE Trip Generation Data 10th Edition

Mode Split

The LRT EA shows an in increase in local transit share between 0.42-0.46 percentage points in the 2031 scenario with the LRT

Does the City support a modal split reduction be applied to the site generated trips or should no modal split reductions be assumed? No modal split reductions shall be assumed.

Site Traffic Distribution

Existing travel patterns and TTS data. Please provide TTS data within the appendices of the report.

Transportation Demand Management Plan

Outline existing and proposed TDM measures, assesses their likely effectiveness for the proposed development, and determine implementation requirements to facilitate their use

Report

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

Thanks,

Greg Lue, M.A.Sc., P.Eng.
Transportation Engineer

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 905.381.2229 x307
m: 905.981.7479
e: glue@ptsl.com
w: www.ptsl.com

Appendix B

Existing Traffic Data

Main St E @ Graham Ave N

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

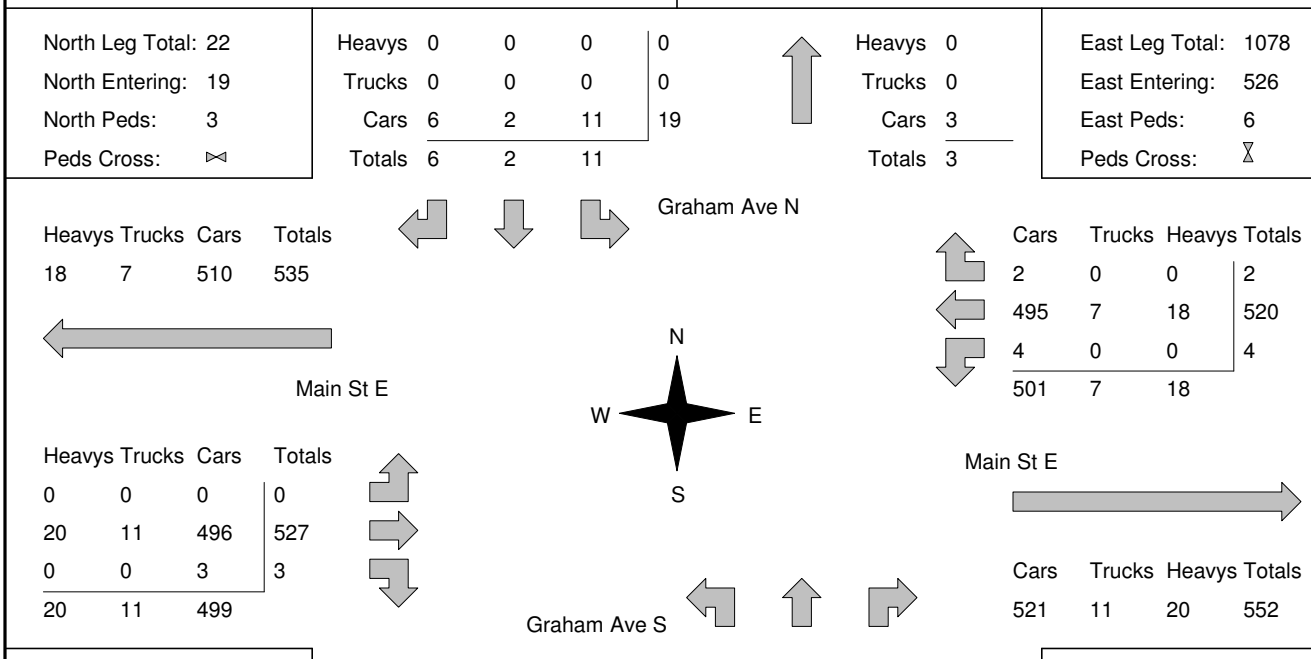
Municipality: Hamilton
Site #: 0000000001
Intersection: Main St E & Graham Ave N
TFR File #: 1
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Main St E runs W/E



Comments

Main St E @ Graham Ave N

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 13:00:00

One Hour Peak
From: 11:00:00
To: 12:00:00

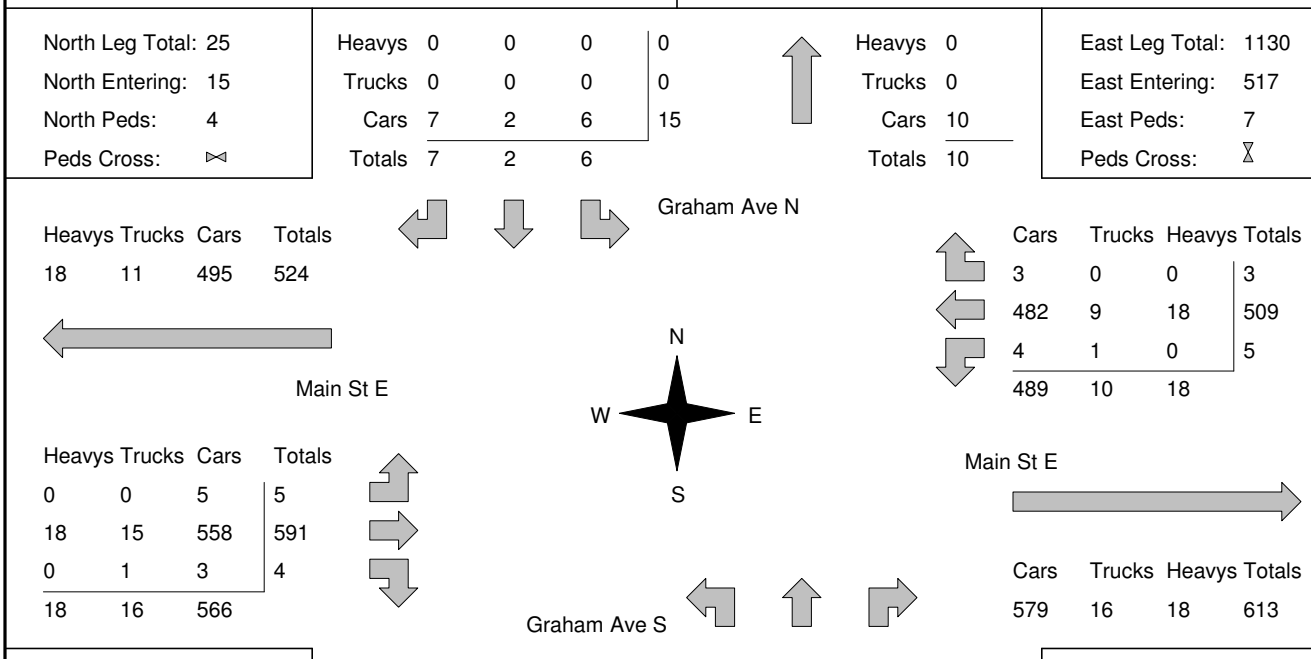
Municipality: Hamilton
Site #: 0000000001
Intersection: Main St E & Graham Ave N
TFR File #: 1
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Main St E runs W/E



Comments

Main St E @ Graham Ave N

Afternoon Peak Diagram

Specified Period
From: 15:30:00
To: 18:30:00

One Hour Peak
From: 16:30:00
To: 17:30:00

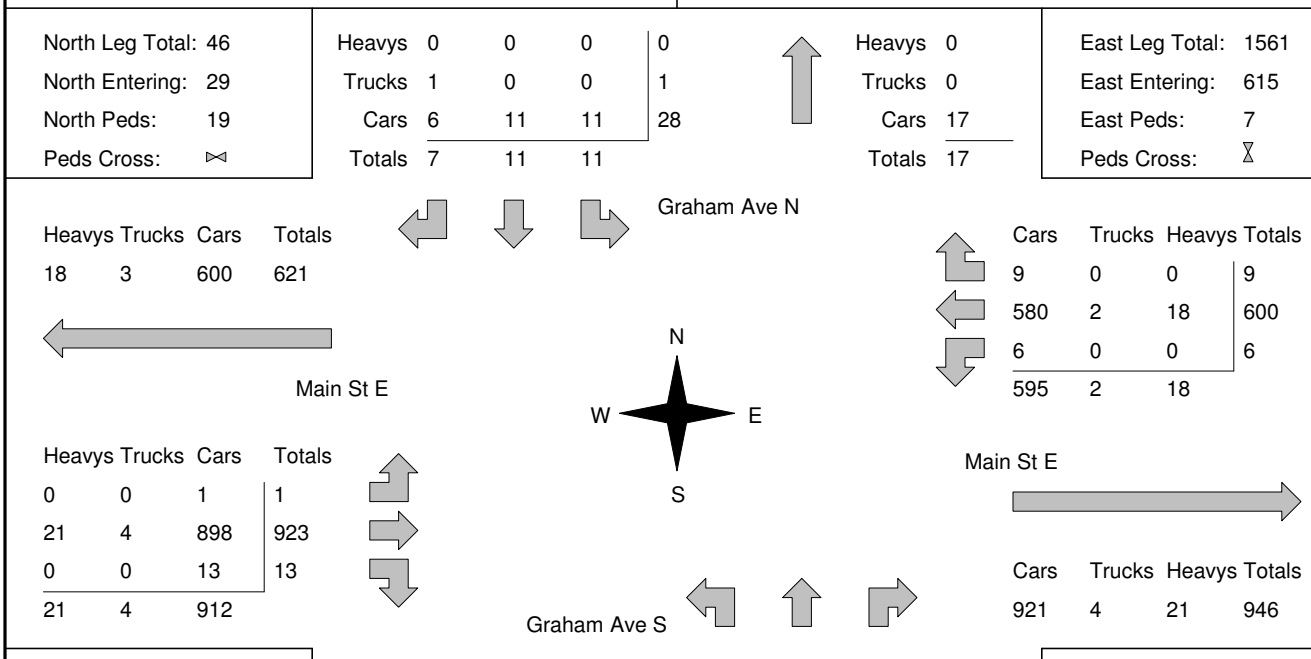
Municipality: Hamilton
Site #: 0000000001
Intersection: Main St E & Graham Ave N
TFR File #: 1
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Main St E runs W/E



Comments

Main St E @ Graham Ave N

Total Count Diagram

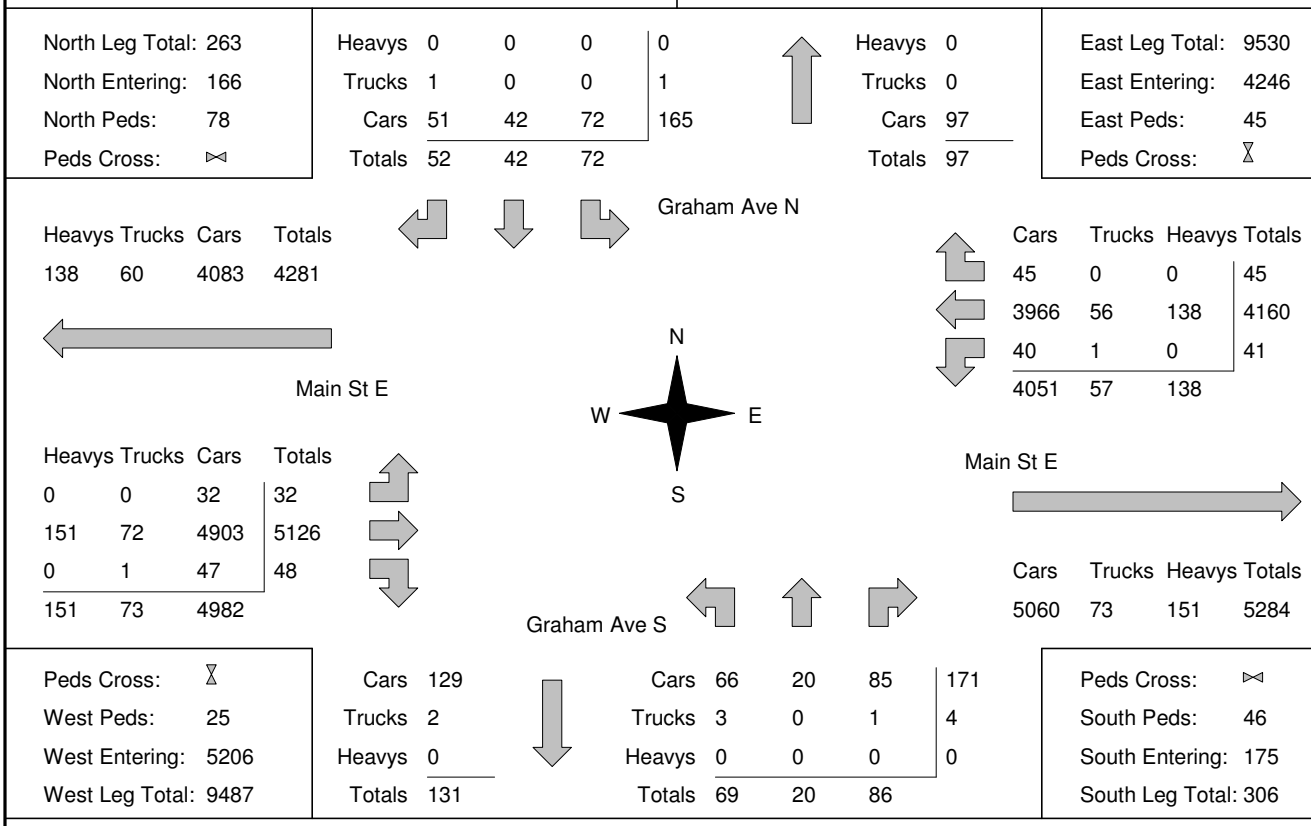
Municipality: Hamilton
Site #: 0000000001
Intersection: Main St E & Graham Ave N
TFR File #: 1
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Main St E runs W/E



Comments

Main St E @ Houghton Ave N

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Hamilton
Site #: 0000000002
Intersection: Main St E & Houghton Ave N
TFR File #: 2
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Main St E runs W/E

North Leg Total: 11
North Entering: 6
North Peds: 5
Peds Cross: ⋈

Heavys	0	0	0
Trucks	0	0	0
Cars	4	2	6
Totals	4	2	

Heavys	0
Trucks	0
Cars	5
Totals	5

East Leg Total: 1086
East Entering: 549
East Peds: 0
Peds Cross: ⧖

Houghton Ave N

Heavys	Trucks	Cars	Totals
19	7	522	548

Cars	Trucks	Heavys	Totals
5	0	0	5
518	7	19	544
523	7	19	

Main St E

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
23	9	503	535
23	9	503	

Main St E

Cars	Trucks	Heavys	Totals
505	9	23	537

Peds Cross: ⧖
West Peds: 0
West Entering: 535
West Leg Total: 1083

Comments

Main St E @ Houghton Ave N

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 13:00:00

One Hour Peak
From: 11:00:00
To: 12:00:00

Municipality: Hamilton
Site #: 0000000002
Intersection: Main St E & Houghton Ave N
TFR File #: 2
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Main St E runs W/E

North Leg Total: 18
North Entering: 5
North Peds: 9
Peds Cross: ⋈

Heavys	0	0	0
Trucks	0	0	0
Cars	1	4	5
Totals	1	4	

Heavys	0
Trucks	0
Cars	13
Totals	13

East Leg Total: 1137
East Entering: 517
East Peds: 0
Peds Cross: ⧖

Houghton Ave N

Heavys	Trucks	Cars	Totals
19	9	484	512

Cars	Trucks	Heavys	Totals
6	0	0	6
483	9	19	511
489	9	19	

Main St E

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	7	7
20	14	582	616
20	14	589	

Main St E

Cars	Trucks	Heavys	Totals
586	14	20	620

Peds Cross: ⧖
West Peds: 0
West Entering: 623
West Leg Total: 1135

Comments

Main St E @ Houghton Ave N

Afternoon Peak Diagram

Specified Period
From: 15:30:00
To: 18:30:00

One Hour Peak
From: 16:15:00
To: 17:15:00

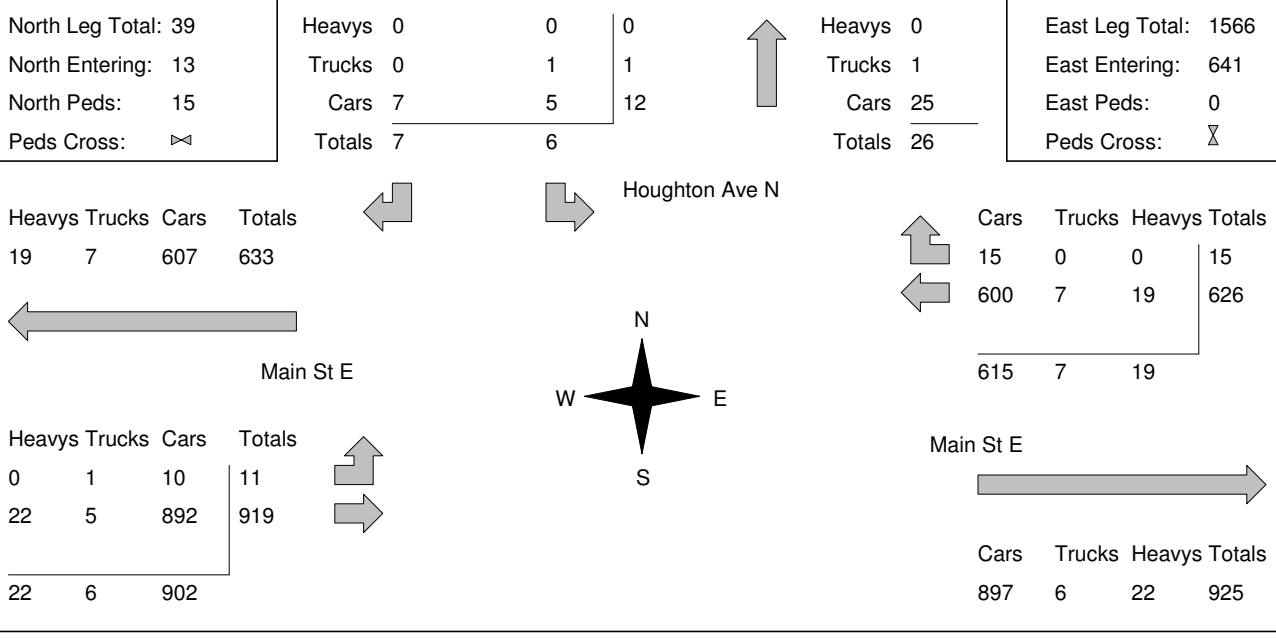
Municipality: Hamilton
Site #: 0000000002
Intersection: Main St E & Houghton Ave N
TFR File #: 2
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Main St E runs W/E



Peds Cross:
West Peds: 0
West Entering: 930
West Leg Total: 1563

Comments

Main St E @ Houghton Ave N

Total Count Diagram

Municipality: Hamilton
Site #: 0000000002
Intersection: Main St E & Houghton Ave N
TFR File #: 2
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Main St E runs W/E

North Leg Total: 181
North Entering: 68
North Peds: 82
Peds Cross: ⋈

Heavys	0	0	0
Trucks	0	1	1
Cars	28	39	67
Totals	28	40	

Heavys	0
Trucks	2
Cars	111
Totals	113

East Leg Total: 9616
East Entering: 4300
East Peds: 1
Peds Cross: ⧖

Houghton Ave N

Heavys	Trucks	Cars	Totals
141	60	4060	4261

Main St E

Heavys	Trucks	Cars	Totals
0	2	44	46
163	70	5043	5276
163	72	5087	

N
W E
S

Cars	Trucks	Heavys	Totals
67	0	0	67
4032	60	141	4233
4099	60	141	

Main St E

Cars	Trucks	Heavys	Totals
5082	71	163	5316

Peds Cross: ⧖
West Peds: 0
West Entering: 5322
West Leg Total: 9583

Comments

Main St E @ Wexford Ave N

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

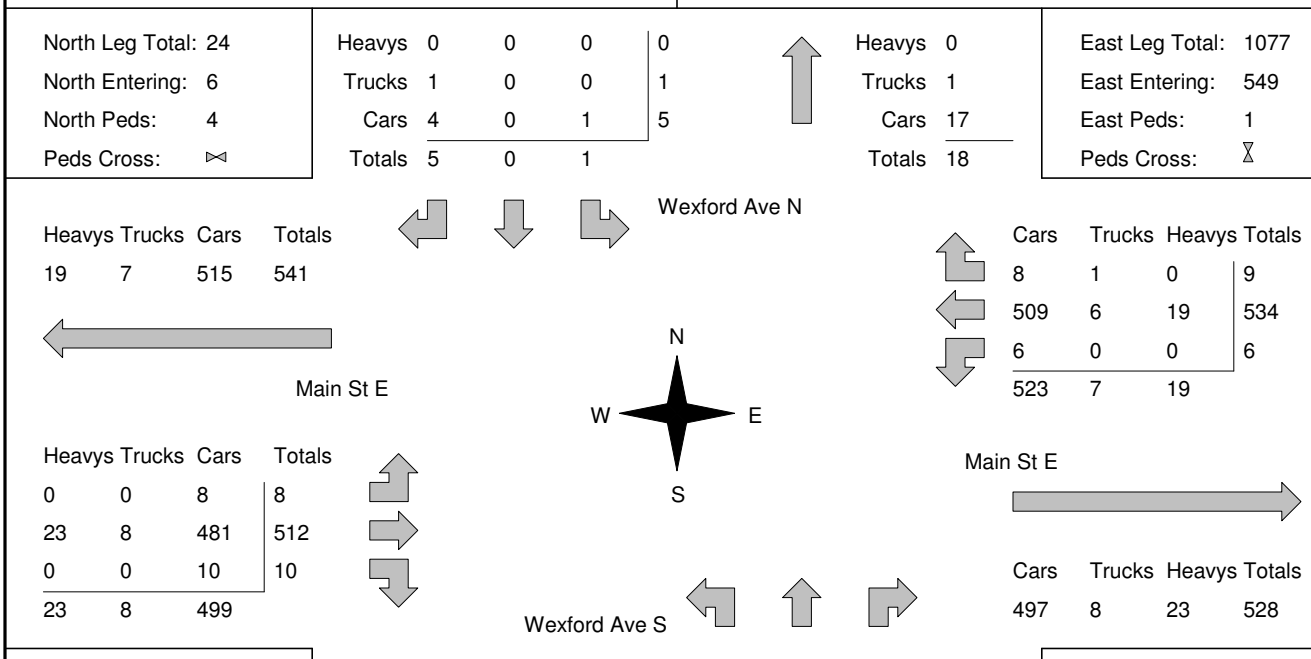
Municipality: Hamilton
Site #: 0000000003
Intersection: Main St E & Wexford Ave N
TFR File #: 3
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Main St E runs W/E



Comments

Main St E @ Wexford Ave N

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 13:00:00

One Hour Peak
From: 11:00:00
To: 12:00:00

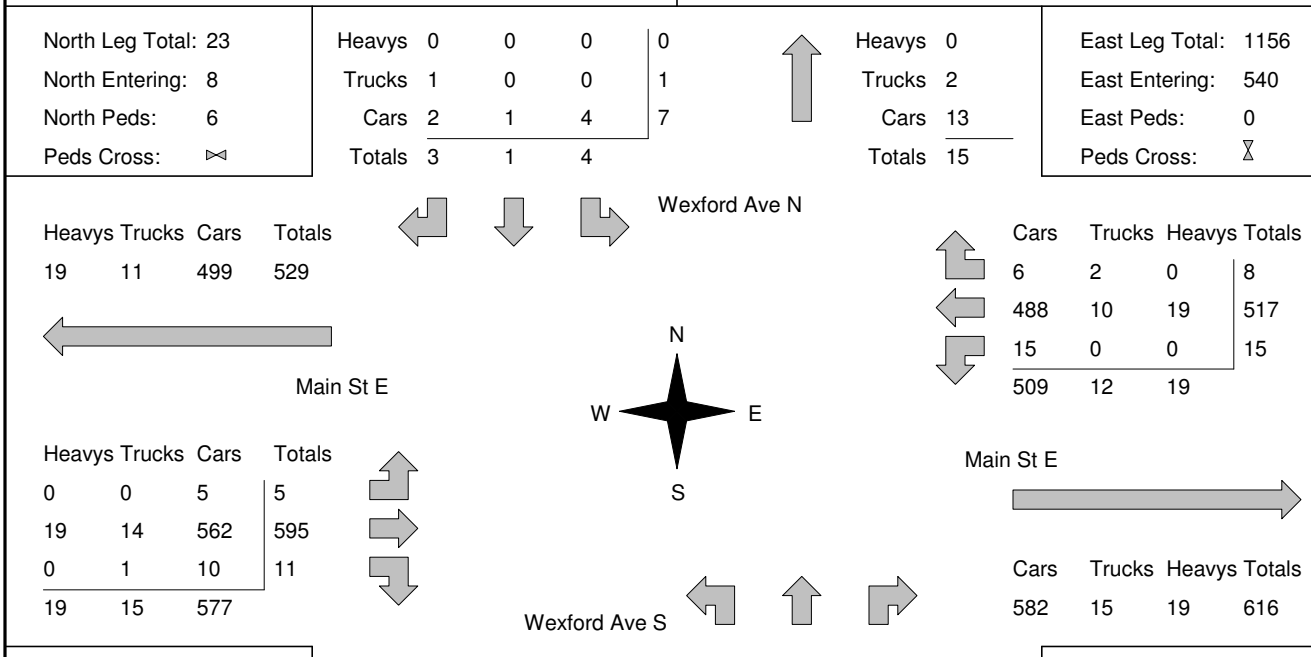
Municipality: Hamilton
Site #: 0000000003
Intersection: Main St E & Wexford Ave N
TFR File #: 3
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Main St E runs W/E



Comments

Main St E @ Wexford Ave N

Afternoon Peak Diagram

Specified Period
From: 15:30:00
To: 18:30:00

One Hour Peak
From: 16:15:00
To: 17:15:00

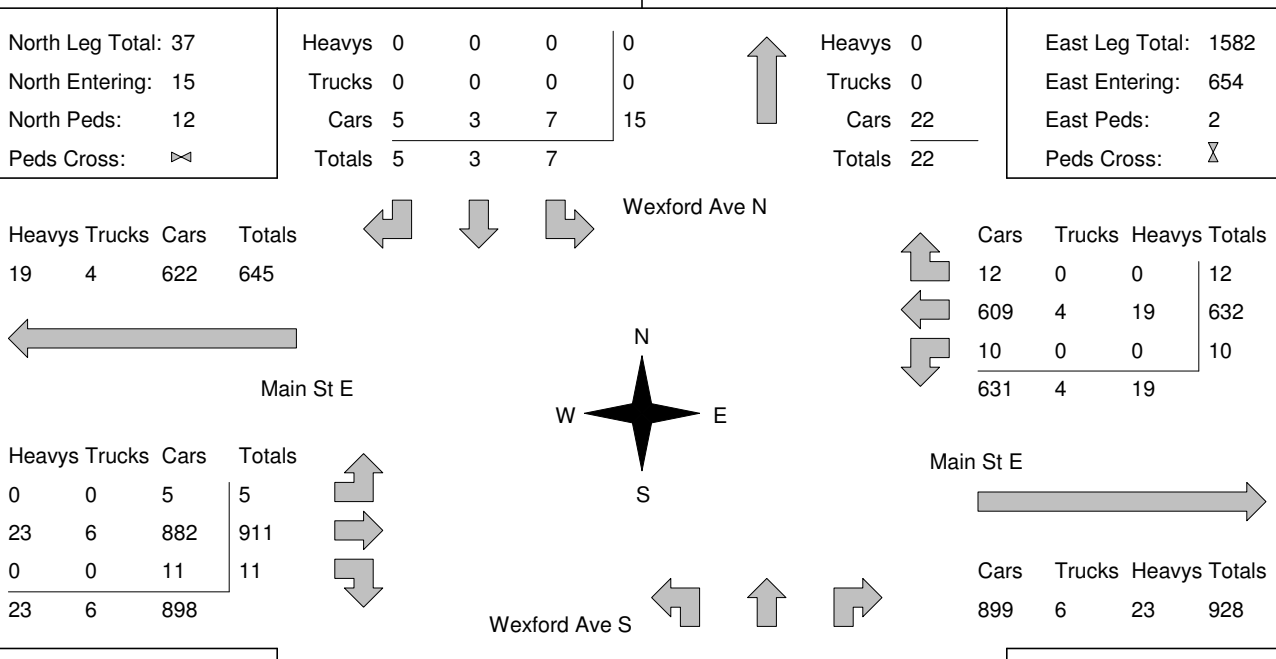
Municipality: Hamilton
Site #: 0000000003
Intersection: Main St E & Wexford Ave N
TFR File #: 3
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Main St E runs W/E



Comments

Main St E @ Wexford Ave N

Total Count Diagram

Municipality: Hamilton
Site #: 0000000003
Intersection: Main St E & Wexford Ave N
TFR File #: 3
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Main St E runs W/E

North Leg Total:	163			
North Entering:	64			
North Peds:	67			
Peds Cross:	⋈			
Heavys	0	0	0	0
Trucks	3	0	0	3
Cars	27	8	26	61
Totals	30	8	26	
Heavys	0			
Trucks	3			
Cars	96			
Totals	99			
East Leg Total:	9667			
East Entering:	4366			
East Peds:	17			
Peds Cross:	⧖			

Wexford Ave N

Heavys	Trucks	Cars	Totals
141	56	4107	4304

Cars	Trucks	Heavys	Totals
45	3	0	48
4036	53	141	4230
88	0	0	88
4169	56	141	

Main St E

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	38	38
155	71	4943	5169
0	1	83	84
155	72	5064	

Main St E

Cars	Trucks	Heavys	Totals
5073	73	155	5301

Wexford Ave S

Peds Cross:	⧖			
West Peds:	7			
West Entering:	5291			
West Leg Total:	9595			
Cars	179			
Trucks	1			
Heavys	0			
Totals	180			
Cars	44	13	104	161
Trucks	0	0	2	2
Heavys	0	0	0	0
Totals	44	13	106	
Peds Cross:	⋈			
South Peds:	58			
South Entering:	163			
South Leg Total:	343			

Comments

Maple Ave @ Graham Ave S

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:30:00
To: 9:30:00

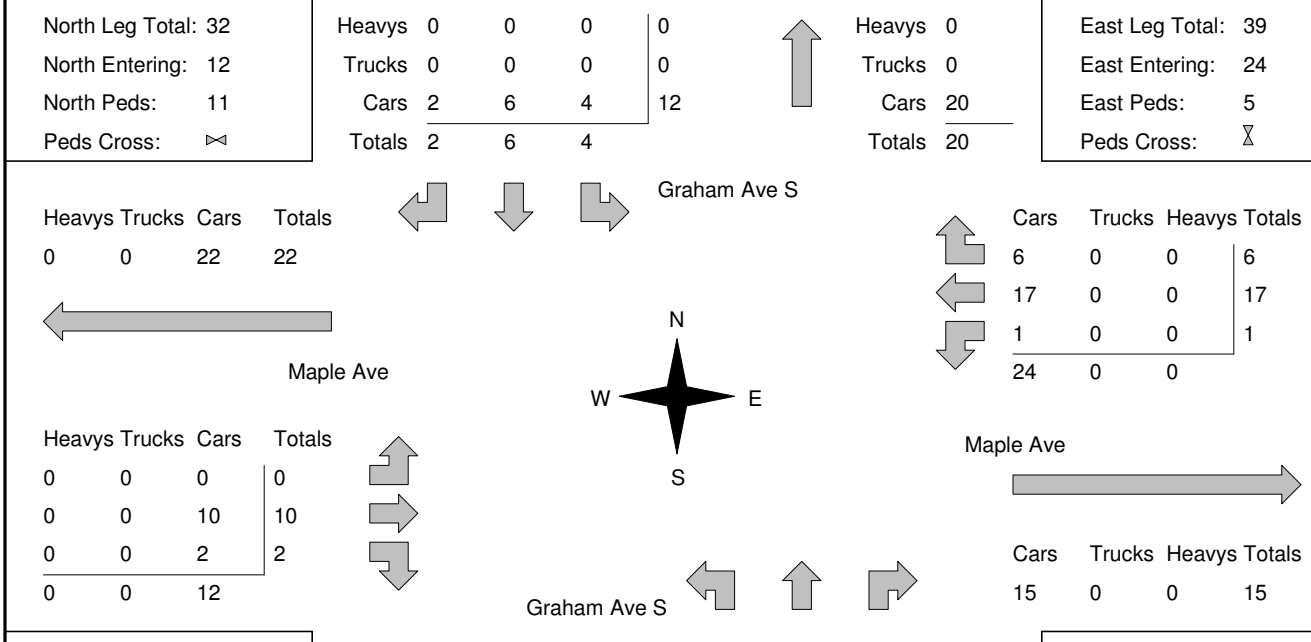
Municipality: Hamilton
Site #: 0000000004
Intersection: Maple Ave & Graham Ave S
TFR File #: 4
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E



Comments

Maple Ave @ Graham Ave S

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 13:00:00

One Hour Peak
From: 12:00:00
To: 13:00:00

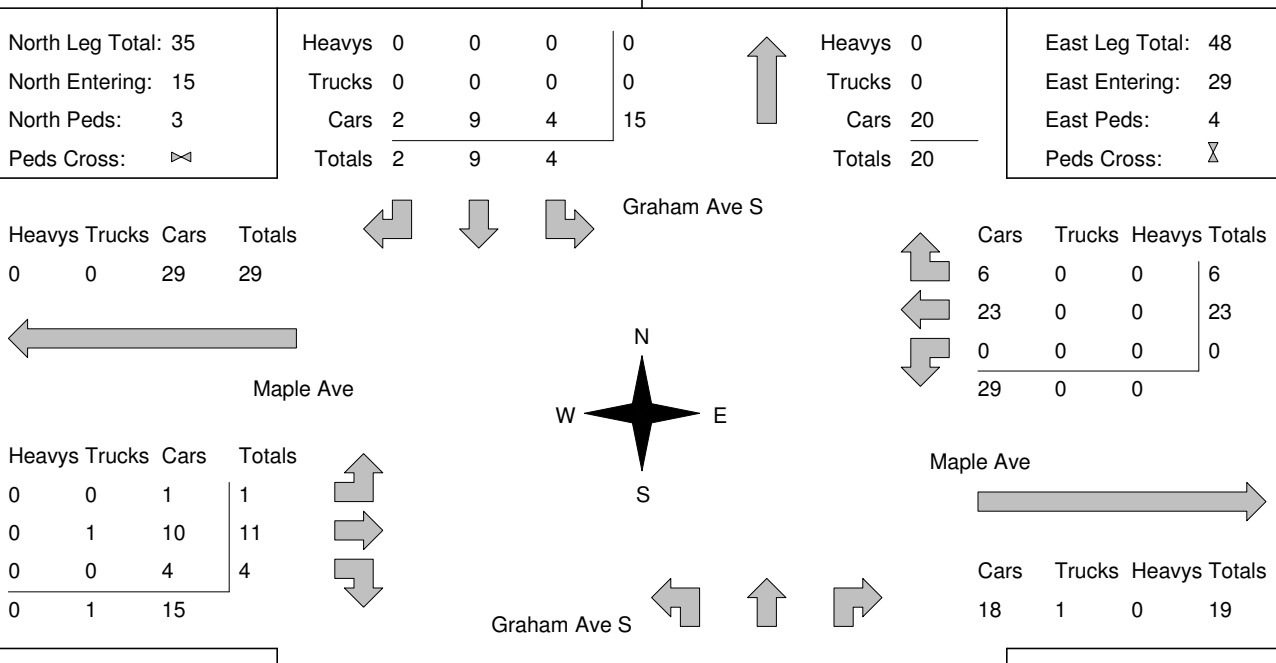
Municipality: Hamilton
Site #: 0000000004
Intersection: Maple Ave & Graham Ave S
TFR File #: 4
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E



Comments

Maple Ave @ Graham Ave S

Afternoon Peak Diagram

Specified Period
From: 15:30:00
To: 18:30:00

One Hour Peak
From: 16:15:00
To: 17:15:00

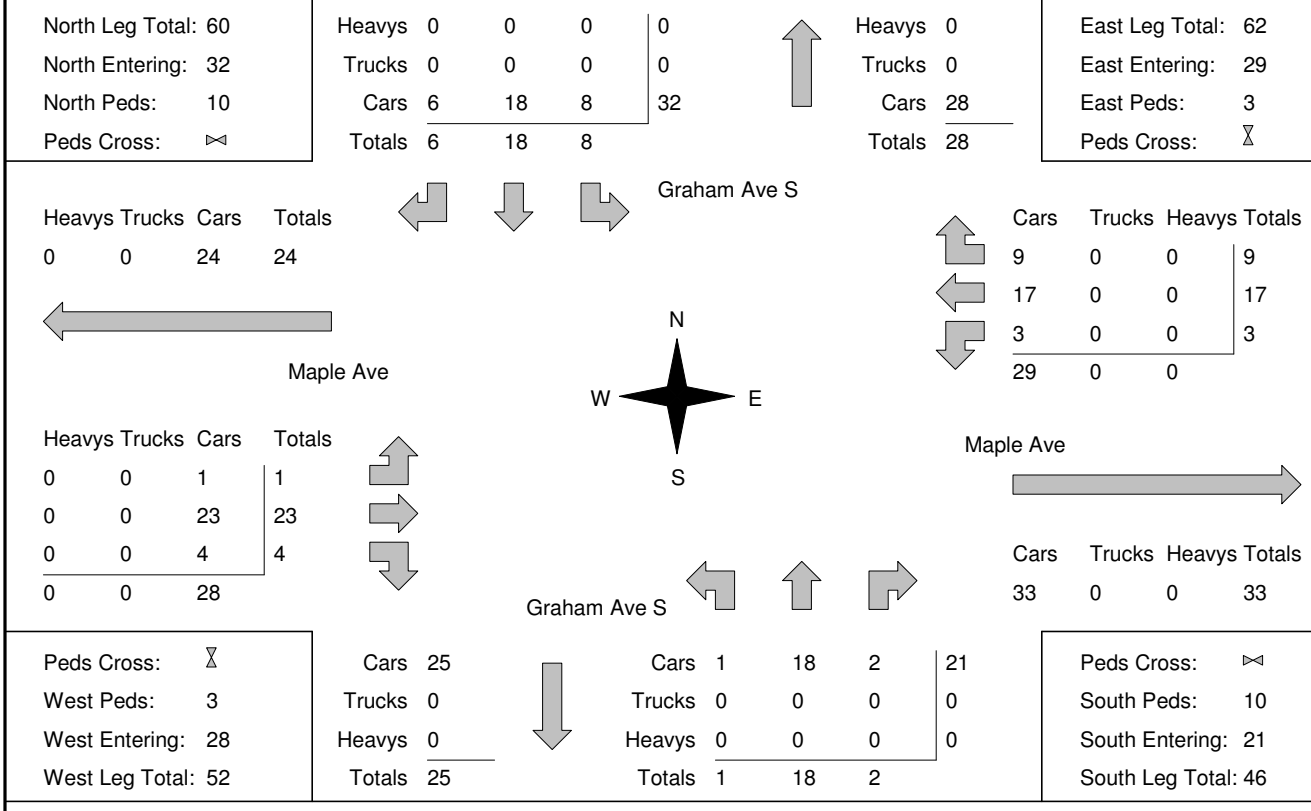
Municipality: Hamilton
Site #: 0000000004
Intersection: Maple Ave & Graham Ave S
TFR File #: 4
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E



Comments

Maple Ave @ Graham Ave S

Total Count Diagram

Municipality: Hamilton
Site #: 0000000004
Intersection: Maple Ave & Graham Ave S
TFR File #: 4
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E

North Leg Total: 281
North Entering: 118
North Peds: 64
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	1	0	1	2
Cars	18	70	28	116
Totals	19	70	29	

Heavys	0
Trucks	3
Cars	160
Totals	163

East Leg Total: 327
East Entering: 190
East Peds: 31
Peds Cross: ⧖

Graham Ave S

Heavys	Trucks	Cars	Totals
0	3	159	162

Maple Ave

	Cars	Trucks	Heavys	Totals
	49	0	0	49
	125	2	0	127
	14	0	0	14
	188	2	0	

N
W E
S

Heavys	Trucks	Cars	Totals
0	1	16	17
0	2	88	90
0	0	20	20
0	3	124	

Maple Ave

Cars	Trucks	Heavys	Totals
133	4	0	137

Graham Ave S

Peds Cross: ⧖
West Peds: 26
West Entering: 127
West Leg Total: 289

Cars	104
Trucks	0
Heavys	0
Totals	104

Cars	16	95	17	128
Trucks	0	2	1	3
Heavys	0	0	0	0
Totals	16	97	18	

Peds Cross: ⋈
South Peds: 57
South Entering: 131
South Leg Total: 235

Comments

Maple Ave @ Houghton Ave S

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:30:00
To: 9:30:00

Municipality: Hamilton
Site #: 0000000005
Intersection: Maple Ave & Houghton Ave S
TFR File #: 5
Count date: 26-Jul-2022

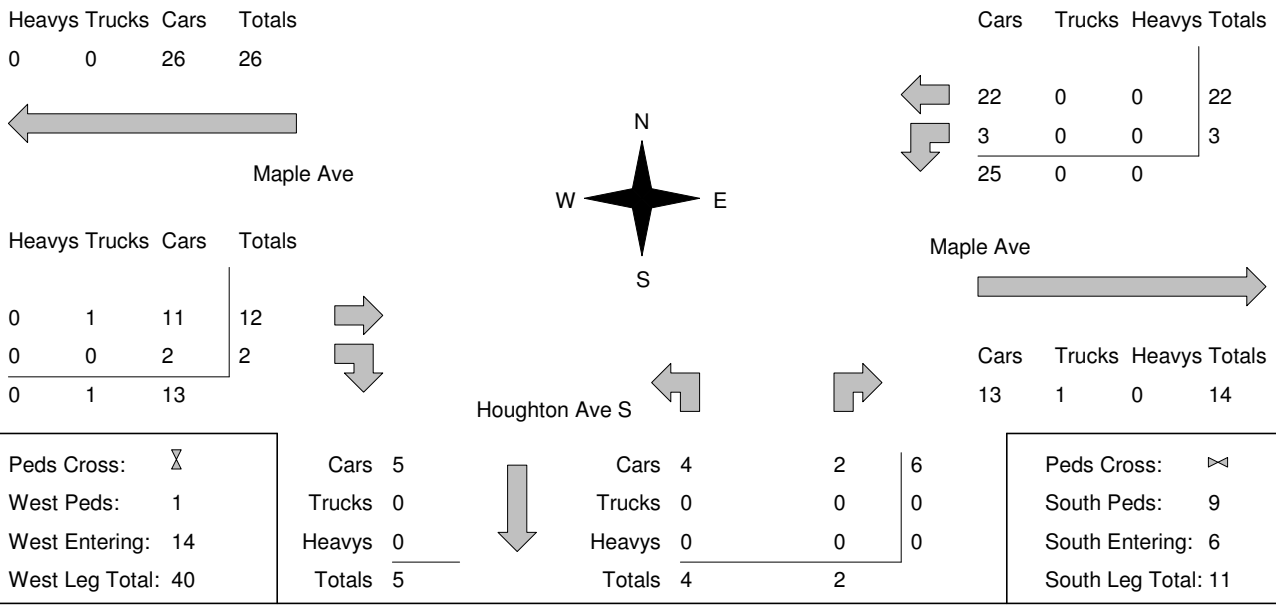
Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E

East Leg Total: 39
East Entering: 25
East Peds: 0
Peds Cross:



Peds Cross:
West Peds: 1
West Entering: 14
West Leg Total: 40

Cars 5
Trucks 0
Heavys 0
Totals 5

Cars 4 2 6
Trucks 0 0 0
Heavys 0 0 0
Totals 4 2

Peds Cross:
South Peds: 9
South Entering: 6
South Leg Total: 11

Comments

Maple Ave @ Houghton Ave S

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 13:00:00

One Hour Peak
From: 12:00:00
To: 13:00:00

Municipality: Hamilton
Site #: 0000000005
Intersection: Maple Ave & Houghton Ave S
TFR File #: 5
Count date: 26-Jul-2022

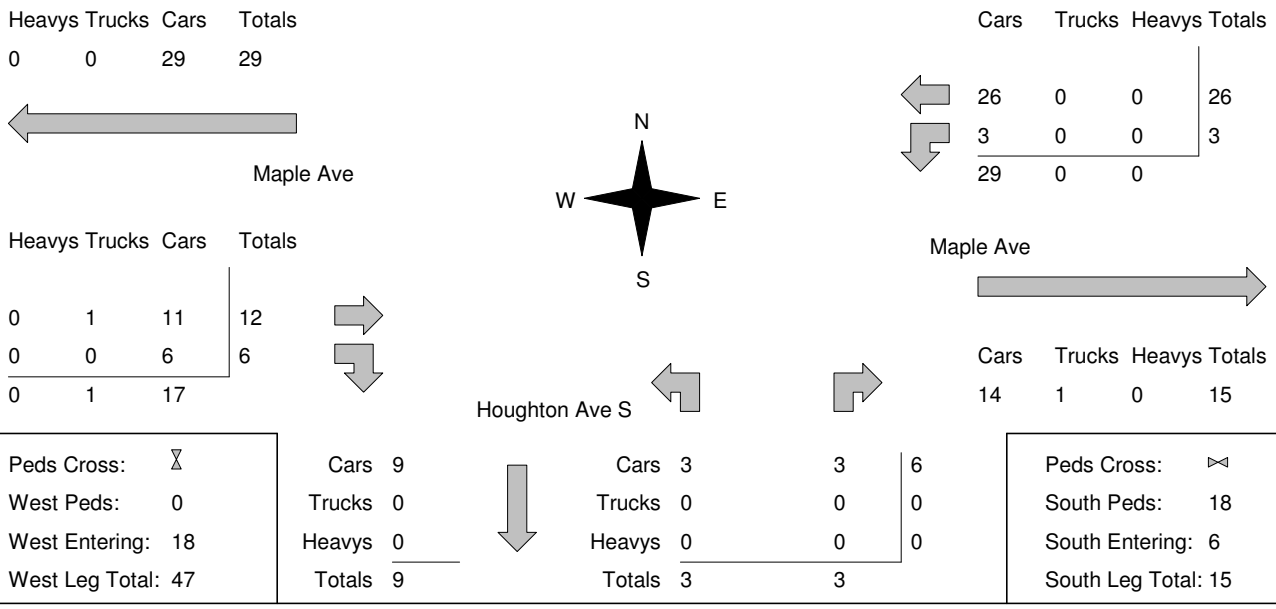
Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E

East Leg Total: 44
East Entering: 29
East Peds: 2
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 18
West Leg Total: 47

Cars 9
Trucks 0
Heavys 0
Totals 9

Peds Cross: ⋈
South Peds: 18
South Entering: 6
South Leg Total: 15

Comments

Maple Ave @ Houghton Ave S

Afternoon Peak Diagram

Specified Period
From: 15:30:00
To: 18:30:00

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Hamilton
Site #: 0000000005
Intersection: Maple Ave & Houghton Ave S
TFR File #: 5
Count date: 26-Jul-2022

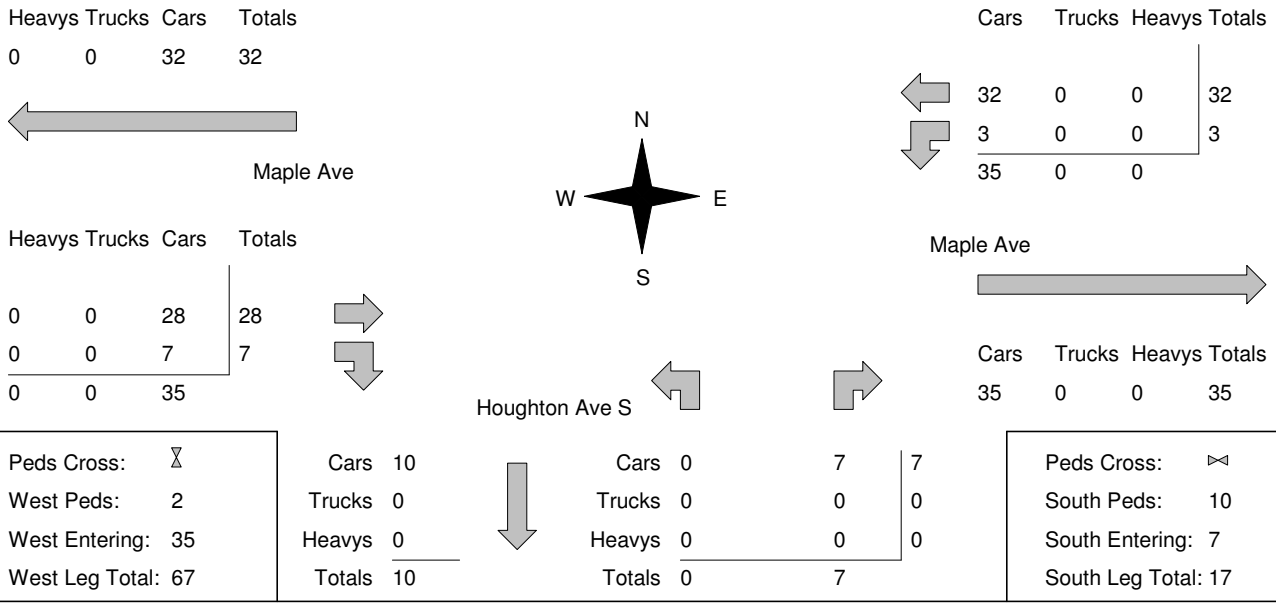
Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E

East Leg Total: 70
East Entering: 35
East Peds: 1
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 2
West Entering: 35
West Leg Total: 67

Cars 10
Trucks 0
Heavys 0
Totals 10

Cars 0 7 7
Trucks 0 0 0
Heavys 0 0 0
Totals 0 7

Peds Cross: ⋈
South Peds: 10
South Entering: 7
South Leg Total: 17

Comments

Maple Ave @ Houghton Ave S

Total Count Diagram

Municipality: Hamilton
Site #: 0000000005
Intersection: Maple Ave & Houghton Ave S
TFR File #: 5
Count date: 26-Jul-2022

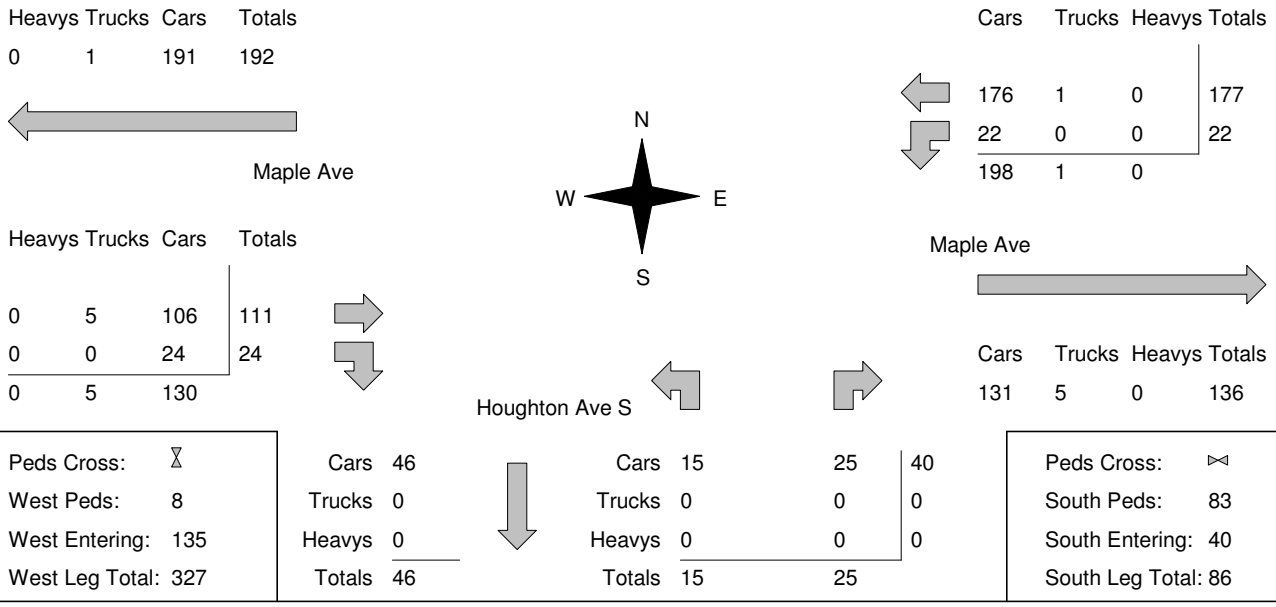
Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E

East Leg Total: 335
East Entering: 199
East Peds: 6
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 8
West Entering: 135
West Leg Total: 327

Cars 46
Trucks 0
Heavys 0
Totals 46

Cars 15 25 40
Trucks 0 0 0
Heavys 0 0 0
Totals 15 25

Peds Cross: ⋈
South Peds: 83
South Entering: 40
South Leg Total: 86

Comments

Maple Ave @ Wexford Ave S

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:45:00
To: 9:45:00

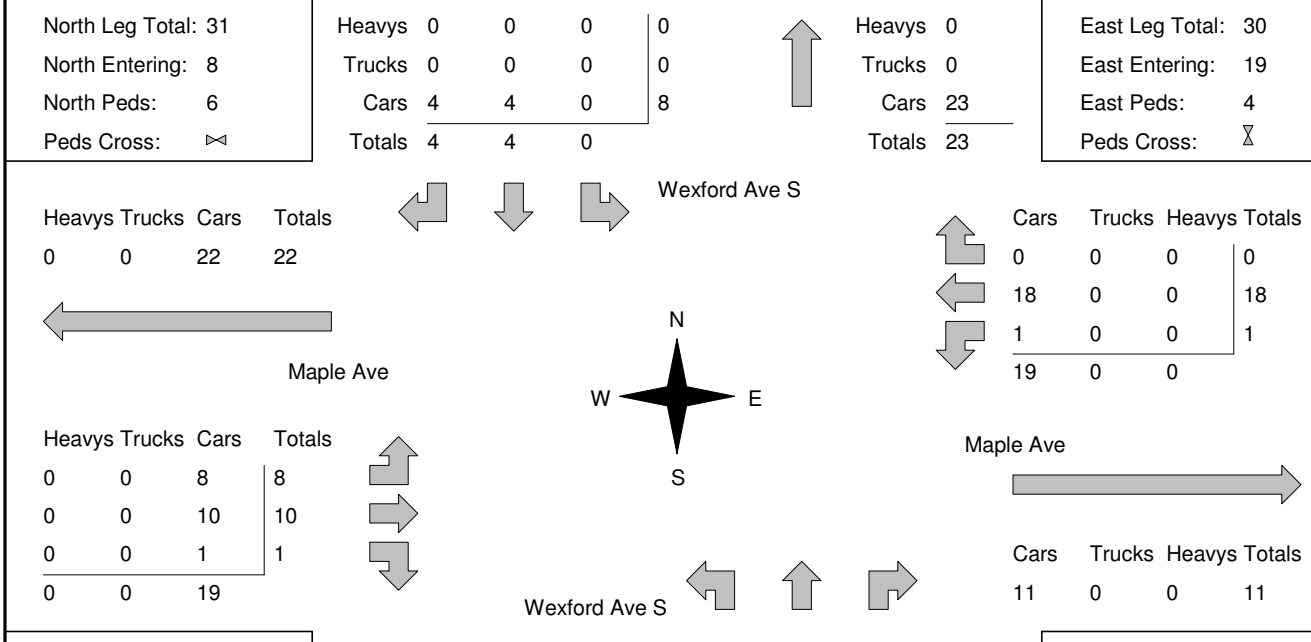
Municipality: Hamilton
Site #: 0000000006
Intersection: Maple Ave & Wexford Ave S
TFR File #: 6
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E



Comments

Maple Ave @ Wexford Ave S

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 13:00:00

One Hour Peak
From: 11:00:00
To: 12:00:00

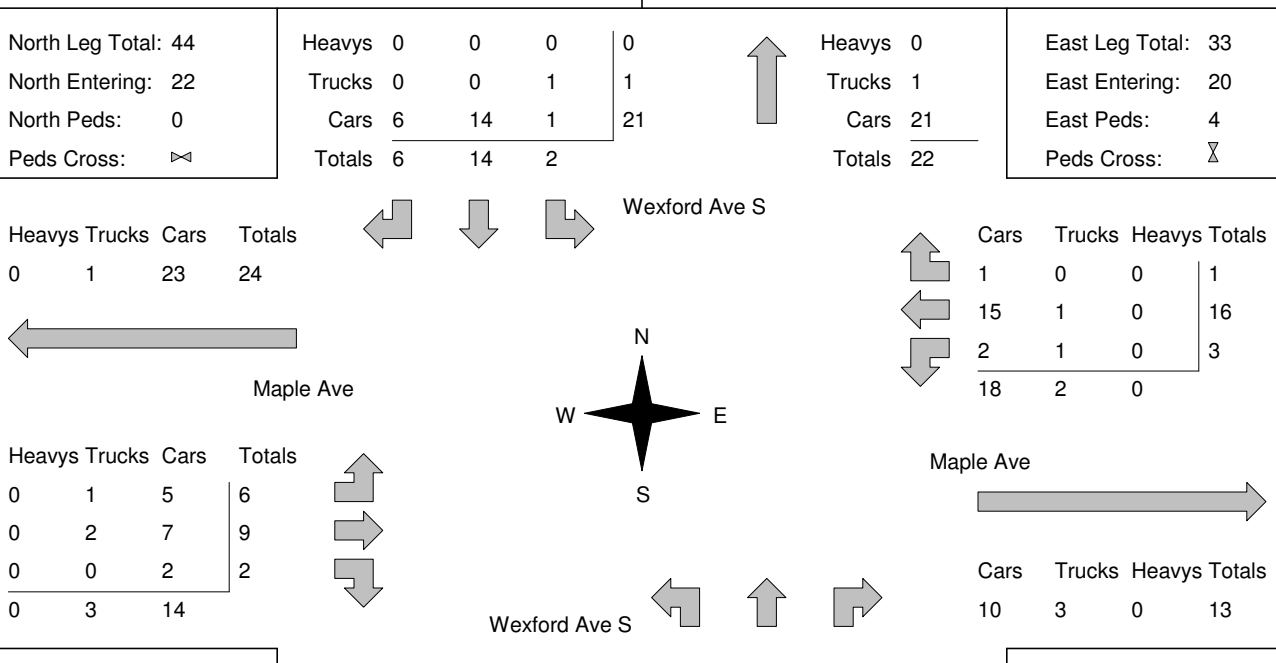
Municipality: Hamilton
Site #: 0000000006
Intersection: Maple Ave & Wexford Ave S
TFR File #: 6
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E



Comments

Maple Ave @ Wexford Ave S

Afternoon Peak Diagram

Specified Period
From: 15:30:00
To: 18:30:00

One Hour Peak
From: 16:15:00
To: 17:15:00

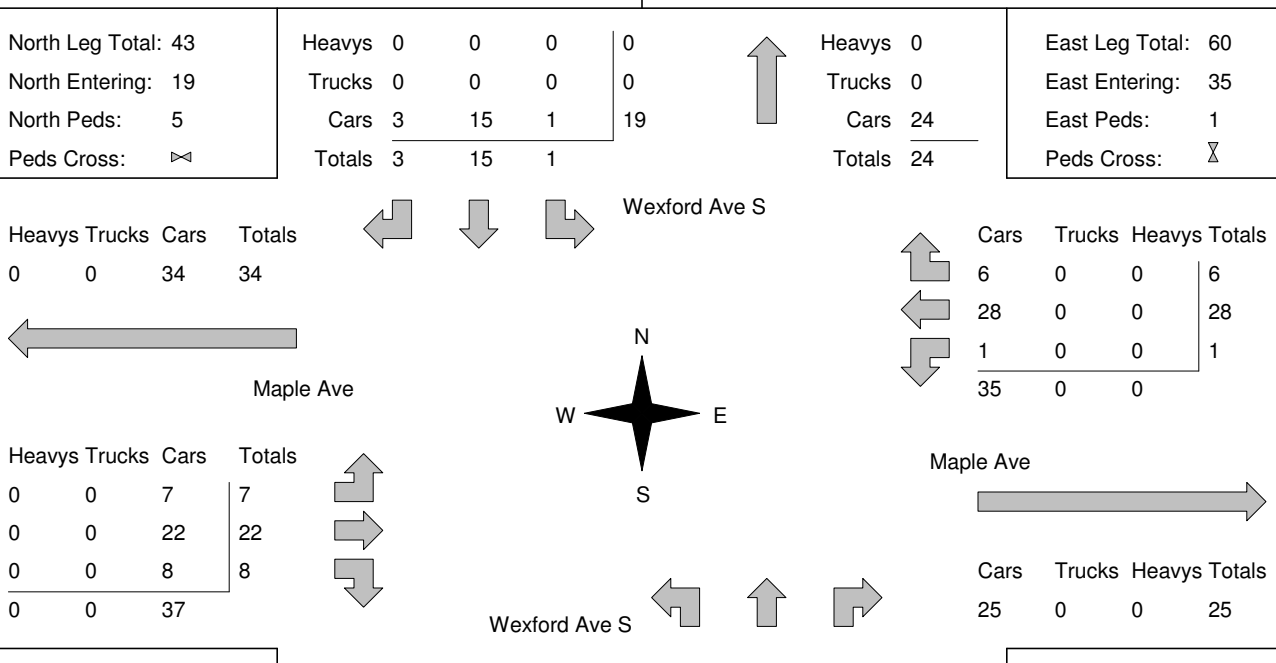
Municipality: Hamilton
Site #: 0000000006
Intersection: Maple Ave & Wexford Ave S
TFR File #: 6
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E



Comments

Maple Ave @ Wexford Ave S

Total Count Diagram

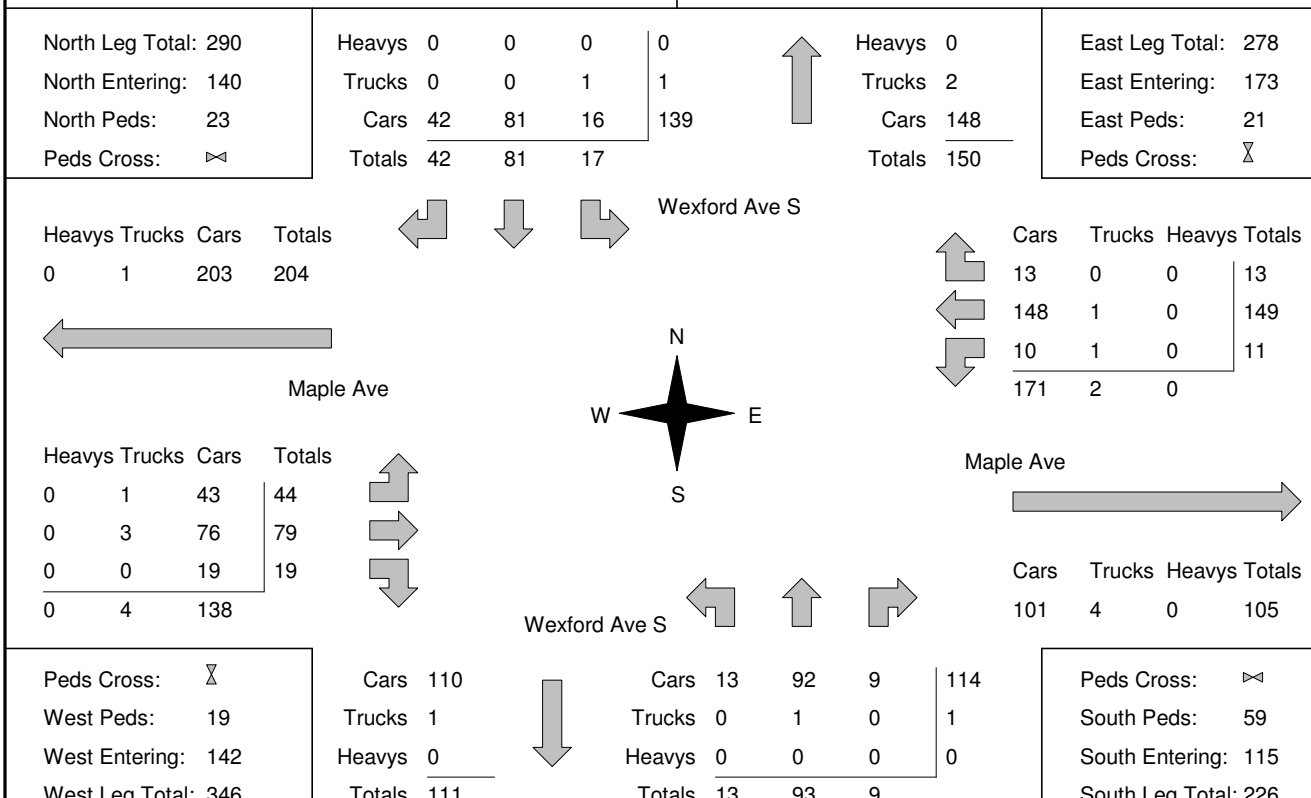
Municipality: Hamilton
Site #: 0000000006
Intersection: Maple Ave & Wexford Ave S
TFR File #: 6
Count date: 26-Jul-2022

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Maple Ave runs W/E



Comments

City of Hamilton - Traffic
Traffic Signal Controller Timing Data

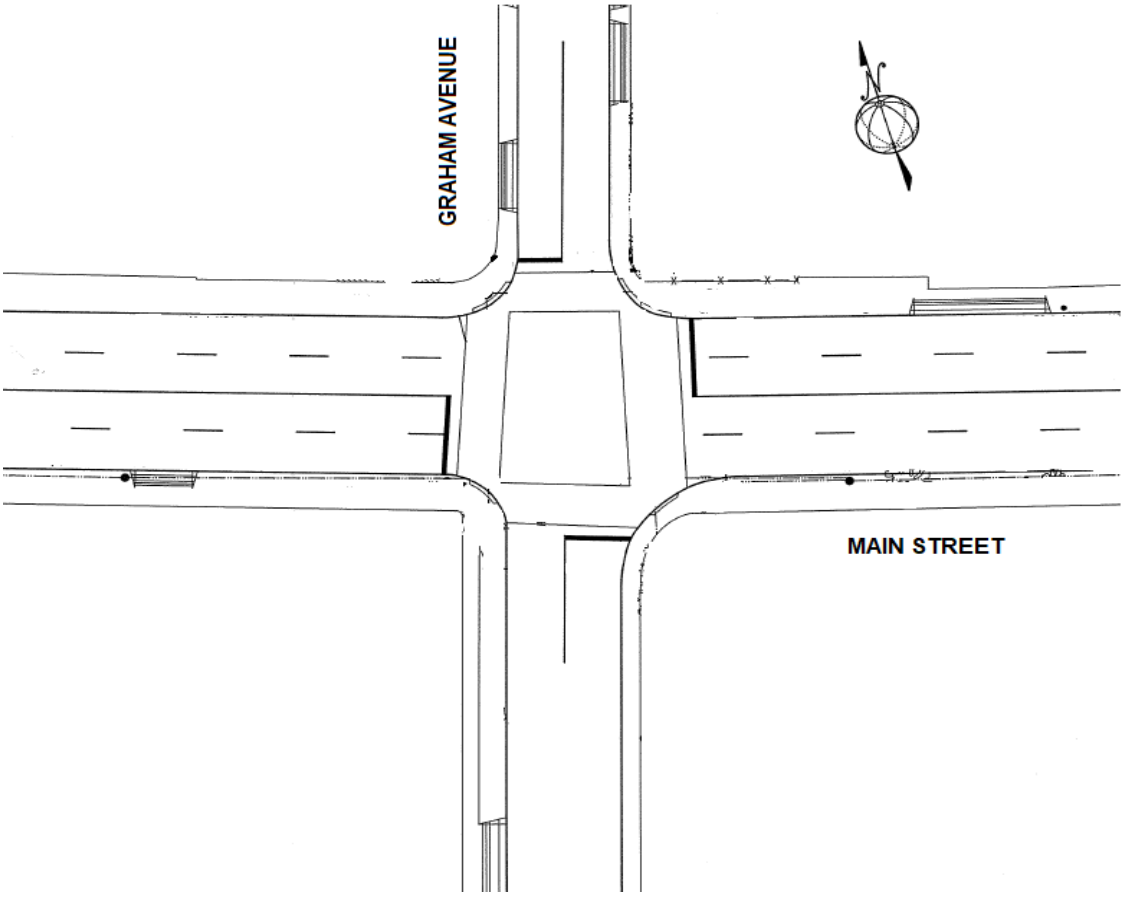
Intersection: **Main St E. at Graham Ave**

Controller Type: **3000E** Page **1** of **15**

Programmed By: **CJM** Installed By: **CJM**

Date: **Dec 19/18** Date:

Readon for Timing Change: **Updated TOD Plan**



ϕ1:
ϕ2: **Main - EB/WB, North & South Xwalk**
ϕ3:
ϕ4: **Graham - NB/SB, East & West Xwalks**
ϕ5:
ϕ6:
ϕ7:
ϕ8:

Flash Operation: **Red: Main**
Red: Graham

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

START-UP PHASES/INTERVAL/SEQUENCE

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

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

PHASE RING ASSIGNMENTS

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

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

CO-PHASE GRP 1-4 ASSIGNMENTS

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

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

CONTROLLER DATA

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

(X = ENABLE) **TP1 PHASE RECALLS**

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

(X = ENABLE) **TP2 PHASE RECALLS**

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

CONTROLLER DATA

TP3 PHASE RECALLS

(X = ENABLE)

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

TP4 PHASE RECALLS

(X = ENABLE)

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

CONTROLLER DATA

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

(X = ENABLE)

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

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

		TP1															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		**35**		**10**												
	Passage				**3.0**												
	Yellow		**3.3**		**3.3**												
	Red		**1.8**		**2.1**												
	Walk		**12**		**10**												
	Ped Clr		**10**		**13**												
	Max 1		**50**		**25**												
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	AI/Act																
	Max In																

CONTROLLER DATA

TP2

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		**10**		**10**												
	Passage				**3.0**												
	Yellow		**3.3**		**3.3**												
	Red		**1.8**		**2.1**												
	Walk		**12**		**10**												
	Ped Clr		**10**		**13**												
	Max 1		**50**		**25**												
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	AI/Act																
	Max In																

TP3

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		**10**		**10**												
	Passage				**3.0**												
	Yellow		**3.3**		**3.3**												
	Red		**1.8**		**2.1**												
	Walk		**12**		**10**												
	Ped Clr		**10**		**13**												
	Max 1		**50**		**25**												
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	AI/Act																
	Max In																

CONTROLLER DATA

		TP4															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE TIMES	Initial		**10**		**10**												
	Passage				**3.0**												
	Yellow		**3.3**		**3.3**												
	Red		**1.8**		**2.1**												
	Walk		**12**		**10**												
	Ped Clr		**10**		**13**												
	Max 1		**50**		**25**												
	Max 2																
	Mx 3 Lim																
	Mx 3 Adh																
	TBR																
	TTR																
	Min Gap																
	Al/Act																
	Max In																

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

(X = ASSIGN VEH DETECTOR TO THAT PHASE)

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

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

(X = ASSIGN PED DETECTOR TO THAT PHASE)

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

SELECTION SOURCE (MM-3-2-2)

Entries determine how parameters get selected

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

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

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

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

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

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

USE THIS CHART WHEN 4 SPLITS/CYCLE = Y

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

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

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

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

CYCLE & OFFSETS	Cycle #	**1/1**	**2/1**	**3/1**				
	Length	**90**	**90**	**90**				
	Offset 1	**65**	**56**	**51**				**Secs**
	Offset 2							
	Offset 3							
	Offset 4							
	Offset 5							
	Max Dwell	**32**	**32**	**32**	**32**			

COORD PHASES (MM-3-2-5)

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

PHASE ALLOCATION (MM-3-2-6)

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

	PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PHASE ALLO-CATION	**C1 S1**		**50**		**40**												
	C1 S2																
	C1 S3																
	C1 S4																
	C2 S1		**50**		**40**												
	C2 S2																
	C2 S3																
	C2 S4																
	C3 S1		**50**		**40**												
	C3 S2																
	C3 S3																
	C3 S4																
	C4 S1		**39**		**31**												
	C4 S2																
	C4 S3																
	C4 S4																

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

Offset Seeeking Mode:	**0**

Mode

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

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

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

ENHANCED OPTIONS

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

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

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

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

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

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

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

MANUAL/AUTO FORCE OFFS & PERMS

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

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

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

	HH	MM	CIRCUIT PLAN	C	O	S	CKT	ON/OFF
1	00	00					11(FRE)	OFF
	00	00		1	1	1		
2	00	00					11(FRE)	OFF
	00	00		1	1	1		
	06	30		2	1	1		
	09	30		1	1	1		
	15	30		3	1	1		
	18	00		1	1	1		

WEEK PLANS (MM-3-3-3)

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

CIRCUIT OVERRIDES (MM-3-3-6)

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

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

DAYLIGHT SAVINGS (MM-3-3-7)

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

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

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

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

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

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

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

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

CLOSED LOOP ID	Master Type:	**1**	0 = None, 1 = 3000 Series Master, 2 = 3800 EL master
	Intersection ID	**13**	0-255
	Master Identification	**10**	0-255
	Allow Comm Xfer Between Ports 2 & 3		Y/N: Y = Incoming signal on Master port (2 or 3), gets echo'd on other port

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

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

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

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

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

PHONE NUMBERS (MM-3-5-3)

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

LOG DATA (MM-3-5-5)

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

Appendix C

Base Year Traffic Operations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	527	3	4	520	2	9	1	14	11	2	6
Future Volume (vph)	0	527	3	4	520	2	9	1	14	11	2	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.999			0.999			0.920			0.955	
Flt Protected								0.982			0.972	
Satd. Flow (prot)	0	3403	0	0	3436	0	0	1697	0	0	1755	0
Flt Permitted					0.952			0.940			0.906	
Satd. Flow (perm)	0	3403	0	0	3271	0	0	1623	0	0	1629	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			1			16			7	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		89.6			83.3			185.5			186.4	
Travel Time (s)		6.5			6.0			16.7			16.8	
Confl. Peds. (#/hr)	3		1	1		3	3		6	6		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	6%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	586	3	4	578	2	10	1	16	12	2	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	589	0	0	584	0	0	27	0	0	21	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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		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)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.1	28.1		28.1	28.1		28.4	28.4		28.4	28.4	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	55.6%	55.6%		55.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	44.9	44.9		44.9	44.9		34.6	34.6		34.6	34.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.8	1.8		1.8	1.8		2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			5.4			5.4	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	12.0	12.0		12.0	12.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
v/c Ratio		0.35			0.36			0.04			0.03	
Control Delay		14.4			14.5			10.8			13.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.4			14.5			10.8			13.6	
LOS		B			B			B			B	
Approach Delay		14.4			14.5			10.8			13.6	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 6 (7%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.36			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 46.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Graham Avenue S/Graham Avenue N & Main Street E

Queues
1: Graham Avenue S/Graham Avenue N & Main Street E

Base Year
AM Peak Hour

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	589	584	27	21
v/c Ratio	0.35	0.36	0.04	0.03
Control Delay	14.4	14.5	10.8	13.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.4	14.5	10.8	13.6
Queue Length 50th (m)	32.5	32.4	1.2	1.6
Queue Length 95th (m)	44.4	44.5	6.5	6.3
Internal Link Dist (m)	65.6	59.3	161.5	162.4
Turn Bay Length (m)				
Base Capacity (vph)	1698	1632	633	630
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.36	0.04	0.03

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Graham Avenue S/Graham Avenue N & Main Street E

Base Year
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	527	3	4	520	2	9	1	14	11	2	6
Future Volume (vph)	0	527	3	4	520	2	9	1	14	11	2	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1			5.1			5.4			5.4	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.92			0.95	
Flt Protected		1.00			1.00			0.98			0.97	
Satd. Flow (prot)		3404			3437			1695			1748	
Flt Permitted		1.00			0.95			0.94			0.91	
Satd. Flow (perm)		3404			3273			1623			1630	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	586	3	4	578	2	10	1	16	12	2	7
RTOR Reduction (vph)	0	1	0	0	1	0	0	10	0	0	4	0
Lane Group Flow (vph)	0	588	0	0	583	0	0	17	0	0	17	0
Confl. Peds. (#/hr)	3		1	1		3	3		6	6		3
Heavy Vehicles (%)	0%	6%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		44.9			44.9			34.6			34.6	
Effective Green, g (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
Clearance Time (s)		5.1			5.1			5.4			5.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1698			1632			623			626	
v/s Ratio Prot		0.17										
v/s Ratio Perm					c0.18			c0.01			0.01	
v/c Ratio		0.35			0.36			0.03			0.03	
Uniform Delay, d1		13.7			13.8			17.2			17.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.6			0.6			0.1			0.1	
Delay (s)		14.2			14.4			17.3			17.3	
Level of Service		B			B			B			B	
Approach Delay (s)		14.2			14.4			17.3			17.3	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.21				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		10.5	
Intersection Capacity Utilization	46.3%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	535	544	5	2	4
Future Volume (vph)	0	535	544	5	2	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.999		0.910	
Flt Protected					0.984	
Satd. Flow (prot)	0	3406	3436	0	1701	0
Flt Permitted					0.984	
Satd. Flow (perm)	0	3406	3436	0	1701	0
Link Speed (k/h)		50	50		40	
Link Distance (m)		83.3	87.2		205.5	
Travel Time (s)		6.0	6.3		18.5	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%
Adj. Flow (vph)	0	588	598	5	2	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	588	603	0	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	535	544	5	2	4
Future Volume (Veh/h)	0	535	544	5	2	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	588	598	5	2	4
Pedestrians					5	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		83				
pX, platoon unblocked					0.90	
vC, conflicting volume	608				900	306
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	608				674	306
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				99	99
cM capacity (veh/h)	976				353	693

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	196	392	399	204	6
Volume Left	0	0	0	0	2
Volume Right	0	0	0	5	4
cSH	976	1700	1700	1700	524
Volume to Capacity	0.00	0.23	0.23	0.12	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	11.9
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.9
Approach LOS					B

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		25.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	512	10	6	534	9	2	1	15	1	0	5
Future Volume (vph)	8	512	10	6	534	9	2	1	15	1	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.998			0.886			0.887	
Flt Protected		0.999			0.999			0.995			0.992	
Satd. Flow (prot)	0	3399	0	0	3426	0	0	1675	0	0	1433	0
Flt Permitted		0.999			0.999			0.995			0.992	
Satd. Flow (perm)	0	3399	0	0	3426	0	0	1675	0	0	1433	0
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		87.2			92.0			186.9			205.1	
Travel Time (s)		6.3			6.6			16.8			18.5	
Confl. Peds. (#/hr)	4		2	2		4			1	1		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	6%	0%	0%	5%	11%	0%	0%	0%	0%	0%	20%
Adj. Flow (vph)	9	563	11	7	587	10	2	1	16	1	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	583	0	0	604	0	0	19	0	0	6	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	512	10	6	534	9	2	1	15	1	0	5
Future Volume (Veh/h)	8	512	10	6	534	9	2	1	15	1	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	9	563	11	7	587	10	2	1	16	1	0	5
Pedestrians					1			2			4	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		170										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	601			576			901	1204	290	927	1204	302
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	601			349			704	1035	36	733	1036	302
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.5
p0 queue free %	99			99			99	100	98	100	100	99
cM capacity (veh/h)	983			1115			292	209	944	274	209	641

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	290	292	300	304	19	6
Volume Left	9	0	7	0	2	1
Volume Right	0	11	0	10	16	5
cSH	983	1700	1115	1700	665	524
Volume to Capacity	0.01	0.17	0.01	0.18	0.03	0.01
Queue Length 95th (m)	0.2	0.0	0.2	0.0	0.7	0.3
Control Delay (s)	0.4	0.0	0.3	0.0	10.6	11.9
Lane LOS	A		A		B	B
Approach Delay (s)	0.2		0.1		10.6	11.9
Approach LOS					B	B

Intersection Summary					
Average Delay	0.4				
Intersection Capacity Utilization	30.5%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	10	2	1	17	6	3	14	1	4	6	2
Future Volume (vph)	0	10	2	1	17	6	3	14	1	4	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.979			0.966			0.993			0.981	
Flt Protected					0.998			0.993			0.982	
Satd. Flow (prot)	0	1860	0	0	1832	0	0	1873	0	0	1830	0
Flt Permitted					0.998			0.993			0.982	
Satd. Flow (perm)	0	1860	0	0	1832	0	0	1873	0	0	1830	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			84.1			166.7			185.5	
Travel Time (s)		7.6			7.6			15.0			16.7	
Confl. Peds. (#/hr)	11		5	5		11	2		5	5		2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	11	2	1	20	7	3	16	1	5	7	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	28	0	0	20	0	0	14	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization	17.9%				ICU Level of Service A							
Analysis Period (min)	15											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	10	2	1	17	6	3	14	1	4	6	2
Future Volume (vph)	0	10	2	1	17	6	3	14	1	4	6	2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	11	2	1	20	7	3	16	1	5	7	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	13	28	20	14
Volume Left (vph)	0	1	3	5
Volume Right (vph)	2	7	1	2
Hadj (s)	-0.09	-0.14	0.00	-0.01
Departure Headway (s)	3.9	3.8	4.0	4.0
Degree Utilization, x	0.01	0.03	0.02	0.02
Capacity (veh/h)	906	923	878	888
Control Delay (s)	7.0	7.0	7.1	7.1
Approach Delay (s)	7.0	7.0	7.1	7.1
Approach LOS	A	A	A	A

Intersection Summary												
Delay			7.0									
Level of Service			A									
Intersection Capacity Utilization			17.9%		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)	8	10	1	1	18	0	0	15	1	0	4	4
Future Volume (vph)	8	10	1	1	18	0	0	15	1	0	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994						0.992			0.932	
Flt Protected		0.980			0.998							
Satd. Flow (prot)	0	1851	0	0	1896	0	0	1885	0	0	1771	0
Flt Permitted		0.980			0.998							
Satd. Flow (perm)	0	1851	0	0	1896	0	0	1885	0	0	1771	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			86.1			155.9			186.9	
Travel Time (s)		7.6			7.7			14.0			16.8	
Confl. Peds. (#/hr)	6		7	7		6	4		4	4		4
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	9	12	1	1	21	0	0	17	1	0	5	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	22	0	0	22	0	0	18	0	0	10	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	17.2%	ICU Level of Service A		
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	10	1	1	18	0	0	15	1	0	4	4
Future Volume (vph)	8	10	1	1	18	0	0	15	1	0	4	4
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	9	12	1	1	21	0	0	17	1	0	5	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	22	22	18	10
Volume Left (vph)	9	1	0	0
Volume Right (vph)	1	0	1	5
Hadj (s)	0.05	0.01	-0.03	-0.30
Departure Headway (s)	4.0	4.0	4.0	3.7
Degree Utilization, x	0.02	0.02	0.02	0.01
Capacity (veh/h)	879	891	884	953
Control Delay (s)	7.1	7.1	7.0	6.7
Approach Delay (s)	7.1	7.1	7.0	6.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.0		
Level of Service		A		
Intersection Capacity Utilization		17.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	12	2	3	22	4	2
Future Volume (vph)	12	2	3	22	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.979				0.949	
Flt Protected				0.994	0.970	
Satd. Flow (prot)	1743	0	0	1889	1749	0
Flt Permitted				0.994	0.970	
Satd. Flow (perm)	1743	0	0	1889	1749	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	84.1			84.7	140.7	
Travel Time (s)	7.6			7.6	12.7	
Confl. Peds. (#/hr)		9	9		1	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles (%)	8%	0%	0%	0%	0%	0%
Adj. Flow (vph)	16	3	4	29	5	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	0	0	33	8	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	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	12	2	3	22	4	2
Future Volume (Veh/h)	12	2	3	22	4	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	16	3	4	29	5	3
Pedestrians	1				9	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			28		64	26
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			28		64	26
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1587		936	1047

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	19	33	8
Volume Left	0	4	5
Volume Right	3	0	3
cSH	1700	1587	975
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.2
Control Delay (s)	0.0	0.9	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.9	8.7
Approach LOS			A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Graham Avenue S/Graham Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	70.0	53.4	62.2	49.9	16.8	12.9
Average Queue (m)	41.7	20.0	36.2	24.8	3.8	3.0
95th Queue (m)	63.2	44.7	55.4	45.5	12.4	10.5
Link Distance (m)	81.1	81.1	68.2	68.2	165.0	174.3
Upstream Blk Time (%)	0		0	0		
Queuing Penalty (veh)	0		0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main Street E & Houghton Avenue N

Movement	WB	SB
Directions Served	T	LR
Maximum Queue (m)	1.8	9.2
Average Queue (m)	0.1	1.0
95th Queue (m)	1.3	5.8
Link Distance (m)	68.5	193.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Wexford Avenue S/Wexford Avenue N & Main Street E

Movement	EB	WB	NB	SB
Directions Served	LT	LT	LTR	LTR
Maximum Queue (m)	11.9	7.9	10.6	15.7
Average Queue (m)	0.8	0.5	3.7	2.3
95th Queue (m)	5.7	4.5	11.0	10.0
Link Distance (m)	68.5	83.4	166.3	193.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Graham Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	12.0	10.6	12.2	9.3
Average Queue (m)	3.1	5.2	4.1	3.1
95th Queue (m)	10.5	12.7	11.9	10.2
Link Distance (m)	76.3	65.5	158.3	165.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Wexford Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.7	10.7	9.3	9.2
Average Queue (m)	3.8	4.5	3.9	1.9
95th Queue (m)	11.3	12.2	11.3	8.0
Link Distance (m)	69.6	77.7	147.5	166.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Houghton Avenue S & Maple Avenue

Movement	NB
Directions Served	LR
Maximum Queue (m)	9.3
Average Queue (m)	1.4
95th Queue (m)	6.9
Link Distance (m)	132.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	923	13	6	600	9	14	7	12	11	11	7
Future Volume (vph)	1	923	13	6	600	9	14	7	12	11	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.998			0.998			0.950			0.967	
Flt Protected								0.979			0.981	
Satd. Flow (prot)	0	3498	0	0	3499	0	0	1754	0	0	1735	0
Flt Permitted		0.955			0.946			0.920			0.934	
Satd. Flow (perm)	0	3340	0	0	3310	0	0	1642	0	0	1647	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			13			7	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		89.6			83.3			185.5			186.4	
Travel Time (s)		6.5			6.0			16.7			16.8	
Confl. Peds. (#/hr)	19		9	1		3	8		7	7		8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	14%
Adj. Flow (vph)	1	961	14	6	625	9	15	7	13	11	11	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	976	0	0	640	0	0	35	0	0	29	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.1	28.1		28.1	28.1		28.4	28.4		28.4	28.4	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	55.6%	55.6%		55.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	44.9	44.9		44.9	44.9		34.6	34.6		34.6	34.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.8	1.8		1.8	1.8		2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			5.4			5.4	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	12.0	12.0		12.0	12.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
v/c Ratio		0.59			0.39			0.05			0.05	
Control Delay		17.7			14.8			12.9			14.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		17.7			14.8			12.9			14.6	
LOS		B			B			B			B	
Approach Delay		17.7			14.8			12.9			14.6	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 6 (7%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 16.5		Intersection LOS: B	
Intersection Capacity Utilization 54.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Graham Avenue S/Graham Avenue N & Main Street E

Queues
1: Graham Avenue S/Graham Avenue N & Main Street E

Base Year
PM Peak Hour

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	976	640	35	29
v/c Ratio	0.59	0.39	0.05	0.05
Control Delay	17.7	14.8	12.9	14.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.7	14.8	12.9	14.6
Queue Length 50th (m)	63.0	36.1	2.4	2.5
Queue Length 95th (m)	82.4	49.2	8.5	8.0
Internal Link Dist (m)	65.6	59.3	161.5	162.4
Turn Bay Length (m)				
Base Capacity (vph)	1667	1652	639	637
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.39	0.05	0.05

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Graham Avenue S/Graham Avenue N & Main Street E

Base Year
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	923	13	6	600	9	14	7	12	11	11	7
Future Volume (vph)	1	923	13	6	600	9	14	7	12	11	11	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1			5.1			5.4			5.4	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.97	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		3497			3497			1747			1731	
Flt Permitted		0.95			0.95			0.92			0.93	
Satd. Flow (perm)		3338			3311			1641			1647	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	961	14	6	625	9	15	7	12	11	11	7
RTOR Reduction (vph)	0	1	0	0	1	0	0	8	0	0	4	0
Lane Group Flow (vph)	0	975	0	0	639	0	0	27	0	0	25	0
Confl. Peds. (#/hr)	19		9	1		3	8		7	7		8
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	14%
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)		44.9			44.9			34.6			34.6	
Effective Green, g (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
Clearance Time (s)		5.1			5.1			5.4			5.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1665			1651			630			633	
v/s Ratio Prot												
v/s Ratio Perm		c0.29			0.19			c0.02			0.01	
v/c Ratio		0.59			0.39			0.04			0.04	
Uniform Delay, d1		16.0			14.0			17.3			17.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.5			0.7			0.1			0.1	
Delay (s)		17.5			14.7			17.5			17.4	
Level of Service		B			B			B			B	
Approach Delay (s)		17.5			14.7			17.5			17.4	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.35				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		10.5	
Intersection Capacity Utilization	54.6%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	919	626	15	6	7
Future Volume (vph)	11	919	626	15	6	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.927	
Flt Protected		0.999			0.977	
Satd. Flow (prot)	0	3499	3460	0	1596	0
Flt Permitted		0.999			0.977	
Satd. Flow (perm)	0	3499	3460	0	1596	0
Link Speed (k/h)		50	50		40	
Link Distance (m)		83.3	87.2		205.5	
Travel Time (s)		6.0	6.3		18.5	
Confl. Peds. (#/hr)	15			15		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	9%	3%	4%	0%	17%	0%
Adj. Flow (vph)	12	967	659	16	6	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	979	675	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	919	626	15	6	7
Future Volume (Veh/h)	11	919	626	15	6	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	967	659	16	6	7
Pedestrians					15	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		83				
pX, platoon unblocked					0.81	
vC, conflicting volume	690				1190	352
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	690				755	352
tC, single (s)	4.3				7.1	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	99				98	99
cM capacity (veh/h)	844				247	641

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	334	645	439	236	13
Volume Left	12	0	0	0	6
Volume Right	0	0	0	16	7
cSH	844	1700	1700	1700	369
Volume to Capacity	0.01	0.38	0.26	0.14	0.04
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.9
Control Delay (s)	0.5	0.0	0.0	0.0	15.1
Lane LOS	A				C
Approach Delay (s)	0.2		0.0		15.1
Approach LOS					C

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		43.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lanes, Volumes, Timings
3: Wexford Avenue S/Wexford Avenue N & Main Street E

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	911	11	10	632	12	8	5	10	7	3	5
Future Volume (vph)	5	911	11	10	632	12	8	5	10	7	3	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.997			0.941			0.955	
Flt Protected					0.999			0.982			0.977	
Satd. Flow (prot)	0	3500	0	0	3462	0	0	1756	0	0	1773	0
Flt Permitted					0.999			0.982			0.977	
Satd. Flow (perm)	0	3500	0	0	3462	0	0	1756	0	0	1773	0
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		87.2			92.0			186.9			205.1	
Travel Time (s)		6.3			6.6			16.8			18.5	
Confl. Peds. (#/hr)	12		6	6		12			2	2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	969	12	11	672	13	9	5	11	7	3	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	986	0	0	696	0	0	25	0	0	15	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Wexford Avenue S/Wexford Avenue N & Main Street E

Base Year
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	911	11	10	632	12	8	5	10	7	3	5
Future Volume (Veh/h)	5	911	11	10	632	12	8	5	10	7	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	969	12	11	672	13	9	5	11	7	3	5
Pedestrians					2			6			12	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		170										
pX, platoon unblocked				0.81			0.81	0.81	0.81	0.81	0.81	
vC, conflicting volume	697			987			1356	1710	498	1222	1710	354
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	697			511			967	1405	0	802	1404	354
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			94	95	99	97	97	99
cM capacity (veh/h)	899			857			161	110	876	207	110	641

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	490	496	347	349	25	15
Volume Left	5	0	11	0	9	7
Volume Right	0	12	0	13	11	5
cSH	899	1700	857	1700	220	218
Volume to Capacity	0.01	0.29	0.01	0.21	0.11	0.07
Queue Length 95th (m)	0.1	0.0	0.3	0.0	3.0	1.8
Control Delay (s)	0.2	0.0	0.4	0.0	23.5	22.8
Lane LOS	A		A		C	C
Approach Delay (s)	0.1		0.2		23.5	22.8
Approach LOS					C	C

Intersection Summary					
Average Delay	0.7				
Intersection Capacity Utilization	39.7%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	23	4	3	17	9	1	18	2	8	18	6
Future Volume (vph)	1	23	4	3	17	9	1	18	2	8	18	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.958			0.988			0.974	
Flt Protected		0.998			0.995			0.998			0.988	
Satd. Flow (prot)	0	1864	0	0	1811	0	0	1873	0	0	1828	0
Flt Permitted		0.998			0.995			0.998			0.988	
Satd. Flow (perm)	0	1864	0	0	1811	0	0	1873	0	0	1828	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			84.1			166.7			185.5	
Travel Time (s)		7.6			7.6			15.0			16.7	
Confl. Peds. (#/hr)	10		10	10		10	3		3	3		3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	26	4	3	19	10	1	20	2	9	20	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	31	0	0	32	0	0	23	0	0	36	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization	18.4%				ICU Level of Service A							
Analysis Period (min)	15											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	23	4	3	17	9	1	18	2	8	18	6
Future Volume (vph)	1	23	4	3	17	9	1	18	2	8	18	6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	26	4	3	19	10	1	20	2	9	20	7

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	31	32	23	36
Volume Left (vph)	1	3	1	9
Volume Right (vph)	4	10	2	7
Hadj (s)	-0.07	-0.17	-0.04	-0.07
Departure Headway (s)	4.0	3.9	4.0	4.0
Degree Utilization, x	0.03	0.03	0.03	0.04
Capacity (veh/h)	883	907	868	884
Control Delay (s)	7.1	7.0	7.1	7.2
Approach Delay (s)	7.1	7.0	7.1	7.2
Approach LOS	A	A	A	A

Intersection Summary												
Delay			7.1									
Level of Service			A									
Intersection Capacity Utilization			18.4%		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)	7	22	8	1	28	6	3	11	2	1	15	3
Future Volume (vph)	7	22	8	1	28	6	3	11	2	1	15	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.970			0.975			0.984			0.980	
Flt Protected		0.990			0.999			0.991			0.998	
Satd. Flow (prot)	0	1825	0	0	1851	0	0	1853	0	0	1858	0
Flt Permitted		0.990			0.999			0.991			0.998	
Satd. Flow (perm)	0	1825	0	0	1851	0	0	1853	0	0	1858	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			86.1			155.9			186.9	
Travel Time (s)		7.6			7.7			14.0			16.8	
Confl. Peds. (#/hr)	5		5	5		5	4		1	1		4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	8	24	9	1	30	7	3	12	2	1	16	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	0	0	38	0	0	17	0	0	20	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	17.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	22	8	1	28	6	3	11	2	1	15	3
Future Volume (vph)	7	22	8	1	28	6	3	11	2	1	15	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	24	9	1	30	7	3	12	2	1	16	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	41	38	17	20
Volume Left (vph)	8	1	3	1
Volume Right (vph)	9	7	2	3
Hadj (s)	-0.09	-0.11	-0.04	-0.08
Departure Headway (s)	3.9	3.9	4.0	4.0
Degree Utilization, x	0.04	0.04	0.02	0.02
Capacity (veh/h)	902	905	860	877
Control Delay (s)	7.1	7.1	7.1	7.1
Approach Delay (s)	7.1	7.1	7.1	7.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.1		
Level of Service	A		
Intersection Capacity Utilization	17.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	28	7	3	32	0	7
Future Volume (vph)	28	7	3	32	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.972				0.865	
Flt Protected				0.996		
Satd. Flow (prot)	1847	0	0	1892	1644	0
Flt Permitted				0.996		
Satd. Flow (perm)	1847	0	0	1892	1644	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	84.1			84.7	140.7	
Travel Time (s)	7.6			7.6	12.7	
Confl. Peds. (#/hr)		10	10		2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	30	8	3	35	0	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	0	0	38	8	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	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	16.5%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	28	7	3	32	0	7
Future Volume (Veh/h)	28	7	3	32	0	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	8	3	35	0	8
Pedestrians	2			1	10	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			48		87	45
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			48		87	45
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1559		908	1021

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	38	38	8
Volume Left	0	3	0
Volume Right	8	0	8
cSH	1700	1559	1021
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.0	0.6	8.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.6	8.6
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	16.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Graham Avenue S/Graham Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	85.6	68.5	64.8	56.0	15.6	16.9
Average Queue (m)	64.2	38.7	37.5	26.7	4.7	4.2
95th Queue (m)	89.8	64.3	58.4	48.9	13.0	13.1
Link Distance (m)	81.1	81.1	68.2	68.2	165.0	174.3
Upstream Blk Time (%)	2	0	0	0		
Queuing Penalty (veh)	0	0	1	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main Street E & Houghton Avenue N

Movement	EB	EB	WB	SB
Directions Served	LT	T	T	LR
Maximum Queue (m)	30.8	16.2	7.6	15.0
Average Queue (m)	2.8	0.5	0.4	4.3
95th Queue (m)	14.8	7.2	4.5	12.9
Link Distance (m)	68.2	68.2	68.5	193.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Wexford Avenue S/Wexford Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	15.6	19.8	28.0	17.0	18.1	11.6
Average Queue (m)	1.1	0.7	2.6	0.8	6.0	3.5
95th Queue (m)	7.4	6.9	15.4	9.7	14.6	10.7
Link Distance (m)	68.5	68.5	83.4	83.4	166.3	193.0
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Graham Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	12.0	9.3	10.8	13.5
Average Queue (m)	6.1	5.4	4.5	6.1
95th Queue (m)	13.4	12.7	12.2	13.7
Link Distance (m)	76.3	65.5	158.3	165.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Wexford Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.8	12.2	11.8	9.3
Average Queue (m)	6.4	6.5	4.1	4.3
95th Queue (m)	13.4	13.9	11.7	11.8
Link Distance (m)	69.6	77.7	147.5	166.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Houghton Avenue S & Maple Avenue

Movement	EB	NB
Directions Served	TR	LR
Maximum Queue (m)	1.8	9.3
Average Queue (m)	0.1	1.4
95th Queue (m)	1.3	6.9
Link Distance (m)	65.5	132.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1

Appendix D

TTS Data

	AM		PM		AM		PM	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
North via Kenilworth Avenue North	415	794	577	286	20%	34%	33%	21%
South via Kenilworth Avenue South	127	0	0	92	6%	0%	0%	7%
North via Ottawa Street North	309	0	34	0	15%	0%	2%	0%
South via Ottawa Street South	0	0	0	0	0%	0%	0%	0%
East via Main Street East	435	546	696	555	21%	23%	39%	41%
West via Main Street East	773	984	459	418	38%	42%	26%	31%
TOTAL	2059	2324	1766	1351	100%	100%	100%	100%

Summarized

From/To	AM		PM	
	Inbound	Outbound	Inbound	Outbound
East via Main Street East	47%	58%	72%	69%
West via Main Street East	53%	42%	28%	31%
TOTAL	**100%**	**100%**	**100%**	**100%**

Thu Jul 14 2022 11:29:57 GMT-0400 (Eastern Daylight Time) - Run Time: 2725ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
(2006 GTA zone of origin - gta06_orig In 5132,5154
or
2006 GTA zone of destination - gta06_dest In 5132,5154)
and
Start time of trip - start_time In 0630-0929

Trip 2016
ROW : gta06_orig
COLUMN : gta06_dest

	gta06_orig	gta06_dest	total	
Inbound	4120	5154	26	North via Kenilworth Avenue North
Inbound	5009	5132	47	East via Main Street East
Inbound	5037	5132	84	East via Main Street East
Inbound	5047	5132	36	West via Main Street East
Inbound	5068	5132	57	South via Kenilworth Avenue South
Inbound	5069	5132	29	West via Main Street East
Inbound	5082	5132	50	South via Kenilworth Avenue South
Inbound	5094	5154	40	West via Main Street East
Inbound	5114	5132	20	South via Kenilworth Avenue South
Inbound	5127	5132	102	East via Main Street East
Inbound	5129	5154	57	West via Main Street East
Outbound	5132	29	15	North via Kenilworth Avenue North
Outbound	5132	67	18	North via Kenilworth Avenue North
Outbound	5132	3704	27	North via Kenilworth Avenue North
Outbound	5132	4057	16	North via Kenilworth Avenue North
Outbound	5132	4063	15	North via Kenilworth Avenue North
Outbound	5132	4069	46	North via Kenilworth Avenue North
Outbound	5132	4125	43	North via Kenilworth Avenue North
Outbound	5132	4148	35	North via Kenilworth Avenue North
Outbound	5132	4187	15	North via Kenilworth Avenue North
Outbound	5132	5036	16	West via Main Street East
Outbound	5132	5039	26	East via Main Street East
Outbound	5132	5041	30	East via Main Street East
Outbound	5132	5051	15	West via Main Street East
Outbound	5132	5053	69	East via Main Street East
Outbound	5132	5079	36	East via Main Street East
Outbound	5132	5123	35	East via Main Street East
Outbound	5132	5125	158	West via Main Street East
Outbound	5132	5127	109	East via Main Street East
Outbound	5132	5132	242	Internal
Outbound	5132	5135	48	West via Main Street East
Outbound	5132	5143	33	West via Main Street East
Outbound	5132	5148	78	East via Main Street East
Outbound	5132	5150	35	West via Main Street East
Outbound	5132	5159	30	West via Main Street East
Outbound	5132	5161	69	North via Kenilworth Avenue North
Outbound	5132	5164	38	West via Main Street East
Outbound	5132	5165	43	West via Main Street East
Outbound	5132	5169	8	East via Main Street East
Outbound	5132	5172	14	West via Main Street East
Outbound	5132	5186	121	West via Main Street East
Outbound	5132	5198	108	West via Main Street East
Outbound	5132	5244	27	East via Main Street East
Outbound	5132	5248	60	West via Main Street East
Outbound	5132	6022	72	North via Kenilworth Avenue North
Outbound	5132	8912	28	West via Main Street East
Inbound	5141	5132	55	West via Main Street East
Inbound	5148	5132	87	East via Main Street East
Inbound	5150	5132	140	West via Main Street East
Inbound	5151	5154	45	East via Main Street East
Outbound	5154	4060	28	North via Kenilworth Avenue North
Outbound	5154	4063	31	North via Kenilworth Avenue North
Outbound	5154	4069	28	North via Kenilworth Avenue North
Outbound	5154	4081	18	North via Kenilworth Avenue North
Outbound	5154	4123	18	North via Kenilworth Avenue North
Outbound	5154	5041	28	East via Main Street East
Outbound	5154	5101	37	East via Main Street East
Outbound	5154	5129	57	West via Main Street East
Outbound	5154	5148	18	East via Main Street East
Outbound	5154	5149	36	North via Kenilworth Avenue North
Outbound	5154	5151	45	East via Main Street East
Outbound	5154	5154	180	Internal
Outbound	5154	5161	91	North via Kenilworth Avenue North
Outbound	5154	5162	53	North via Kenilworth Avenue North
Outbound	5154	5170	54	West via Main Street East
Outbound	5154	5172	21	West via Main Street East
Outbound	5154	5173	18	North via Kenilworth Avenue North
Outbound	5154	5180	25	West via Main Street East
Outbound	5154	5184	36	West via Main Street East

Thu Jul 14 2022 11:30:33 GMT-0400 (Eastern Daylight Time) - Run Time: 2556ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
(2006 GTA zone of origin - gta06_orig In 5132,5154
or
2006 GTA zone of destination - gta06_dest In 5132,5154)
and
Start time of trip - start_time In 1530-1829

Trip 2016
ROW : gta06_orig
COLUMN : gta06_dest

	gta06_orig	gta06_dest	total	
Inbound	29	5132	15	North via Kenilworth Avenue North
Inbound	43	5132	35	North via Kenilworth Avenue North
Inbound	2271	5132	14	North via Kenilworth Avenue North
Inbound	3701	5154	77	North via Kenilworth Avenue North
Inbound	4056	5132	42	North via Kenilworth Avenue North
Inbound	4057	5154	25	North via Kenilworth Avenue North
Inbound	4063	5132	15	North via Kenilworth Avenue North
Inbound	4063	5154	52	North via Kenilworth Avenue North
Inbound	4069	5154	28	North via Kenilworth Avenue North
Inbound	4081	5154	18	North via Kenilworth Avenue North
Inbound	4123	5154	18	North via Kenilworth Avenue North
Inbound	4125	5132	43	North via Kenilworth Avenue North
Inbound	4135	5132	15	North via Kenilworth Avenue North
Inbound	4148	5132	35	North via Kenilworth Avenue North
Inbound	5036	5132	16	West via Main Street East
Inbound	5039	5132	38	East via Main Street East
Inbound	5041	5154	28	East via Main Street East
Inbound	5043	5132	15	East via Main Street East
Inbound	5053	5132	69	East via Main Street East
Inbound	5056	5132	50	East via Main Street East
Inbound	5079	5132	18	East via Main Street East
Inbound	5093	5154	28	East via Main Street East
Inbound	5104	5154	15	East via Main Street East
Inbound	5111	5154	162	East via Main Street East
Inbound	5123	5132	35	East via Main Street East
Inbound	5126	5154	25	East via Main Street East
Inbound	5127	5132	135	East via Main Street East
Outbound	5132	4062	15	North via Kenilworth Avenue North
Outbound	5132	4064	33	North via Kenilworth Avenue North
Outbound	5132	5009	47	East via Main Street East
Outbound	5132	5037	84	East via Main Street East
Outbound	5132	5082	50	South via Kenilworth Avenue South
Outbound	5132	5087	15	West via Main Street East
Outbound	5132	5105	51	West via Main Street East
Outbound	5132	5114	20	South via Kenilworth Avenue South
Outbound	5132	5127	131	East via Main Street East
Outbound	5132	5132	33	Internal
Outbound	5132	5154	57	Internal
Outbound	5132	5164	38	West via Main Street East
Outbound	5132	5165	15	West via Main Street East
Outbound	5132	5173	74	North via Kenilworth Avenue North
Outbound	5132	5180	45	West via Main Street East
Outbound	5132	5183	55	North via Kenilworth Avenue North
Outbound	5132	5198	29	West via Main Street East
Outbound	5132	5233	71	West via Main Street East
Inbound	5135	5132	48	West via Main Street East
Inbound	5135	5154	36	West via Main Street East
Inbound	5148	5132	45	East via Main Street East
Inbound	5148	5154	18	East via Main Street East
Inbound	5149	5132	24	North via Kenilworth Avenue North
Inbound	5150	5132	35	West via Main Street East
Outbound	5154	5036	28	West via Main Street East
Outbound	5154	5073	40	West via Main Street East
Outbound	5154	5082	22	South via Kenilworth Avenue South
Outbound	5154	5104	15	West via Main Street East
Outbound	5154	5110	40	West via Main Street East
Outbound	5154	5111	162	East via Main Street East
Outbound	5154	5154	25	Internal
Outbound	5154	5161	91	North via Kenilworth Avenue North
Outbound	5154	5170	31	West via Main Street East
Outbound	5154	5173	18	North via Kenilworth Avenue North
Outbound	5154	5238	70	East via Main Street East
Outbound	5154	6357	61	East via Main Street East
Inbound	5165	5132	43	West via Main Street East
Inbound	5172	5132	14	West via Main Street East
Inbound	5173	5132	26	North via Kenilworth Avenue North
Inbound	5173	5154	18	North via Kenilworth Avenue North
Inbound	5174	5132	47	West via Main Street East
Inbound	5176	5132	16	North via Ottawa Street North

Outbound	5154	5187	44	West via Main Street East
Outbound	5154	5197	102	North via Kenilworth Avenue North
Inbound	5157	5132	83	West via Main Street East
Inbound	5157	5154	54	West via Main Street East
Inbound	5161	5132	69	North via Kenilworth Avenue North
Inbound	5161	5154	91	North via Kenilworth Avenue North
Inbound	5162	5154	53	North via Kenilworth Avenue North
Inbound	5164	5132	38	West via Main Street East
Inbound	5176	5132	309	North via Ottawa Street North
Inbound	5180	5132	45	West via Main Street East
Inbound	5183	5132	55	North via Kenilworth Avenue North
Inbound	5186	5132	50	West via Main Street East
Inbound	5197	5132	121	North via Kenilworth Avenue North
Inbound	5198	5132	29	West via Main Street East
Inbound	5208	5132	69	West via Main Street East
Inbound	5238	5154	70	East via Main Street East
Inbound	7060	5132	48	West via Main Street East
Inbound	5180	5154	25	West via Main Street East
Inbound	5184	5132	41	West via Main Street East
Inbound	5184	5154	36	West via Main Street East
Inbound	5186	5132	14	West via Main Street East
Inbound	5187	5154	44	West via Main Street East
Inbound	5197	5154	77	North via Kenilworth Avenue North
Inbound	5200	5132	17	West via Main Street East
Inbound	5210	5132	18	North via Ottawa Street North
Inbound	5232	5132	15	West via Main Street East
Inbound	6026	5132	15	East via Main Street East
Inbound	8912	5132	28	West via Main Street East

Appendix E

Background Traffic Operations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	554	3	4	547	2	9	1	15	12	2	6
Future Volume (vph)	0	554	3	4	547	2	9	1	15	12	2	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.999						0.918			0.957	
Flt Protected								0.982			0.971	
Satd. Flow (prot)	0	3403	0	0	3439	0	0	1693	0	0	1757	0
Flt Permitted					0.952			0.942			0.901	
Satd. Flow (perm)	0	3403	0	0	3274	0	0	1622	0	0	1624	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1						17			7	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		89.6			83.3			185.5			186.4	
Travel Time (s)		6.5			6.0			16.7			16.8	
Confl. Peds. (#/hr)	3		1	1		3	3		6	6		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	6%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	616	3	4	608	2	10	1	17	13	2	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	619	0	0	614	0	0	28	0	0	22	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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		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)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.1	28.1		28.1	28.1		28.4	28.4		28.4	28.4	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	55.6%	55.6%		55.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	44.9	44.9		44.9	44.9		34.6	34.6		34.6	34.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.8	1.8		1.8	1.8		2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			5.4			5.4	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	12.0	12.0		12.0	12.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
v/c Ratio		0.36			0.38			0.04			0.04	
Control Delay		14.6			14.8			10.7			13.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.6			14.8			10.7			13.8	
LOS		B			B			B			B	
Approach Delay		14.6			14.8			10.7			13.8	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 6 (7%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.38			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 46.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Graham Avenue S/Graham Avenue N & Main Street E

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	619	614	28	22
v/c Ratio	0.36	0.38	0.04	0.04
Control Delay	14.6	14.8	10.7	13.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.6	14.8	10.7	13.8
Queue Length 50th (m)	34.5	34.5	1.2	1.7
Queue Length 95th (m)	47.0	47.2	6.6	6.5
Internal Link Dist (m)	65.6	59.3	161.5	162.4
Turn Bay Length (m)				
Base Capacity (vph)	1698	1633	634	628
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.38	0.04	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	554	3	4	547	2	9	1	15	12	2	6
Future Volume (vph)	0	554	3	4	547	2	9	1	15	12	2	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1			5.1			5.4			5.4	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.92			0.96	
Flt Protected		1.00			1.00			0.98			0.97	
Satd. Flow (prot)		3404			3437			1692			1750	
Flt Permitted		1.00			0.95			0.94			0.90	
Satd. Flow (perm)		3404			3273			1622			1623	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	616	3	4	608	2	10	1	17	13	2	7
RTOR Reduction (vph)	0	1	0	0	0	0	0	10	0	0	4	0
Lane Group Flow (vph)	0	618	0	0	614	0	0	18	0	0	18	0
Confl. Peds. (#/hr)	3		1	1		3	3		6	6		3
Heavy Vehicles (%)	0%	6%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		44.9			44.9			34.6			34.6	
Effective Green, g (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
Clearance Time (s)		5.1			5.1			5.4			5.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1698			1632			623			623	
v/s Ratio Prot		0.18										
v/s Ratio Perm					c0.19			0.01			c0.01	
v/c Ratio		0.36			0.38			0.03			0.03	
Uniform Delay, d1		13.8			13.9			17.2			17.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.6			0.7			0.1			0.1	
Delay (s)		14.4			14.6			17.3			17.3	
Level of Service		B			B			B			B	
Approach Delay (s)		14.4			14.6			17.3			17.3	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.22				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		10.5	
Intersection Capacity Utilization	46.3%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	562	572	5	2	4
Future Volume (vph)	0	562	572	5	2	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.999		0.910	
Flt Protected					0.984	
Satd. Flow (prot)	0	3406	3436	0	1701	0
Flt Permitted					0.984	
Satd. Flow (perm)	0	3406	3436	0	1701	0
Link Speed (k/h)		50	50		40	
Link Distance (m)		83.3	87.2		205.5	
Travel Time (s)		6.0	6.3		18.5	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%
Adj. Flow (vph)	0	618	629	5	2	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	618	634	0	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	562	572	5	2	4
Future Volume (Veh/h)	0	562	572	5	2	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	618	629	5	2	4
Pedestrians					5	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		83				
pX, platoon unblocked					0.90	
vC, conflicting volume	639				946	322
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	639				707	322
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				99	99
cM capacity (veh/h)	951				334	677

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	206	412	419	215	6
Volume Left	0	0	0	0	2
Volume Right	0	0	0	5	4
cSH	951	1700	1700	1700	504
Volume to Capacity	0.00	0.24	0.25	0.13	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	12.2
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.2
Approach LOS					B

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		26.0%	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)	8	538	11	6	561	9	2	1	16	1	0	5
Future Volume (vph)	8	538	11	6	561	9	2	1	16	1	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.998			0.884			0.887	
Flt Protected		0.999			0.999			0.995			0.992	
Satd. Flow (prot)	0	3399	0	0	3426	0	0	1671	0	0	1433	0
Flt Permitted		0.999			0.999			0.995			0.992	
Satd. Flow (perm)	0	3399	0	0	3426	0	0	1671	0	0	1433	0
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		87.2			92.0			186.9			205.1	
Travel Time (s)		6.3			6.6			16.8			18.5	
Confl. Peds. (#/hr)	4		2	2		4			1	1		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	6%	0%	0%	5%	11%	0%	0%	0%	0%	0%	20%
Adj. Flow (vph)	9	591	12	7	616	10	2	1	18	1	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	612	0	0	633	0	0	21	0	0	6	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.2%	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)	8	538	11	6	561	9	2	1	16	1	0	5
Future Volume (Veh/h)	8	538	11	6	561	9	2	1	16	1	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	9	591	12	7	616	10	2	1	18	1	0	5
Pedestrians					1			2			4	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		170										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	630			605			944	1261	304	972	1262	317
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	630			359			733	1083	28	764	1084	317
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.5
p0 queue free %	99			99			99	99	98	100	100	99
cM capacity (veh/h)	959			1096			276	195	947	258	194	626

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	304	308	315	318	21	6
Volume Left	9	0	7	0	2	1
Volume Right	0	12	0	10	18	5
cSH	959	1700	1096	1700	669	506
Volume to Capacity	0.01	0.18	0.01	0.19	0.03	0.01
Queue Length 95th (m)	0.2	0.0	0.2	0.0	0.8	0.3
Control Delay (s)	0.4	0.0	0.2	0.0	10.6	12.2
Lane LOS	A		A		B	B
Approach Delay (s)	0.2		0.1		10.6	12.2
Approach LOS					B	B

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	31.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	11	2	1	19	7	3	15	1	4	7	2
Future Volume (vph)	0	11	2	1	19	7	3	15	1	4	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.982			0.965			0.994			0.982	
Flt Protected					0.998			0.993			0.984	
Satd. Flow (prot)	0	1866	0	0	1830	0	0	1875	0	0	1836	0
Flt Permitted					0.998			0.993			0.984	
Satd. Flow (perm)	0	1866	0	0	1830	0	0	1875	0	0	1836	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			84.1			166.7			185.5	
Travel Time (s)		7.6			7.6			15.0			16.7	
Confl. Peds. (#/hr)	11		5	5		11	2		5	5		2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	13	2	1	22	8	3	17	1	5	8	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	15	0	0	31	0	0	21	0	0	15	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization	17.9%				ICU Level of Service A							
Analysis Period (min)	15											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	2	1	19	7	3	15	1	4	7	2
Future Volume (vph)	0	11	2	1	19	7	3	15	1	4	7	2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	13	2	1	22	8	3	17	1	5	8	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	15	31	21	15
Volume Left (vph)	0	1	3	5
Volume Right (vph)	2	8	1	2
Hadj (s)	-0.08	-0.15	0.00	-0.01
Departure Headway (s)	3.9	3.8	4.0	4.0
Degree Utilization, x	0.02	0.03	0.02	0.02
Capacity (veh/h)	901	923	875	884
Control Delay (s)	7.0	7.0	7.1	7.1
Approach Delay (s)	7.0	7.0	7.1	7.1
Approach LOS	A	A	A	A

Intersection Summary												
Delay			7.0									
Level of Service			A									
Intersection Capacity Utilization			17.9%		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)	9	11	1	1	20	0	0	17	1	0	4	4
Future Volume (vph)	9	11	1	1	20	0	0	17	1	0	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994						0.994			0.932	
Flt Protected		0.980			0.998							
Satd. Flow (prot)	0	1851	0	0	1896	0	0	1889	0	0	1771	0
Flt Permitted		0.980			0.998							
Satd. Flow (perm)	0	1851	0	0	1896	0	0	1889	0	0	1771	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			86.1			155.9			186.9	
Travel Time (s)		7.6			7.7			14.0			16.8	
Confl. Peds. (#/hr)	6		7	7		6	4		4	4		4
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	13	1	1	23	0	0	20	1	0	5	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	24	0	0	24	0	0	21	0	0	10	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	17.8%	ICU Level of Service A		
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	11	1	1	20	0	0	17	1	0	4	4
Future Volume (vph)	9	11	1	1	20	0	0	17	1	0	4	4
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	10	13	1	1	23	0	0	20	1	0	5	5

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	24	24	21	10
Volume Left (vph)	10	1	0	0
Volume Right (vph)	1	0	1	5
Hadj (s)	0.06	0.01	-0.03	-0.30
Departure Headway (s)	4.0	4.0	4.0	3.7
Degree Utilization, x	0.03	0.03	0.02	0.01
Capacity (veh/h)	876	888	880	948
Control Delay (s)	7.2	7.1	7.1	6.8
Approach Delay (s)	7.2	7.1	7.1	6.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.1			
Level of Service	A			
Intersection Capacity Utilization	17.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	13	2	3	24	4	2
Future Volume (vph)	13	2	3	24	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.980				0.949	
Flt Protected				0.994	0.970	
Satd. Flow (prot)	1743	0	0	1889	1749	0
Flt Permitted				0.994	0.970	
Satd. Flow (perm)	1743	0	0	1889	1749	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	84.1			84.7	140.7	
Travel Time (s)	7.6			7.6	12.7	
Confl. Peds. (#/hr)		9	9		1	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles (%)	8%	0%	0%	0%	0%	0%
Adj. Flow (vph)	17	3	4	32	5	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	0	0	36	8	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	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	13	2	3	24	4	2
Future Volume (Veh/h)	13	2	3	24	4	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	17	3	4	32	5	3
Pedestrians	1				9	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			29		68	28
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			29		68	28
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1585		931	1046

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	20	36	8
Volume Left	0	4	5
Volume Right	3	0	3
cSH	1700	1585	971
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.2
Control Delay (s)	0.0	0.8	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	0.8	8.7
Approach LOS			A

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Graham Avenue S/Graham Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	81.1	60.1	61.8	60.1	14.3	13.3
Average Queue (m)	43.2	21.0	34.0	23.7	3.4	3.8
95th Queue (m)	67.7	47.0	54.0	45.7	11.1	11.8
Link Distance (m)	81.1	81.1	68.2	68.2	165.0	174.3
Upstream Blk Time (%)	0		0	0		
Queuing Penalty (veh)	0		0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main Street E & Houghton Avenue N

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.3
Average Queue (m)	1.4
95th Queue (m)	6.8
Link Distance (m)	193.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Wexford Avenue S/Wexford Avenue N & Main Street E

Movement	EB	WB	WB	NB	SB
Directions Served	LT	LT	TR	LTR	LTR
Maximum Queue (m)	14.2	20.3	1.7	9.1	12.0
Average Queue (m)	1.2	1.7	0.1	3.5	1.3
95th Queue (m)	7.0	10.0	1.2	10.7	7.0
Link Distance (m)	68.5	83.4	83.4	166.3	193.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Graham Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.3	9.3	10.8	10.8
Average Queue (m)	3.0	5.0	4.3	3.2
95th Queue (m)	10.0	12.5	12.0	10.5
Link Distance (m)	76.3	65.5	158.3	165.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Wexford Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.8	10.7	10.7	9.2
Average Queue (m)	4.5	4.9	4.0	2.3
95th Queue (m)	12.1	12.5	11.5	8.8
Link Distance (m)	69.6	77.7	147.5	166.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Houghton Avenue S & Maple Avenue

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	1.8	9.2
Average Queue (m)	0.1	1.1
95th Queue (m)	1.3	5.9
Link Distance (m)	69.6	132.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	970	14	6	631	9	15	7	13	12	12	7
Future Volume (vph)	1	970	14	6	631	9	15	7	13	12	12	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.998			0.998			0.949			0.971	
Flt Protected								0.979			0.981	
Satd. Flow (prot)	0	3497	0	0	3499	0	0	1752	0	0	1750	0
Flt Permitted		0.955			0.946			0.916			0.927	
Satd. Flow (perm)	0	3340	0	0	3310	0	0	1633	0	0	1648	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			14			7	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		89.6			83.3			185.5			186.4	
Travel Time (s)		6.5			6.0			16.7			16.8	
Confl. Peds. (#/hr)	19		9	1		3	8		7	7		8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	14%
Adj. Flow (vph)	1	1010	15	6	657	9	16	7	14	13	13	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1026	0	0	672	0	0	37	0	0	33	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.1	28.1		28.1	28.1		28.4	28.4		28.4	28.4	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	55.6%	55.6%		55.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	44.9	44.9		44.9	44.9		34.6	34.6		34.6	34.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.8	1.8		1.8	1.8		2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			5.4			5.4	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	12.0	12.0		12.0	12.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
v/c Ratio		0.62			0.41			0.06			0.05	
Control Delay		18.3			15.1			12.8			15.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.3			15.1			12.8			15.0	
LOS		B			B			B			B	
Approach Delay		18.3			15.1			12.8			15.0	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 6 (7%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 16.9		Intersection LOS: B	
Intersection Capacity Utilization 55.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Graham Avenue S/Graham Avenue N & Main Street E

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1026	672	37	33
v/c Ratio	0.62	0.41	0.06	0.05
Control Delay	18.3	15.1	12.8	15.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.3	15.1	12.8	15.0
Queue Length 50th (m)	67.6	38.4	2.6	2.9
Queue Length 95th (m)	88.2	52.0	8.8	8.9
Internal Link Dist (m)	65.6	59.3	161.5	162.4
Turn Bay Length (m)				
Base Capacity (vph)	1667	1652	636	637
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.41	0.06	0.05

Intersection Summary

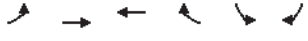
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	970	14	6	631	9	15	7	13	12	12	7
Future Volume (vph)	1	970	14	6	631	9	15	7	13	12	12	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1			5.1			5.4			5.4	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.97	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		3497			3497			1745			1744	
Flt Permitted		0.95			0.95			0.92			0.93	
Satd. Flow (perm)		3338			3311			1633			1649	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	1010	15	6	657	9	16	7	14	12	12	7
RTOR Reduction (vph)	0	1	0	0	1	0	0	9	0	0	4	0
Lane Group Flow (vph)	0	1025	0	0	671	0	0	28	0	0	29	0
Confl. Peds. (#/hr)	19		9	1		3	8		7	7		8
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	14%
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)		44.9			44.9			34.6			34.6	
Effective Green, g (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
Clearance Time (s)		5.1			5.1			5.4			5.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1665			1651			627			633	
v/s Ratio Prot												
v/s Ratio Perm		c0.31			0.20			0.02			c0.02	
v/c Ratio		0.62			0.41			0.05			0.05	
Uniform Delay, d1		16.3			14.2			17.4			17.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.7			0.7			0.1			0.1	
Delay (s)		18.0			14.9			17.5			17.5	
Level of Service		B			B			B			B	
Approach Delay (s)		18.0			14.9			17.5			17.5	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.37				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5		
Intersection Capacity Utilization	55.9%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	966	658	16	6	7
Future Volume (vph)	12	966	658	16	6	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.927	
Flt Protected		0.999			0.977	
Satd. Flow (prot)	0	3499	3460	0	1596	0
Flt Permitted		0.999			0.977	
Satd. Flow (perm)	0	3499	3460	0	1596	0
Link Speed (k/h)		50	50		40	
Link Distance (m)		83.3	87.2		205.5	
Travel Time (s)		6.0	6.3		18.5	
Confl. Peds. (#/hr)	15			15		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	9%	3%	4%	0%	17%	0%
Adj. Flow (vph)	13	1017	693	17	6	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1030	710	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	966	658	16	6	7
Future Volume (Veh/h)	12	966	658	16	6	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	1017	693	17	6	7
Pedestrians					15	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		83				
pX, platoon unblocked					0.79	
vC, conflicting volume	725				1251	370
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	725				791	370
tC, single (s)	4.3				7.1	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	98				97	99
cM capacity (veh/h)	818				229	625

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	352	678	462	248	13
Volume Left	13	0	0	0	6
Volume Right	0	0	0	17	7
cSH	818	1700	1700	1700	348
Volume to Capacity	0.02	0.40	0.27	0.15	0.04
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.9
Control Delay (s)	0.5	0.0	0.0	0.0	15.8
Lane LOS	A				C
Approach Delay (s)	0.2		0.0		15.8
Approach LOS					C

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		45.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	957	12	11	664	13	8	5	11	7	3	5
Future Volume (vph)	5	957	12	11	664	13	8	5	11	7	3	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.997			0.938			0.955	
Flt Protected					0.999			0.983			0.977	
Satd. Flow (prot)	0	3500	0	0	3462	0	0	1752	0	0	1773	0
Flt Permitted					0.999			0.983			0.977	
Satd. Flow (perm)	0	3500	0	0	3462	0	0	1752	0	0	1773	0
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		87.2			92.0			186.9			205.1	
Travel Time (s)		6.3			6.6			16.8			18.5	
Confl. Peds. (#/hr)	12		6	6		12			2	2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	1018	13	12	706	14	9	5	12	7	3	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1036	0	0	732	0	0	26	0	0	15	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	41.0%	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)	5	957	12	11	664	13	8	5	11	7	3	5
Future Volume (Veh/h)	5	957	12	11	664	13	8	5	11	7	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	1018	13	12	706	14	9	5	12	7	3	5
Pedestrians					2			6			12	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		170										
pX, platoon unblocked				0.79			0.79	0.79	0.79	0.79	0.79	
vC, conflicting volume	732			1037			1424	1796	524	1284	1796	372
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	732			527			1014	1484	0	838	1483	372
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			94	95	99	96	97	99
cM capacity (veh/h)	873			830			146	97	860	190	97	625

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	514	522	365	367	26	15
Volume Left	5	0	12	0	9	7
Volume Right	0	13	0	14	12	5
cSH	873	1700	830	1700	204	198
Volume to Capacity	0.01	0.31	0.01	0.22	0.13	0.08
Queue Length 95th (m)	0.1	0.0	0.4	0.0	3.4	2.0
Control Delay (s)	0.2	0.0	0.5	0.0	25.2	24.7
Lane LOS	A		A		D	C
Approach Delay (s)	0.1		0.2		25.2	24.7
Approach LOS					D	C

Intersection Summary					
Average Delay	0.7				
Intersection Capacity Utilization	41.0%	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)	1	25	4	3	19	10	1	20	2	9	20	7
Future Volume (vph)	1	25	4	3	19	10	1	20	2	9	20	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.984			0.958			0.989			0.973	
Flt Protected		0.998			0.996			0.998			0.988	
Satd. Flow (prot)	0	1866	0	0	1813	0	0	1875	0	0	1827	0
Flt Permitted		0.998			0.996			0.998			0.988	
Satd. Flow (perm)	0	1866	0	0	1813	0	0	1875	0	0	1827	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			84.1			166.7			185.5	
Travel Time (s)		7.6			7.6			15.0			16.7	
Confl. Peds. (#/hr)	10		10	10		10	3		3	3		3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	28	4	3	21	11	1	22	2	10	22	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	35	0	0	25	0	0	40	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	25	4	3	19	10	1	20	2	9	20	7
Future Volume (vph)	1	25	4	3	19	10	1	20	2	9	20	7
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	28	4	3	21	11	1	22	2	10	22	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	33	35	25	40
Volume Left (vph)	1	3	1	10
Volume Right (vph)	4	11	2	8
Hadj (s)	-0.07	-0.17	-0.04	-0.07
Departure Headway (s)	4.0	3.9	4.0	4.0
Degree Utilization, x	0.04	0.04	0.03	0.04
Capacity (veh/h)	878	902	863	881
Control Delay (s)	7.2	7.1	7.2	7.2
Approach Delay (s)	7.2	7.1	7.2	7.2
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.1		
Level of Service	A		
Intersection Capacity Utilization	19.1%	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)	8	24	9	1	31	7	3	12	2	1	17	3
Future Volume (vph)	8	24	9	1	31	7	3	12	2	1	17	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.970			0.975			0.985			0.982	
Flt Protected		0.990			0.999			0.992			0.998	
Satd. Flow (prot)	0	1825	0	0	1851	0	0	1857	0	0	1862	0
Flt Permitted		0.990			0.999			0.992			0.998	
Satd. Flow (perm)	0	1825	0	0	1851	0	0	1857	0	0	1862	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			86.1			155.9			186.9	
Travel Time (s)		7.6			7.7			14.0			16.8	
Confl. Peds. (#/hr)	5		5	5		5	4		1	1		4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	9	26	10	1	34	8	3	13	2	1	18	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	45	0	0	43	0	0	18	0	0	22	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	24	9	1	31	7	3	12	2	1	17	3
Future Volume (vph)	8	24	9	1	31	7	3	12	2	1	17	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	26	10	1	34	8	3	13	2	1	18	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	45	43	18	22
Volume Left (vph)	9	1	3	1
Volume Right (vph)	10	8	2	3
Hadj (s)	-0.09	-0.11	-0.03	-0.07
Departure Headway (s)	3.9	3.9	4.1	4.0
Degree Utilization, x	0.05	0.05	0.02	0.02
Capacity (veh/h)	898	902	854	870
Control Delay (s)	7.1	7.1	7.2	7.1
Approach Delay (s)	7.1	7.1	7.2	7.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.1		
Level of Service	A		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	31	8	3	35	0	8
Future Volume (vph)	31	8	3	35	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.972				0.865	
Flt Protected				0.996		
Satd. Flow (prot)	1847	0	0	1892	1644	0
Flt Permitted				0.996		
Satd. Flow (perm)	1847	0	0	1892	1644	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	84.1			84.7	140.7	
Travel Time (s)	7.6			7.6	12.7	
Confl. Peds. (#/hr)		10	10		2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	34	9	3	38	0	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	41	9	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	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	16.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	31	8	3	35	0	8
Future Volume (Veh/h)	31	8	3	35	0	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	9	3	38	0	9
Pedestrians	2			1	10	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			53		94	50
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			53		94	50
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1553		899	1015

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	43	41	9
Volume Left	0	3	0
Volume Right	9	0	9
cSH	1700	1553	1015
Volume to Capacity	0.03	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.0	0.5	8.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.5	8.6
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	16.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Graham Avenue S/Graham Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	87.9	80.4	68.4	63.1	19.6	21.0
Average Queue (m)	65.9	43.3	39.3	28.8	5.2	5.3
95th Queue (m)	93.0	72.9	59.5	50.5	14.9	15.0
Link Distance (m)	81.1	81.1	68.2	68.2	165.0	174.3
Upstream Blk Time (%)	3	0	0	0		
Queuing Penalty (veh)	0	0	0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main Street E & Houghton Avenue N

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (m)	32.2	17.8	5.0	1.2	14.7
Average Queue (m)	3.6	0.8	0.2	0.0	3.8
95th Queue (m)	17.7	8.9	2.6	0.8	12.0
Link Distance (m)	68.2	68.2	68.5	68.5	193.5
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Wexford Avenue S/Wexford Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	12.6	3.3	36.9	10.4	15.6	14.2
Average Queue (m)	0.7	0.1	4.6	0.4	5.6	4.1
95th Queue (m)	5.5	2.3	20.9	6.4	14.0	12.2
Link Distance (m)	68.5	68.5	83.4	83.4	166.3	193.0
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Graham Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.3	10.6	10.6	13.2
Average Queue (m)	5.6	6.2	5.2	6.8
95th Queue (m)	12.8	13.3	12.8	13.7
Link Distance (m)	76.3	65.5	158.3	165.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Wexford Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.8	15.0	10.7	10.4
Average Queue (m)	6.9	7.2	4.5	4.7
95th Queue (m)	13.5	14.1	12.1	12.3
Link Distance (m)	69.6	77.7	147.5	166.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Houghton Avenue S & Maple Avenue

Movement	NB
Directions Served	LR
Maximum Queue (m)	9.2
Average Queue (m)	2.2
95th Queue (m)	8.6
Link Distance (m)	132.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	582	3	4	574	2	10	1	15	12	2	7
Future Volume (vph)	0	582	3	4	574	2	10	1	15	12	2	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.999						0.921			0.953	
Flt Protected								0.981			0.973	
Satd. Flow (prot)	0	3403	0	0	3439	0	0	1698	0	0	1752	0
Flt Permitted					0.952			0.936			0.904	
Satd. Flow (perm)	0	3403	0	0	3274	0	0	1618	0	0	1622	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1						17			8	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		89.6			83.3			185.5			186.4	
Travel Time (s)		6.5			6.0			16.7			16.8	
Confl. Peds. (#/hr)	3		1	1		3	3		6	6		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	6%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	647	3	4	638	2	11	1	17	13	2	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	650	0	0	644	0	0	29	0	0	23	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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		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)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.1	28.1		28.1	28.1		28.4	28.4		28.4	28.4	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	55.6%	55.6%		55.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	44.9	44.9		44.9	44.9		34.6	34.6		34.6	34.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.8	1.8		1.8	1.8		2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			5.4			5.4	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	12.0	12.0		12.0	12.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
v/c Ratio		0.38			0.39			0.05			0.04	
Control Delay		14.8			15.0			10.8			13.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.8			15.0			10.8			13.5	
LOS		B			B			B			B	
Approach Delay		14.8			15.0			10.8			13.5	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 6 (7%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.39			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 46.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Graham Avenue S/Graham Avenue N & Main Street E

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	650	644	29	23
v/c Ratio	0.38	0.39	0.05	0.04
Control Delay	14.8	15.0	10.8	13.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.8	15.0	10.8	13.5
Queue Length 50th (m)	36.7	36.7	1.3	1.7
Queue Length 95th (m)	49.6	49.7	6.9	6.6
Internal Link Dist (m)	65.6	59.3	161.5	162.4
Turn Bay Length (m)				
Base Capacity (vph)	1698	1633	632	628
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.38	0.39	0.05	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	582	3	4	574	2	10	1	15	12	2	7
Future Volume (vph)	0	582	3	4	574	2	10	1	15	12	2	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1			5.1			5.4			5.4	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.92			0.95	
Flt Protected		1.00			1.00			0.98			0.97	
Satd. Flow (prot)		3404			3437			1696			1745	
Flt Permitted		1.00			0.95			0.94			0.90	
Satd. Flow (perm)		3404			3273			1618			1622	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	647	3	4	638	2	11	1	17	13	2	8
RTOR Reduction (vph)	0	1	0	0	0	0	0	10	0	0	5	0
Lane Group Flow (vph)	0	649	0	0	644	0	0	19	0	0	18	0
Confl. Peds. (#/hr)	3		1	1		3	3		6	6		3
Heavy Vehicles (%)	0%	6%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		44.9			44.9			34.6			34.6	
Effective Green, g (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
Clearance Time (s)		5.1			5.1			5.4			5.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1698			1632			622			623	
v/s Ratio Prot		0.19										
v/s Ratio Perm					c0.20			c0.01			0.01	
v/c Ratio		0.38			0.39			0.03			0.03	
Uniform Delay, d1		14.0			14.1			17.2			17.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.7			0.7			0.1			0.1	
Delay (s)		14.6			14.8			17.3			17.3	
Level of Service		B			B			B			B	
Approach Delay (s)		14.6			14.8			17.3			17.3	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.24				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		10.5	
Intersection Capacity Utilization	46.6%	ICU Level of Service		A	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	591	601	6	2	4
Future Volume (vph)	0	591	601	6	2	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.910	
Flt Protected					0.984	
Satd. Flow (prot)	0	3406	3433	0	1701	0
Flt Permitted					0.984	
Satd. Flow (perm)	0	3406	3433	0	1701	0
Link Speed (k/h)		50	50		40	
Link Distance (m)		83.3	87.2		205.5	
Travel Time (s)		6.0	6.3		18.5	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%
Adj. Flow (vph)	0	649	660	7	2	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	649	667	0	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	591	601	6	2	4
Future Volume (Veh/h)	0	591	601	6	2	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	649	660	7	2	4
Pedestrians					5	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		83				
pX, platoon unblocked					0.89	
vC, conflicting volume	672				993	338
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	672				742	338
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				99	99
cM capacity (veh/h)	924				315	660

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	216	433	440	227	6
Volume Left	0	0	0	0	2
Volume Right	0	0	0	7	4
cSH	924	1700	1700	1700	483
Volume to Capacity	0.00	0.25	0.26	0.13	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	12.5
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.5
Approach LOS					B

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		26.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	566	11	7	590	10	2	1	17	1	0	6
Future Volume (vph)	9	566	11	7	590	10	2	1	17	1	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.998			0.883			0.882	
Flt Protected		0.999			0.999			0.995			0.994	
Satd. Flow (prot)	0	3399	0	0	3427	0	0	1669	0	0	1418	0
Flt Permitted		0.999			0.999			0.995			0.994	
Satd. Flow (perm)	0	3399	0	0	3427	0	0	1669	0	0	1418	0
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		87.2			92.0			186.9			205.1	
Travel Time (s)		6.3			6.6			16.8			18.5	
Confl. Peds. (#/hr)	4		2	2		4			1	1		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	6%	0%	0%	5%	11%	0%	0%	0%	0%	0%	20%
Adj. Flow (vph)	10	622	12	8	648	11	2	1	19	1	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	644	0	0	667	0	0	22	0	0	8	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	32.7%	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)	9	566	11	7	590	10	2	1	17	1	0	6
Future Volume (Veh/h)	9	566	11	7	590	10	2	1	17	1	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	10	622	12	8	648	11	2	1	19	1	0	7
Pedestrians					1			2			4	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		170										
pX, platoon unblocked				0.90			0.90	0.90	0.90	0.90	0.90	
vC, conflicting volume	663			636			997	1329	320	1025	1330	334
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	663			369			771	1141	18	802	1141	334
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.5
p0 queue free %	99			99			99	99	98	100	100	99
cM capacity (veh/h)	932			1077			256	178	953	239	178	610

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	321	323	332	335	22	8
Volume Left	10	0	8	0	2	1
Volume Right	0	12	0	11	19	7
cSH	932	1700	1077	1700	659	511
Volume to Capacity	0.01	0.19	0.01	0.20	0.03	0.02
Queue Length 95th (m)	0.3	0.0	0.2	0.0	0.8	0.4
Control Delay (s)	0.4	0.0	0.3	0.0	10.7	12.2
Lane LOS	A		A		B	B
Approach Delay (s)	0.2		0.1		10.7	12.2
Approach LOS					B	B

Intersection Summary					
Average Delay	0.4				
Intersection Capacity Utilization	32.7%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	12	2	1	21	7	4	17	1	5	7	2
Future Volume (vph)	0	12	2	1	21	7	4	17	1	5	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.967			0.995			0.983	
Flt Protected					0.998			0.990			0.982	
Satd. Flow (prot)	0	1868	0	0	1834	0	0	1872	0	0	1834	0
Flt Permitted					0.998			0.990			0.982	
Satd. Flow (perm)	0	1868	0	0	1834	0	0	1872	0	0	1834	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			84.1			166.7			185.5	
Travel Time (s)		7.6			7.6			15.0			16.7	
Confl. Peds. (#/hr)	11		5	5		11	2		5	5		2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	14	2	1	24	8	5	20	1	6	8	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	33	0	0	26	0	0	16	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization	17.9%				ICU Level of Service A							
Analysis Period (min)	15											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	12	2	1	21	7	4	17	1	5	7	2
Future Volume (vph)	0	12	2	1	21	7	4	17	1	5	7	2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	14	2	1	24	8	5	20	1	6	8	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	33	26	16
Volume Left (vph)	0	1	5	6
Volume Right (vph)	2	8	1	2
Hadj (s)	-0.07	-0.14	0.02	0.00
Departure Headway (s)	3.9	3.9	4.0	4.0
Degree Utilization, x	0.02	0.04	0.03	0.02
Capacity (veh/h)	895	916	870	878
Control Delay (s)	7.0	7.0	7.2	7.1
Approach Delay (s)	7.0	7.0	7.2	7.1
Approach LOS	A	A	A	A

Intersection Summary												
Delay			7.1									
Level of Service			A									
Intersection Capacity Utilization			17.9%		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)	10	12	1	1	22	0	0	18	1	0	5	5
Future Volume (vph)	10	12	1	1	22	0	0	18	1	0	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995						0.994			0.932	
Flt Protected		0.978			0.998							
Satd. Flow (prot)	0	1849	0	0	1896	0	0	1889	0	0	1771	0
Flt Permitted		0.978			0.998							
Satd. Flow (perm)	0	1849	0	0	1896	0	0	1889	0	0	1771	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			86.1			155.9			186.9	
Travel Time (s)		7.6			7.7			14.0			16.8	
Confl. Peds. (#/hr)	6		7	7		6	4		4	4		4
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	12	14	1	1	26	0	0	21	1	0	6	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	0	0	27	0	0	22	0	0	12	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	12	1	1	22	0	0	18	1	0	5	5
Future Volume (vph)	10	12	1	1	22	0	0	18	1	0	5	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	12	14	1	1	26	0	0	21	1	0	6	6

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	27	27	22	12
Volume Left (vph)	12	1	0	0
Volume Right (vph)	1	0	1	6
Hadj (s)	0.07	0.01	-0.03	-0.30
Departure Headway (s)	4.1	4.0	4.0	3.7
Degree Utilization, x	0.03	0.03	0.02	0.01
Capacity (veh/h)	872	886	876	943
Control Delay (s)	7.2	7.1	7.1	6.8
Approach Delay (s)	7.2	7.1	7.1	6.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.1		
Level of Service	A		
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	15	2	4	27	5	2
Future Volume (vph)	15	2	4	27	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.982				0.959	
Flt Protected				0.994	0.966	
Satd. Flow (prot)	1744	0	0	1889	1760	0
Flt Permitted				0.994	0.966	
Satd. Flow (perm)	1744	0	0	1889	1760	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	84.1			84.7	140.7	
Travel Time (s)	7.6			7.6	12.7	
Confl. Peds. (#/hr)		9	9		1	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles (%)	8%	0%	0%	0%	0%	0%
Adj. Flow (vph)	20	3	5	36	7	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	0	41	10	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	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	15	2	4	27	5	2
Future Volume (Veh/h)	15	2	4	27	5	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	20	3	5	36	7	3
Pedestrians	1				9	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			32		78	30
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			32		78	30
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1581		920	1042

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	23	41	10
Volume Left	0	5	7
Volume Right	3	0	3
cSH	1700	1581	953
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.3
Control Delay (s)	0.0	0.9	8.8
Lane LOS		A	A
Approach Delay (s)	0.0	0.9	8.8
Approach LOS			A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Graham Avenue S/Graham Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	75.7	58.0	58.0	47.8	14.0	16.7
Average Queue (m)	45.0	24.0	37.8	25.0	4.0	3.1
95th Queue (m)	65.5	50.7	54.1	43.9	12.0	11.7
Link Distance (m)	81.1	81.1	68.2	68.2	165.0	174.3
Upstream Blk Time (%)	0		0			
Queuing Penalty (veh)	0		0			
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main Street E & Houghton Avenue N

Movement	SB
Directions Served	LR
Maximum Queue (m)	9.3
Average Queue (m)	1.7
95th Queue (m)	7.4
Link Distance (m)	193.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Wexford Avenue S/Wexford Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	22.9	9.8	24.3	6.6	9.1	15.8
Average Queue (m)	2.5	0.3	2.0	0.3	4.3	2.3
95th Queue (m)	12.4	5.4	11.8	3.6	11.7	9.6
Link Distance (m)	68.5	68.5	83.4	83.4	166.3	193.0
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Graham Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.3	9.3	10.8	10.6
Average Queue (m)	3.2	5.2	5.1	3.6
95th Queue (m)	10.4	12.6	12.7	11.1
Link Distance (m)	76.3	65.5	158.3	165.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Wexford Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.8	10.7	9.3	9.2
Average Queue (m)	4.4	5.2	4.8	2.4
95th Queue (m)	12.0	12.7	12.3	8.9
Link Distance (m)	69.6	77.7	147.5	166.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Houghton Avenue S & Maple Avenue

Movement	NB
Directions Served	LR
Maximum Queue (m)	9.3
Average Queue (m)	1.8
95th Queue (m)	7.8
Link Distance (m)	132.2
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1020	14	7	663	10	15	8	13	12	12	8
Future Volume (vph)	1	1020	14	7	663	10	15	8	13	12	12	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.998			0.998			0.950			0.968	
Flt Protected								0.979			0.981	
Satd. Flow (prot)	0	3498	0	0	3499	0	0	1754	0	0	1738	0
Flt Permitted		0.955			0.944			0.918			0.929	
Satd. Flow (perm)	0	3340	0	0	3303	0	0	1639	0	0	1641	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			14			8	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		89.6			83.3			185.5			186.4	
Travel Time (s)		6.5			6.0			16.7			16.8	
Confl. Peds. (#/hr)	19		9	1		3	8		7	7		8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	14%
Adj. Flow (vph)	1	1063	15	7	691	10	16	8	14	13	13	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1079	0	0	708	0	0	38	0	0	34	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.1	28.1		28.1	28.1		28.4	28.4		28.4	28.4	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	55.6%	55.6%		55.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	44.9	44.9		44.9	44.9		34.6	34.6		34.6	34.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.8	1.8		1.8	1.8		2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			5.4			5.4	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	12.0	12.0		12.0	12.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
v/c Ratio		0.65			0.43			0.06			0.05	
Control Delay		18.9			15.4			12.9			14.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.9			15.4			12.9			14.7	
LOS		B			B			B			B	
Approach Delay		18.9			15.4			12.9			14.7	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 6 (7%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 17.4		Intersection LOS: B	
Intersection Capacity Utilization 57.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Graham Avenue S/Graham Avenue N & Main Street E

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1079	708	38	34
v/c Ratio	0.65	0.43	0.06	0.05
Control Delay	18.9	15.4	12.9	14.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.9	15.4	12.9	14.7
Queue Length 50th (m)	72.7	41.1	2.7	2.9
Queue Length 95th (m)	94.6	55.3	9.0	9.0
Internal Link Dist (m)	65.6	59.3	161.5	162.4
Turn Bay Length (m)				
Base Capacity (vph)	1667	1648	638	635
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.43	0.06	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1020	14	7	663	10	15	8	13	12	12	8
Future Volume (vph)	1	1020	14	7	663	10	15	8	13	12	12	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1			5.1			5.4			5.4	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			1.00			0.95			0.97	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		3497			3497			1749			1734	
Flt Permitted		0.95			0.94			0.92			0.93	
Satd. Flow (perm)		3339			3302			1639			1641	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	1062	15	7	691	10	16	8	14	12	12	8
RTOR Reduction (vph)	0	1	0	0	1	0	0	9	0	0	5	0
Lane Group Flow (vph)	0	1078	0	0	707	0	0	29	0	0	29	0
Confl. Peds. (#/hr)	19		9	1		3	8		7	7		8
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	14%
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)		44.9			44.9			34.6			34.6	
Effective Green, g (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
Clearance Time (s)		5.1			5.1			5.4			5.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1665			1647			630			630	
v/s Ratio Prot												
v/s Ratio Perm		c0.32			0.21			c0.02			0.02	
v/c Ratio		0.65			0.43			0.05			0.05	
Uniform Delay, d1		16.7			14.4			17.4			17.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.0			0.8			0.1			0.1	
Delay (s)		18.7			15.2			17.5			17.5	
Level of Service		B			B			B			B	
Approach Delay (s)		18.7			15.2			17.5			17.5	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.39				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	1015	691	17	7	8
Future Volume (vph)	12	1015	691	17	7	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.928	
Flt Protected		0.999			0.977	
Satd. Flow (prot)	0	3499	3460	0	1596	0
Flt Permitted		0.999			0.977	
Satd. Flow (perm)	0	3499	3460	0	1596	0
Link Speed (k/h)		50	50		40	
Link Distance (m)		83.3	87.2		205.5	
Travel Time (s)		6.0	6.3		18.5	
Confl. Peds. (#/hr)	15			15		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	9%	3%	4%	0%	17%	0%
Adj. Flow (vph)	13	1068	727	18	7	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1081	745	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	1015	691	17	7	8
Future Volume (Veh/h)	12	1015	691	17	7	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	1068	727	18	7	8
Pedestrians					15	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		83				
pX, platoon unblocked					0.78	
vC, conflicting volume	760				1311	388
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	760				822	388
tC, single (s)	4.3				7.1	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	98				97	99
cM capacity (veh/h)	793				214	609

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	369	712	485	260	15
Volume Left	13	0	0	0	7
Volume Right	0	0	0	18	8
cSH	793	1700	1700	1700	327
Volume to Capacity	0.02	0.42	0.29	0.15	0.05
Queue Length 95th (m)	0.4	0.0	0.0	0.0	1.2
Control Delay (s)	0.5	0.0	0.0	0.0	16.5
Lane LOS	A				C
Approach Delay (s)	0.2		0.0		16.5
Approach LOS					C

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		46.5%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1006	12	11	698	13	9	6	11	8	3	6
Future Volume (vph)	6	1006	12	11	698	13	9	6	11	8	3	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.997			0.942			0.955	
Flt Protected					0.999			0.982			0.976	
Satd. Flow (prot)	0	3500	0	0	3462	0	0	1758	0	0	1771	0
Flt Permitted					0.999			0.982			0.976	
Satd. Flow (perm)	0	3500	0	0	3462	0	0	1758	0	0	1771	0
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		87.2			92.0			186.9			205.1	
Travel Time (s)		6.3			6.6			16.8			18.5	
Confl. Peds. (#/hr)	12		6	6		12			2	2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	6	1070	13	12	743	14	10	6	12	9	3	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1089	0	0	769	0	0	28	0	0	18	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.0%	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)	6	1006	12	11	698	13	9	6	11	8	3	6
Future Volume (Veh/h)	6	1006	12	11	698	13	9	6	11	8	3	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	6	1070	13	12	743	14	10	6	12	9	3	6
Pedestrians					2			6			12	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		170										
pX, platoon unblocked				0.78			0.78	0.78	0.78	0.78	0.78	
vC, conflicting volume	769			1089			1498	1888	550	1350	1887	390
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	769			540			1066	1568	0	876	1567	390
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			92	93	99	95	96	99
cM capacity (veh/h)	846			803			130	84	842	171	84	608

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	541	548	384	386	28	18
Volume Left	6	0	12	0	10	9
Volume Right	0	13	0	14	12	6
cSH	846	1700	803	1700	172	183
Volume to Capacity	0.01	0.32	0.01	0.23	0.16	0.10
Queue Length 95th (m)	0.2	0.0	0.4	0.0	4.5	2.6
Control Delay (s)	0.2	0.0	0.5	0.0	30.0	26.7
Lane LOS	A		A		D	D
Approach Delay (s)	0.1		0.2		30.0	26.7
Approach LOS					D	D

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	43.0%	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)	1	28	5	4	21	11	1	22	2	10	22	7
Future Volume (vph)	1	28	5	4	21	11	1	22	2	10	22	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.979			0.959			0.990			0.975	
Flt Protected		0.999			0.995			0.998			0.988	
Satd. Flow (prot)	0	1858	0	0	1813	0	0	1877	0	0	1830	0
Flt Permitted		0.999			0.995			0.998			0.988	
Satd. Flow (perm)	0	1858	0	0	1813	0	0	1877	0	0	1830	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			84.1			166.7			185.5	
Travel Time (s)		7.6			7.6			15.0			16.7	
Confl. Peds. (#/hr)	10		10	10		10	3		3	3		3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	31	6	4	24	12	1	25	2	11	25	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	0	0	40	0	0	28	0	0	44	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	20.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	28	5	4	21	11	1	22	2	10	22	7
Future Volume (vph)	1	28	5	4	21	11	1	22	2	10	22	7
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	31	6	4	24	12	1	25	2	11	25	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	38	40	28	44
Volume Left (vph)	1	4	1	11
Volume Right (vph)	6	12	2	8
Hadj (s)	-0.09	-0.16	-0.04	-0.06
Departure Headway (s)	4.0	3.9	4.1	4.0
Degree Utilization, x	0.04	0.04	0.03	0.05
Capacity (veh/h)	877	894	855	871
Control Delay (s)	7.2	7.1	7.2	7.2
Approach Delay (s)	7.2	7.1	7.2	7.2
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.2		
Level of Service	A		
Intersection Capacity Utilization	20.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	27	10	1	34	7	4	13	2	1	18	4
Future Volume (vph)	9	27	10	1	34	7	4	13	2	1	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.970			0.977			0.986			0.978	
Flt Protected		0.990			0.999			0.990			0.998	
Satd. Flow (prot)	0	1825	0	0	1854	0	0	1855	0	0	1854	0
Flt Permitted		0.990			0.999			0.990			0.998	
Satd. Flow (perm)	0	1825	0	0	1854	0	0	1855	0	0	1854	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			86.1			155.9			186.9	
Travel Time (s)		7.6			7.7			14.0			16.8	
Confl. Peds. (#/hr)	5		5	5		5	4		1	1		4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	29	11	1	37	8	4	14	2	1	20	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	0	0	46	0	0	20	0	0	25	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	27	10	1	34	7	4	13	2	1	18	4
Future Volume (vph)	9	27	10	1	34	7	4	13	2	1	18	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	29	11	1	37	8	4	14	2	1	20	4

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	50	46	20	25
Volume Left (vph)	10	1	4	1
Volume Right (vph)	11	8	2	4
Hadj (s)	-0.09	-0.10	-0.02	-0.09
Departure Headway (s)	3.9	3.9	4.1	4.0
Degree Utilization, x	0.05	0.05	0.02	0.03
Capacity (veh/h)	894	896	845	867
Control Delay (s)	7.2	7.2	7.2	7.1
Approach Delay (s)	7.2	7.2	7.2	7.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.2		
Level of Service	A		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	34	9	4	39	0	9
Future Volume (vph)	34	9	4	39	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.971				0.865	
Flt Protected				0.996		
Satd. Flow (prot)	1845	0	0	1892	1644	0
Flt Permitted				0.996		
Satd. Flow (perm)	1845	0	0	1892	1644	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	84.1			84.7	140.7	
Travel Time (s)	7.6			7.6	12.7	
Confl. Peds. (#/hr)		10	10		2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	37	10	4	42	0	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	0	0	46	10	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	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	16.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	34	9	4	39	0	9
Future Volume (Veh/h)	34	9	4	39	0	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	10	4	42	0	10
Pedestrians	2			1	10	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			57		104	53
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			57		104	53
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1547		888	1011

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	47	46	10
Volume Left	0	4	0
Volume Right	10	0	10
cSH	1700	1547	1011
Volume to Capacity	0.03	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.2
Control Delay (s)	0.0	0.7	8.6
Lane LOS		A	A
Approach Delay (s)	0.0	0.7	8.6
Approach LOS			A

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	16.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Graham Avenue S/Graham Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	89.6	86.7	70.4	65.5	19.4	21.5
Average Queue (m)	69.1	47.2	43.5	34.3	5.4	5.2
95th Queue (m)	94.0	76.1	63.6	58.2	14.6	15.4
Link Distance (m)	81.1	81.1	68.2	68.2	165.0	174.3
Upstream Blk Time (%)	4	0	0	0		
Queuing Penalty (veh)	0	0	1	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main Street E & Houghton Avenue N

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (m)	24.7	9.2	16.8	8.3	15.5
Average Queue (m)	2.9	0.3	0.8	0.3	4.1
95th Queue (m)	14.1	4.3	8.8	5.8	12.6
Link Distance (m)	68.2	68.2	68.5	68.5	193.5
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Wexford Avenue S/Wexford Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	17.9	3.0	41.1	18.6	16.6	11.9
Average Queue (m)	1.4	0.1	4.1	0.6	5.3	4.7
95th Queue (m)	8.9	2.1	21.4	8.7	13.5	12.9
Link Distance (m)	68.5	68.5	83.4	83.4	166.3	193.0
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Graham Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	12.2	9.3	10.8	12.2
Average Queue (m)	5.8	6.4	5.5	6.3
95th Queue (m)	13.7	13.2	13.0	13.8
Link Distance (m)	76.3	65.5	158.3	165.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Wexford Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	13.7	10.8	9.3	10.6
Average Queue (m)	7.2	7.0	4.1	5.3
95th Queue (m)	14.1	13.8	11.6	12.9
Link Distance (m)	69.6	77.7	147.5	166.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Houghton Avenue S & Maple Avenue

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	3.1	1.8	9.3
Average Queue (m)	0.1	0.1	2.3
95th Queue (m)	2.2	1.3	8.7
Link Distance (m)	65.5	69.6	132.2
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 2

Appendix F

Total Traffic Operations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	554	35	4	547	2	70	1	15	12	2	6
Future Volume (vph)	0	554	35	4	547	2	70	1	15	12	2	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.991						0.976			0.957	
Flt Protected								0.961			0.971	
Satd. Flow (prot)	0	3382	0	0	3439	0	0	1776	0	0	1757	0
Flt Permitted					0.952			0.779			0.881	
Satd. Flow (perm)	0	3382	0	0	3274	0	0	1436	0	0	1588	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10						14			7	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		89.6			83.3			185.5			186.4	
Travel Time (s)		6.5			6.0			16.7			16.8	
Confl. Peds. (#/hr)	3		1	1		3	3		6	6		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	6%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	616	39	4	608	2	78	1	17	13	2	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	655	0	0	614	0	0	96	0	0	22	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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		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)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.1	28.1		28.1	28.1		28.4	28.4		28.4	28.4	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	55.6%	55.6%		55.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	44.9	44.9		44.9	44.9		34.6	34.6		34.6	34.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.8	1.8		1.8	1.8		2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			5.4			5.4	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	12.0	12.0		12.0	12.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
v/c Ratio		0.39			0.38			0.17			0.04	
Control Delay		14.6			14.8			16.5			13.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.6			14.8			16.5			13.8	
LOS		B			B			B			B	
Approach Delay		14.6			14.8			16.5			13.8	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 6 (7%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.39			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 46.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Graham Avenue S/Graham Avenue N & Main Street E

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	655	614	96	22
v/c Ratio	0.39	0.38	0.17	0.04
Control Delay	14.6	14.8	16.5	13.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.6	14.8	16.5	13.8
Queue Length 50th (m)	36.5	34.5	9.6	1.7
Queue Length 95th (m)	49.5	47.2	20.4	6.5
Internal Link Dist (m)	65.6	59.3	161.5	162.4
Turn Bay Length (m)				
Base Capacity (vph)	1692	1633	560	614
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.38	0.17	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	554	35	4	547	2	70	1	15	12	2	6
Future Volume (vph)	0	554	35	4	547	2	70	1	15	12	2	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1			5.1			5.4			5.4	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.98			0.96	
Flt Protected		1.00			1.00			0.96			0.97	
Satd. Flow (prot)		3382			3437			1771			1751	
Flt Permitted		1.00			0.95			0.78			0.88	
Satd. Flow (perm)		3382			3272			1437			1589	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	616	39	4	608	2	78	1	17	13	2	7
RTOR Reduction (vph)	0	5	0	0	0	0	0	9	0	0	4	0
Lane Group Flow (vph)	0	650	0	0	614	0	0	87	0	0	18	0
Confl. Peds. (#/hr)	3		1	1		3	3		6	6		3
Heavy Vehicles (%)	0%	6%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		44.9			44.9			34.6			34.6	
Effective Green, g (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
Clearance Time (s)		5.1			5.1			5.4			5.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1687			1632			552			610	
v/s Ratio Prot		c0.19										
v/s Ratio Perm					0.19			c0.06			0.01	
v/c Ratio		0.39			0.38			0.16			0.03	
Uniform Delay, d1		14.0			13.9			18.2			17.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.7			0.7			0.6			0.1	
Delay (s)		14.7			14.6			18.8			17.3	
Level of Service		B			B			B			B	
Approach Delay (s)		14.7			14.6			18.8			17.3	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.29				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	562	572	5	2	4
Future Volume (vph)	0	562	572	5	2	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.999		0.910	
Flt Protected					0.984	
Satd. Flow (prot)	0	3406	3436	0	1701	0
Flt Permitted					0.984	
Satd. Flow (perm)	0	3406	3436	0	1701	0
Link Speed (k/h)		50	50		40	
Link Distance (m)		83.3	87.2		205.5	
Travel Time (s)		6.0	6.3		18.5	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%
Adj. Flow (vph)	0	618	629	5	2	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	618	634	0	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	562	572	5	2	4
Future Volume (Veh/h)	0	562	572	5	2	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	618	629	5	2	4
Pedestrians					5	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		83				
pX, platoon unblocked					0.89	
vC, conflicting volume	639				946	322
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	639				695	322
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				99	99
cM capacity (veh/h)	951				338	677

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	206	412	419	215	6
Volume Left	0	0	0	0	2
Volume Right	0	0	0	5	4
cSH	951	1700	1700	1700	507
Volume to Capacity	0.00	0.24	0.25	0.13	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	12.2
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.2
Approach LOS					B

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		26.0%	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)	8	538	11	34	561	9	2	1	100	1	0	5
Future Volume (vph)	8	538	11	34	561	9	2	1	100	1	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.998			0.869			0.887	
Flt Protected		0.999			0.997			0.999			0.992	
Satd. Flow (prot)	0	3399	0	0	3427	0	0	1649	0	0	1433	0
Flt Permitted		0.999			0.997			0.999			0.992	
Satd. Flow (perm)	0	3399	0	0	3427	0	0	1649	0	0	1433	0
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		87.2			92.0			186.9			205.1	
Travel Time (s)		6.3			6.6			16.8			18.5	
Confl. Peds. (#/hr)	4		2	2		4			1	1		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	6%	0%	0%	5%	11%	0%	0%	0%	0%	0%	20%
Adj. Flow (vph)	9	591	12	37	616	10	2	1	110	1	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	612	0	0	663	0	0	113	0	0	6	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	538	11	34	561	9	2	1	100	1	0	5
Future Volume (Veh/h)	8	538	11	34	561	9	2	1	100	1	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	9	591	12	37	616	10	2	1	110	1	0	5
Pedestrians					1			2			4	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		170										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	630			605			1004	1321	304	1124	1322	317
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	630			354			795	1145	22	928	1146	317
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.5
p0 queue free %	99			97			99	99	88	99	100	99
cM capacity (veh/h)	959			1099			243	173	954	173	173	626

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	304	308	345	318	113	6
Volume Left	9	0	37	0	2	1
Volume Right	0	12	0	10	110	5
cSH	959	1700	1099	1700	874	436
Volume to Capacity	0.01	0.18	0.03	0.19	0.13	0.01
Queue Length 95th (m)	0.2	0.0	0.8	0.0	3.5	0.3
Control Delay (s)	0.4	0.0	1.2	0.0	9.7	13.4
Lane LOS	A		A		A	B
Approach Delay (s)	0.2		0.6		9.7	13.4
Approach LOS					A	B

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	49.1%	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)	0	11	2	1	19	68	3	15	1	36	7	2
Future Volume (vph)	0	11	2	1	19	68	3	15	1	36	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.982			0.896			0.994			0.995	
Flt Protected								0.993			0.961	
Satd. Flow (prot)	0	1866	0	0	1702	0	0	1875	0	0	1817	0
Flt Permitted								0.993			0.961	
Satd. Flow (perm)	0	1866	0	0	1702	0	0	1875	0	0	1817	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			84.1			166.7			185.5	
Travel Time (s)		7.6			7.6			15.0			16.7	
Confl. Peds. (#/hr)	11		5	5		11	2		5	5		2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	13	2	1	22	78	3	17	1	41	8	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	15	0	0	101	0	0	21	0	0	51	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization	25.0%			ICU Level of Service A								
Analysis Period (min)	15											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	2	1	19	68	3	15	1	36	7	2
Future Volume (vph)	0	11	2	1	19	68	3	15	1	36	7	2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	13	2	1	22	78	3	17	1	41	8	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	15	101	21	51
Volume Left (vph)	0	1	3	41
Volume Right (vph)	2	78	1	2
Hadj (s)	-0.08	-0.46	0.00	0.14
Departure Headway (s)	4.1	3.6	4.2	4.3
Degree Utilization, x	0.02	0.10	0.02	0.06
Capacity (veh/h)	859	972	826	814
Control Delay (s)	7.1	7.0	7.3	7.6
Approach Delay (s)	7.1	7.0	7.3	7.6
Approach LOS	A	A	A	A

Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			25.0%		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)	93	11	1	1	20	0	0	17	1	0	4	32
Future Volume (vph)	93	11	1	1	20	0	0	17	1	0	4	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999						0.994			0.881	
Flt Protected		0.958			0.998							
Satd. Flow (prot)	0	1818	0	0	1896	0	0	1889	0	0	1674	0
Flt Permitted		0.958			0.998							
Satd. Flow (perm)	0	1818	0	0	1896	0	0	1889	0	0	1674	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			86.1			155.9			186.9	
Travel Time (s)		7.6			7.7			14.0			16.8	
Confl. Peds. (#/hr)	6		7	7		6	4		4	4		4
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	108	13	1	1	23	0	0	20	1	0	5	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	0	24	0	0	21	0	0	42	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	23.9%	ICU Level of Service A		
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	93	11	1	1	20	0	0	17	1	0	4	32
Future Volume (vph)	93	11	1	1	20	0	0	17	1	0	4	32
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	108	13	1	1	23	0	0	20	1	0	5	37

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	122	24	21	42
Volume Left (vph)	108	1	0	0
Volume Right (vph)	1	0	1	37
Hadj (s)	0.17	0.01	-0.03	-0.53
Departure Headway (s)	4.2	4.2	4.2	3.7
Degree Utilization, x	0.14	0.03	0.02	0.04
Capacity (veh/h)	835	843	810	926
Control Delay (s)	7.9	7.3	7.3	6.9
Approach Delay (s)	7.9	7.3	7.3	6.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.6		
Level of Service		A		
Intersection Capacity Utilization		23.9%	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)	32	13	2	3	24	28	4	0	2	84	0	61
Future Volume (vph)	32	13	2	3	24	28	4	0	2	84	0	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.993			0.939			0.949			0.943	
Flt Protected		0.969			0.997			0.970			0.972	
Satd. Flow (prot)	0	1762	0	0	1763	0	0	1749	0	0	1707	0
Flt Permitted		0.969			0.997			0.970			0.972	
Satd. Flow (perm)	0	1762	0	0	1763	0	0	1749	0	0	1707	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.1			84.7			140.7			47.2	
Travel Time (s)		7.6			7.6			12.7			4.2	
Confl. Peds. (#/hr)			9	9			1					
Peak Hour Factor	0.92	0.75	0.75	0.75	0.75	0.92	0.75	0.92	0.75	0.92	0.92	0.92
Heavy Vehicles (%)	2%	8%	0%	0%	0%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	35	17	3	4	32	30	5	0	3	91	0	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	55	0	0	66	0	0	8	0	0	157	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	13	2	3	24	28	4	0	2	84	0	61
Future Volume (Veh/h)	32	13	2	3	24	28	4	0	2	84	0	61
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.75	0.75	0.75	0.75	0.92	0.75	0.92	0.75	0.92	0.92	0.92
Hourly flow rate (vph)	35	17	3	4	32	30	5	0	3	91	0	66
Pedestrians		1						9				
Lane Width (m)		3.6						3.6				
Walking Speed (m/s)		1.2						1.2				
Percent Blockage		0						1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	62			29			220	168	28	146	154	48
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	62			29			220	168	28	146	154	48
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	100	89	100	94
cM capacity (veh/h)	1541			1585			670	702	1046	799	714	1020

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	55	66	8	157
Volume Left	35	4	5	91
Volume Right	3	30	3	66
cSH	1541	1585	774	879
Volume to Capacity	0.02	0.00	0.01	0.18
Queue Length 95th (m)	0.6	0.1	0.3	5.2
Control Delay (s)	4.8	0.5	9.7	10.0
Lane LOS	A	A	A	A
Approach Delay (s)	4.8	0.5	9.7	10.0
Approach LOS			A	A

Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	26.4%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection: 1: Graham Avenue S/Graham Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	73.0	53.5	60.4	51.5	28.2	10.5
Average Queue (m)	41.9	20.2	36.7	26.2	11.0	2.3
95th Queue (m)	65.9	42.6	54.5	46.0	23.3	8.7
Link Distance (m)	81.1	81.1	68.2	68.2	165.0	174.3
Upstream Blk Time (%)	0		0			
Queuing Penalty (veh)	0		0			
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main Street E & Houghton Avenue N

Movement	WB	SB
Directions Served	T	LR
Maximum Queue (m)	1.8	9.3
Average Queue (m)	0.1	1.8
95th Queue (m)	1.3	7.8
Link Distance (m)	68.5	193.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Wexford Avenue S/Wexford Avenue N & Main Street E

Movement	EB	EB	WB	NB	SB
Directions Served	LT	TR	LT	LTR	LTR
Maximum Queue (m)	15.2	3.1	31.5	23.4	16.9
Average Queue (m)	1.1	0.2	4.6	10.1	2.7
95th Queue (m)	7.5	2.6	19.8	16.2	10.6
Link Distance (m)	68.5	68.5	83.4	166.3	193.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Graham Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.3	13.2	9.3	14.8
Average Queue (m)	3.1	9.0	4.3	7.4
95th Queue (m)	10.2	12.2	11.8	14.1
Link Distance (m)	76.3	67.2	158.3	165.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Wexford Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	14.9	11.8	10.7	12.0
Average Queue (m)	9.2	4.6	4.5	5.7
95th Queue (m)	12.9	12.3	12.2	13.2
Link Distance (m)	67.8	77.7	147.5	166.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Houghton Avenue S/Site Driveway & Maple Avenue

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	7.2	10.8	21.7
Average Queue (m)	0.6	2.0	12.2
95th Queue (m)	4.3	8.4	18.5
Link Distance (m)	67.2	132.3	38.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	970	58	6	631	9	45	7	13	12	12	7
Future Volume (vph)	1	970	58	6	631	9	45	7	13	12	12	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.992			0.998			0.972			0.971	
Flt Protected								0.967			0.981	
Satd. Flow (prot)	0	3475	0	0	3499	0	0	1778	0	0	1750	0
Flt Permitted		0.955			0.946			0.825			0.920	
Satd. Flow (perm)	0	3319	0	0	3310	0	0	1508	0	0	1636	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			2			14			7	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		89.6			83.3			185.5			186.4	
Travel Time (s)		6.5			6.0			16.7			16.8	
Confl. Peds. (#/hr)	19		9	1		3	8		7	7		8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	14%
Adj. Flow (vph)	1	1010	60	6	657	9	47	7	14	13	13	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1071	0	0	672	0	0	68	0	0	33	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.1	28.1		28.1	28.1		28.4	28.4		28.4	28.4	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	55.6%	55.6%		55.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	44.9	44.9		44.9	44.9		34.6	34.6		34.6	34.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.8	1.8		1.8	1.8		2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			5.4			5.4	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	12.0	12.0		12.0	12.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
v/c Ratio		0.65			0.41			0.12			0.05	
Control Delay		18.7			15.1			15.5			15.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.7			15.1			15.5			15.0	
LOS		B			B			B			B	
Approach Delay		18.7			15.1			15.5			15.0	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 6 (7%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 17.2		Intersection LOS: B	
Intersection Capacity Utilization 57.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Graham Avenue S/Graham Avenue N & Main Street E

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1071	672	68	33
v/c Ratio	0.65	0.41	0.12	0.05
Control Delay	18.7	15.1	15.5	15.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.7	15.1	15.5	15.0
Queue Length 50th (m)	71.5	38.4	6.1	2.9
Queue Length 95th (m)	93.2	52.0	15.0	8.9
Internal Link Dist (m)	65.6	59.3	161.5	162.4
Turn Bay Length (m)				
Base Capacity (vph)	1660	1652	588	633
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.41	0.12	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	970	58	6	631	9	45	7	13	12	12	7
Future Volume (vph)	1	970	58	6	631	9	45	7	13	12	12	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1			5.1			5.4			5.4	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		0.99			1.00			0.97			0.97	
Flt Protected		1.00			1.00			0.97			0.98	
Satd. Flow (prot)		3474			3497			1767			1745	
Flt Permitted		0.95			0.95			0.83			0.92	
Satd. Flow (perm)		3316			3309			1509			1637	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	1010	60	6	657	9	47	7	14	12	12	7
RTOR Reduction (vph)	0	5	0	0	1	0	0	9	0	0	4	0
Lane Group Flow (vph)	0	1066	0	0	671	0	0	59	0	0	29	0
Confl. Peds. (#/hr)	19		9	1		3	8		7	7		8
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	14%
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)		44.9			44.9			34.6			34.6	
Effective Green, g (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
Clearance Time (s)		5.1			5.1			5.4			5.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1654			1650			580			629	
v/s Ratio Prot												
v/s Ratio Perm		c0.32			0.20			c0.04			0.02	
v/c Ratio		0.64			0.41			0.10			0.05	
Uniform Delay, d1		16.7			14.2			17.7			17.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.9			0.7			0.4			0.1	
Delay (s)		18.6			14.9			18.1			17.5	
Level of Service		B			B			B			B	
Approach Delay (s)		18.6			14.9			18.1			17.5	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.41				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	966	658	16	6	7
Future Volume (vph)	12	966	658	16	6	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.927	
Flt Protected		0.999			0.977	
Satd. Flow (prot)	0	3499	3460	0	1596	0
Flt Permitted		0.999			0.977	
Satd. Flow (perm)	0	3499	3460	0	1596	0
Link Speed (k/h)		50	50		40	
Link Distance (m)		83.3	87.2		205.5	
Travel Time (s)		6.0	6.3		18.5	
Confl. Peds. (#/hr)	15			15		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	9%	3%	4%	0%	17%	0%
Adj. Flow (vph)	13	1017	693	17	6	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1030	710	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	966	658	16	6	7
Future Volume (Veh/h)	12	966	658	16	6	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	1017	693	17	6	7
Pedestrians					15	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		83				
pX, platoon unblocked					0.78	
vC, conflicting volume	725				1251	370
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	725				757	370
tC, single (s)	4.3				7.1	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	98				97	99
cM capacity (veh/h)	818				238	625

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	352	678	462	248	13
Volume Left	13	0	0	0	6
Volume Right	0	0	0	17	7
cSH	818	1700	1700	1700	357
Volume to Capacity	0.02	0.40	0.27	0.15	0.04
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.9
Control Delay (s)	0.5	0.0	0.0	0.0	15.5
Lane LOS	A				C
Approach Delay (s)	0.2		0.0		15.5
Approach LOS					C

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		45.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	957	12	124	664	13	8	5	77	7	3	5
Future Volume (vph)	5	957	12	124	664	13	8	5	77	7	3	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.998			0.885			0.955	
Flt Protected					0.992			0.995			0.977	
Satd. Flow (prot)	0	3500	0	0	3459	0	0	1673	0	0	1773	0
Flt Permitted					0.992			0.995			0.977	
Satd. Flow (perm)	0	3500	0	0	3459	0	0	1673	0	0	1773	0
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		87.2			92.0			186.9			205.1	
Travel Time (s)		6.3			6.6			16.8			18.5	
Confl. Peds. (#/hr)	12		6	6		12			2	2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	1018	13	132	706	14	9	5	82	7	3	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1036	0	0	852	0	0	96	0	0	15	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	957	12	124	664	13	8	5	77	7	3	5
Future Volume (Veh/h)	5	957	12	124	664	13	8	5	77	7	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	1018	13	132	706	14	9	5	82	7	3	5
Pedestrians					2			6			12	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		170										
pX, platoon unblocked				0.78			0.78	0.78	0.78	0.78	0.78	
vC, conflicting volume	732			1037			1664	2036	524	1594	2036	372
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	732			497			1297	1772	0	1208	1771	372
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			84			88	91	90	91	94	99
cM capacity (veh/h)	873			841			78	54	850	80	54	625

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	514	522	485	367	96	15
Volume Left	5	0	132	0	9	7
Volume Right	0	13	0	14	82	5
cSH	873	1700	841	1700	316	99
Volume to Capacity	0.01	0.31	0.16	0.22	0.30	0.15
Queue Length 95th (m)	0.1	0.0	4.4	0.0	10.0	4.1
Control Delay (s)	0.2	0.0	4.2	0.0	21.3	47.5
Lane LOS	A		A		C	E
Approach Delay (s)	0.1		2.4		21.3	47.5
Approach LOS					C	E

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	65.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	25	4	3	19	40	1	20	2	53	20	7
Future Volume (vph)	1	25	4	3	19	40	1	20	2	53	20	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.984			0.912			0.989			0.988	
Flt Protected		0.998			0.998			0.998			0.968	
Satd. Flow (prot)	0	1866	0	0	1729	0	0	1875	0	0	1817	0
Flt Permitted		0.998			0.998			0.998			0.968	
Satd. Flow (perm)	0	1866	0	0	1729	0	0	1875	0	0	1817	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			84.1			166.7			185.5	
Travel Time (s)		7.6			7.6			15.0			16.7	
Confl. Peds. (#/hr)	10		10	10		10	3		3	3		3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	28	4	3	21	45	1	22	2	60	22	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	69	0	0	25	0	0	90	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	25	4	3	19	40	1	20	2	53	20	7
Future Volume (vph)	1	25	4	3	19	40	1	20	2	53	20	7
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	28	4	3	21	45	1	22	2	60	22	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	33	69	25	90
Volume Left (vph)	1	3	1	60
Volume Right (vph)	4	45	2	8
Hadj (s)	-0.07	-0.38	-0.04	0.08
Departure Headway (s)	4.2	3.8	4.2	4.2
Degree Utilization, x	0.04	0.07	0.03	0.11
Capacity (veh/h)	836	914	830	831
Control Delay (s)	7.3	7.1	7.3	7.7
Approach Delay (s)	7.3	7.1	7.3	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.4		
Level of Service	A		
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	24	9	1	31	7	3	12	2	1	17	116
Future Volume (vph)	74	24	9	1	31	7	3	12	2	1	17	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.975			0.985			0.883	
Flt Protected		0.967			0.999			0.992				
Satd. Flow (prot)	0	1815	0	0	1851	0	0	1857	0	0	1678	0
Flt Permitted		0.967			0.999			0.992				
Satd. Flow (perm)	0	1815	0	0	1851	0	0	1857	0	0	1678	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			86.1			155.9			186.9	
Travel Time (s)		7.6			7.7			14.0			16.8	
Confl. Peds. (#/hr)	5		5	5		5	4		1	1		4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	80	26	10	1	34	8	3	13	2	1	18	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	116	0	0	43	0	0	18	0	0	145	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization	28.6%			ICU Level of Service A								
Analysis Period (min)	15											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	74	24	9	1	31	7	3	12	2	1	17	116
Future Volume (vph)	74	24	9	1	31	7	3	12	2	1	17	116
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	26	10	1	34	8	3	13	2	1	18	126

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	116	43	18	145
Volume Left (vph)	80	1	3	1
Volume Right (vph)	10	8	2	126
Hadj (s)	0.09	-0.11	-0.03	-0.52
Departure Headway (s)	4.4	4.3	4.4	3.8
Degree Utilization, x	0.14	0.05	0.02	0.15
Capacity (veh/h)	793	797	779	918
Control Delay (s)	8.1	7.5	7.5	7.4
Approach Delay (s)	8.1	7.5	7.5	7.4
Approach LOS	A	A	A	A

Intersection Summary												
Delay			7.7									
Level of Service			A									
Intersection Capacity Utilization			28.6%		ICU Level of Service				A			
Analysis Period (min)			15									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	31	8	3	35	113	0	0	8	66	0	30
Future Volume (vph)	44	31	8	3	35	113	0	0	8	66	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.899			0.865			0.958	
Flt Protected		0.974			0.999						0.967	
Satd. Flow (prot)	0	1807	0	0	1681	0	0	1644	0	0	1726	0
Flt Permitted		0.974			0.999						0.967	
Satd. Flow (perm)	0	1807	0	0	1681	0	0	1644	0	0	1726	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.1			84.7			140.7			46.8	
Travel Time (s)		7.6			7.6			12.7			4.2	
Confl. Peds. (#/hr)			10	10			2		1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	0%	0%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	48	34	9	3	38	123	0	0	9	72	0	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	91	0	0	164	0	0	9	0	0	105	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.2%	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)	44	31	8	3	35	113	0	0	8	66	0	30
Future Volume (Veh/h)	44	31	8	3	35	113	0	0	8	66	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	34	9	3	38	123	0	0	9	72	0	33
Pedestrians		2			1			10				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		0			0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	161			53			285	312	50	250	254	102
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	161			53			285	312	50	250	254	102
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	100	99	89	100	97
cM capacity (veh/h)	1418			1553			620	577	1015	673	621	952

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	91	164	9	105
Volume Left	48	3	0	72
Volume Right	9	123	9	33
cSH	1418	1553	1015	742
Volume to Capacity	0.03	0.00	0.01	0.14
Queue Length 95th (m)	0.8	0.0	0.2	3.9
Control Delay (s)	4.1	0.1	8.6	10.7
Lane LOS	A	A	A	B
Approach Delay (s)	4.1	0.1	8.6	10.7
Approach LOS			A	B

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	38.2%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection: 1: Graham Avenue S/Graham Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	89.1	82.5	66.6	62.1	24.3	15.4
Average Queue (m)	66.2	45.3	38.8	32.5	9.3	4.4
95th Queue (m)	94.4	75.2	59.8	52.0	21.0	13.0
Link Distance (m)	81.1	81.1	68.2	68.2	165.0	174.3
Upstream Blk Time (%)	3	0	0	0		
Queuing Penalty (veh)	0	0	0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main Street E & Houghton Avenue N

Movement	EB	EB	WB	SB
Directions Served	LT	T	T	LR
Maximum Queue (m)	40.6	25.8	6.8	16.6
Average Queue (m)	4.2	1.0	0.3	3.4
95th Queue (m)	21.6	13.5	3.6	11.6
Link Distance (m)	68.2	68.2	68.5	193.5
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Wexford Avenue S/Wexford Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	28.5	13.1	76.4	52.8	25.7	11.7
Average Queue (m)	2.3	0.6	27.0	5.0	11.5	3.2
95th Queue (m)	13.5	6.5	60.9	28.7	20.3	10.4
Link Distance (m)	68.5	68.5	83.4	83.4	166.3	193.0
Upstream Blk Time (%)			0			
Queuing Penalty (veh)			0			
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Graham Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.6	10.6	9.3	16.2
Average Queue (m)	5.6	7.9	4.3	9.1
95th Queue (m)	13.0	13.2	11.8	14.2
Link Distance (m)	76.3	67.3	158.3	165.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Wexford Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	13.6	14.7	10.7	17.7
Average Queue (m)	9.0	6.8	4.4	10.5
95th Queue (m)	12.6	13.9	12.0	16.0
Link Distance (m)	67.7	77.7	147.5	166.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Houghton Avenue S/Site Driveway & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	10.5	1.2	9.3	19.6
Average Queue (m)	2.0	0.0	1.8	10.5
95th Queue (m)	8.3	0.9	7.7	16.6
Link Distance (m)	67.3	67.7	132.3	38.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	582	51	4	574	2	97	1	15	12	2	7
Future Volume (vph)	0	582	51	4	574	2	97	1	15	12	2	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.988						0.982			0.953	
Flt Protected								0.959			0.973	
Satd. Flow (prot)	0	3374	0	0	3439	0	0	1785	0	0	1752	0
Flt Permitted					0.952			0.752			0.877	
Satd. Flow (perm)	0	3374	0	0	3274	0	0	1395	0	0	1574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14						10			8	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		89.6			83.3			185.5			186.4	
Travel Time (s)		6.5			6.0			16.7			16.8	
Confl. Peds. (#/hr)	3		1	1		3	3		6	6		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	6%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	647	57	4	638	2	108	1	17	13	2	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	704	0	0	644	0	0	126	0	0	23	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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		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)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.1	28.1		28.1	28.1		28.4	28.4		28.4	28.4	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	55.6%	55.6%		55.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	44.9	44.9		44.9	44.9		34.6	34.6		34.6	34.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.8	1.8		1.8	1.8		2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			5.4			5.4	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	12.0	12.0		12.0	12.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
v/c Ratio		0.42			0.39			0.23			0.04	
Control Delay		14.9			15.0			18.6			13.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.9			15.0			18.6			13.5	
LOS		B			B			B			B	
Approach Delay		14.9			15.0			18.6			13.5	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 6 (7%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.42			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 46.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Graham Avenue S/Graham Avenue N & Main Street E

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	704	644	126	23
v/c Ratio	0.42	0.39	0.23	0.04
Control Delay	14.9	15.0	18.6	13.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.9	15.0	18.6	13.5
Queue Length 50th (m)	39.7	36.7	13.9	1.7
Queue Length 95th (m)	53.6	49.7	27.1	6.6
Internal Link Dist (m)	65.6	59.3	161.5	162.4
Turn Bay Length (m)				
Base Capacity (vph)	1690	1633	542	610
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.39	0.23	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	582	51	4	574	2	97	1	15	12	2	7
Future Volume (vph)	0	582	51	4	574	2	97	1	15	12	2	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1			5.1			5.4			5.4	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.98			0.95	
Flt Protected		1.00			1.00			0.96			0.97	
Satd. Flow (prot)		3374			3437			1779			1746	
Flt Permitted		1.00			0.95			0.75			0.88	
Satd. Flow (perm)		3374			3272			1395			1575	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	647	57	4	638	2	108	1	17	13	2	8
RTOR Reduction (vph)	0	7	0	0	0	0	0	6	0	0	5	0
Lane Group Flow (vph)	0	697	0	0	644	0	0	120	0	0	18	0
Confl. Peds. (#/hr)	3		1	1		3	3		6	6		3
Heavy Vehicles (%)	0%	6%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		44.9			44.9			34.6			34.6	
Effective Green, g (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
Clearance Time (s)		5.1			5.1			5.4			5.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1683			1632			536			605	
v/s Ratio Prot		c0.21										
v/s Ratio Perm					0.20			c0.09			0.01	
v/c Ratio		0.41			0.39			0.22			0.03	
Uniform Delay, d1		14.2			14.1			18.7			17.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			0.7			1.0			0.1	
Delay (s)		15.0			14.8			19.6			17.3	
Level of Service		B			B			B			B	
Approach Delay (s)		15.0			14.8			19.6			17.3	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	591	601	6	2	4
Future Volume (vph)	0	591	601	6	2	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.910	
Flt Protected					0.984	
Satd. Flow (prot)	0	3406	3433	0	1701	0
Flt Permitted					0.984	
Satd. Flow (perm)	0	3406	3433	0	1701	0
Link Speed (k/h)		50	50		40	
Link Distance (m)		83.3	87.2		205.5	
Travel Time (s)		6.0	6.3		18.5	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%
Adj. Flow (vph)	0	649	660	7	2	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	649	667	0	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	591	601	6	2	4
Future Volume (Veh/h)	0	591	601	6	2	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	649	660	7	2	4
Pedestrians					5	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		83				
pX, platoon unblocked					0.88	
vC, conflicting volume	672				993	338
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	672				722	338
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				99	99
cM capacity (veh/h)	924				321	660

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	216	433	440	227	6
Volume Left	0	0	0	0	2
Volume Right	0	0	0	7	4
cSH	924	1700	1700	1700	488
Volume to Capacity	0.00	0.25	0.26	0.13	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	12.5
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.5
Approach LOS					B

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		26.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	566	11	50	590	10	2	1	135	1	0	6
Future Volume (vph)	9	566	11	50	590	10	2	1	135	1	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.998			0.868			0.882	
Flt Protected		0.999			0.996			0.999			0.994	
Satd. Flow (prot)	0	3399	0	0	3427	0	0	1648	0	0	1418	0
Flt Permitted		0.999			0.996			0.999			0.994	
Satd. Flow (perm)	0	3399	0	0	3427	0	0	1648	0	0	1418	0
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		87.2			92.0			186.9			205.1	
Travel Time (s)		6.3			6.6			16.8			18.5	
Confl. Peds. (#/hr)	4		2	2		4			1	1		
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	6%	0%	0%	5%	11%	0%	0%	0%	0%	0%	20%
Adj. Flow (vph)	10	622	12	55	648	11	2	1	148	1	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	644	0	0	714	0	0	151	0	0	8	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	566	11	50	590	10	2	1	135	1	0	6
Future Volume (Veh/h)	9	566	11	50	590	10	2	1	135	1	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	10	622	12	55	648	11	2	1	148	1	0	7
Pedestrians					1			2			4	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		170										
pX, platoon unblocked				0.90			0.90	0.90	0.90	0.90	0.90	
vC, conflicting volume	663			636			1091	1423	320	1248	1424	334
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	663			359			868	1239	7	1043	1239	334
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.5
p0 queue free %	99			95			99	99	85	99	100	99
cM capacity (veh/h)	932			1082			210	148	965	133	148	610

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	321	323	379	335	151	8
Volume Left	10	0	55	0	2	1
Volume Right	0	12	0	11	148	7
cSH	932	1700	1082	1700	890	421
Volume to Capacity	0.01	0.19	0.05	0.20	0.17	0.02
Queue Length 95th (m)	0.3	0.0	1.3	0.0	4.9	0.5
Control Delay (s)	0.4	0.0	1.7	0.0	9.9	13.7
Lane LOS	A		A		A	B
Approach Delay (s)	0.2		0.9		9.9	13.7
Approach LOS					A	B

Intersection Summary					
Average Delay	1.6				
Intersection Capacity Utilization	53.4%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	12	2	1	21	94	4	17	1	53	7	2
Future Volume (vph)	0	12	2	1	21	94	4	17	1	53	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.983			0.890			0.995			0.996	
Flt Protected								0.990			0.959	
Satd. Flow (prot)	0	1868	0	0	1691	0	0	1872	0	0	1815	0
Flt Permitted								0.990			0.959	
Satd. Flow (perm)	0	1868	0	0	1691	0	0	1872	0	0	1815	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			84.1			166.7			185.5	
Travel Time (s)		7.6			7.6			15.0			16.7	
Confl. Peds. (#/hr)	11		5	5		11	2		5	5		2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	14	2	1	24	108	5	20	1	61	8	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	133	0	0	26	0	0	71	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	27.1%	ICU Level of Service A		
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	12	2	1	21	94	4	17	1	53	7	2
Future Volume (vph)	0	12	2	1	21	94	4	17	1	53	7	2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	14	2	1	24	108	5	20	1	61	8	2

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	16	133	26	71
Volume Left (vph)	0	1	5	61
Volume Right (vph)	2	108	1	2
Hadj (s)	-0.07	-0.49	0.02	0.15
Departure Headway (s)	4.2	3.7	4.3	4.4
Degree Utilization, x	0.02	0.13	0.03	0.09
Capacity (veh/h)	833	958	800	793
Control Delay (s)	7.2	7.2	7.4	7.8
Approach Delay (s)	7.2	7.2	7.4	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.4		
Level of Service		A		
Intersection Capacity Utilization		27.1%	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)	128	12	1	1	22	0	0	18	1	0	5	48
Future Volume (vph)	128	12	1	1	22	0	0	18	1	0	5	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999						0.994			0.878	
Flt Protected		0.957			0.998							
Satd. Flow (prot)	0	1816	0	0	1896	0	0	1889	0	0	1668	0
Flt Permitted		0.957			0.998							
Satd. Flow (perm)	0	1816	0	0	1896	0	0	1889	0	0	1668	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			86.1			155.9			186.9	
Travel Time (s)		7.6			7.7			14.0			16.8	
Confl. Peds. (#/hr)	6		7	7		6	4		4	4		4
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	149	14	1	1	26	0	0	21	1	0	6	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	164	0	0	27	0	0	22	0	0	62	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	128	12	1	1	22	0	0	18	1	0	5	48
Future Volume (vph)	128	12	1	1	22	0	0	18	1	0	5	48
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	149	14	1	1	26	0	0	21	1	0	6	56

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	164	27	22	62
Volume Left (vph)	149	1	0	0
Volume Right (vph)	1	0	1	56
Hadj (s)	0.18	0.01	-0.03	-0.54
Departure Headway (s)	4.3	4.3	4.4	3.8
Degree Utilization, x	0.20	0.03	0.03	0.07
Capacity (veh/h)	822	820	778	895
Control Delay (s)	8.3	7.4	7.5	7.1
Approach Delay (s)	8.3	7.4	7.5	7.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.9		
Level of Service	A		
Intersection Capacity Utilization	26.0%	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)	48	15	2	4	27	43	5	0	2	118	0	87
Future Volume (vph)	48	15	2	4	27	43	5	0	2	118	0	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.928			0.959			0.942	
Flt Protected		0.966			0.997			0.966			0.972	
Satd. Flow (prot)	0	1764	0	0	1739	0	0	1760	0	0	1706	0
Flt Permitted		0.966			0.997			0.966			0.972	
Satd. Flow (perm)	0	1764	0	0	1739	0	0	1760	0	0	1706	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.1			84.7			140.7			47.2	
Travel Time (s)		7.6			7.6			12.7			4.2	
Confl. Peds. (#/hr)			9	9			1					
Peak Hour Factor	0.92	0.75	0.75	0.75	0.75	0.92	0.75	0.92	0.75	0.92	0.92	0.92
Heavy Vehicles (%)	2%	8%	0%	0%	0%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	52	20	3	5	36	47	7	0	3	128	0	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	75	0	0	88	0	0	10	0	0	223	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	30.4%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	15	2	4	27	43	5	0	2	118	0	87
Future Volume (Veh/h)	48	15	2	4	27	43	5	0	2	118	0	87
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.75	0.75	0.75	0.75	0.92	0.75	0.92	0.75	0.92	0.92	0.92
Hourly flow rate (vph)	52	20	3	5	36	47	7	0	3	128	0	95
Pedestrians		1						9				
Lane Width (m)		3.6						3.6				
Walking Speed (m/s)		1.2						1.2				
Percent Blockage		0						1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	83			32			300	228	30	198	206	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	83			32			300	228	30	198	206	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			99	100	100	83	100	91
cM capacity (veh/h)	1514			1581			569	642	1042	733	660	1004

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	75	88	10	223
Volume Left	52	5	7	128
Volume Right	3	47	3	95
cSH	1514	1581	659	828
Volume to Capacity	0.03	0.00	0.02	0.27
Queue Length 95th (m)	0.9	0.1	0.4	8.7
Control Delay (s)	5.3	0.4	10.5	10.9
Lane LOS	A	A	B	B
Approach Delay (s)	5.3	0.4	10.5	10.9
Approach LOS			B	B

Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	30.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Graham Avenue S/Graham Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	72.6	51.4	61.7	52.1	30.9	12.2
Average Queue (m)	42.1	20.7	36.9	26.3	14.2	3.6
95th Queue (m)	65.3	42.2	55.8	45.9	26.4	11.2
Link Distance (m)	81.1	81.1	68.2	68.2	165.0	174.3
Upstream Blk Time (%)	0		0	0		
Queuing Penalty (veh)	0		0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main Street E & Houghton Avenue N

Movement	SB
Directions Served	LR
Maximum Queue (m)	11.8
Average Queue (m)	1.9
95th Queue (m)	8.3
Link Distance (m)	193.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Wexford Avenue S/Wexford Avenue N & Main Street E

Movement	EB	EB	WB	NB	SB
Directions Served	LT	TR	LT	LTR	LTR
Maximum Queue (m)	15.8	5.3	34.9	23.1	15.1
Average Queue (m)	1.5	0.2	7.1	10.9	2.4
95th Queue (m)	8.6	3.7	22.4	17.2	9.7
Link Distance (m)	68.5	68.5	83.4	166.3	193.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: Graham Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.3	14.5	12.2	16.0
Average Queue (m)	3.4	9.3	4.5	8.3
95th Queue (m)	10.7	12.7	12.3	13.9
Link Distance (m)	76.3	67.2	158.3	165.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Wexford Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	16.6	13.4	10.7	12.2
Average Queue (m)	9.6	5.2	4.6	7.3
95th Queue (m)	13.4	13.1	12.2	13.8
Link Distance (m)	67.8	77.7	147.5	166.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Houghton Avenue S/Site Driveway & Maple Avenue

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	10.5	10.5	26.7
Average Queue (m)	1.1	1.5	14.9
95th Queue (m)	6.1	7.3	23.0
Link Distance (m)	67.2	132.3	38.8
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1020	76	7	663	10	58	8	13	12	12	8
Future Volume (vph)	1	1020	76	7	663	10	58	8	13	12	12	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.990			0.998			0.977			0.968	
Flt Protected								0.965			0.981	
Satd. Flow (prot)	0	3468	0	0	3499	0	0	1785	0	0	1738	0
Flt Permitted		0.955			0.943			0.804			0.919	
Satd. Flow (perm)	0	3312	0	0	3300	0	0	1478	0	0	1624	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			2			13			8	
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		89.6			83.3			185.5			186.4	
Travel Time (s)		6.5			6.0			16.7			16.8	
Confl. Peds. (#/hr)	19		9	1		3	8		7	7		8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	14%
Adj. Flow (vph)	1	1063	79	7	691	10	60	8	14	13	13	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1143	0	0	708	0	0	82	0	0	34	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	28.1	28.1		28.1	28.1		28.4	28.4		28.4	28.4	
Total Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (%)	55.6%	55.6%		55.6%	55.6%		44.4%	44.4%		44.4%	44.4%	
Maximum Green (s)	44.9	44.9		44.9	44.9		34.6	34.6		34.6	34.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	1.8	1.8		1.8	1.8		2.1	2.1		2.1	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			5.4			5.4	
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	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	12.0	12.0		12.0	12.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
v/c Ratio		0.69			0.43			0.14			0.05	
Control Delay		19.7			15.4			16.1			14.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		19.7			15.4			16.1			14.7	
LOS		B			B			B			B	
Approach Delay		19.7			15.4			16.1			14.7	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 6 (7%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 17.9		Intersection LOS: B	
Intersection Capacity Utilization 59.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Graham Avenue S/Graham Avenue N & Main Street E

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1143	708	82	34
v/c Ratio	0.69	0.43	0.14	0.05
Control Delay	19.7	15.4	16.1	14.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.7	15.4	16.1	14.7
Queue Length 50th (m)	79.0	41.1	8.0	2.9
Queue Length 95th (m)	102.8	55.3	17.6	9.0
Internal Link Dist (m)	65.6	59.3	161.5	162.4
Turn Bay Length (m)				
Base Capacity (vph)	1658	1647	576	629
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.69	0.43	0.14	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1020	76	7	663	10	58	8	13	12	12	8
Future Volume (vph)	1	1020	76	7	663	10	58	8	13	12	12	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.1			5.1			5.4			5.4	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		0.99			1.00			0.98			0.97	
Flt Protected		1.00			1.00			0.96			0.98	
Satd. Flow (prot)		3466			3497			1773			1734	
Flt Permitted		0.95			0.94			0.80			0.92	
Satd. Flow (perm)		3309			3299			1477			1625	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	1062	79	7	691	10	60	8	14	12	12	8
RTOR Reduction (vph)	0	6	0	0	1	0	0	8	0	0	5	0
Lane Group Flow (vph)	0	1137	0	0	707	0	0	74	0	0	29	0
Confl. Peds. (#/hr)	19		9	1		3	8		7	7		8
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%	14%
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)		44.9			44.9			34.6			34.6	
Effective Green, g (s)		44.9			44.9			34.6			34.6	
Actuated g/C Ratio		0.50			0.50			0.38			0.38	
Clearance Time (s)		5.1			5.1			5.4			5.4	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1650			1645			567			624	
v/s Ratio Prot												
v/s Ratio Perm		c0.34			0.21			c0.05			0.02	
v/c Ratio		0.69			0.43			0.13			0.05	
Uniform Delay, d1		17.2			14.4			18.0			17.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.4			0.8			0.5			0.1	
Delay (s)		19.6			15.2			18.4			17.5	
Level of Service		B			B			B			B	
Approach Delay (s)		19.6			15.2			18.4			17.5	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.45				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5		
Intersection Capacity Utilization	59.3%	ICU Level of Service	B		
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	1015	691	17	7	8
Future Volume (vph)	12	1015	691	17	7	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.928	
Flt Protected		0.999			0.977	
Satd. Flow (prot)	0	3499	3460	0	1596	0
Flt Permitted		0.999			0.977	
Satd. Flow (perm)	0	3499	3460	0	1596	0
Link Speed (k/h)		50	50		40	
Link Distance (m)		83.3	87.2		205.5	
Travel Time (s)		6.0	6.3		18.5	
Confl. Peds. (#/hr)	15			15		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	9%	3%	4%	0%	17%	0%
Adj. Flow (vph)	13	1068	727	18	7	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1081	745	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	1015	691	17	7	8
Future Volume (Veh/h)	12	1015	691	17	7	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	1068	727	18	7	8
Pedestrians					15	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		83				
pX, platoon unblocked					0.76	
vC, conflicting volume	760				1311	388
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	760				769	388
tC, single (s)	4.3				7.1	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	98				97	99
cM capacity (veh/h)	793				226	609

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	369	712	485	260	15
Volume Left	13	0	0	0	7
Volume Right	0	0	0	18	8
cSH	793	1700	1700	1700	340
Volume to Capacity	0.02	0.42	0.29	0.15	0.04
Queue Length 95th (m)	0.4	0.0	0.0	0.0	1.1
Control Delay (s)	0.5	0.0	0.0	0.0	16.1
Lane LOS	A				C
Approach Delay (s)	0.2		0.0		16.1
Approach LOS					C

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		46.5%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1006	12	172	698	13	9	6	106	8	3	6
Future Volume (vph)	6	1006	12	172	698	13	9	6	106	8	3	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998			0.998			0.882			0.955	
Flt Protected					0.990			0.996			0.976	
Satd. Flow (prot)	0	3500	0	0	3457	0	0	1669	0	0	1771	0
Flt Permitted					0.990			0.996			0.976	
Satd. Flow (perm)	0	3500	0	0	3457	0	0	1669	0	0	1771	0
Link Speed (k/h)		50			50			40			40	
Link Distance (m)		87.2			92.0			186.9			205.1	
Travel Time (s)		6.3			6.6			16.8			18.5	
Confl. Peds. (#/hr)	12		6	6		12			2	2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	3%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	6	1070	13	183	743	14	10	6	113	9	3	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1089	0	0	940	0	0	129	0	0	18	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1006	12	172	698	13	9	6	106	8	3	6
Future Volume (Veh/h)	6	1006	12	172	698	13	9	6	106	8	3	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	6	1070	13	183	743	14	10	6	113	9	3	6
Pedestrians					2			6			12	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		170										
pX, platoon unblocked				0.76			0.76	0.76	0.76	0.76	0.76	
vC, conflicting volume	769			1089			1840	2230	550	1793	2229	390
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	769			492			1477	1989	0	1416	1988	390
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			78			80	83	86	80	92	99
cM capacity (veh/h)	846			820			51	36	826	46	36	608

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	541	548	554	386	129	18
Volume Left	6	0	183	0	10	9
Volume Right	0	13	0	14	113	6
cSH	846	1700	820	1700	258	62
Volume to Capacity	0.01	0.32	0.22	0.23	0.50	0.29
Queue Length 95th (m)	0.2	0.0	6.8	0.0	20.7	8.2
Control Delay (s)	0.2	0.0	5.5	0.0	32.1	85.0
Lane LOS	A		A		D	F
Approach Delay (s)	0.1		3.3		32.1	85.0
Approach LOS					D	F

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	71.1%	ICU Level of Service		C
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	28	5	4	21	54	1	22	2	72	22	7
Future Volume (vph)	1	28	5	4	21	54	1	22	2	72	22	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.979			0.907			0.990			0.991	
Flt Protected		0.999			0.998			0.998			0.966	
Satd. Flow (prot)	0	1858	0	0	1720	0	0	1877	0	0	1819	0
Flt Permitted		0.999			0.998			0.998			0.966	
Satd. Flow (perm)	0	1858	0	0	1720	0	0	1877	0	0	1819	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			84.1			166.7			185.5	
Travel Time (s)		7.6			7.6			15.0			16.7	
Confl. Peds. (#/hr)	10		10	10		10	3		3	3		3
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	31	6	4	24	61	1	25	2	81	25	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	38	0	0	89	0	0	28	0	0	114	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	27.9%	ICU Level of Service A		
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	28	5	4	21	54	1	22	2	72	22	7
Future Volume (vph)	1	28	5	4	21	54	1	22	2	72	22	7
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	31	6	4	24	61	1	25	2	81	25	8

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	38	89	28	114
Volume Left (vph)	1	4	1	81
Volume Right (vph)	6	61	2	8
Hadj (s)	-0.09	-0.40	-0.04	0.10
Departure Headway (s)	4.2	3.9	4.2	4.3
Degree Utilization, x	0.04	0.10	0.03	0.14
Capacity (veh/h)	817	896	808	812
Control Delay (s)	7.4	7.3	7.4	8.0
Approach Delay (s)	7.4	7.3	7.4	8.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.6		
Level of Service		A		
Intersection Capacity Utilization		27.9%	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)	104	27	10	1	34	7	4	13	2	1	18	165
Future Volume (vph)	104	27	10	1	34	7	4	13	2	1	18	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.990			0.977			0.986			0.879	
Flt Protected		0.964			0.999			0.990				
Satd. Flow (prot)	0	1813	0	0	1854	0	0	1855	0	0	1670	0
Flt Permitted		0.964			0.999			0.990				
Satd. Flow (perm)	0	1813	0	0	1854	0	0	1855	0	0	1670	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.7			86.1			155.9			186.9	
Travel Time (s)		7.6			7.7			14.0			16.8	
Confl. Peds. (#/hr)	5		5	5		5	4		1	1		4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	113	29	11	1	37	8	4	14	2	1	20	179
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	153	0	0	46	0	0	20	0	0	200	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	33.0%	ICU Level of Service A		
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	104	27	10	1	34	7	4	13	2	1	18	165
Future Volume (vph)	104	27	10	1	34	7	4	13	2	1	18	165
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	113	29	11	1	37	8	4	14	2	1	20	179

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	153	46	20	200
Volume Left (vph)	113	1	4	1
Volume Right (vph)	11	8	2	179
Hadj (s)	0.10	-0.10	-0.02	-0.54
Departure Headway (s)	4.5	4.4	4.6	3.9
Degree Utilization, x	0.19	0.06	0.03	0.21
Capacity (veh/h)	752	755	739	891
Control Delay (s)	8.6	7.7	7.7	7.9
Approach Delay (s)	8.6	7.7	7.7	7.9
Approach LOS	A	A	A	A

Intersection Summary						
Delay	8.1					
Level of Service	A					
Intersection Capacity Utilization	33.0%	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)	62	34	9	4	39	161	0	0	9	95	0	43
Future Volume (vph)	62	34	9	4	39	161	0	0	9	95	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988			0.893			0.865			0.958	
Flt Protected		0.971			0.999						0.967	
Satd. Flow (prot)	0	1802	0	0	1669	0	0	1644	0	0	1726	0
Flt Permitted		0.971			0.999						0.967	
Satd. Flow (perm)	0	1802	0	0	1669	0	0	1644	0	0	1726	0
Link Speed (k/h)		40			40			40			40	
Link Distance (m)		84.1			84.7			140.7			46.8	
Travel Time (s)		7.6			7.6			12.7			4.2	
Confl. Peds. (#/hr)			10	10			2		1			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	0%	0%	0%	0%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	67	37	10	4	42	175	0	0	10	103	0	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	114	0	0	221	0	0	10	0	0	150	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.7%	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)	62	34	9	4	39	161	0	0	9	95	0	43
Future Volume (Veh/h)	62	34	9	4	39	161	0	0	9	95	0	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	37	10	4	42	175	0	0	10	103	0	47
Pedestrians		2			1			10				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		0			0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	217			57			372	411	53	324	328	132
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	217			57			372	411	53	324	328	132
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			100	100	99	83	100	95
cM capacity (veh/h)	1353			1547			527	499	1011	593	555	916

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	114	221	10	150
Volume Left	67	4	0	103
Volume Right	10	175	10	47
cSH	1353	1547	1011	667
Volume to Capacity	0.05	0.00	0.01	0.22
Queue Length 95th (m)	1.2	0.1	0.2	6.9
Control Delay (s)	4.7	0.2	8.6	12.0
Lane LOS	A	A	A	B
Approach Delay (s)	4.7	0.2	8.6	12.0
Approach LOS			A	B

Intersection Summary				
Average Delay		5.0		
Intersection Capacity Utilization		44.7%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection: 1: Graham Avenue S/Graham Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	90.0	85.7	65.9	65.5	30.6	17.3
Average Queue (m)	70.0	46.6	38.8	34.7	10.9	5.2
95th Queue (m)	95.4	77.9	61.8	55.7	23.7	14.1
Link Distance (m)	81.1	81.1	68.2	68.2	165.0	174.3
Upstream Blk Time (%)	4	1	0	0		
Queuing Penalty (veh)	0	0	0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Main Street E & Houghton Avenue N

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (m)	33.3	10.9	5.0	1.8	19.2
Average Queue (m)	3.0	0.6	0.4	0.1	4.7
95th Queue (m)	16.1	8.3	3.6	1.3	14.1
Link Distance (m)	68.2	68.2	68.5	68.5	193.5
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Wexford Avenue S/Wexford Avenue N & Main Street E

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	TR	LT	TR	LTR	LTR
Maximum Queue (m)	21.5	10.1	81.9	60.5	47.9	14.3
Average Queue (m)	1.7	0.5	40.4	9.4	16.2	4.3
95th Queue (m)	10.9	4.2	74.7	40.7	34.1	12.4
Link Distance (m)	68.5	68.5	83.4	83.4	166.3	193.0
Upstream Blk Time (%)			0	0		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Graham Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	14.7	13.2	13.6	16.5
Average Queue (m)	7.0	8.8	5.9	9.5
95th Queue (m)	14.1	13.4	13.6	13.5
Link Distance (m)	76.3	67.3	158.3	165.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Wexford Avenue S & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	15.2	13.2	9.3	21.2
Average Queue (m)	9.4	7.3	4.2	12.4
95th Queue (m)	12.5	13.9	11.6	19.3
Link Distance (m)	67.7	77.7	147.5	166.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Houghton Avenue S/Site Driveway & Maple Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	11.5	2.7	9.2	24.0
Average Queue (m)	3.5	0.2	2.1	12.7
95th Queue (m)	11.0	1.9	8.4	21.2
Link Distance (m)	67.3	67.7	132.3	38.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0