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48 Main Street West
City of Port Colborne
Transportation Impact Study

Paradigm Transportation Solutions Limited

October 2023
220766

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Project Summary

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City of Port Colborne
Transportation Impact Study

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Executive Summary

Content

ePrime Construction Management retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study (TIS) for the proposed mixed-use development located at 48 Main Street West in the City of Port Colborne.

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

Development Concept

The development concept includes an 8-storey mixed use building containing approximately 108 residential units and approximately 123 m² of ground floor retail space. Build-out and occupancy is anticipated to occur by Year 2027.

Vehicle access is proposed by the existing Lock 8 Park driveway to Main Street West and the existing Lock 8 Park driveway to Mellanby Avenue.

Conclusions

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

- **Existing Traffic Operations**: The intersections within the study area are operating with acceptable levels of service and well within capacity during the AM, PM, and Saturday peak hours.

  The westbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is expected to extend through the Lock 8 Park Driveway to Main Street West during the AM, PM, and Saturday peak hours.
- **Site Generated Traffic**: The subject site is forecast to generate approximately 44 new vehicle trips during the AM peak hour, 61 new trips during the PM peak hour and 52 new trips during the Saturday peak hour.
- **Forecast Traffic**: The forecast traffic volumes near the subject site have been assessed for a five-year horizon beyond the opening date (Year 2032). The forecast traffic volumes are estimated to consist of:
  - Generalized background traffic growth; and

- Traffic generated by the subject site.

- **Background Traffic Operations:** The intersections within the study area are operating with acceptable levels of service and well within capacity during the AM, PM, and Saturday peak hours.

  The westbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is expected to extend through the Lock 8 Park Driveway to Main Street West during the AM, PM, and Saturday peak hours.

- **Total Traffic Operations:** The intersections within the study area are operating with acceptable levels of service and well within capacity during the AM, PM, and Saturday peak hours.

  The westbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is expected to extend through the Lock 8 Park Driveway to Main Street West during the AM, PM, and Saturday peak hours.

- **Remedial Measures**: A westbound left-turn lane with 25 metres of storage is warranted during the PM and Saturday peak hours at the existing Main Street West and Lock 8 Park Driveway. The westbound left-turn lane is not triggered by the addition of site generated traffic.

  Due to the existing back-to-back left-turn lanes on Main Street West between Mellanby Avenue and Ramey Avenue it is not feasible to construct the warranted westbound left-turn lane at the driveway intersection. Furthermore, the queueing of vehicles from the signal is expected to spill back into the Lock 8 Park driveway.

  A scenario with one-driveway access to Mellanby Avenue was assessed. The intersections within the study area are forecast to continue to operate with acceptable levels of service and well within capacity.

Recommendations

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

- The existing Main Street Lock 8 driveway be closed to regular traffic, and the driveway function as an emergency connection to the park.
- The existing crosswalk over the Lock 8 Park Driveway to Mellanby Avenue should be redesigned with a crossing treatment consistent with the OTM Book 18 – Cycling Facilities.

Contents

1 Introduction 1

1.1 Overview 1

2 Existing Conditions 3

2.1 Road Network 3
2.2 Pedestrian Network 5
2.3 Cycling Network 5
2.4 Transit Service 5
2.5 Traffic Volumes 8
2.6 Traffic Operations 11

3 Development Concept 14

3.1 Description 14
3.2 Site Trip Generation 17

4 Future Traffic Conditions 21

4.1 Forecast Traffic 21
4.2 Background Traffic Operations 26
4.3 Total Traffic Operations 28

5 Remedial Measures 30

5.1 Traffic Control Improvements 30
5.2 Auxiliary Turn Lanes 30

6 Conclusions and Recommendations 35

6.1 Conclusions 35
6.2 Recommendations 36

Appendices

Appendix A Pre-Study Consultation
Appendix B Existing Data
Appendix C Base Year Traffic Operations
Appendix D Background Traffic Operations
Appendix E Total Traffic Operations
Appendix F OTM Traffic Signal Justification Warrants
Appendix G Remedial – Total Traffic Operations Reports
Appendix H Left Turn Lane Warrant Nomograph

Figures

Figure 1.1: Site Location 2
Figure 2.1: Existing Lane Configuration and Traffic Control 4
Figure 2.2: The Port Colborne – Welland Link Service Map 7
Figure 2.3A: Base Year Traffic Volumes – AM and PM Peak Hour..9
Figure 2.3B: Base Year Traffic Volumes – Saturday Peak Hour....10
Figure 3.1: Site Concept Plan 15
Figure 3.2: Typical High-Volume Driveway Treatment - Multi-Use Path 16
Figure 3.3A: Site Generated Traffic – AM and PM Peak Hour 19
Figure 3.3B: Site Generated Traffic – Saturday Peak Hour 20
Figure 4.1A: Five-Year Background Traffic Volumes – AM and PM Peak Hour 22
Figure 4.1B: Five-Year Background Traffic Volumes – Saturday Peak Hour 23
Figure 4.2A: Five-Year Total Traffic Volumes – AM and PM Peak Hour 24
Figure 4.2B: Five-Year Total Traffic Volumes – Saturday Peak Hour 25
Figure 5.1A: Total Traffic Volumes (Mellanby Avenue Driveway Only) – AM and PM Peak Hour 32
Figure 5.1B: Total Traffic Volumes (Mellanby Avenue Driveway Only) – Saturday Peak Hour 33

Tables

Table 2.1: Existing Turning Movement Counts 8
Table 2.2: Existing Traffic Operations 13
Table 3.1: Site Generated Traffic 17
Table 3.2: Estimated Trip Distribution 18
Table 4.1: Background Traffic Operations 27
Table 4.2: Total Traffic Operations 29
Table 5.1: Total Traffic Operations – Remedial Measures 34

1 Introduction

1.1 Overview

ePrime Construction Management retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study (TIS) for the proposed mixed-use development located at 48 Main Street West in the City of Port Colborne. **Figure 1.1** illustrates the site location.

The scope of the study includes:

- Estimates of background traffic growth;
- Estimates of additional traffic generated by the subject site;
- Analyses of the impact of the future traffic on the surrounding road network; and
- Recommendations necessary to mitigate this future traffic in a satisfactory manner.

Appendix A contains the pre-study consultation material and responses from the Niagara Region and the City of Port Colborne. The study generally follows the Niagara Region Transportation Impact Assessment Guidelines[1]:

This submission assesses the AM, PM and Saturday peak hour analysis periods as directed through pre-consultation with Niagara Region staff.

The study area intersections assessed include:

- Main Street West at Mellanby Avenue (signalized);
- Main Street West at Lock 8 Park Driveway (unsignalized); and
- Mellanby Avenue at Lock 8 Park Driveway (unsignalized).

[1] Niagara Region. *Transportation Impact Assessment Guidelines*. (*Niagara: July 2023*).

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Site Location

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Figure 1.1

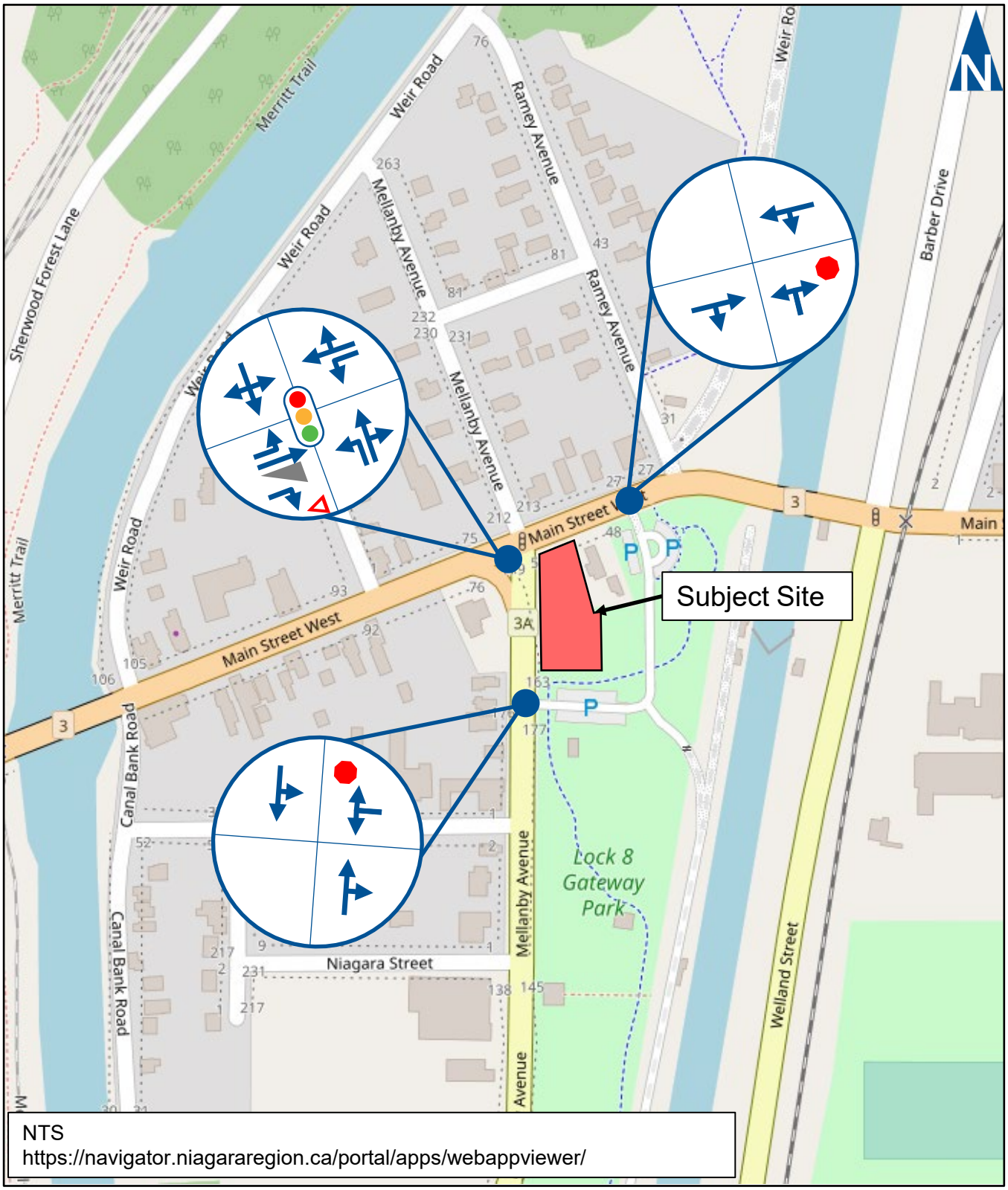
2 Existing Conditions

2.1 Road Network

The roadways of interest within the study area include:

- **Main Street West** (RR3), within the study area is an east-west two-lane roadway with an urban cross-section and a posted speed limit of 50 km/h. The intersection the Mellanby Avenue is signalized. The roadway is under the jurisdiction of the Niagara Region.
- **Mellanby Avenue** (RR3A) within the study area is a north-south two-lane roadway with an urban cross-section and an assumed speed limit of 50 km/h. The roadway is under the jurisdiction of the Niagara Region south of Main Street while the northern portion is under the jurisdiction of the City of Port Colborne.
- **Lock 8 Driveway's** are existing full-move driveways providing access to the Lock 8 Park parking lot areas. The driveways connect to Main Street West and Mellanby Avenue The driveway approaches to Main Street West and Mellanby Drive are stop controlled.

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



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Existing Lane Configuration and Traffic Control

48 Main Street
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Figure 2.1

2.2 Pedestrian Network

Sidewalks are provided along the north and south sides of Main Street West within the study area. Sidewalks are provided along the east side of Mellanby Avenue between the Lock 8 Park driveway and Main Street West. Sidewalks on the west side of Mellanby Avenue terminate south of Niagara Street. The signalized intersection of Main Street West and Mellanby Avenue provides pedestrian push buttons and crosswalks on all approaches.

A trail network within Lock 8 park provides additional pedestrian facilities.

2.3 Cycling Network

There are no existing cycling facilities identified within the study area. The Niagara Region official plan identifies future cycling facilities along Main Street West. The specific type of facility and timeline is not currently identified.

2.4 Transit Service

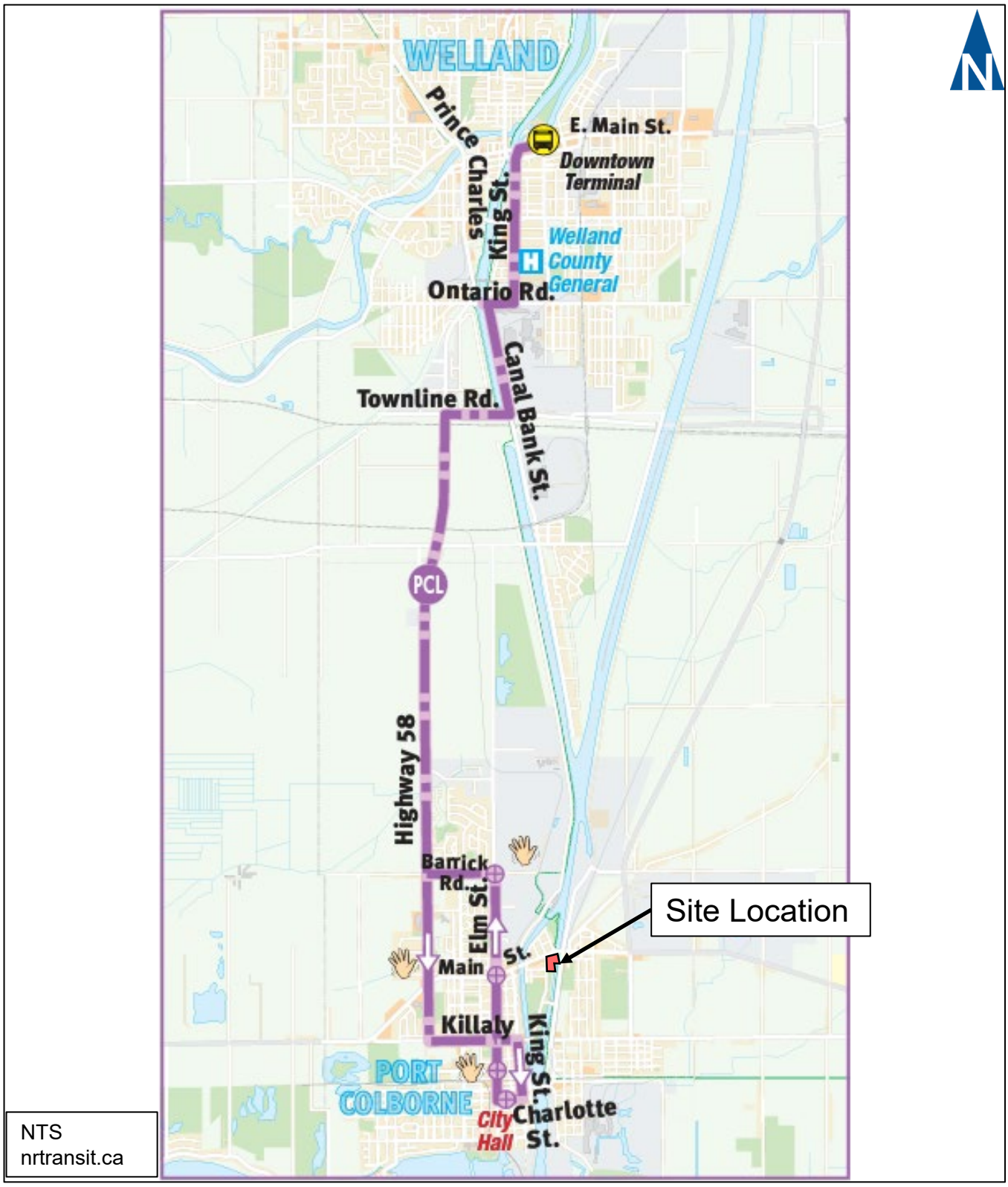
Transit service within the City of Port Colborne is provided by the newly consolidated Niagara Region Transit. Niagara Region Transit offers a non-fixed route transit service to residents called OnDemand transit.

OnDemand transit is a shared-ride public transit service without a fixed schedule or route. The vehicles' travel is optimized by computer software, and it is based upon rider trip requests. OnDemand Transit operates within the entire City allowing riders to travel from point to point without transfers. Riders may have to walk up to 400 metres to a bus stop or point of interest to meet their vehicle.

The OnDemand transit program allows people to book a trip by either calling the customer service office, booking online, or through the app. By downloading the "On Demand Transit" app, riders can not only book their ride instantly but also track the status of their on-demand transit vehicle in real-time.

In addition to the OnDemand transit provided by the City of Poer Colborne and additional transit link is provided by Welland transit to the site. The Port Colborne – Welland Link provides a direct route between the Town of Welland and the City of Port Colborne. The nearest stop is provided at Highway 58 and Main Street West approximately 1.5 km or a 20-minute walk towards the west. Service is provided Monday to

Saturday between 6:30 am and 9:30 pm with 60-minute headways. **Figure 2.2** illustrates The Port Colborne – Welland Link service map.



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The Port Colborne – Welland Link Service Map

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Figure 2.2

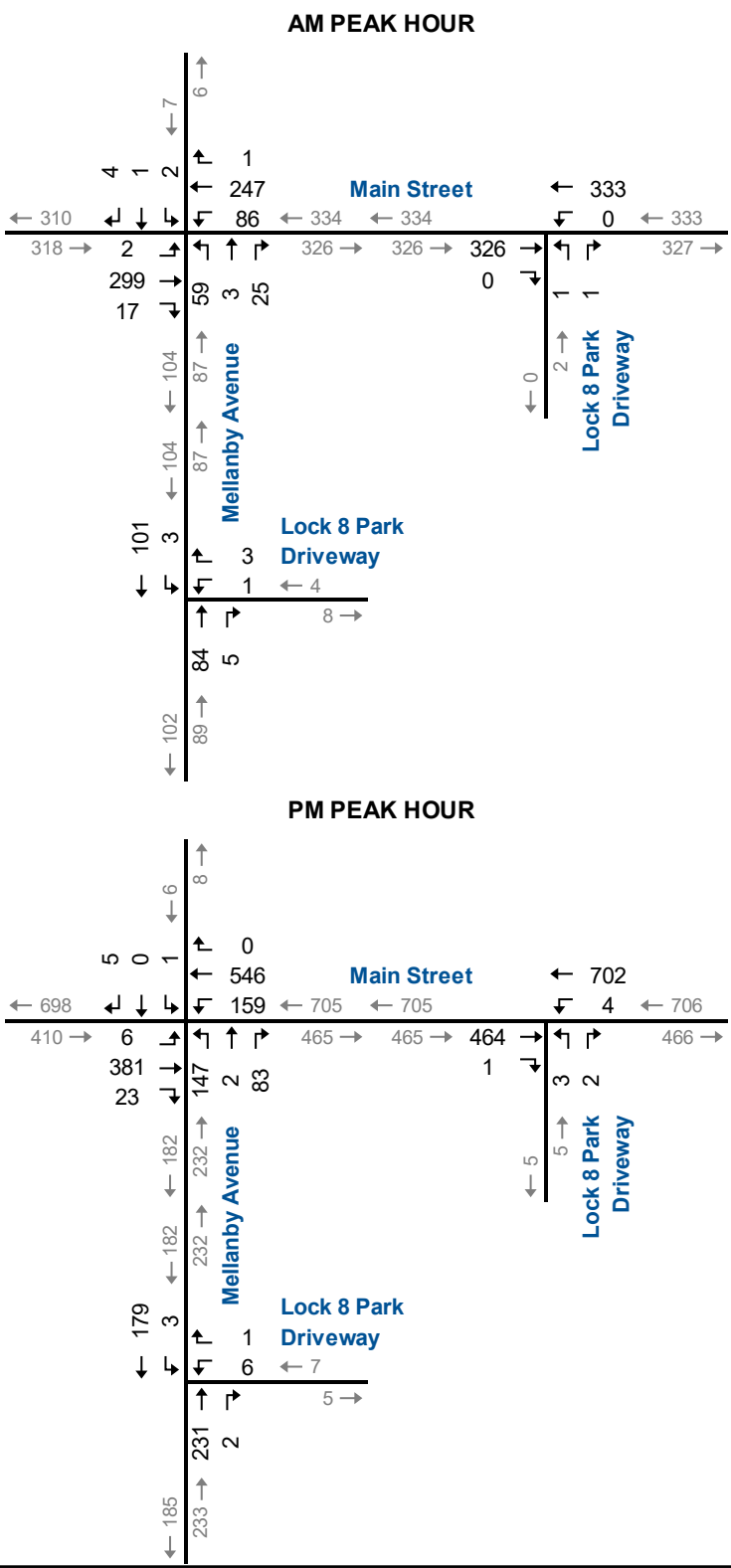
2.5 Traffic Volumes

Table 2.1 summarizes the location and date of the existing turning movement count (TMC) data used in the analysis. The TMC data used was collected by Paradigm in August 2023. Volume balancing was undertaken between the Main Street West and Mellanby Avenue intersections with the Lock 8 Park Driveways. Volumes were increased to account for variation in the TMC data due to differing peak hour periods.

Appendix B contains the existing count data and signal timing data. **Figure 2.3A-B** illustrates the base year traffic volumes.

TABLE 2.1: EXISTING TURNING MOVEMENT COUNTS

Intersection	Weekday Date	Weekend Date
Mellanby Avenue & Main Street West	Thursday, August 10, 2023	Saturday, August 12, 2023
Mellanby Avenue & Lock 8 Park Driveway	Thursday, August 10, 2023	Saturday, August 12, 2023
Main Street West & Lock 8 Park Driveway	Thursday, August 10, 2023	Saturday, August 12, 2023



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Base Year Traffic Volumes AM and PM Peak Hour

48 Main Street
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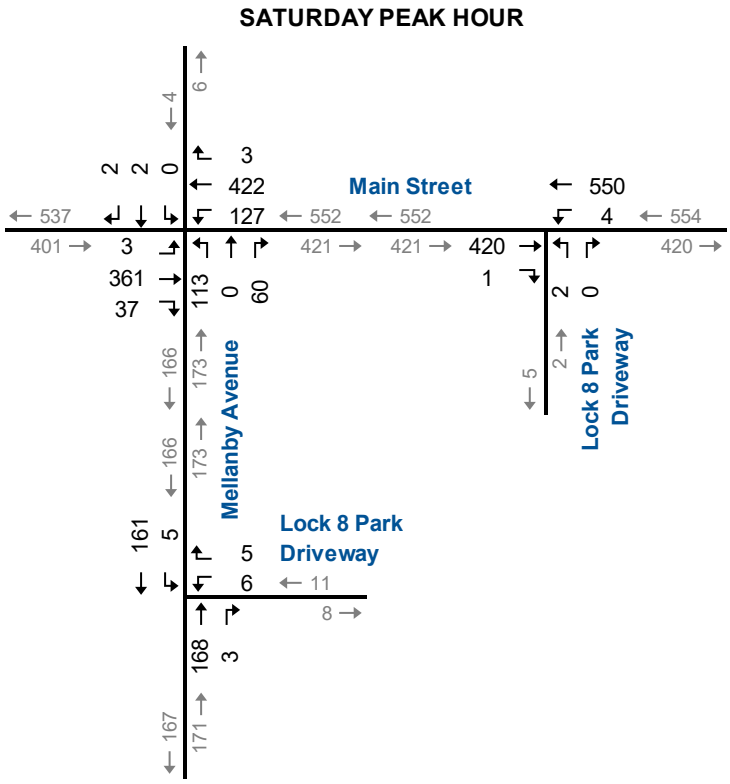
Figure 2.3A



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Base Year Traffic Volumes Saturday Peak Hour

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Figure 2.3B

2.6 Traffic Operations

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

The intersection analysis considered three separate measures of performance:

- The LOS for each turning movement. LOS is based on the average control delay per vehicle;
- The volume to capacity ratio for each intersection; and
- 95th percentile queue length (metres) using Synchro 11.

Under the Region's TIA Guidelines[2], the operational analysis must include identification of signalized and unsignalized intersections where:

- v/c ratios (v/c) for all movement that exceed 0.85 and/or LOS "E" or worse at signalized intersections;
- The 95th percentile queues for an individual movement are projected to exceed available turning lane storage; and
- LOS, based on average delay per vehicle on individual movements, operate at LOS E or worse at unsignalized intersections.

Under guidance from the Region's TIA Guidelines, the operational analysis includes the saturated flow rates contained in Table 1 of the TIA Guidelines.

2 Niagara Region. *Transportation Impact Assessment Guidelines.* (*Niagara: July 2023*).

The evaluation criteria used to analyze signalized and unsignalized intersections are based on the Highway Capacity Manual (HCM) 2000 using Synchro 11 software.

The operations of the intersections in the study area were evaluated using the existing lane configuration, signal timings, and traffic control.

Table 2.2 summarizes the level of service conditions.

The intersections within the study area are operating with acceptable levels of service and well within capacity during the AM, PM, and Saturday peak hours.

The westbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is expected to extend through the Lock 8 Park Driveway to Main Street West during the AM, PM, and Saturday peak hours.

The northbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is not expected to block the Lock 8 Park Driveway to Mellanby Avenue.

Appendix C contains the detailed Synchro 11 reports.

TABLE 2.2: EXISTING TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	A	A	>	**A**	C	C	>	**C**	<	D	>	**D**	**A**
			Delay	4	6	4	**6**	6	7	>	**6**	27	26	>	**27**	<	37	>	**37**	**9**
			V/C	0.00	0.34	0.02		0.19	0.34	>		0.31	0.05	>		<	0.11	>		**0.35**
			95th	1	43	0		15	37	>		15	6	>		<	4	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	19	-	40		20	-	>		20	-	>		<	-	>		
	Main Street West & Lock 8 Park Driveway	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**A**					
			Delay		0	>	**0**	<	0		**0**	13		>	**0**					
			V/C		0.23	>		<	0.00			0.00		>						
			95th		0	>		<	0			0		>						
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					A		>	**A**		A	>	**A**	<	A		**A**	
			Delay					9		>	**9**		0	>	**0**	<	0		**0**	
			V/C					0.01		>			0.07	>		<	0.00			
			95th					0		>			0	>		<	0			
PM Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	A	B	>	**B**	C	C	>	**C**	<	C	>	**C**	**B**
			Delay	6	9	6	**9**	9	14	>	**13**	25	22	>	**24**	<	35	>	**35**	**14**
			V/C	0.02	0.40	0.02		0.35	0.68	>		0.47	0.08	>		<	0.00	>		**0.65**
			95th	2	59	1		30	128	>		30	10	>		<	0	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	18	-	39		5	-	>		5	-	>		<	-	>		
	Main Street West & Lock 8 Park Driveway	TWSC	LOS		A	>	**A**	<	A		**A**	C		>	**A**					
			Delay		0	>	**0**	<	0		**0**	19		>	**0**					
			V/C		0.28	>		<	0.00			0.02		>						
			95th		0	>		<	0			1		>						
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	<	A		**A**	
			Delay					13		>	**13**		0	>	**0**	<	0		**0**	
			V/C					0.02		>			0.20	>		<	0.00			
			95th					1		>			0	>		<	0			
Saturday Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	A	B	>	**A**	C	C	>	**C**	<	D	>	**D**	**B**
			Delay	5	8	6	**8**	8	10	>	**10**	25	23	>	**24**	<	36	>	**36**	**12**
			V/C	0.01	0.39	0.03		0.30	0.53	>		0.39	0.05	>		<	0.08	>		**0.52**
			95th	2	55	3		24	75	>		25	0	>		<	3	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	19	-	37		11	-	>		10	-	>		<	-	>		
	Main Street West & Lock 8 Park Driveway	TWSC	LOS		A	>	**A**	<	A		**A**	C		>	**A**					
			Delay		0	>	**0**	<	0		**0**	23		>	**0**					
			V/C		0.26	>		<	0.00			0.01		>						
			95th		0	>		<	0			0		>						
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	<	A		**A**	
			Delay					13		>	**13**		0	>	**0**	<	0		**0**	
			V/C					0.05		>			0.20	>		<	0.01			
			95th					1		>			0	>		<	0			

MOE - Measure of Effectiveness
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
LOS - Level of Service
V/C - Volume to Capacity Ratio
95th - 95th Percentile Queue Length
Ex. - Existing Storage (m)
Avail. - Available Storage (m)
> - Shared Right-Turn Lane
< - Shared Left-Turn Lane

3 Development Concept

3.1 Description

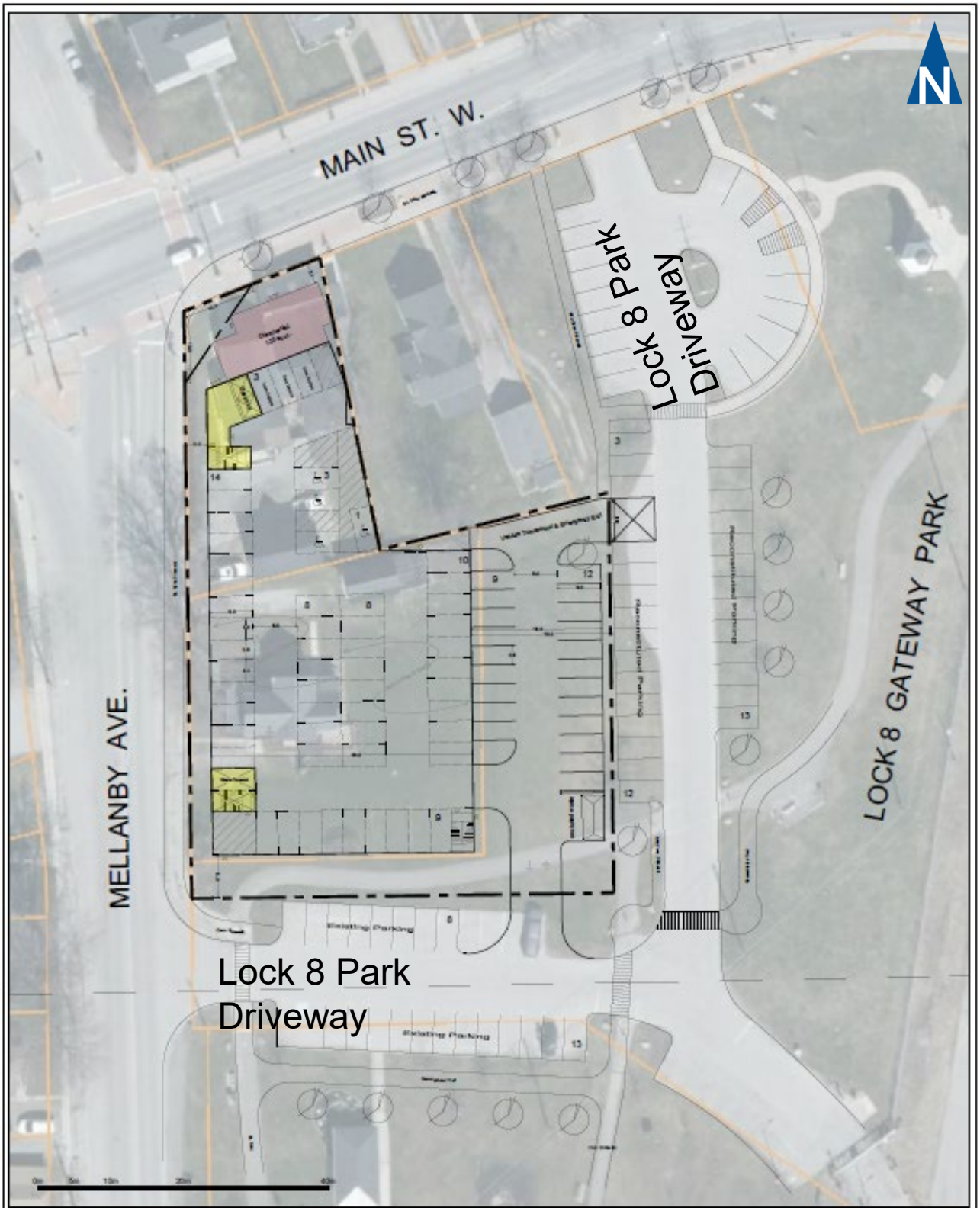
The subject site is located at 48 Main Street West in the City of Port Colborne. **Figure 3.1** illustrates the site concept plan.

The development concept includes an 8-storey mixed use building containing approximately 108 residential units and approximately 123 m² (1,324 sq.ft.) of ground floor retail space. Build-out and occupancy is anticipated to occur by Year 2027.

Vehicle access is proposed by the existing Lock 8 Park driveway to Main Street West and the existing Lock 8 Park driveway to Mellanby Avenue.

It is recommended that the existing crosswalk over the Lock 8 Park Driveway to Mellanby Avenue be redesigned with a crossing treatment consistent with the OTM Book 18 – Cycling Facilities[3]. **Figure 3.2** illustrates the typical layout for a multi-use crossing treatment over a driveway.

[3] Ontario. *Ontario Traffic Manual – Book 18 Cycling Facilities.* Figure 6.72: High-Volume Driveway Treatment, In-Boulevard Facility (Multi-Use Path). (*Niagara: May 2012*).



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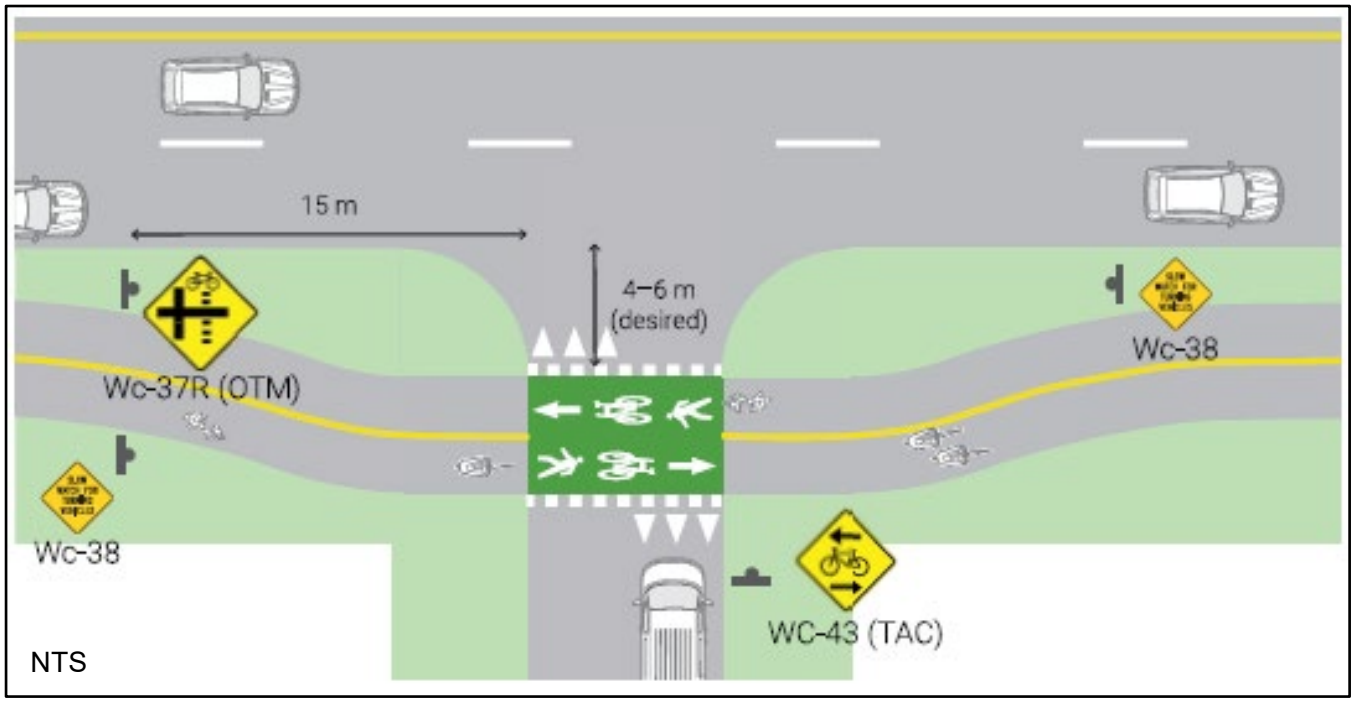
Site Concept Plan

48 Main Street
220766

Figure 3.1

OTM Book 18, Figure 6.72: High-Volume Driveway Treatment, In-Boulevard Facility (Multi-Use Path)



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Typical High-Volume Driveway Treatment - Multi-Use Path

48 Main Street
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Figure 3.2

3.2 Site Trip Generation

The Institute of Transportation Engineer (ITE)Trip Generation 11th edition[4] data was used to estimate the vehicular site trip generation. The following ITE land use codes were used to estimate the site's trip generation:

- Multifamily Housing (Mid-Rise) (LUC 221)
- Shopping Plaza (<44k) (LUC 822)

Table 3.1 summarizes the estimated trip generation. To remain conservative, no modal split adjustments or pass-by trips have been applied to the trip generation estimate to account for active transportation or transit-oriented trips.

The subject site is forecast to generate approximately 44 new vehicle trips during the AM peak hour, 61 new trips during the PM peak hour and 52 new trips during the Saturday peak hour.

TABLE 3.1: SITE GENERATED TRAFFIC

Land Use	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Sum	In	Out	Sum	In	Out	Sum
LUC 221[1] - 108 units	8	28	**36**	26	16	**42**	22	21	**43**
LUC 822[2] - 123 m² (1,324 sq.ft.)	5	3	**8**	9	10	**19**	4	5	**9**
Total Generation	**13**	**31**	**44**	**35**	**26**	**61**	**26**	**26**	**52**

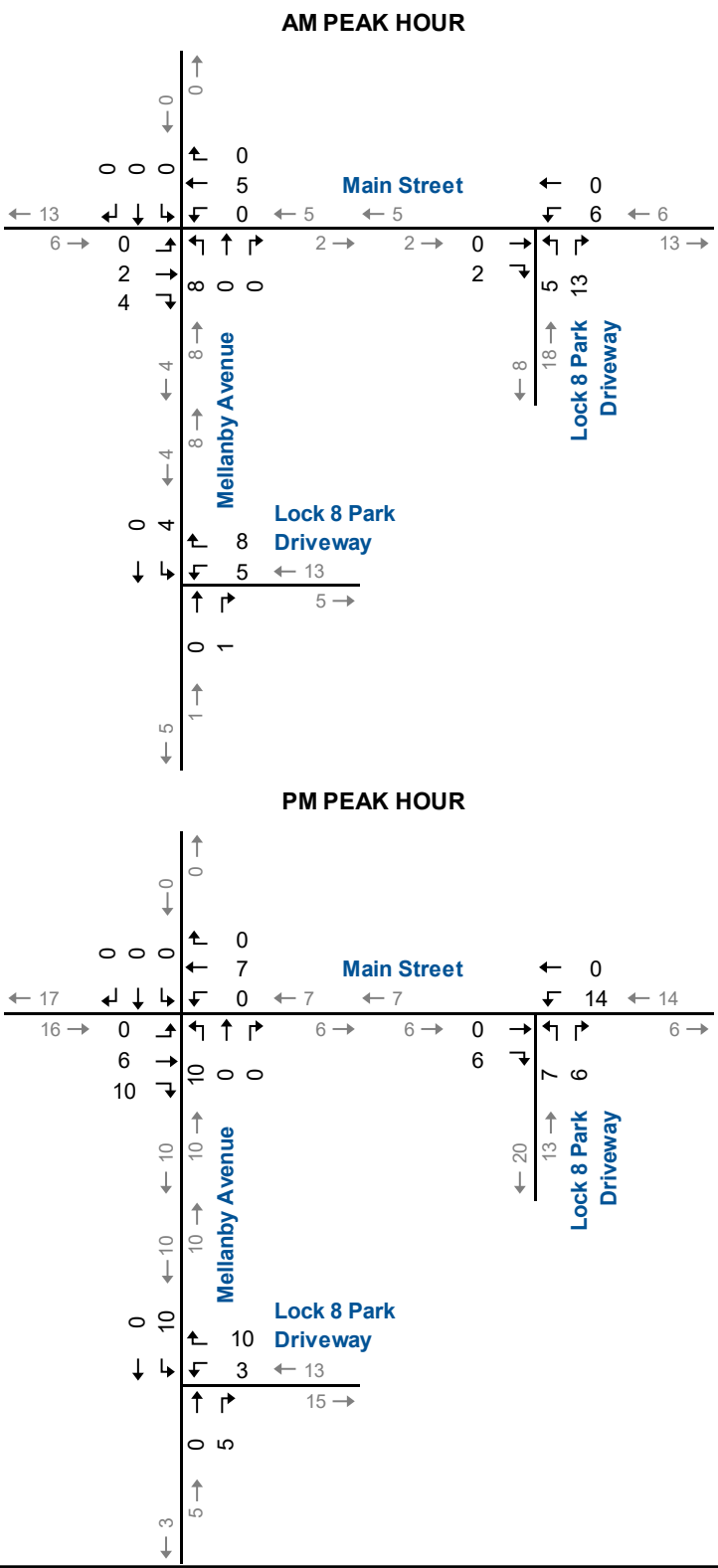
AM - T = 0.44(X) - 11.61, PM - T = 0.39(X) + 0.34, SAT - Ln(T) = 1.00 Ln(X) - 0.91
AM - Ln(T) = 0.66 Ln(X) + 1.84, PM - Ln(T) = 0.71 Ln(X) + 2.72, SAT - 6.57

The surrounding area is primarily residential with retail land uses along Main Street West. As such the trip distribution for the subject site reflects existing travel patterns as documented in the turning movement counts. **Table 3.2** summarizes the estimated trip distribution. **Figure 3.3A-B** illustrates the site generated traffic assignment.

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

TABLE 3.2: ESTIMATED TRIP DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
	In	Out	In	Out	In	Out
South via Mellanby Avenue	10%	15%	15%	10%	15%	10%
East via Main Street	45%	45%	55%	35%	50%	40%
West via Main Street	45%	40%	30%	55%	35%	50%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**



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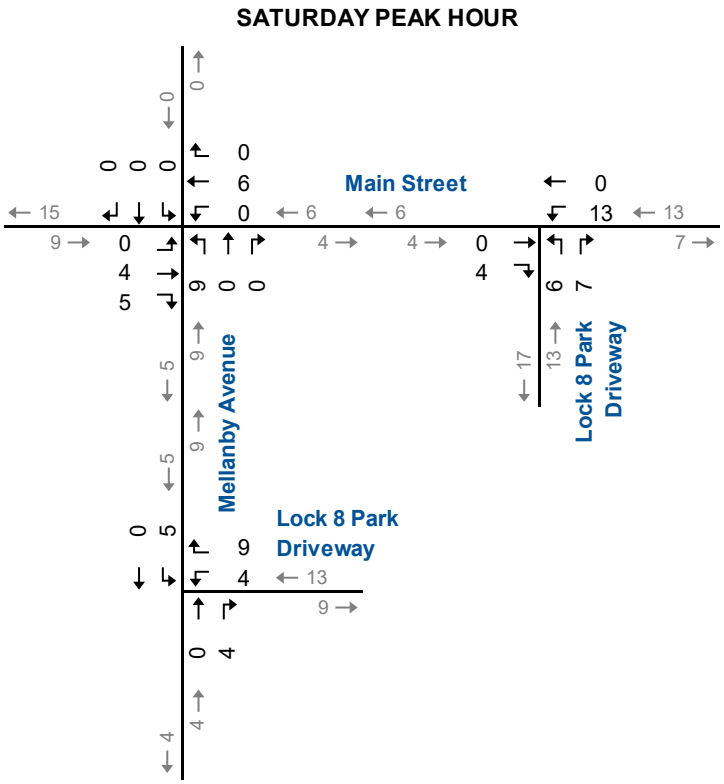
Site Generated Traffic AM and PM Peak Hour

48 Main Street
220766

Figure 3.3A



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Site Generated Traffic Saturday Peak Hour

48 Main Street
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Figure 3.3B

4 Future Traffic Conditions

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

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

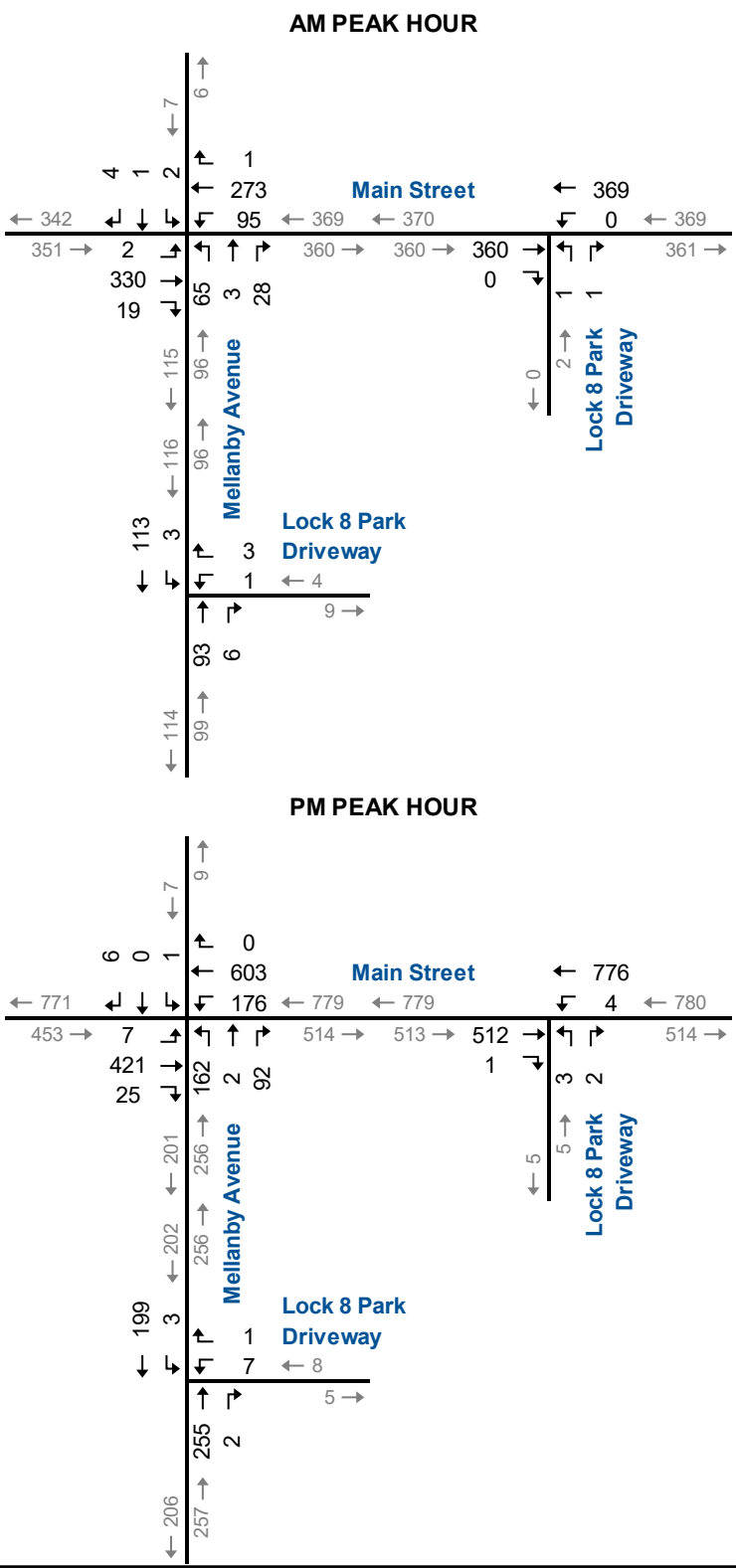
4.1 Forecast Traffic

A five-year horizon (Year 2032) following the expected build-out of the site has been assessed. The likely future traffic volumes near the subject site are estimated to consist of:

- Increased non-site traffic (generalized background traffic growth); and
- Traffic generated by the subject site.

During pre-study consultations, Regional staff confirmed a generalized background growth rate of 2% per annum. To be conservative the background growth rate was applied to the traffic volumes using the Lock 8 Park.

Figure 4.1A-B illustrates the forecast five-year background traffic volumes for the AM, PM, and Saturday peak hours. **Figure 4.2A-B** illustrates the forecast five-year total traffic volumes during the AM, PM, and Saturday peak hours.

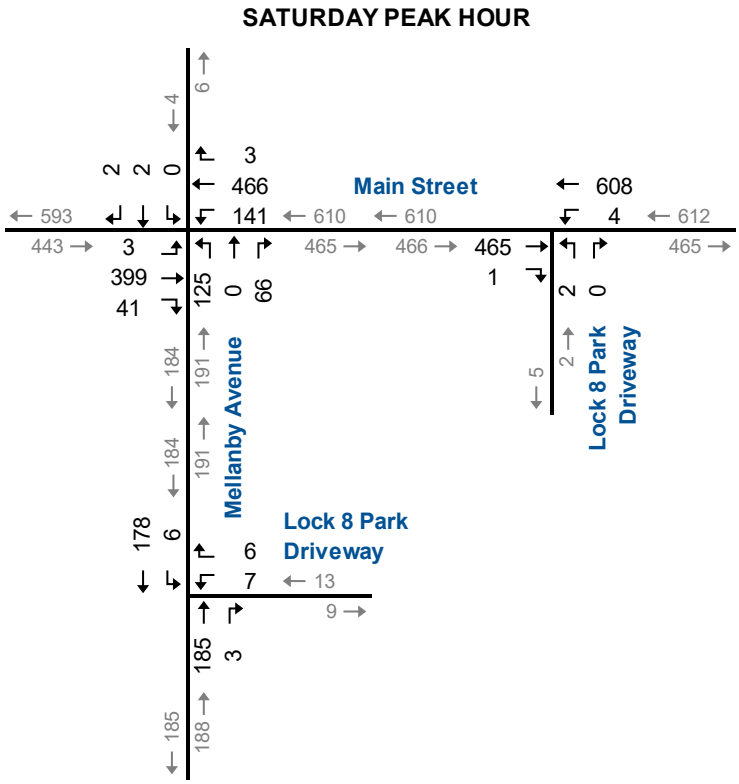


NTS

Five-Year Background Traffic Volumes AM and PM Peak Hour

48 Main Street
220766

Figure 4.1A

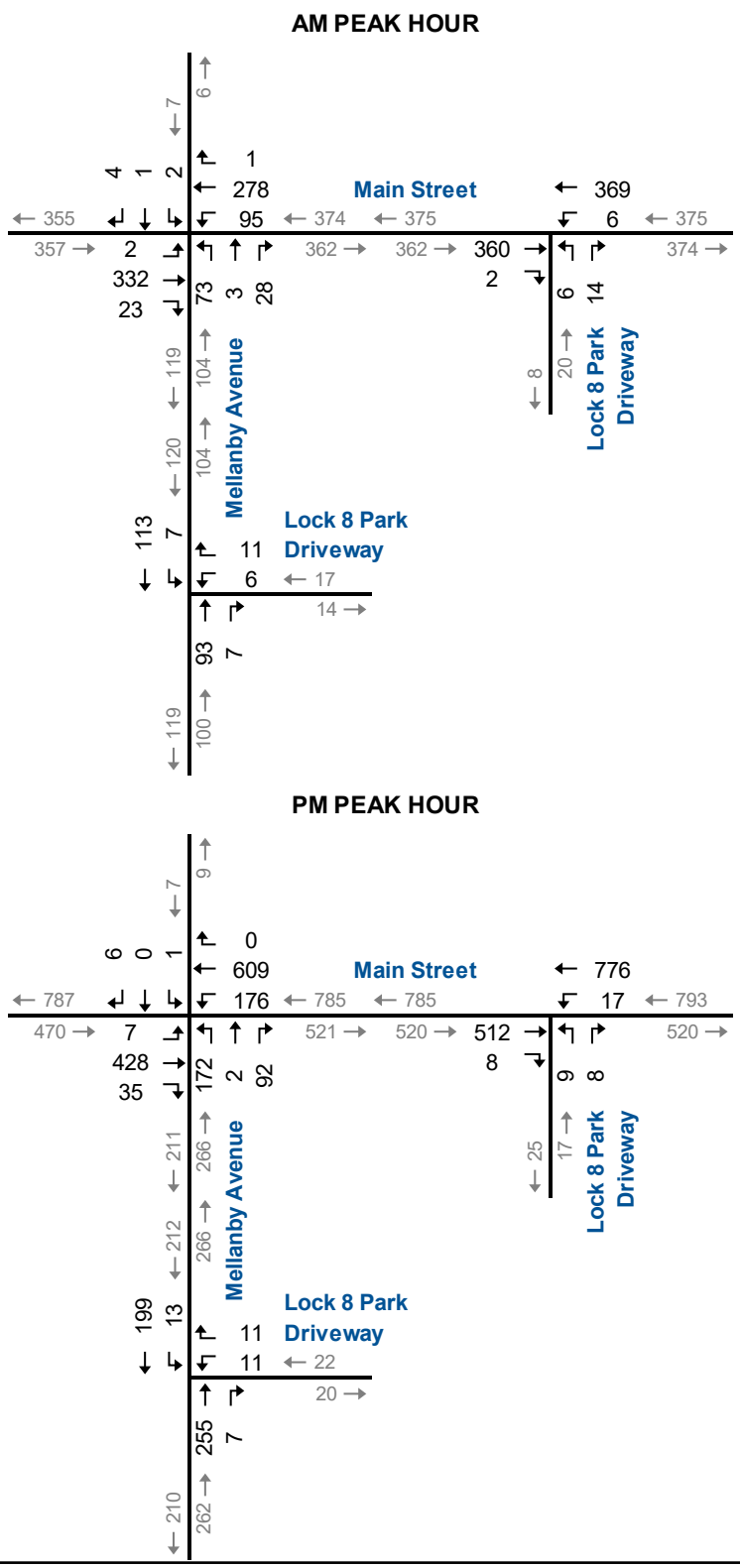


NTS

Five-Year Background Traffic Volumes Saturday Peak Hour

48 Main Street
220766

Figure 4.1B

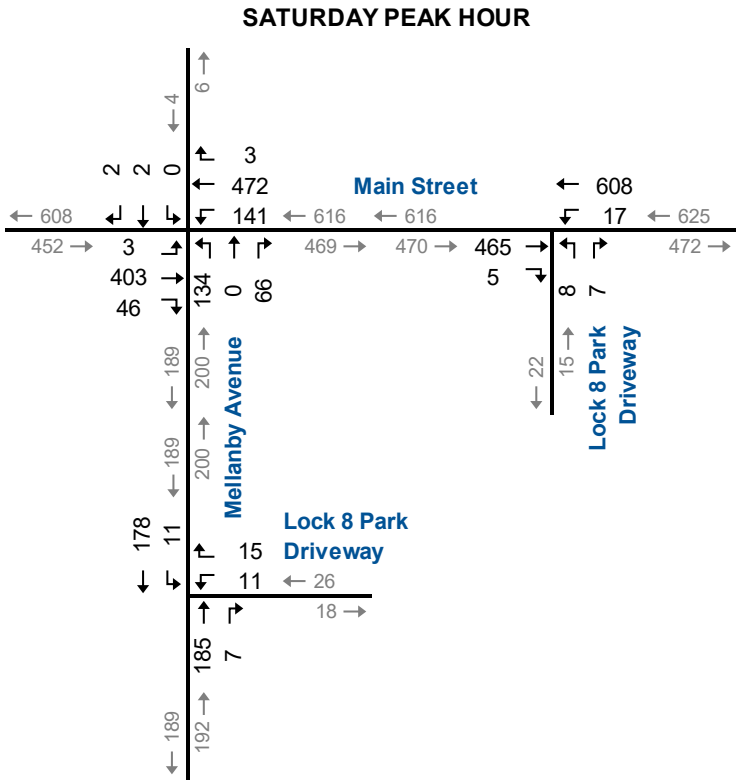


NTS

Five-Year Total Traffic Volumes AM and PM Peak Hour

48 Main Street
220766

Figure 4.2A



NTS

Five-Year Total Traffic Volumes Saturday Peak Hour

48 Main Street
220766

Figure 4.2B

4.2 Background Traffic Operations

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

Table 4.1 summarizes the level of service conditions.

The intersections within the study area are operating with acceptable levels of service and well within capacity during the AM, PM, and Saturday peak hours.

The westbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is expected to extend through the Lock 8 Park Driveway to Main Street West during the AM, PM, and Saturday peak hours.

The northbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is not expected to block the Lock 8 Park Driveway to Mellanby Avenue.

Appendix D contains the detailed Synchro 11 reports.

TABLE 4.1: BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	A	A	>	**A**	C	C	>	**C**	<	D	>	**D**	**A**
			Delay	4	7	4	**7**	6	7	>	**7**	27	26	>	**27**	<	37	>	**37**	**9**
			V/C	0.00	0.38	0.02		0.23	0.37	>		0.33	0.05	>		<	0.11	>		**0.39**
			95th	1	49	1		17	42	>		16	6	>		<	4	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	19	-	39		18	-	>		19	-	>		<	-	>		
	Main Street West & Lock 8 Park Driveway	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**A**					
			Delay		0	>	**0**	<	0		**0**	13		>	**0**					
			V/C		0.25	>		<	0.00			0.00		>						
			95th		0	>		<	0			0		>						
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					A		>	**A**		A	>	**A**	<	A		**A**	
			Delay					9		>	**9**		0	>	**0**	<	0		**0**	
			V/C					0.01		>			0.08	>		<	0.00			
			95th					0		>			0	>		<	0			
PM Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	B	B	>	**B**	C	C	>	**C**	<	C	>	**C**	**B**
			Delay	6	10	6	**9**	11	17	>	**16**	25	22	>	**24**	<	35	>	**35**	**15**
			V/C	0.02	0.45	0.02		0.43	0.76	>		0.50	0.08	>		<	0.01	>		**0.72**
			95th	3	69	2		37	152	>		33	10	>		<	0	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	18	-	39		-2	-	>		2	-	>		<	-	>		
	Main Street West & Lock 8 Park Driveway	TWSC	LOS		A	>	**A**	<	A		**A**	C		>	**A**					
			Delay		0	>	**0**	<	0		**0**	21		>	**0**					
			V/C		0.30	>		<	0.00			0.02		>						
			95th		0	>		<	0			1		>						
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	<	A		**A**	
			Delay					13		>	**13**		0	>	**0**	<	0		**0**	
			V/C					0.02		>			0.22	>		<	0.00			
			95th					1		>			0	>		<	0			
Saturday Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	A	B	>	**B**	C	C	>	**C**	<	D	>	**D**	**B**
			Delay	6	9	6	**9**	9	12	>	**11**	25	22	>	**24**	<	36	>	**36**	**12**
			V/C	0.01	0.43	0.04		0.35	0.59	>		0.42	0.06	>		<	0.08	>		**0.57**
			95th	2	64	4		28	90	>		27	0	>		<	3	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	19	-	36		7	-	>		8	-	>		<	-	>		
	Main Street West & Lock 8 Park Driveway	TWSC	LOS		A	>	**A**	<	A		**A**	D		>	**A**					
			Delay		0	>	**0**	<	0		**0**	27		>	**0**					
			V/C		0.29	>		<	0.00			0.01		>						
			95th		0	>		<	0			0		>						
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	<	A		**A**	
			Delay					14		>	**14**		0	>	**0**	<	0		**0**	
			V/C					0.06		>			0.22	>		<	0.01			
			95th					2		>			0	>		<	0			

MOE - Measure of Effectiveness
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
LOS - Level of Service
V/C - Volume to Capacity Ratio
95th - 95th Percentile Queue Length
Ex. - Existing Storage (m)
Avail. - Available Storage (m)
> - Shared Right-Turn Lane
< - Shared Left-Turn Lane

4.3 Total Traffic Operations

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

Table 4.2 summarizes the level of service conditions.

The intersections within the study area are operating with acceptable levels of service and well within capacity during the AM, PM, and Saturday peak hours.

The westbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is expected to extend through the Lock 8 Park Driveway to Main Street West during the AM, PM, and Saturday peak hours.

The northbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is not expected to block the Lock 8 Park Driveway to Mellanby Avenue.

The Lock 8 Park Driveway approaches to Mellanby Avenue and Main Street West are forecast to operate with acceptable levels of service in the AM, PM, and Saturday peak hours. Delays on the driveway approaches are forecast to be in the LOS A-C range with v/c ratios of less than 0.15 with minimal queuing.

The overall impact of the proposed development on the existing road network from an intersection capacity perspective is minimal.

Appendix E contains the detailed Synchro 11 reports.

TABLE 4.2: TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																
				Eastbound				Westbound				Northbound				Southbound				OVERALL
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	A	A	>	**A**	C	C	>	**C**	<	D	>	**D**	**A**
			Delay	4	7	5	**7**	6	7	>	**7**	27	25	>	**27**	<	37	>	**37**	**10**
			V/C	0.00	0.38	0.03		0.23	0.38	>		0.37	0.05	>		<	0.11	>		**0.40**
			95th	1	50	1		17	44	>		18	6	>		<	4	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	19	-	39		18	-	>		17	-	>		<	-	>		
	Main Street West & Lock 8 Park Driveway	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**A**					
			Delay		0	>	**0**	<	0		**0**	13		>	**0**					
			V/C		0.25	>		<	0.01			0.05		>						
			95th		0	>		<	0			1		>						
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					A		>	**A**		A	>	**A**	<	A		**A**	
			Delay					10		>	**10**		0	>	**0**	<	1		**0**	
			V/C					0.03		>			0.08	>		<	0.01			
			95th					1		>			0	>		<	0			
PM Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	B	B	>	**B**	C	C	>	**C**	<	C	>	**C**	**B**
			Delay	6	10	6	**10**	11	18	>	**17**	25	22	>	**24**	<	35	>	**35**	**16**
			V/C	0.02	0.46	0.03		0.44	0.77	>		0.52	0.08	>		<	0.01	>		**0.74**
			95th	3	71	3		38	156	>		35	10	>		<	0	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	18	-	37		-3	-	>		0	-	>		<	-	>		
	Main Street West & Lock 8 Park Driveway	TWSC	LOS		A	>	**A**	<	A		**A**	C		>	**A**					
			Delay		0	>	**0**	<	1		**1**	22		>	**0**					
			V/C		0.31	>		<	0.02			0.07		>						
			95th		0	>		<	0			2		>						
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	<	A		**A**	
			Delay					13		>	**13**		0	>	**0**	<	1		**0**	
			V/C					0.06		>			0.22	>		<	0.02			
			95th					2		>			0	>		<	0			
Saturday Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	A	B	>	**B**	C	C	>	**C**	<	D	>	**D**	**B**
			Delay	6	9	6	**9**	10	12	>	**11**	25	22	>	**24**	<	36	>	**36**	**13**
			V/C	0.01	0.44	0.04		0.35	0.60	>		0.45	0.06	>		<	0.08	>		**0.59**
			95th	1	65	4		29	93	>		29	0	>		<	3	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	19	-	36		7	-	>		6	-	>		<	-	>		
	Main Street West & Lock 8 Park Driveway	TWSC	LOS		A	>	**A**	<	A		**A**	C		>	**A**					
			Delay		0	>	**0**	<	1		**1**	22		>	**0**					
			V/C		0.29	>		<	0.02			0.07		>						
			95th		0	>		<	0			2		>						
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	<	A		**A**	
			Delay					14		>	**14**		0	>	**0**	<	1		**0**	
			V/C					0.11		>			0.23	>		<	0.02			
			95th					3		>			0	>		<	1			

MOE - Measure of Effectiveness
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
LOS - Level of Service
V/C - Volume to Capacity Ratio
95th - 95th Percentile Queue Length
Ex. - Existing Storage (m)
Avail. - Available Storage (m)
> - Shared Right-Turn Lane
< - Shared Left-Turn Lane

5 Remedial Measures

5.1 Traffic Control Improvements

The Lock 8 Park driveway intersections with Main Street West and Mellanby Avenue were assessed using the Ontario Traffic Manual (OTM Book 12 – Justification 7) signal warrant procedures under total conditions. **Appendix F** contains the warrant analysis.

Based on the warrant analysis, signals are not warranted at the site driveway intersection with Main Street West and Mellanby Avenue. Stop control is an appropriate form of traffic control for the site driveway approaches.

5.2 Auxiliary Turn Lanes

The Ministry of Transportation's (MTO) Design Supplement for the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads[5] provides guidance on the assessment and/or need for auxiliary left-turn lanes.

The warrants have been completed for the Lock 8 Park Driveway intersections with Main Street West and Mellanby Avenue.

The warrant analysis indicates that a southbound left-turn lane at the driveway connection with Mellanby Avenue is not warranted during the AM, PM, and Saturday peak hour in the Total Traffic Horizon. No changes to the existing lane configuration at the Lock 8 Park driveway to Mellanby Avenue is recommended.

The warrant analysis indicates that a westbound left-turn lane with 25 metres of storage is warranted at the site driveway with Main Street West during the PM and Saturday peak hour under existing and background conditions. The turn lane remains warranted, with no change in storage, with the expected growth in non-site traffic and site generated traffic.

Appendix G contains the left-turn lane warrant nomographs.

Due to the existing back-to-back left-turn lanes provided at the intersections of Main Street West at Mellanby Avenue and Ramey Avenue it is not feasible to implement another left-turn lane on Main Street West for the Lock 8 Park Driveway. Also, with the queueing of

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

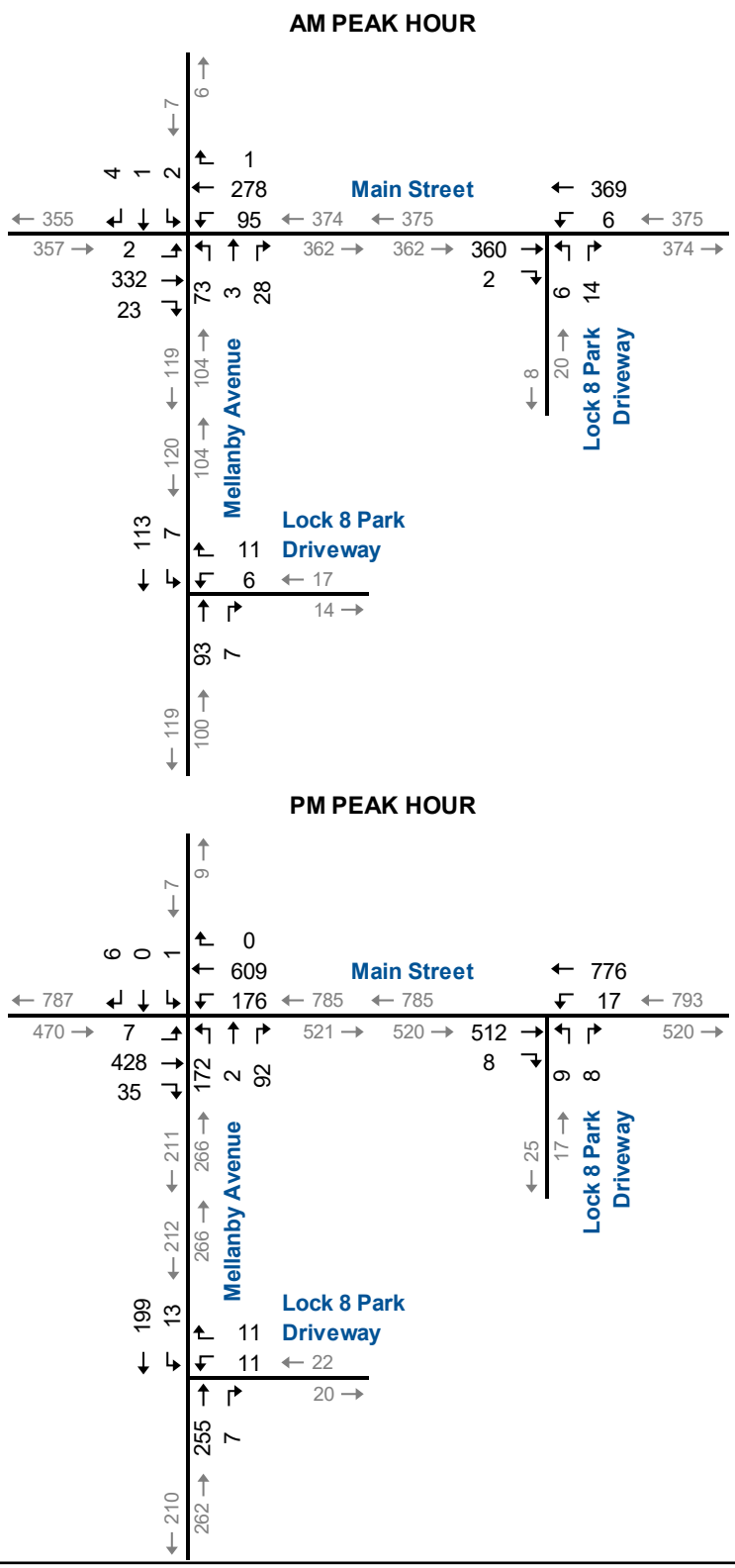
vehicles from the Mellanby Avenue signal expected to spill back into the Lock 8 Park driveway. It is recommended that the existing Main Street Lock 8 driveway be closed to regular traffic, and the driveway function as an emergency connection to the park.

The scenario with one-driveway access to Mellanby Avenue was assessed. **Figure 5.1A-B** illustrates the total traffic volumes with one driveway to Mellanby Avenue. **Table 5.1** summarizes the level of service conditions with a single driveway. The analysis follows the same methodology as the total traffic horizon. **Appendix H** contains the detailed Synchro 11 reports.

The intersections within the study area are forecast to continue to operate with acceptable levels of service and well within capacity during the AM, PM, and Saturday peak hours. No critical movements are noted.

The Lock 8 Park Driveway approach to Mellanby Avenue is forecast to operate with acceptable levels of service in the AM, PM, and Saturday peak hours. Delays on the driveway approach are forecast to be in the LOS A-B range with v/c ratios of less than 0.15 with minimal queuing.

The northbound queue length generated by the downstream traffic control signal at Main Street West is not forecast to extend through the Lock 8 Park Driveway to Mellanby Avenue.

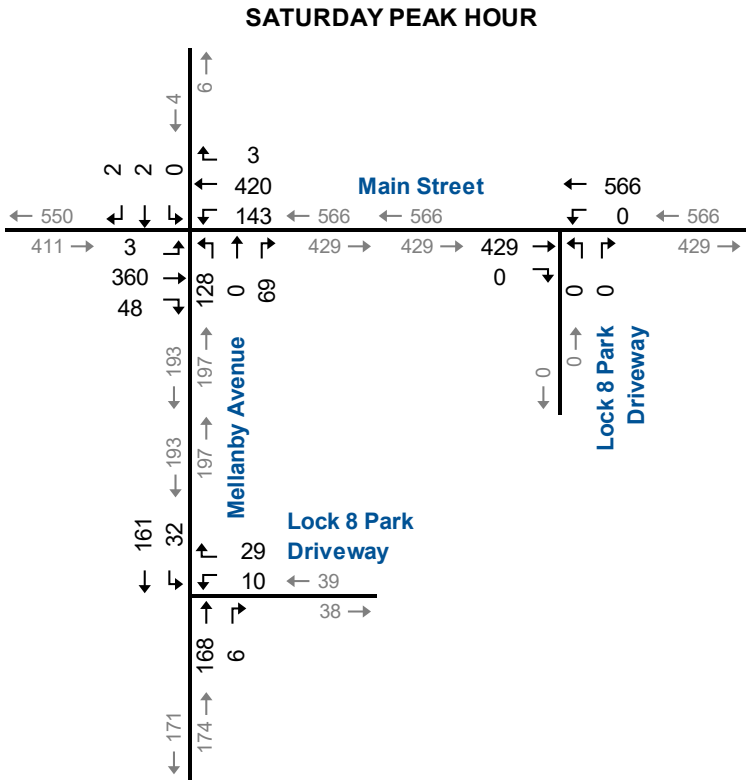


NTS

Total Traffic Volumes (Mellanby Avenue Driveway Only) – AM and PM Peak Hour

48 Main Street
220766

Figure 5.1A



NTS

Total Traffic Volumes (Mellanby Avenue Driveway Only) – Saturday Peak Hour

48 Main Street
220766

Figure 5.1B

TABLE 5.1: TOTAL TRAFFIC OPERATIONS – REMEDIAL MEASURES

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	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	A	A	>	**A**	C	C	>	**C**	<	D	>	**D**	**A**
			Delay	5	7	5	**7**	7	7	>	**7**	27	25	>	**26**	<	37	>	**37**	**10**
			V/C	0.00	0.39	0.03		0.24	0.38	>		0.39	0.06	>		<	0.12	>		**0.41**
			95th	1	50	2		18	44	>		19	7	>		<	4	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	19	-	39		17	-	>		16	-	>		<	-	>		
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					A		>	**A**		A	>	**A**	<	A		**A**	
			Delay					9		>	**9**		0	>	**0**	<	1		**0**	
			V/C					0.06		>			0.08	>		<	0.01			
			95th					2		>			0	>		<	0			
PM Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	B	B	>	**B**	C	C	>	**C**	<	C	>	**C**	**B**
			Delay	6	10	6	**10**	12	18	>	**17**	25	21	>	**24**	<	35	>	**35**	**16**
			V/C	0.02	0.45	0.04		0.48	0.77	>		0.54	0.09	>		<	0.01	>		**0.74**
			95th	3	71	4		44	155	>		37	10	>		<	0	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	17	-	36		-9	-	>		-2	-	>		<	-	>		
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	<	A		**A**	
			Delay					12		>	**12**		0	>	**0**	<	2		**0**	
			V/C					0.10		>			0.22	>		<	0.05			
			95th					3		>			0	>		<	1			
Saturday Peak Hour	Main Street West & Mellanby Avenue	TCS	LOS	A	A	A	**A**	A	B	>	**B**	C	C	>	**C**	<	D	>	**D**	**B**
			Delay	6	8	6	**8**	9	11	>	**10**	25	22	>	**24**	<	36	>	**36**	**12**
			V/C	0.01	0.39	0.04		0.34	0.53	>		0.43	0.06	>		<	0.08	>		**0.53**
			95th	1	56	5		28	76	>		28	0	>		<	3	>		
			Storage	20	-	40		35	-	>		35	-	>		<	-	>		
			Avail.	19	-	35		7	-	>		8	-	>		<	-	>		
	Mellanby Avenue & Lock 8 Park Driveway	TWSC	LOS					B		>	**B**		A	>	**A**	<	A		**A**	
			Delay					13		>	**13**		0	>	**0**	<	2		**0**	
			V/C					0.15		>			0.20	>		<	0.07			
			95th					4		>			0	>		<	2			

MOE - Measure of Effectiveness
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
LOS - Level of Service
V/C - Volume to Capacity Ratio
95th - 95th Percentile Queue Length
Ex. - Existing Storage (m)
Avail. - Available Storage (m)
> - Shared Right-Turn Lane
< - Shared Left-Turn Lane

6 Conclusions and Recommendations

6.1 Conclusions

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

- **Existing Traffic Operations**: The intersections within the study area are operating with acceptable levels of service and well within capacity during the AM, PM, and Saturday peak hours.

  The westbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is expected to extend through the Lock 8 Park Driveway to Main Street West during the AM, PM, and Saturday peak hours.
- **Site Generated Traffic**: The subject site is forecast to generate approximately 44 new vehicle trips during the AM peak hour, 61 new trips during the PM peak hour and 52 new trips during the Saturday peak hour.
- **Forecast Traffic**: The forecast traffic volumes near the subject site have been assessed for a five-year horizon beyond the opening date (Year 2032). The forecast traffic volumes are estimated to consist of:
  - Generalized background traffic growth; and
  - Traffic generated by the subject site.
- **Background Traffic Operations:** The intersections within the study area are operating with acceptable levels of service and well within capacity during the AM, PM, and Saturday peak hours.

  The westbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is expected to extend through the Lock 8 Park Driveway to Main Street West during the AM, PM, and Saturday peak hours.
- **Total Traffic Operations:** The intersections within the study area are operating with acceptable levels of service and well within capacity during the AM, PM, and Saturday peak hours.

  The westbound queue length generated by the signalized Main Street West intersection with Mellanby Avenue is expected to extend through the Lock 8 Park Driveway to Main Street West during the AM, PM, and Saturday peak hours.
- **Remedial Measures**: A westbound left-turn lane with 25 metres of storage is warranted during the PM and Saturday peak hours at the existing Main Street West and Lock 8 Park Driveway. The

westbound left-turn lane is not triggered by the addition of site generated traffic.

Due to the existing back-to-back left-turn lanes on Main Street West between Mellanby Avenue and Ramey Avenue it is not feasible to construct the warranted westbound left-turn lane at the driveway intersection. Furthermore, the queueing of vehicles from the signal is expected to spill back into the Lock 8 Park driveway.

A scenario with one-driveway access to Mellanby Avenue was assessed. The intersections within the study area are forecast to continue to operate with acceptable levels of service and well within capacity.

6.2 Recommendations

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

- The existing Main Street Lock 8 driveway be closed to regular traffic, and the driveway function as an emergency connection to the park.
- The existing crosswalk over the Lock 8 Park Driveway to Mellanby Avenue should be redesigned with a crossing treatment consistent with the OTM Book 18 – Cycling Facilities.

Appendix A

Pre-Study Consultation

Creighton Chartier

From: Nicholas Olschansky <Nicholas.Olschansky@portcolborne.ca>
Sent: March 7, 2023 9:48 PM
To: Creighton Chartier
Cc: Scott Catton; David Schulz
Subject: RE: 220766 (48 Main Street, Port Colborne Traffic Impact Study) - Scope of Work

Hi Creighton,

My apologies for delayed response.

The existing entrance on Main Street provides access for the SLSCM to the property which they also own. You might want to reach out to the SLSMC, if you haven't already, to ensure all stakeholders are involved. Other than that, I do not have any other comments to offer.

Kind regards,
Nick

PORT COLBORNE

Nicholas Olschansky
Engineering Technologist
City of Port Colborne

www.portcolborne.ca

Port Colborne, ON
Phone 905-835-2900 x226
Email Nicholas.Olschansky@portcolborne.ca

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From: Creighton Chartier <cchartier@ptsl.com>
Sent: March 7, 2023 9:46 AM
To: David Schulz <David.Schulz@portcolborne.ca>

Cc: Scott Catton <scatton@ptsl.com>; Nicholas Olschansky <Nicholas.Olschansky@portcolborne.ca>
Subject: RE: 220766 (48 Main Street, Port Colborne Traffic Impact Study) - Scope of Work

> Some people who received this message don't often get email from cchartier@ptsl.com. Learn why this is important

Thank you David.

Hi Nick just following to see if you had any comment for the scope of work?

Regards,

Creighton Chartier
Transportation Consultant, Associate
(he/him)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 905.381.2229 x504
m: 905.252.2420
w: www.ptsl.com

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From: David Schulz <David.Schulz@portcolborne.ca>
Sent: Wednesday, March 1, 2023 1:03 PM
To: Creighton Chartier <cchartier@ptsl.com>; Dunsmore, Susan <Susan.Dunsmore@niagararegion.ca>
Cc: Scott Catton <scatton@ptsl.com>; Nicholas Olschansky <Nicholas.Olschansky@portcolborne.ca>
Subject: RE: 220766 (48 Main Street, Port Colborne Traffic Impact Study) - Scope of Work

Hi Creighton,

I have copied my colleague Nick Olschansky on this email. Although, I believe the Region would take precedence on this one as it is a Regional Road. We don't have any significant developments in the vicinity that would warrant being included in the study from what I can tell.

Regards,

David

PORT COLBORNE

www.portcolborne.ca

David Schulz BURPI, MCIP, RPP
Senior Planner
City of Port Colborne

66 Charlotte Street
Port Colborne, ON L3K 3C8
Phone 905-835-2900 x202
Email David.Schulz@portcolborne.ca

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From: Creighton Chartier <cchartier@ptsl.com>
Sent: February 23, 2023 9:34 AM
To: Dunsmore, Susan <Susan.Dunsmore@niagararegion.ca>; David Schulz <David.Schulz@portcolborne.ca>
Cc: Scott Catton <scatton@ptsl.com>
Subject: 220766 (48 Main Street, Port Colborne Traffic Impact Study) - Scope of Work

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Hello All,

Paradigm has been retained to prepare a traffic study for the proposed development of the south-east quadrant of Main Street West and Mellanby Avenue in the City of Port Colborne. The conceptual site plan is attached. The property owner is proposing to redevelop the lands to include an 8-storey mixed use building containing approximately 122 residential units and approximately 346 m2 of ground floor retail space.

The site plan illustrates vehicle access by a shared driveway connection to the Lock 8 Gateway Park. The driveway is located approximately 100 metres south of Main Street West. The site plan contemplates closing the existing Lock 8 driveway to Main Street West to regular traffic. The driveway would remain as an emergency connection.

Build-out is anticipated to occur by Year 2027.

Proposed Terms of Reference – [Transportation Impact Study]

Study Guidelines:

- Generally follow the Niagara Region Guidelines for Transportation Impact Studies

Study Area Intersections:

- Main Street West at Mellanby Avenue (signalized); and
- Main Street West at Lock 8 Park Driveway (unsignalized).

Analysis Periods:

- Weekday AM peak hour
- Weekday PM peak hour

Existing Data:

- Collect new TMC data for the above noted intersections.

Horizon Year[s]:

- Five-years from the date the study

Analysis:
- Synchro 11 with HCM analysis

Traffic Forecast:
- Background traffic annual growth rate of 2% per annum.
- Other approved developments to include in background. **Please identify**

Trip Generation:
- ITE Trip Generation Data 11th Edition
  - Multifamily Housing (Mid-Rise) (LUC 221)
  - Shopping Plaza (<44k) (LUC 822)
- Preliminary trip generation
  - AM Peak Hour – 44 Total Trips (13in/31out)
  - PM Peak Hour – 61 Total Trips (35in/26out)
- No modal split reductions.
- 40% PM pass-by rate for LUC 822.

Trip Distribution:
- Existing Traffic Patterns

Future Road Improvements:
- **None, unless identified**

Remedial Measure:
- OTM Traffic Control signal warrants
- Left-Turn lane warrants

Report:
Report documenting the study methodologies, findings and conclusions.

Regards,

Creighton Chartier
Transportation Consultant
(he/him)

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Creighton Chartier

From: Dunsmore, Susan <Susan.Dunsmore@niagararegion.ca>
Sent: March 2, 2023 10:45 AM
To: Creighton Chartier
Cc: Scott Catton; David Schulz; Pirkas, Chris
Subject: RE: 220766 (48 Main Street, Port Colborne Traffic Impact Study) - Scope of Work

Hello

Thank you for submitting your terms of reference. Transportation planning has reviewed the submission and has provided their comments in green. We would look to the City to provide surrounding developments that are within the study area. For Regional transportation please submit requests through the Region's website using the following link: https://www.niagararegion.ca/living/roads/permits/traffic-data-requests.aspx. As noted if there are any changes/lane requirements based on the TIS recommendations, a functional design is to be included in the TIS.

If you have any questions or concerns please contact me at your convenience.

Thank you

Susan M. Dunsmore, P. Eng.
Manager, Development Engineering
Planning and Development Services

Phone: (905) 980-6000 or 1-800-263-7215 ext 3661
Address: 1815 Sir Isaac Brock Way, Thorold ON, L2V4T7

Niagara Region

From: Creighton Chartier <cchartier@ptsl.com>
Sent: Thursday, February 23, 2023 9:34 AM
To: Dunsmore, Susan <Susan.Dunsmore@niagararegion.ca>; David Schulz <David.Schulz@portcolborne.ca>
Cc: Scott Catton <scatton@ptsl.com>
Subject: 220766 (48 Main Street, Port Colborne Traffic Impact Study) - Scope of Work

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Hello All,

Paradigm has been retained to prepare a traffic study for the proposed development of the south-east quadrant of Main Street West and Mellanby Avenue in the City of Port Colborne. The conceptual site plan is

attached. The property owner is proposing to redevelop the lands to include an 8-storey mixed use building containing approximately 122 residential units and approximately 346 m2 of ground floor retail space.

The site plan illustrates vehicle access by a shared driveway connection to the Lock 8 Gateway Park. The driveway is located approximately 100 metres south of Main Street West. The site plan contemplates closing the existing Lock 8 driveway to Main Street West to regular traffic. The driveway would remain as an emergency connection.

Build-out is anticipated to occur by Year 2027.

Proposed Terms of Reference – [Transportation Impact Study]

Study Guidelines:

- Generally follow the Niagara Region Guidelines for Transportation Impact Studies

Study Area Intersections:

- Main Street West at Mellanby Avenue (signalized); and (Region has 2021 TMCs. If the Consultant will utilize historic counts, counts to be factored into a baseline condition (Year 2023) using a growth rate of 2% per annum)
- Main Street West at Lock 8 Park Driveway (unsignalized).
- Mellanby Ave at Lock 8 Park Driveway (unsignalized).

Analysis Periods:

- Weekday AM peak hour
- Weekday PM peak hour
- Weekend peak hour since the site is neighbouring Lock 8 Gateway Park

Existing Data:

- Collect new TMC data for the above noted intersections. Please make sure the TMCs for the two driveways to the Lock 8 Park are carried out in the summer.

Horizon Year[s]:

- Existing Conditions
- Five-years from the ~~date the study~~ anticipated build-out.

Analysis:

- Synchro 11 with HCM analysis

Traffic Forecast:

- Background traffic annual growth rate of 2% per annum. Accepted
- Other approved developments to include in background. **Please identify**

Trip Generation:

- ITE Trip Generation Data 11th Edition
  - Multifamily Housing (Mid-Rise) (LUC 221)
  - Shopping Plaza (<44k) (LUC 822)
- Preliminary trip generation
  - AM Peak Hour – 44 Total Trips (13in/31out)
  - PM Peak Hour – 61 Total Trips (35in/26out)
- No modal split reductions.
- 40% PM pass-by rate for LUC 822. Please justify the proposed 40% pass-by rate in the TIS report.

Trip Distribution:

- Existing Traffic Patterns

Future Road Improvements:

- **None, unless identified**

Remedial Measure:

- OTM Traffic Control signal warrants
- Left-Turn lane warrants ; If the left lane is warranted, a functional drawing is required for the Region's review.

Report:

Report documenting the study methodologies, findings and conclusions.

General Comment

- For the ideal saturation flows, there are currently new saturation flow rates that will be a part of the new TIS Guidelines. The Consultant can use either use the new saturation values or 1750 across the board for all movements as per the Region's TIS Guidelines (2012).

Variable	Saturation Flow Rate (pc/h/ln)
T	1,629
L	1,504
LT	1,228
LL	2,194
R	1,351
RT	1,388
LTR	1,483

Regards,

Creighton Chartier
Transportation Consultant
(he/him)

Paradigm Transportation Solutions Limited
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Appendix B

Existing Data

Signal Code: 0033AM

Intersection: RR3(MAIN ST.) & RR3A(MELLANBY ST.)

Municipality: ptcolborne

Owner: region

Last Modified: 2019-06-14 9:03:56 AM

Timing Parameters	EBD/WBD THRU MAIN ST.	NBD ADV MELLANBY	NBD/SBD THRU MELLANBY	n/a	n/a	n/a
Min Green	10	6	8	0	0	0
Walk	7	0	7	0	0	0
Ped Clearance	11	0	10	0	0	0
Vehicle Ext.	2.5	2.5	2.5	0	0	0
Max Green	40	25	40	0	0	0
Yellow	4.1	3	4.1	0	0	0
All Red	2	0	2	0	0	0

		Offset
Minimum Cycle	30.2	0
Pedestrian Cycle	47.2	
Maximum Cycle	120.2	0
Operation	FA	

Installed On:	2009-06-25
Count Date:	2008-12-02

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

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Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway - Saturday
Site Code: 220766
Start Date: 08/12/2023

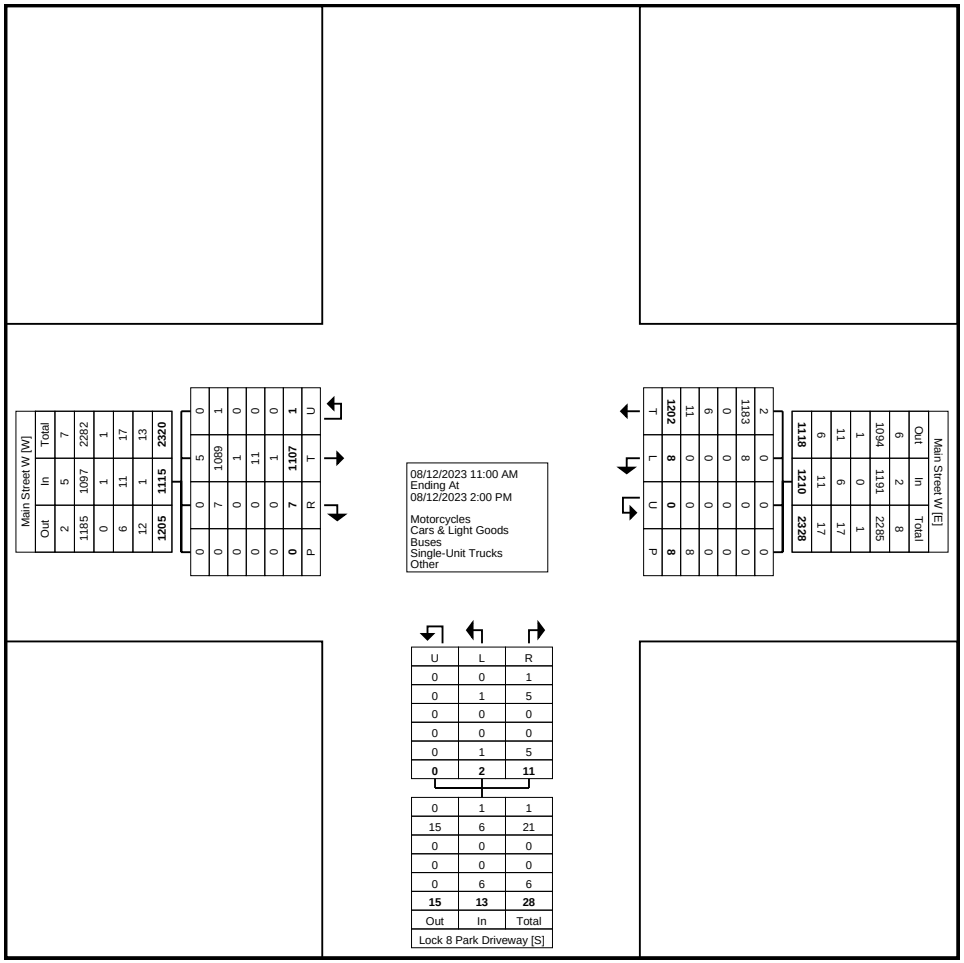
Turning Movement Data

Start Time	Main Street W Eastbound					Main Street W Westbound					Lock 8 Park Driveway Northbound				
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	App. Total	Int. Total
11:00 AM	89	0	0	0	89	0	140	0	0	140	1	0	0	1	230
11:15 AM	100	1	0	0	101	1	131	0	0	132	0	0	0	0	233
11:30 AM	103	0	0	0	103	1	104	0	0	105	0	0	0	0	208
11:45 AM	97	0	0	0	97	2	100	0	0	102	1	0	0	1	200
Hourly Total	389	1	0	0	390	4	475	0	0	479	2	0	0	2	871
12:00 PM	108	0	0	0	108	0	99	0	0	99	0	1	0	1	208
12:15 PM	100	0	0	0	100	1	108	0	0	109	0	1	0	1	210
12:30 PM	123	1	0	0	124	0	92	0	2	92	0	1	0	1	217
12:45 PM	56	4	0	0	60	0	65	0	0	65	0	0	0	0	125
Hourly Total	387	5	0	0	392	1	364	0	2	365	0	3	0	3	760
1:00 PM	5	1	1	0	7	0	1	0	0	1	0	0	0	0	8
1:15 PM	110	0	0	0	110	1	117	0	2	118	0	5	0	5	233
1:30 PM	112	0	0	0	112	1	124	0	0	125	0	1	0	1	238
1:45 PM	104	0	0	0	104	1	121	0	4	122	0	2	0	2	228
Hourly Total	331	1	1	0	333	3	363	0	6	366	0	8	0	8	707
Grand Total	1107	7	1	0	1115	8	1202	0	8	1210	2	11	0	13	2338
Approach %	99.3	0.6	0.1	-	-	0.7	99.3	0.0	-	-	15.4	84.6	0.0	-	-
Total %	47.3	0.3	0.0	-	47.7	0.3	51.4	0.0	-	51.8	0.1	0.5	0.0	0.6	-
Motorcycles	5	0	0	-	5	0	2	0	-	2	0	1	0	1	8
% Motorcycles	0.5	0.0	0.0	-	0.4	0.0	0.2	-	-	0.2	0.0	9.1	-	7.7	0.3
Cars & Light Goods	1089	7	1	-	1097	8	1183	0	-	1191	1	5	0	6	2294
% Cars & Light Goods	98.4	100.0	100.0	-	98.4	100.0	98.4	-	-	98.4	50.0	45.5	-	46.2	98.1
Buses	1	0	0	-	1	0	0	0	-	0	0	0	0	0	1
% Buses	0.1	0.0	0.0	-	0.1	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	11	0	0	-	11	0	6	0	-	6	0	0	0	0	17
% Single-Unit Trucks	1.0	0.0	0.0	-	1.0	0.0	0.5	-	-	0.5	0.0	0.0	-	0.0	0.7
Articulated Trucks	1	0	0	-	1	0	5	0	-	5	0	0	0	0	6
% Articulated Trucks	0.1	0.0	0.0	-	0.1	0.0	0.4	-	-	0.4	0.0	0.0	-	0.0	0.3
Bicycles on Road	0	0	0	-	0	0	6	0	-	6	1	5	0	6	12
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.5	-	-	0.5	50.0	45.5	-	46.2	0.5
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	25.0	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	6	-	-	-	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	75.0	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway - Saturday
Site Code: 220766
Start Date: 08/12/2023
Page No: 2



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway - Saturday
Site Code: 220766
Start Date: 08/12/2023

Turning Movement Peak Hour Data (11:00 AM)

Start Time	Main Street W Eastbound					Main Street W Westbound					Lock 8 Park Driveway Northbound				
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	App. Total	Int. Total
11:00 AM	89	0	0	0	89	0	140	0	0	140	1	0	0	1	230
11:15 AM	100	1	0	0	101	1	131	0	0	132	0	0	0	0	233
11:30 AM	103	0	0	0	103	1	104	0	0	105	0	0	0	0	208
11:45 AM	97	0	0	0	97	2	100	0	0	102	1	0	0	1	200
Total	389	1	0	0	390	4	475	0	0	479	2	0	0	2	871
Approach %	99.7	0.3	0.0	-	-	0.8	99.2	0.0	-	-	100.0	0.0	0.0	-	-
Total %	44.7	0.1	0.0	-	44.8	0.5	54.5	0.0	-	55.0	0.2	0.0	0.0	0.2	-
PHF	0.944	0.250	0.000	-	0.947	0.500	0.848	0.000	-	0.855	0.500	0.000	0.000	0.500	0.935
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	381	1	0	-	382	4	467	0	-	471	1	0	0	1	854
% Cars & Light Goods	97.9	100.0	-	-	97.9	100.0	98.3	-	-	98.3	50.0	-	-	50.0	98.0
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	7	0	0	-	7	0	3	0	-	3	0	0	0	0	10
% Single-Unit Trucks	1.8	0.0	-	-	1.8	0.0	0.6	-	-	0.6	0.0	-	-	0.0	1.1
Articulated Trucks	1	0	0	-	1	0	2	0	-	2	0	0	0	0	3
% Articulated Trucks	0.3	0.0	-	-	0.3	0.0	0.4	-	-	0.4	0.0	-	-	0.0	0.3
Bicycles on Road	0	0	0	-	0	0	3	0	-	3	1	0	0	1	4
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.6	-	-	0.6	50.0	-	-	50.0	0.5
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
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519-896-3163 cbowness@ptsl.com

Count Name: Main Street W & Lock 8 Park Driveway - Saturday
Site Code: 220766
Start Date: 08/12/2023

Peak Hour Data

08/12/2023 11:00 AM
Ending At
08/12/2023 12:00 PM

Motorcycles
Cars & Light Goods
Buses
Single-Unit Trucks
Other

Main Street W [W]

	Out	In	Total
Motorcycles	0	0	0
Cars & Light Goods	468	382	850
Buses	0	0	0
Single-Unit Trucks	3	7	10
Other	6	1	7
Total	**477**	**390**	**867**

	U	T	R	P
Motorcycles	0	0	0	0
Cars & Light Goods	0	381	1	0
Buses	0	0	0	0
Single-Unit Trucks	0	7	0	0
Other	0	1	0	0
Total	**0**	**389**	**1**	**0**

Main Street W [E]

	Out	In	Total
Motorcycles	0	0	0
Cars & Light Goods	381	471	852
Buses	0	0	0
Single-Unit Trucks	7	3	10
Other	1	5	6
Total	**389**	**479**	**868**

	T	L	U	P
Motorcycles	0	0	0	0
Cars & Light Goods	467	4	0	0
Buses	0	0	0	0
Single-Unit Trucks	3	0	0	0
Other	5	0	0	0
Total	**475**	**4**	**0**	**0**

Lock 8 Park Driveway [S]

	U	L	R
Motorcycles	0	0	0
Cars & Light Goods	0	1	0
Buses	0	0	0
Single-Unit Trucks	0	0	0
Other	0	1	0
Total	**0**	**2**	**0**

	Out	In	Total
Motorcycles	0	0	0
Cars & Light Goods	5	1	6
Buses	0	0	0
Single-Unit Trucks	0	0	0
Other	0	1	1
Total	**5**	**2**	**7**

Turning Movement Peak Hour Data Plot (11:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

Turning Movement Data

Start Time	Main Street W Eastbound					Main Street W Westbound					Lock 8 Park Driveway Northbound				
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	App. Total	Int. Total
6:00 AM	38	0	0	1	38	1	30	0	0	31	0	1	0	1	70
6:15 AM	68	0	0	0	68	0	35	0	0	35	0	0	0	0	103
6:30 AM	66	0	0	0	66	0	50	0	0	50	0	0	0	0	116
6:45 AM	54	0	0	0	54	0	82	0	0	82	0	1	0	1	137
Hourly Total	226	0	0	1	226	1	197	0	0	198	0	2	0	2	426
7:00 AM	59	0	0	0	59	0	46	0	0	46	0	0	0	0	105
7:15 AM	86	0	0	0	86	0	60	0	0	60	0	0	0	0	146
7:30 AM	45	1	0	0	46	0	18	0	0	18	0	0	0	0	64
7:45 AM	80	0	0	0	80	1	100	0	0	101	0	1	0	1	182
Hourly Total	270	1	0	0	271	1	224	0	0	225	0	1	0	1	497
8:00 AM	80	0	0	0	80	0	69	0	1	69	0	0	0	0	149
8:15 AM	90	0	0	0	90	0	84	0	0	84	0	0	0	0	174
8:30 AM	71	0	0	0	71	0	67	0	0	67	0	0	0	0	138
8:45 AM	85	0	0	0	85	0	104	0	0	104	1	1	0	2	191
Hourly Total	326	0	0	0	326	0	324	0	1	324	1	1	0	2	652
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	96	0	0	0	96	0	94	0	0	94	0	2	0	2	192
11:15 AM	77	1	0	0	78	1	92	0	0	93	0	0	0	0	171
11:30 AM	98	0	0	1	98	2	128	0	0	130	0	0	0	0	228
11:45 AM	106	0	0	1	106	0	109	0	0	109	0	4	0	4	219
Hourly Total	377	1	0	2	378	3	423	0	0	426	0	6	0	6	810
12:00 PM	91	1	0	0	92	0	132	0	0	132	1	1	0	2	226
12:15 PM	105	1	0	0	106	1	107	0	0	108	0	2	0	2	216
12:30 PM	95	1	0	0	96	0	108	0	0	108	0	2	0	2	206
12:45 PM	15	0	0	0	15	0	6	0	0	6	0	0	0	0	21
Hourly Total	306	3	0	0	309	1	353	0	0	354	1	5	0	6	669
1:00 PM	46	0	0	0	46	2	53	0	0	55	0	0	0	0	101
1:15 PM	108	1	0	0	109	0	142	0	0	142	0	3	0	3	254
1:30 PM	121	1	0	0	122	1	150	0	0	151	1	2	0	3	276
1:45 PM	106	0	0	0	106	1	121	0	3	122	0	1	0	1	229
Hourly Total	381	2	0	0	383	4	466	0	3	470	1	6	0	7	860
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	115	0	0	0	115	2	117	0	0	119	0	0	0	0	234
3:15 PM	79	1	0	0	80	0	141	0	0	141	0	1	0	1	222
3:30 PM	127	1	0	0	128	0	123	0	0	123	0	2	0	2	253
3:45 PM	136	1	0	0	137	1	163	0	0	164	0	3	0	3	304

Hourly Total	457	3	0	0	460	3	544	0	0	547	0	6	0	6	1013
4:00 PM	68	2	1	0	71	0	82	0	0	82	1	0	0	1	154
4:15 PM	44	0	0	0	44	1	47	0	0	48	0	1	0	1	93
4:30 PM	103	0	0	0	103	0	151	0	0	151	0	0	0	0	254
4:45 PM	103	0	0	0	103	0	162	0	0	162	0	1	0	1	266
Hourly Total	318	2	1	0	321	1	442	0	0	443	1	2	0	3	767
5:00 PM	112	1	0	0	113	0	150	0	0	150	1	1	0	2	265
5:15 PM	96	0	0	0	96	4	165	0	0	169	2	0	0	2	267
5:30 PM	94	0	0	0	94	0	137	0	0	137	0	0	0	0	231
5:45 PM	68	0	0	0	68	0	116	0	0	116	0	0	0	0	184
Hourly Total	370	1	0	0	371	4	568	0	0	572	3	1	0	4	947
Grand Total	3031	13	1	3	3045	18	3541	0	4	3559	7	30	0	37	6641
Approach %	99.5	0.4	0.0	-	-	0.5	99.5	0.0	-	-	18.9	81.1	0.0	-	-
Total %	45.6	0.2	0.0	-	45.9	0.3	53.3	0.0	-	53.6	0.1	0.5	0.0	0.6	-
Motorcycles	10	0	0	-	10	0	8	0	-	8	0	0	0	0	18
% Motorcycles	0.3	0.0	0.0	-	0.3	0.0	0.2	-	-	0.2	0.0	0.0	-	0.0	0.3
Cars & Light Goods	2916	13	1	-	2930	11	3384	0	-	3395	7	22	0	29	6354
% Cars & Light Goods	96.2	100.0	100.0	-	96.2	61.1	95.6	-	-	95.4	100.0	73.3	-	78.4	95.7
Buses	2	0	0	-	2	0	3	0	-	3	0	0	0	0	5
% Buses	0.1	0.0	0.0	-	0.1	0.0	0.1	-	-	0.1	0.0	0.0	-	0.0	0.1
Single-Unit Trucks	59	0	0	-	59	0	103	0	-	103	0	1	0	1	163
% Single-Unit Trucks	1.9	0.0	0.0	-	1.9	0.0	2.9	-	-	2.9	0.0	3.3	-	2.7	2.5
Articulated Trucks	44	0	0	-	44	0	37	0	-	37	0	0	0	0	81
% Articulated Trucks	1.5	0.0	0.0	-	1.4	0.0	1.0	-	-	1.0	0.0	0.0	-	0.0	1.2
Bicycles on Road	0	0	0	-	0	7	6	0	-	13	0	7	0	7	20
% Bicycles on Road	0.0	0.0	0.0	-	0.0	38.9	0.2	-	-	0.4	0.0	23.3	-	18.9	0.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-
Pedestrians	-	-	-	3	-	-	-	-	4	-	-	-	-	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

08/10/2023 6:00 AM
Ending At
08/10/2023 6:00 PM

Main Street W [W]

	Out	In	Total
Motorcycles	8	10	18
Cars & Light Goods	3392	2930	6322
Buses	3	2	5
Single-Unit Trucks	103	59	162
Other	43	44	87
Total	**3549**	**3045**	**6594**

	U	T	R	P
Motorcycles	0	10	0	0
Cars & Light Goods	1	2916	13	0
Buses	0	2	0	0
Single-Unit Trucks	0	59	0	0
Other	0	44	0	3
Total	**1**	**3031**	**13**	**3**

Main Street W [E]

	Out	In	Total
Motorcycles	10	8	18
Cars & Light Goods	2938	3395	6333
Buses	2	3	5
Single-Unit Trucks	60	103	163
Other	51	50	101
Total	**3061**	**3559**	**6620**

	T	L	U	P
Motorcycles	8	0	0	0
Cars & Light Goods	3384	11	0	0
Buses	3	0	0	0
Single-Unit Trucks	103	0	0	0
Other	43	7	0	4
Total	**3541**	**18**	**0**	**4**

Lock 8 Park Driveway [S]

	U	L	R
Motorcycles	0	0	0
Cars & Light Goods	0	7	22
Buses	0	0	0
Single-Unit Trucks	0	0	1
Other	0	0	7
Total	**0**	**7**	**30**

	Out	In	Total
Motorcycles	0	0	0
Cars & Light Goods	24	29	53
Buses	0	0	0
Single-Unit Trucks	0	1	1
Other	7	7	14
Total	**31**	**37**	**68**

Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

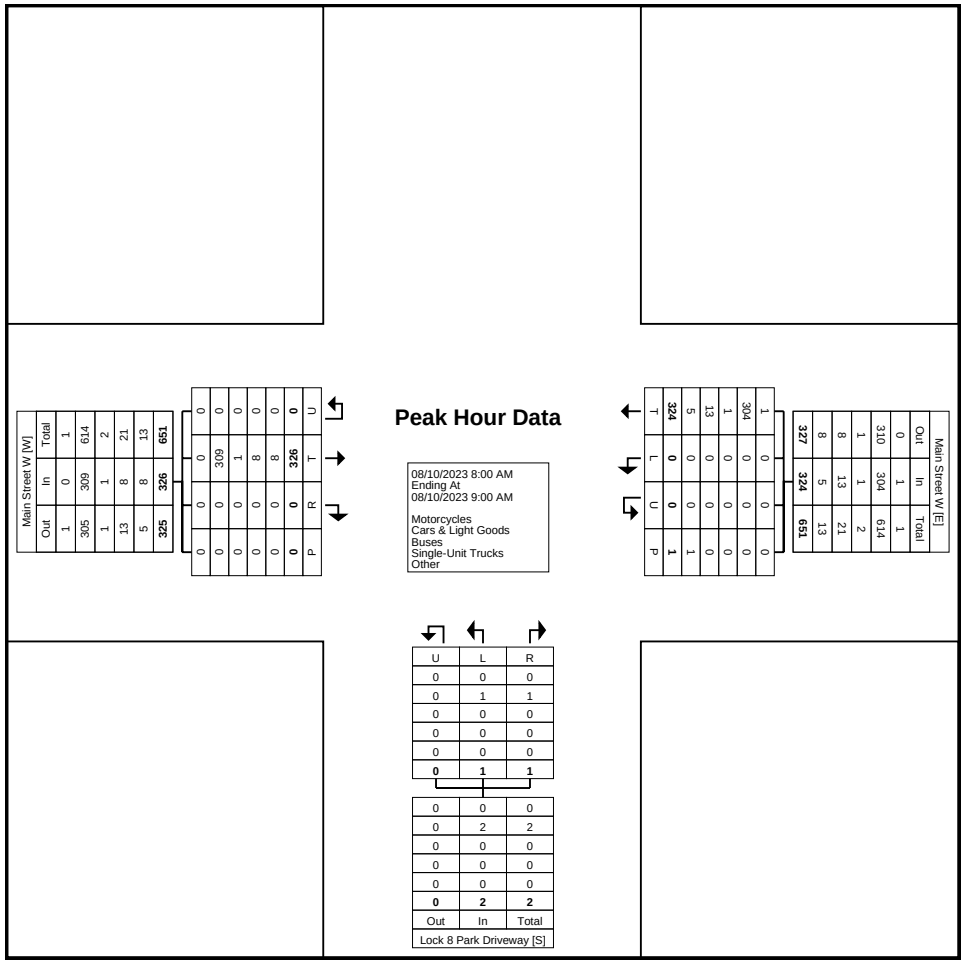
Turning Movement Peak Hour Data (8:00 AM)

Start Time	Main Street W Eastbound					Main Street W Westbound					Lock 8 Park Driveway Northbound				
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	App. Total	Int. Total
8:00 AM	80	0	0	0	80	0	69	0	1	69	0	0	0	0	149
8:15 AM	90	0	0	0	90	0	84	0	0	84	0	0	0	0	174
8:30 AM	71	0	0	0	71	0	67	0	0	67	0	0	0	0	138
8:45 AM	85	0	0	0	85	0	104	0	0	104	1	1	0	2	191
Total	326	0	0	0	326	0	324	0	1	324	1	1	0	2	652
Approach %	100.0	0.0	0.0	-	-	0.0	100.0	0.0	-	-	50.0	50.0	0.0	-	-
Total %	50.0	0.0	0.0	-	50.0	0.0	49.7	0.0	-	49.7	0.2	0.2	0.0	0.3	-
PHF	0.906	0.000	0.000	-	0.906	0.000	0.779	0.000	-	0.779	0.250	0.250	0.000	0.250	0.853
Motorcycles	0	0	0	-	0	0	1	0	-	1	0	0	0	0	1
% Motorcycles	0.0	-	-	-	0.0	-	0.3	-	-	0.3	0.0	0.0	-	0.0	0.2
Cars & Light Goods	309	0	0	-	309	0	304	0	-	304	1	1	0	2	615
% Cars & Light Goods	94.8	-	-	-	94.8	-	93.8	-	-	93.8	100.0	100.0	-	100.0	94.3
Buses	1	0	0	-	1	0	1	0	-	1	0	0	0	0	2
% Buses	0.3	-	-	-	0.3	-	0.3	-	-	0.3	0.0	0.0	-	0.0	0.3
Single-Unit Trucks	8	0	0	-	8	0	13	0	-	13	0	0	0	0	21
% Single-Unit Trucks	2.5	-	-	-	2.5	-	4.0	-	-	4.0	0.0	0.0	-	0.0	3.2
Articulated Trucks	8	0	0	-	8	0	5	0	-	5	0	0	0	0	13
% Articulated Trucks	2.5	-	-	-	2.5	-	1.5	-	-	1.5	0.0	0.0	-	0.0	2.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0
% Bicycles on Road	0.0	-	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

Turning Movement Peak Hour Data (11:30 AM)

Start Time	Main Street W Eastbound					Main Street W Westbound					Lock 8 Park Driveway Northbound				
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	App. Total	Int. Total
11:30 AM	98	0	0	1	98	2	128	0	0	130	0	0	0	0	228
11:45 AM	106	0	0	1	106	0	109	0	0	109	0	4	0	4	219
12:00 PM	91	1	0	0	92	0	132	0	0	132	1	1	0	2	226
12:15 PM	105	1	0	0	106	1	107	0	0	108	0	2	0	2	216
Total	400	2	0	2	402	3	476	0	0	479	1	7	0	8	889
Approach %	99.5	0.5	0.0	-	-	0.6	99.4	0.0	-	-	12.5	87.5	0.0	-	-
Total %	45.0	0.2	0.0	-	45.2	0.3	53.5	0.0	-	53.9	0.1	0.8	0.0	0.9	-
PHF	0.943	0.500	0.000	-	0.948	0.375	0.902	0.000	-	0.907	0.250	0.438	0.000	0.500	0.975
Motorcycles	2	0	0	-	2	0	0	0	-	0	0	0	0	0	2
% Motorcycles	0.5	0.0	-	-	0.5	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	0.2
Cars & Light Goods	379	2	0	-	381	1	449	0	-	450	1	3	0	4	835
% Cars & Light Goods	94.8	100.0	-	-	94.8	33.3	94.3	-	-	93.9	100.0	42.9	-	50.0	93.9
Buses	0	0	0	-	0	0	1	0	-	1	0	0	0	0	1
% Buses	0.0	0.0	-	-	0.0	0.0	0.2	-	-	0.2	0.0	0.0	-	0.0	0.1
Single-Unit Trucks	9	0	0	-	9	0	20	0	-	20	0	0	0	0	29
% Single-Unit Trucks	2.3	0.0	-	-	2.2	0.0	4.2	-	-	4.2	0.0	0.0	-	0.0	3.3
Articulated Trucks	10	0	0	-	10	0	6	0	-	6	0	0	0	0	16
% Articulated Trucks	2.5	0.0	-	-	2.5	0.0	1.3	-	-	1.3	0.0	0.0	-	0.0	1.8
Bicycles on Road	0	0	0	-	0	2	0	0	-	2	0	4	0	4	6
% Bicycles on Road	0.0	0.0	-	-	0.0	66.7	0.0	-	-	0.4	0.0	57.1	-	50.0	0.7
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

Peak Hour Data

08/10/2023 11:30 AM
Ending At
08/10/2023 12:30 PM

Motorcycles
Cars & Light Goods
Buses
Single-Unit Trucks
Other

Main Street W [W]

	Out	In	Total
Motorcycles	0	2	2
Cars & Light Goods	450	381	831
Buses	1	0	1
Single-Unit Trucks	20	9	29
Other	6	10	16
Total	**477**	**402**	**879**

	U	T	R	P
Motorcycles	0	2	0	0
Cars & Light Goods	0	379	2	0
Buses	0	0	0	0
Single-Unit Trucks	0	9	0	0
Other	0	10	0	2
Total	**0**	**400**	**2**	**2**

Main Street W [E]

	Out	In	Total
Motorcycles	2	0	2
Cars & Light Goods	382	450	832
Buses	0	1	1
Single-Unit Trucks	9	20	29
Other	14	8	22
Total	**407**	**479**	**886**

	T	L	U	P
Motorcycles	0	0	0	0
Cars & Light Goods	449	1	0	0
Buses	1	0	0	0
Single-Unit Trucks	20	0	0	0
Other	6	2	0	0
Total	**476**	**3**	**0**	**0**

Lock 8 Park Driveway [S]

U	L	R
0	0	0
0	1	3
0	0	0
0	0	0
0	0	4
0	**1**	**7**

Out	In	Total
0	0	0
3	4	7
0	0	0
0	0	0
2	4	6
5	**8**	**13**

Turning Movement Peak Hour Data Plot (11:30 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Main Street W Eastbound					Main Street W Westbound					Lock 8 Park Driveway Northbound				
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	App. Total	Int. Total
4:30 PM	103	0	0	0	103	0	151	0	0	151	0	0	0	0	254
4:45 PM	103	0	0	0	103	0	162	0	0	162	0	1	0	1	266
5:00 PM	112	1	0	0	113	0	150	0	0	150	1	1	0	2	265
5:15 PM	96	0	0	0	96	4	165	0	0	169	2	0	0	2	267
Total	414	1	0	0	415	4	628	0	0	632	3	2	0	5	1052
Approach %	99.8	0.2	0.0	-	-	0.6	99.4	0.0	-	-	60.0	40.0	0.0	-	-
Total %	39.4	0.1	0.0	-	39.4	0.4	59.7	0.0	-	60.1	0.3	0.2	0.0	0.5	-
PHF	0.924	0.250	0.000	-	0.918	0.250	0.952	0.000	-	0.935	0.375	0.500	0.000	0.625	0.985
Motorcycles	0	0	0	-	0	0	2	0	-	2	0	0	0	0	2
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.3	-	-	0.3	0.0	0.0	-	0.0	0.2
Cars & Light Goods	409	1	0	-	410	3	615	0	-	618	3	2	0	5	1033
% Cars & Light Goods	98.8	100.0	-	-	98.8	75.0	97.9	-	-	97.8	100.0	100.0	-	100.0	98.2
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	3	0	0	-	3	0	7	0	-	7	0	0	0	0	10
% Single-Unit Trucks	0.7	0.0	-	-	0.7	0.0	1.1	-	-	1.1	0.0	0.0	-	0.0	1.0
Articulated Trucks	2	0	0	-	2	0	3	0	-	3	0	0	0	0	5
% Articulated Trucks	0.5	0.0	-	-	0.5	0.0	0.5	-	-	0.5	0.0	0.0	-	0.0	0.5
Bicycles on Road	0	0	0	-	0	1	1	0	-	2	0	0	0	0	2
% Bicycles on Road	0.0	0.0	-	-	0.0	25.0	0.2	-	-	0.3	0.0	0.0	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

paradigm

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

Peak Hour Data

08/10/2023 4:30 PM
Ending At
08/10/2023 5:30 PM

Motorcycles
Cars & Light Goods
Buses
Single-Unit Trucks
Other

Main Street W [W]

	Out	In	Total
Motorcycles	2	0	2
Cars & Light Goods	618	410	1028
Buses	0	0	0
Single-Unit Trucks	7	3	10
Other	4	2	6
Total	**631**	**415**	**1046**

	U	T	R	P
Motorcycles	0	0	0	0
Cars & Light Goods	0	409	1	0
Buses	0	0	0	0
Single-Unit Trucks	0	3	0	0
Other	0	2	0	0
Total	**0**	**414**	**1**	**0**

Main Street W [E]

	T	L	U	P
Motorcycles	2	0	0	0
Cars & Light Goods	615	3	0	0
Buses	0	0	0	0
Single-Unit Trucks	7	0	0	0
Other	4	1	0	0
Total	**628**	**4**	**0**	**0**

	Out	In	Total
Motorcycles	0	2	2
Cars & Light Goods	411	618	1029
Buses	0	0	0
Single-Unit Trucks	3	7	10
Other	2	5	7
Total	**416**	**632**	**1048**

Lock 8 Park Driveway [S]

	U	L	R
Motorcycles	0	0	0
Cars & Light Goods	0	3	2
Buses	0	0	0
Single-Unit Trucks	0	0	0
Other	0	0	0
Total	**0**	**3**	**2**

	Out	In	Total
Motorcycles	0	0	0
Cars & Light Goods	4	5	9
Buses	0	0	0
Single-Unit Trucks	0	0	0
Other	1	0	1
Total	**5**	**5**	**10**

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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Mellanby Avenue - Saturday
Site Code: 220766
Start Date: 08/12/2023

Turning Movement Data

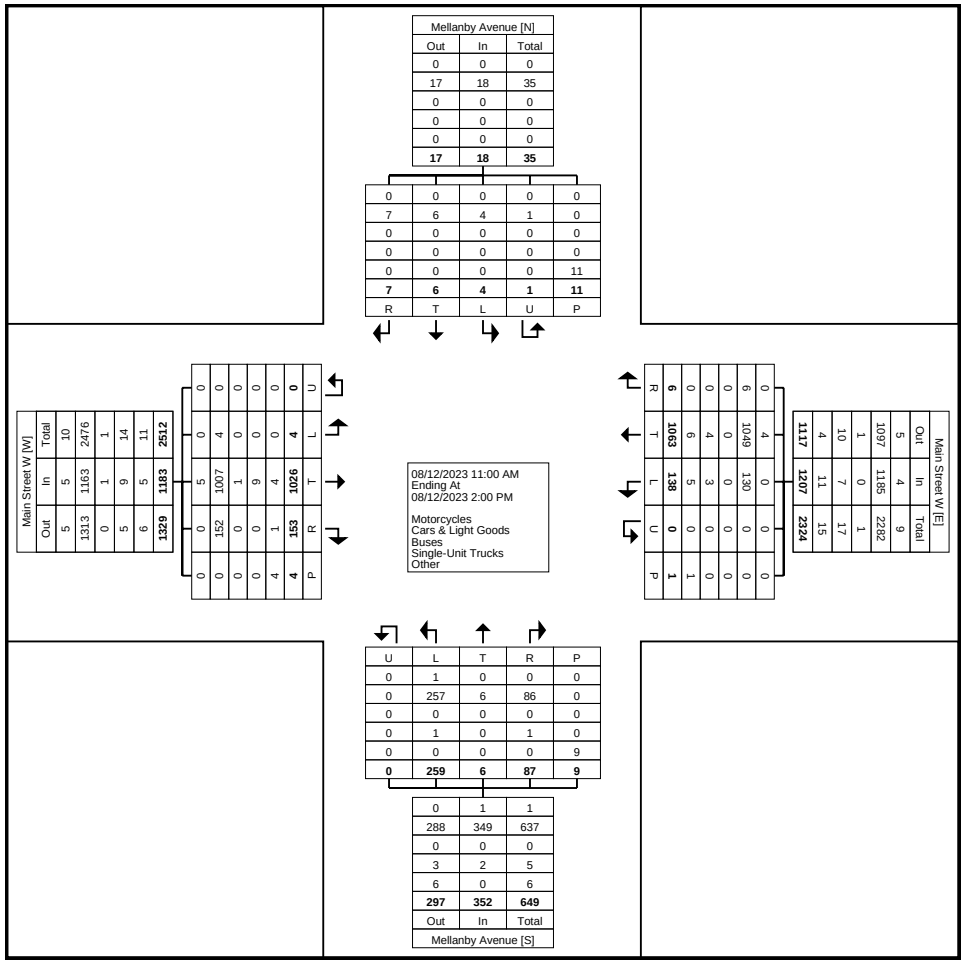
Start Time	Main Street W Eastbound						Main Street W Westbound						Mellanby Avenue Northbound						Mellanby Avenue Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
11:00 AM	0	77	4	0	0	81	22	117	1	0	0	140	14	0	11	0	0	25	0	1	0	0	2	1	247
11:15 AM	0	95	3	0	0	98	10	118	0	0	0	128	15	0	7	0	0	22	0	0	1	0	1	1	249
11:30 AM	1	100	4	0	0	105	12	94	0	0	0	106	14	0	3	0	0	17	0	0	1	0	2	1	229
11:45 AM	2	89	4	0	0	95	7	93	2	0	0	102	15	0	10	0	0	25	0	0	0	0	1	0	222
Hourly Total	3	361	15	0	0	379	51	422	3	0	0	476	58	0	31	0	0	89	0	1	2	0	6	3	947
12:00 PM	0	99	11	0	0	110	9	87	0	0	1	96	19	1	4	0	0	24	0	2	1	1	0	4	234
12:15 PM	0	94	5	0	0	99	15	94	0	0	0	109	15	0	5	0	1	20	1	1	0	0	0	2	230
12:30 PM	0	114	3	0	3	117	6	87	0	0	0	93	10	0	8	0	4	18	2	0	1	0	0	3	231
12:45 PM	0	57	29	0	0	86	17	50	0	0	0	67	32	1	3	0	0	36	0	0	0	0	0	0	189
Hourly Total	0	364	48	0	3	412	47	318	0	0	1	365	76	2	20	0	5	98	3	3	2	1	0	9	884
1:00 PM	1	15	82	0	1	98	3	4	0	0	0	7	78	3	2	0	1	83	0	1	1	0	4	2	190
1:15 PM	0	92	4	0	0	96	10	107	1	0	0	118	16	1	10	0	1	27	1	1	0	0	1	2	243
1:30 PM	0	93	0	0	0	93	14	104	0	0	0	118	8	0	19	0	2	27	0	0	1	0	0	1	239
1:45 PM	0	101	4	0	0	105	13	108	2	0	0	123	23	0	5	0	0	28	0	0	1	0	0	1	257
Hourly Total	1	301	90	0	1	392	40	323	3	0	0	366	125	4	36	0	4	165	1	2	3	0	5	6	929
Grand Total	4	1026	153	0	4	1183	138	1063	6	0	1	1207	259	6	87	0	9	352	4	6	7	1	11	18	2760
Approach %	0.3	86.7	12.9	0.0	-	-	11.4	88.1	0.5	0.0	-	-	73.6	1.7	24.7	0.0	-	-	22.2	33.3	38.9	5.6	-	-	-
Total %	0.1	37.2	5.5	0.0	-	42.9	5.0	38.5	0.2	0.0	-	43.7	9.4	0.2	3.2	0.0	-	12.8	0.1	0.2	0.3	0.0	-	0.7	-
Motorcycles	0	5	0	0	-	5	0	4	0	0	-	4	1	0	0	0	-	1	0	0	0	0	-	0	10
% Motorcycles	0.0	0.5	0.0	-	-	0.4	0.0	0.4	0.0	-	-	0.3	0.4	0.0	0.0	-	-	0.3	0.0	0.0	0.0	0.0	-	0.0	0.4
Cars & Light Goods	4	1007	152	0	-	1163	130	1049	6	0	-	1185	257	6	86	0	-	349	4	6	7	1	-	18	2715
% Cars & Light Goods	100.0	98.1	99.3	-	-	98.3	94.2	98.7	100.0	-	-	98.2	99.2	100.0	98.9	-	-	99.1	100.0	100.0	100.0	100.0	-	100.0	98.4
Buses	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Buses	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	0	9	0	0	-	9	3	4	0	0	-	7	1	0	1	0	-	2	0	0	0	0	-	0	18
% Single-Unit Trucks	0.0	0.9	0.0	-	-	0.8	2.2	0.4	0.0	-	-	0.6	0.4	0.0	1.1	-	-	0.6	0.0	0.0	0.0	0.0	-	0.0	0.7
Articulated Trucks	0	2	1	0	-	3	0	5	0	0	-	5	0	0	0	0	-	0	0	0	0	0	-	0	8
% Articulated Trucks	0.0	0.2	0.7	-	-	0.3	0.0	0.5	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.3
Bicycles on Road	0	2	0	0	-	2	5	1	0	0	-	6	0	0	0	0	-	0	0	0	0	0	-	0	8
% Bicycles on Road	0.0	0.2	0.0	-	-	0.2	3.6	0.1	0.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.3
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	100.0	-	-	-	-	-	22.2	-	-	-	-	-	9.1	-	-

Pedestrians	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	7	-	-	-	-	-	10	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	0.0	-	-	-	-	-	77.8	-	-	-	-	-	90.9	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Mellanby Avenue - Saturday
Site Code: 220766
Start Date: 08/12/2023



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Mellanby Avenue - Saturday
Site Code: 220766
Start Date: 08/12/2023

Turning Movement Peak Hour Data (11:00 AM)

Start Time	Main Street W Eastbound						Main Street W Westbound						Mellanby Avenue Northbound						Mellanby Avenue Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
11:00 AM	0	77	4	0	0	81	22	117	1	0	0	140	14	0	11	0	0	25	0	1	0	0	2	1	247
11:15 AM	0	95	3	0	0	98	10	118	0	0	0	128	15	0	7	0	0	22	0	0	1	0	1	1	249
11:30 AM	1	100	4	0	0	105	12	94	0	0	0	106	14	0	3	0	0	17	0	0	1	0	2	1	229
11:45 AM	2	89	4	0	0	95	7	93	2	0	0	102	15	0	10	0	0	25	0	0	0	0	1	0	222
Total	3	361	15	0	0	379	51	422	3	0	0	476	58	0	31	0	0	89	0	1	2	0	6	3	947
Approach %	0.8	95.3	4.0	0.0	-	-	10.7	88.7	0.6	0.0	-	-	65.2	0.0	34.8	0.0	-	-	0.0	33.3	66.7	0.0	-	-	-
Total %	0.3	38.1	1.6	0.0	-	40.0	5.4	44.6	0.3	0.0	-	50.3	6.1	0.0	3.3	0.0	-	9.4	0.0	0.1	0.2	0.0	-	0.3	-
PHF	0.375	0.903	0.938	0.000	-	0.902	0.580	0.894	0.375	0.000	-	0.850	0.967	0.000	0.705	0.000	-	0.890	0.000	0.250	0.500	0.000	-	0.750	0.951
Motorcycles	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	2
% Motorcycles	0.0	0.3	0.0	-	-	0.3	0.0	0.2	0.0	-	-	0.2	0.0	-	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.2
Cars & Light Goods	3	353	15	0	-	371	48	417	3	0	-	468	58	0	30	0	-	88	0	1	2	0	-	3	930
% Cars & Light Goods	100.0	97.8	100.0	-	-	97.9	94.1	98.8	100.0	-	-	98.3	100.0	-	96.8	-	-	98.9	-	100.0	100.0	-	-	100.0	98.2
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	5	0	0	-	5	1	1	0	0	-	2	0	0	1	0	-	1	0	0	0	0	-	0	8
% Single-Unit Trucks	0.0	1.4	0.0	-	-	1.3	2.0	0.2	0.0	-	-	0.4	0.0	-	3.2	-	-	1.1	-	0.0	0.0	-	-	0.0	0.8
Articulated Trucks	0	2	0	0	-	2	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	4
% Articulated Trucks	0.0	0.6	0.0	-	-	0.5	0.0	0.5	0.0	-	-	0.4	0.0	-	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.4
Bicycles on Road	0	0	0	0	-	0	2	1	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	3
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	3.9	0.2	0.0	-	-	0.6	0.0	-	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.3
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.7	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83.3	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Mellanby Avenue - Saturday
Site Code: 220766
Start Date: 08/12/2023

Peak Hour Data

08/12/2023 11:00 AM
Ending At
08/12/2023 12:00 PM

Motorcycles
Cars & Light Goods
Buses
Single-Unit Trucks
Other

Mellanby Avenue [N]

	Out	In	Total
Motorcycles	0	0	0
Cars & Light Goods	6	3	9
Buses	0	0	0
Single-Unit Trucks	0	0	0
Other	0	0	0
Total	**6**	**3**	**9**

	R	T	L	U	P
Motorcycles	0	0	0	0	0
Cars & Light Goods	2	1	0	0	0
Buses	0	0	0	0	0
Single-Unit Trucks	0	0	0	0	0
Other	0	0	0	0	6
Total	**2**	**1**	**0**	**0**	**6**

Main Street W [W]

	Out	In	Total
Motorcycles	1	1	2
Cars & Light Goods	477	371	848
Buses	0	0	0
Single-Unit Trucks	1	5	6
Other	3	2	5
Total	**482**	**379**	**861**

	U	L	T	R	P
Motorcycles	0	0	1	0	0
Cars & Light Goods	0	3	353	15	0
Buses	0	0	0	0	0
Single-Unit Trucks	0	0	5	0	0
Other	0	0	2	0	0
Total	**0**	**3**	**361**	**15**	**0**

Main Street W [E]

	Out	In	Total
Motorcycles	1	1	2
Cars & Light Goods	383	468	851
Buses	0	0	0
Single-Unit Trucks	6	2	8
Other	2	5	7
Total	**392**	**476**	**868**

	R	T	L	U	P
Motorcycles	0	1	0	0	0
Cars & Light Goods	3	417	48	0	0
Buses	0	0	0	0	0
Single-Unit Trucks	0	1	1	0	0
Other	0	3	2	0	0
Total	**3**	**422**	**51**	**0**	**0**

Mellanby Avenue [S]

	U	L	T	R	P
Motorcycles	0	0	0	0	0
Cars & Light Goods	0	58	0	30	0
Buses	0	0	0	0	0
Single-Unit Trucks	0	0	0	1	0
Other	0	0	0	0	0
Total	**0**	**58**	**0**	**31**	**0**

	Out	In	Total
Motorcycles	0	0	0
Cars & Light Goods	64	88	152
Buses	0	0	0
Single-Unit Trucks	1	1	2
Other	2	0	2
Total	**67**	**89**	**156**

Turning Movement Peak Hour Data Plot (11:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Mellanby Avenue
Site Code: 220766
Start Date: 08/10/2023

Turning Movement Data

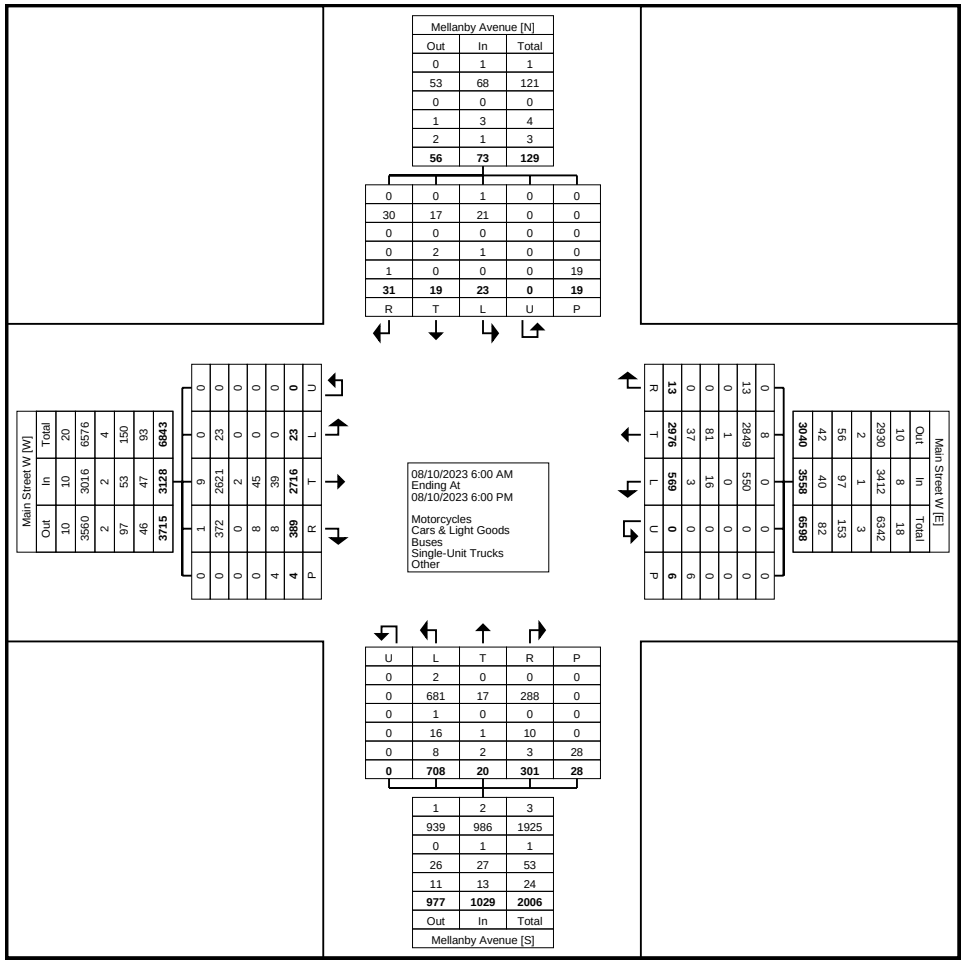
Start Time	Main Street W Eastbound						Main Street W Westbound						Mellanby Avenue Northbound						Mellanby Avenue Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
6:00 AM	0	33	1	0	0	34	1	28	0	0	0	29	9	0	3	0	1	12	1	0	0	0	0	1	76
6:15 AM	1	62	2	0	0	65	3	32	0	0	0	35	9	0	6	0	0	15	0	0	1	0	0	1	116
6:30 AM	0	57	5	0	0	62	10	41	0	0	0	51	10	0	6	0	0	16	3	0	3	0	1	6	135
6:45 AM	0	51	10	0	0	61	10	72	0	0	0	82	19	1	3	0	0	23	0	0	1	0	0	1	167
Hourly Total	1	203	18	0	0	222	24	173	0	0	0	197	47	1	18	0	1	66	4	0	5	0	1	9	494
7:00 AM	0	54	8	0	0	62	5	39	0	0	0	44	11	0	5	0	0	16	0	0	0	0	1	0	122
7:15 AM	0	59	1	0	0	60	7	50	1	0	0	58	5	0	24	0	0	29	1	2	0	0	1	3	150
7:30 AM	0	39	30	0	0	69	2	17	0	0	0	19	26	0	5	0	0	31	0	0	1	0	0	1	120
7:45 AM	0	76	1	0	0	77	18	82	0	0	0	100	9	0	3	0	1	12	0	0	0	0	0	0	189
Hourly Total	0	228	40	0	0	268	32	188	1	0	0	221	51	0	37	0	1	88	1	2	1	0	2	4	581
8:00 AM	0	72	4	0	0	76	14	57	0	0	0	71	12	0	7	0	1	19	1	0	0	0	0	1	167
8:15 AM	1	79	5	0	0	85	26	56	0	0	0	82	18	0	9	0	2	27	0	1	2	0	0	3	197
8:30 AM	0	67	2	0	0	69	13	55	1	0	0	69	11	2	2	0	0	15	1	0	0	0	0	1	154
8:45 AM	1	79	5	0	1	85	26	79	0	0	1	105	16	1	6	0	4	23	0	0	2	0	0	2	215
Hourly Total	2	297	16	0	1	315	79	247	1	0	1	327	57	3	24	0	7	84	2	1	4	0	0	7	733
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	80	3	0	0	83	11	85	0	0	0	96	9	0	13	0	2	22	0	0	0	0	1	0	201
11:15 AM	1	73	3	0	2	77	13	79	2	0	0	94	19	1	4	0	1	24	1	0	1	0	1	2	197
11:30 AM	3	94	3	0	0	100	23	101	1	0	0	125	16	0	4	0	2	20	0	1	0	0	0	1	246
11:45 AM	0	101	4	0	1	105	22	87	1	0	0	110	9	1	5	0	1	15	0	2	0	0	0	2	232
Hourly Total	4	348	13	0	3	365	69	352	4	0	0	425	53	2	26	0	6	81	1	3	1	0	2	5	876
12:00 PM	0	90	4	0	0	94	11	122	0	0	0	133	20	0	3	0	0	23	1	2	0	0	0	3	253
12:15 PM	0	103	4	0	0	107	21	84	0	0	0	105	15	0	4	0	0	19	1	0	0	0	0	1	232
12:30 PM	3	84	17	0	0	104	23	89	0	0	0	112	22	1	7	0	0	30	2	0	0	0	2	2	248
12:45 PM	1	8	69	0	0	78	5	2	0	0	0	7	76	3	6	0	0	85	1	3	3	0	3	7	177
Hourly Total	4	285	94	0	0	383	60	297	0	0	0	357	133	4	20	0	0	157	5	5	3	0	5	13	910
1:00 PM	1	45	59	0	0	105	4	45	1	0	0	50	43	0	3	0	1	46	2	1	0	0	3	3	204
1:15 PM	0	90	7	0	0	97	26	120	0	0	2	146	12	3	15	0	0	30	0	1	1	0	0	2	275
1:30 PM	1	96	4	0	0	101	18	131	1	0	0	150	9	1	26	0	0	36	1	0	3	0	0	4	291
1:45 PM	0	97	1	0	0	98	21	102	0	0	0	123	20	0	6	0	2	26	3	0	1	0	1	4	251
Hourly Total	2	328	71	0	0	401	69	398	2	0	2	469	84	4	50	0	3	138	6	2	5	0	4	13	1021
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	105	3	0	0	109	18	101	0	0	0	119	29	0	6	0	1	35	1	1	1	0	1	3	266
3:15 PM	0	75	4	0	0	79	30	106	1	0	0	137	19	0	5	0	0	24	0	0	0	0	0	0	240
3:30 PM	0	121	5	0	0	126	11	113	2	0	0	126	39	0	8	0	0	47	0	0	3	0	2	3	302

3:45 PM	0	95	5	0	0	100	26	134	2	0	2	162	3	0	45	0	2	48	0	0	0	0	0	0	310
Hourly Total	1	396	17	0	0	414	85	454	5	0	2	544	90	0	64	0	3	154	1	1	4	0	3	6	1118
4:00 PM	1	59	45	0	0	105	14	70	0	0	0	84	47	2	10	0	0	59	2	2	0	0	0	4	252
4:15 PM	0	39	58	0	0	97	11	34	0	0	0	45	67	2	7	0	1	76	0	0	1	0	0	1	219
4:30 PM	5	91	5	0	0	101	24	132	0	0	0	156	22	0	11	0	1	33	0	0	0	0	0	0	290
4:45 PM	0	99	3	0	0	102	20	136	0	0	0	156	10	0	8	0	0	18	0	0	0	0	0	0	276
Hourly Total	6	288	111	0	0	405	69	372	0	0	0	441	146	4	36	0	2	186	2	2	1	0	0	5	1037
5:00 PM	1	99	2	0	0	102	27	131	0	0	0	158	13	0	11	0	0	24	0	0	2	0	0	2	286
5:15 PM	0	92	3	0	0	95	17	147	0	0	0	164	17	1	5	0	2	23	1	0	3	0	0	4	286
5:30 PM	0	87	3	0	0	90	20	118	0	0	0	138	9	0	6	0	2	15	0	3	0	0	2	3	246
5:45 PM	2	65	1	0	0	68	18	99	0	0	1	117	8	1	4	0	1	13	0	0	2	0	0	2	200
Hourly Total	3	343	9	0	0	355	82	495	0	0	1	577	47	2	26	0	5	75	1	3	7	0	2	11	1018
Grand Total	23	2716	389	0	4	3128	569	2976	13	0	6	3558	708	20	301	0	28	1029	23	19	31	0	19	73	7788
Approach %	0.7	86.8	12.4	0.0	-	-	16.0	83.6	0.4	0.0	-	-	68.8	1.9	29.3	0.0	-	-	31.5	26.0	42.5	0.0	-	-	-
Total %	0.3	34.9	5.0	0.0	-	40.2	7.3	38.2	0.2	0.0	-	45.7	9.1	0.3	3.9	0.0	-	13.2	0.3	0.2	0.4	0.0	-	0.9	-
Motorcycles	0	9	1	0	-	10	0	8	0	0	-	8	2	0	0	0	-	2	1	0	0	0	-	1	21
% Motorcycles	0.0	0.3	0.3	-	-	0.3	0.0	0.3	0.0	-	-	0.2	0.3	0.0	0.0	-	-	0.2	4.3	0.0	0.0	-	-	1.4	0.3
Cars & Light Goods	23	2621	372	0	-	3016	550	2849	13	0	-	3412	681	17	288	0	-	986	21	17	30	0	-	68	7482
% Cars & Light Goods	100.0	96.5	95.6	-	-	96.4	96.7	95.7	100.0	-	-	95.9	96.2	85.0	95.7	-	-	95.8	91.3	89.5	96.8	-	-	93.2	96.1
Buses	0	2	0	0	-	2	0	1	0	0	-	1	1	0	0	0	-	1	0	0	0	0	-	0	4
% Buses	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.1	0.0	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.1
Single-Unit Trucks	0	45	8	0	-	53	16	81	0	0	-	97	16	1	10	0	-	27	1	2	0	0	-	3	180
% Single-Unit Trucks	0.0	1.7	2.1	-	-	1.7	2.8	2.7	0.0	-	-	2.7	2.3	5.0	3.3	-	-	2.6	4.3	10.5	0.0	-	-	4.1	2.3
Articulated Trucks	0	38	6	0	-	44	2	34	0	0	-	36	8	0	3	0	-	11	0	0	0	0	-	0	91
% Articulated Trucks	0.0	1.4	1.5	-	-	1.4	0.4	1.1	0.0	-	-	1.0	1.1	0.0	1.0	-	-	1.1	0.0	0.0	0.0	-	-	0.0	1.2
Bicycles on Road	0	1	2	0	-	3	1	3	0	0	-	4	0	2	0	0	-	2	0	0	1	0	-	1	10
% Bicycles on Road	0.0	0.0	0.5	-	-	0.1	0.2	0.1	0.0	-	-	0.1	0.0	10.0	0.0	-	-	0.2	0.0	0.0	3.2	-	-	1.4	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	7	-	-	-	-	-	12	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	33.3	-	-	-	-	-	25.0	-	-	-	-	-	63.2	-	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	4	-	-	-	-	-	21	-	-	-	-	-	7	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	66.7	-	-	-	-	-	75.0	-	-	-	-	-	36.8	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Mellanby Avenue
Site Code: 220766
Start Date: 08/10/2023
Page No: 3



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Mellanby Avenue
Site Code: 220766
Start Date: 08/10/2023

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Main Street W Eastbound						Main Street W Westbound						Mellanby Avenue Northbound						Mellanby Avenue Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
8:00 AM	0	72	4	0	0	76	14	57	0	0	0	71	12	0	7	0	1	19	1	0	0	0	0	1	167
8:15 AM	1	79	5	0	0	85	26	56	0	0	0	82	18	0	9	0	2	27	0	1	2	0	0	3	197
8:30 AM	0	67	2	0	0	69	13	55	1	0	0	69	11	2	2	0	0	15	1	0	0	0	0	1	154
8:45 AM	1	79	5	0	1	85	26	79	0	0	1	105	16	1	6	0	4	23	0	0	2	0	0	2	215
Total	2	297	16	0	1	315	79	247	1	0	1	327	57	3	24	0	7	84	2	1	4	0	0	7	733
Approach %	0.6	94.3	5.1	0.0	-	-	24.2	75.5	0.3	0.0	-	-	67.9	3.6	28.6	0.0	-	-	28.6	14.3	57.1	0.0	-	-	-
Total %	0.3	40.5	2.2	0.0	-	43.0	10.8	33.7	0.1	0.0	-	44.6	7.8	0.4	3.3	0.0	-	11.5	0.3	0.1	0.5	0.0	-	1.0	-
PHF	0.500	0.940	0.800	0.000	-	0.926	0.760	0.782	0.250	0.000	-	0.779	0.792	0.375	0.667	0.000	-	0.778	0.500	0.250	0.500	0.000	-	0.583	0.852
Motorcycles	0	0	0	0	-	0	0	1	0	0	-	1	1	0	0	0	-	1	0	0	0	0	-	0	2
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.4	0.0	-	-	0.3	1.8	0.0	0.0	-	-	1.2	0.0	0.0	0.0	-	-	0.0	0.3
Cars & Light Goods	2	281	14	0	-	297	76	233	1	0	-	310	53	1	23	0	-	77	2	1	4	0	-	7	691
% Cars & Light Goods	100.0	94.6	87.5	-	-	94.3	96.2	94.3	100.0	-	-	94.8	93.0	33.3	95.8	-	-	91.7	100.0	100.0	100.0	-	-	100.0	94.3
Buses	0	1	0	0	-	1	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	2
% Buses	0.0	0.3	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	1.8	0.0	0.0	-	-	1.2	0.0	0.0	0.0	-	-	0.0	0.3
Single-Unit Trucks	0	7	2	0	-	9	3	11	0	0	-	14	1	0	1	0	-	2	0	0	0	0	-	0	25
% Single-Unit Trucks	0.0	2.4	12.5	-	-	2.9	3.8	4.5	0.0	-	-	4.3	1.8	0.0	4.2	-	-	2.4	0.0	0.0	0.0	-	-	0.0	3.4
Articulated Trucks	0	7	0	0	-	7	0	2	0	0	-	2	1	0	0	0	-	1	0	0	0	0	-	0	10
% Articulated Trucks	0.0	2.4	0.0	-	-	2.2	0.0	0.8	0.0	-	-	0.6	1.8	0.0	0.0	-	-	1.2	0.0	0.0	0.0	-	-	0.0	1.4
Bicycles on Road	0	1	0	0	-	1	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	3
% Bicycles on Road	0.0	0.3	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	66.7	0.0	-	-	2.4	0.0	0.0	0.0	-	-	0.0	0.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	7	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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519-896-3163 cbowness@ptsl.com

Count Name: Main Street W & Mellanby Avenue
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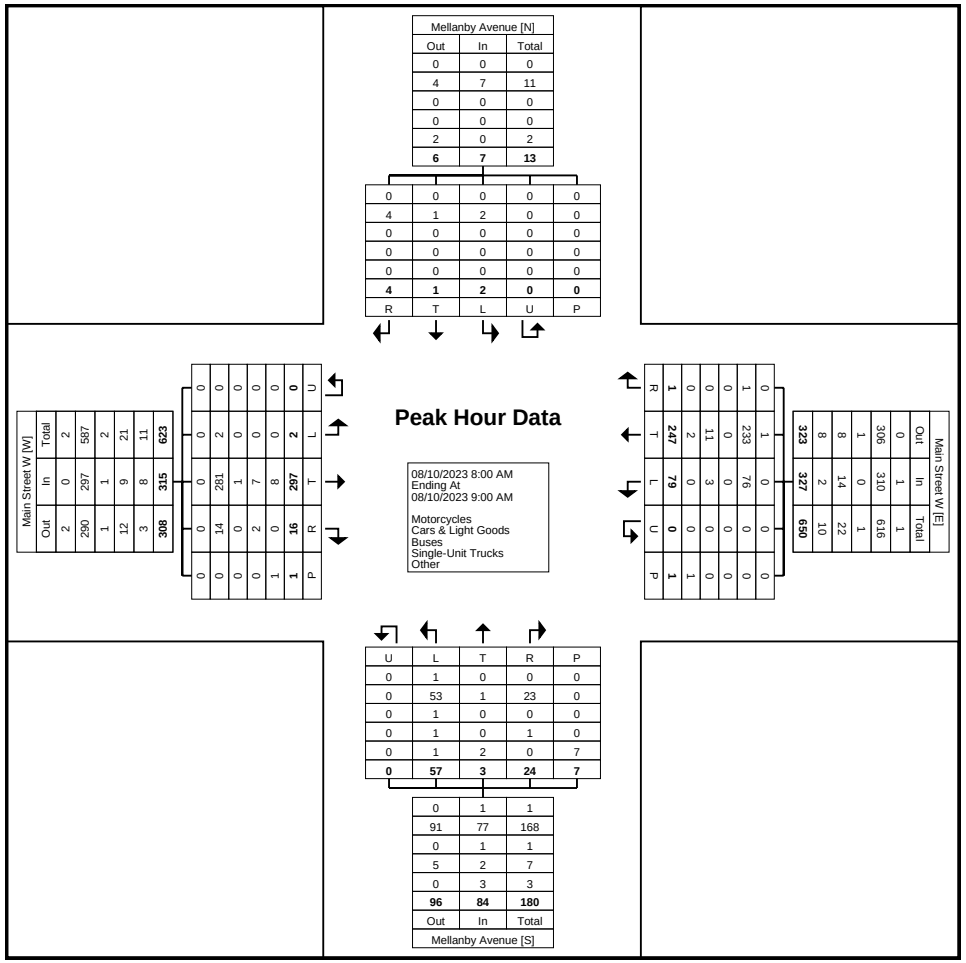
Start Date: 08/10/2023



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Mellanby Avenue
Site Code: 220766
Start Date: 08/10/2023

Turning Movement Peak Hour Data (1:00 PM)

Start Time	Main Street W Eastbound						Main Street W Westbound						Mellanby Avenue Northbound						Mellanby Avenue Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
1:00 PM	1	45	59	0	0	105	4	45	1	0	0	50	43	0	3	0	1	46	2	1	0	0	3	3	204
1:15 PM	0	90	7	0	0	97	26	120	0	0	2	146	12	3	15	0	0	30	0	1	1	0	0	2	275
1:30 PM	1	96	4	0	0	101	18	131	1	0	0	150	9	1	26	0	0	36	1	0	3	0	0	4	291
1:45 PM	0	97	1	0	0	98	21	102	0	0	0	123	20	0	6	0	2	26	3	0	1	0	1	4	251
Total	2	328	71	0	0	401	69	398	2	0	2	469	84	4	50	0	3	138	6	2	5	0	4	13	1021
Approach %	0.5	81.8	17.7	0.0	-	-	14.7	84.9	0.4	0.0	-	-	60.9	2.9	36.2	0.0	-	-	46.2	15.4	38.5	0.0	-	-	-
Total %	0.2	32.1	7.0	0.0	-	39.3	6.8	39.0	0.2	0.0	-	45.9	8.2	0.4	4.9	0.0	-	13.5	0.6	0.2	0.5	0.0	-	1.3	-
PHF	0.500	0.845	0.301	0.000	-	0.955	0.663	0.760	0.500	0.000	-	0.782	0.488	0.333	0.481	0.000	-	0.750	0.500	0.500	0.417	0.000	-	0.813	0.877
Motorcycles	0	5	1	0	-	6	0	4	0	0	-	4	0	0	0	0	-	0	1	0	0	0	-	1	11
% Motorcycles	0.0	1.5	1.4	-	-	1.5	0.0	1.0	0.0	-	-	0.9	0.0	0.0	0.0	-	-	0.0	16.7	0.0	0.0	-	-	7.7	1.1
Cars & Light Goods	2	310	66	0	-	378	65	369	2	0	-	436	80	4	47	0	-	131	4	2	5	0	-	11	956
% Cars & Light Goods	100.0	94.5	93.0	-	-	94.3	94.2	92.7	100.0	-	-	93.0	95.2	100.0	94.0	-	-	94.9	66.7	100.0	100.0	-	-	84.6	93.6
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	6	2	0	-	8	2	15	0	0	-	17	2	0	3	0	-	5	1	0	0	0	-	1	31
% Single-Unit Trucks	0.0	1.8	2.8	-	-	2.0	2.9	3.8	0.0	-	-	3.6	2.4	0.0	6.0	-	-	3.6	16.7	0.0	0.0	-	-	7.7	3.0
Articulated Trucks	0	7	1	0	-	8	1	9	0	0	-	10	2	0	0	0	-	2	0	0	0	0	-	0	20
% Articulated Trucks	0.0	2.1	1.4	-	-	2.0	1.4	2.3	0.0	-	-	2.1	2.4	0.0	0.0	-	-	1.4	0.0	0.0	0.0	-	-	0.0	2.0
Bicycles on Road	0	0	1	0	-	1	1	1	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	3
% Bicycles on Road	0.0	0.0	1.4	-	-	0.2	1.4	0.3	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.3
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	0.0	-	-	-	-	-	75.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	100.0	-	-	-	-	-	25.0	-	-

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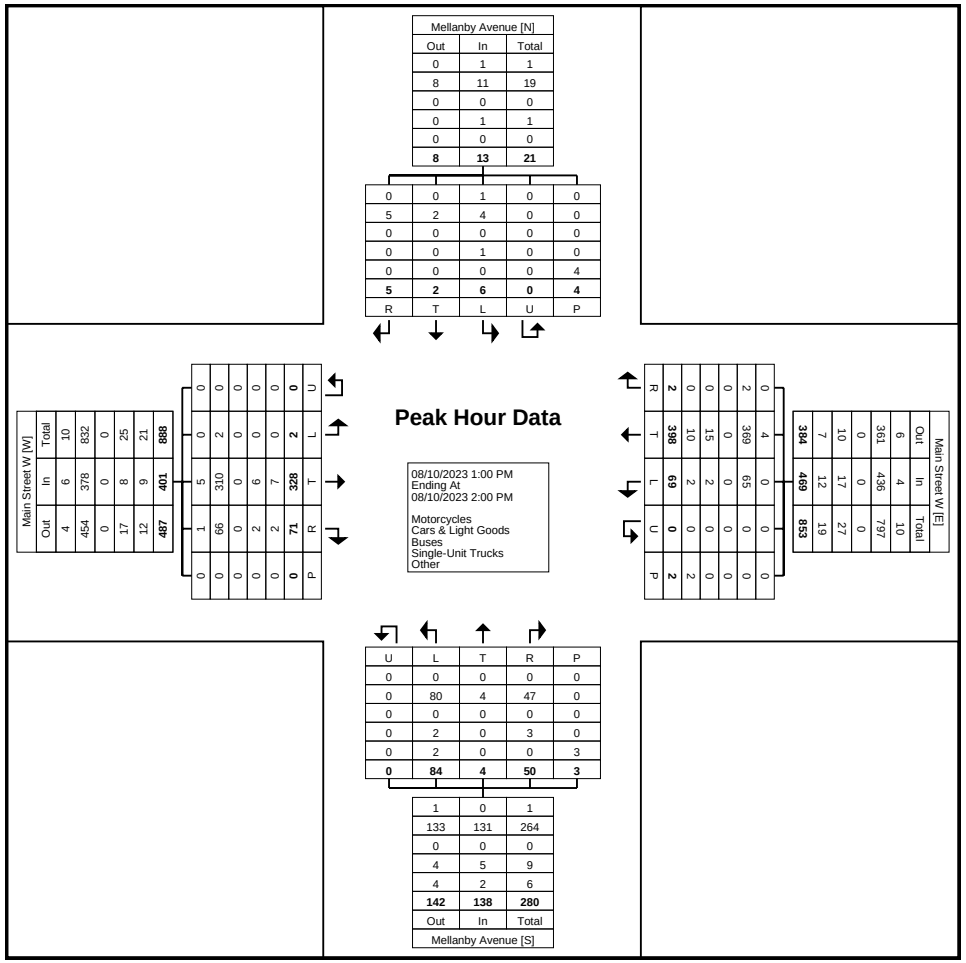

Turning Movement Peak Hour Data Plot (1:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Main Street W & Mellanby Avenue
Site Code: 220766
Start Date: 08/10/2023

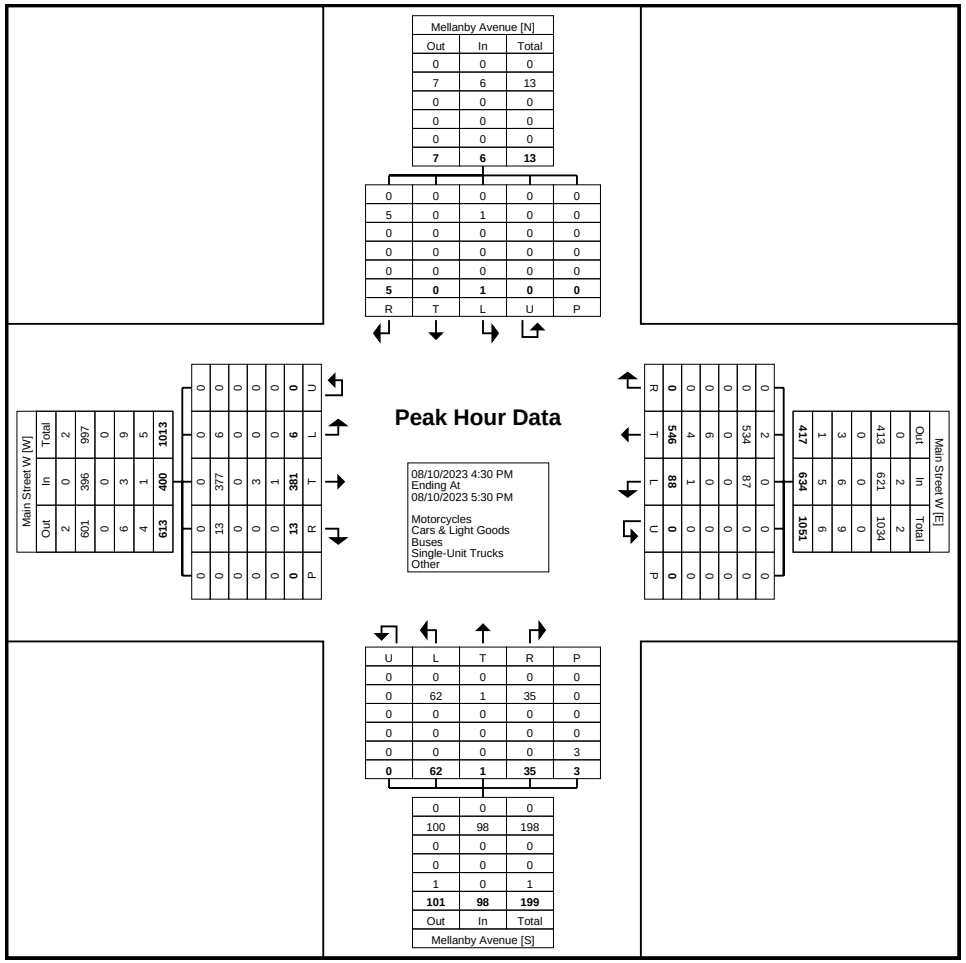
Turning Movement Peak Hour Data (4:30 PM)

Start Time	Main Street W Eastbound						Main Street W Westbound						Mellanby Avenue Northbound						Mellanby Avenue Southbound						
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:30 PM	5	91	5	0	0	101	24	132	0	0	0	156	22	0	11	0	1	33	0	0	0	0	0	0	290
4:45 PM	0	99	3	0	0	102	20	136	0	0	0	156	10	0	8	0	0	18	0	0	0	0	0	0	276
5:00 PM	1	99	2	0	0	102	27	131	0	0	0	158	13	0	11	0	0	24	0	0	2	0	0	2	286
5:15 PM	0	92	3	0	0	95	17	147	0	0	0	164	17	1	5	0	2	23	1	0	3	0	0	4	286
Total	6	381	13	0	0	400	88	546	0	0	0	634	62	1	35	0	3	98	1	0	5	0	0	6	1138
Approach %	1.5	95.3	3.3	0.0	-	-	13.9	86.1	0.0	0.0	-	-	63.3	1.0	35.7	0.0	-	-	16.7	0.0	83.3	0.0	-	-	-
Total %	0.5	33.5	1.1	0.0	-	35.1	7.7	48.0	0.0	0.0	-	55.7	5.4	0.1	3.1	0.0	-	8.6	0.1	0.0	0.4	0.0	-	0.5	-
PHF	0.300	0.962	0.650	0.000	-	0.980	0.815	0.929	0.000	0.000	-	0.966	0.705	0.250	0.795	0.000	-	0.742	0.250	0.000	0.417	0.000	-	0.375	0.981
Motorcycles	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	2
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.4	-	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.2
Cars & Light Goods	6	377	13	0	-	396	87	534	0	0	-	621	62	1	35	0	-	98	1	0	5	0	-	6	1121
% Cars & Light Goods	100.0	99.0	100.0	-	-	99.0	98.9	97.8	-	-	-	97.9	100.0	100.0	100.0	-	-	100.0	100.0	-	100.0	-	-	100.0	98.5
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	3	0	0	-	3	0	6	0	0	-	6	0	0	0	0	-	0	0	0	0	0	-	0	9
% Single-Unit Trucks	0.0	0.8	0.0	-	-	0.8	0.0	1.1	-	-	-	0.9	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.8
Articulated Trucks	0	1	0	0	-	1	1	3	0	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	5
% Articulated Trucks	0.0	0.3	0.0	-	-	0.3	1.1	0.5	-	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.4
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.2	-	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Main Street W & Mellanby Avenue
Site Code: 220766
Start Date: 08/10/2023



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Mellanby Avenue & Lock 8 Park Driveway - Saturday
Site Code: 220766
Start Date: 08/12/2023

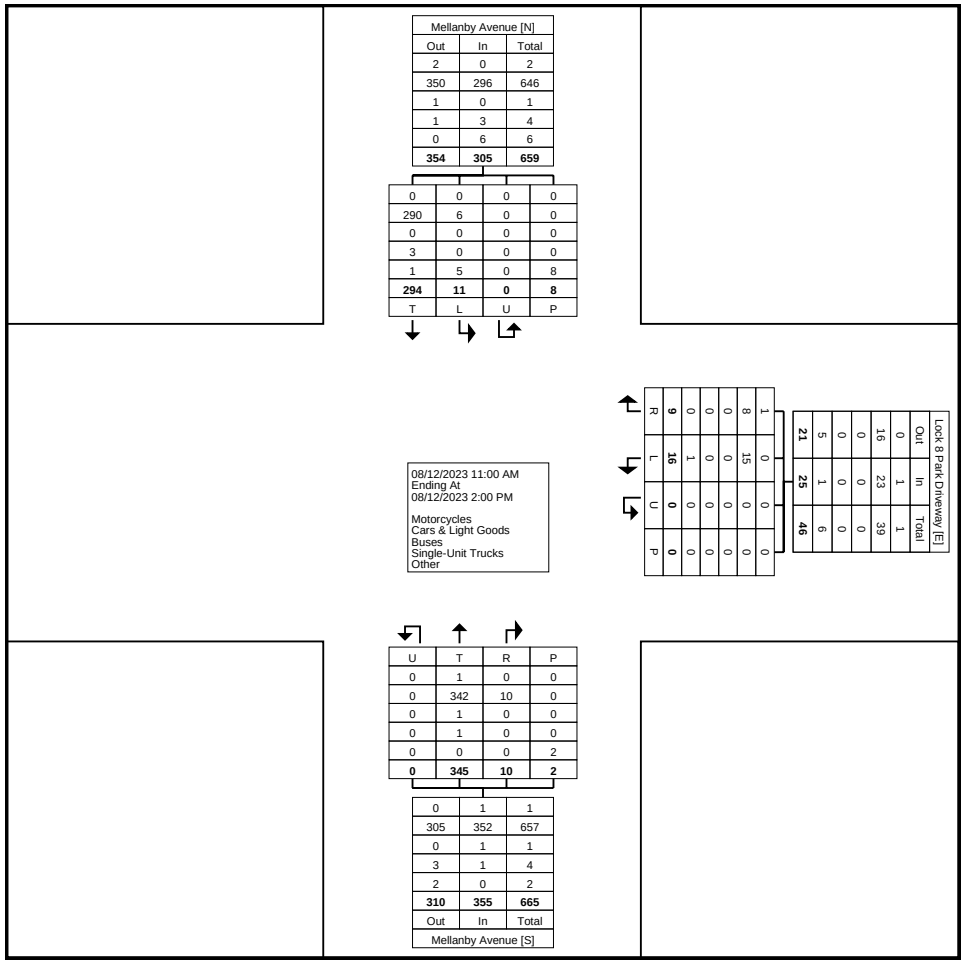
Turning Movement Data

Start Time	Lock 8 Park Driveway Westbound					Mellanby Avenue Northbound					Mellanby Avenue Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
11:00 AM	1	0	0	0	1	27	0	0	0	27	1	26	0	0	27	55
11:15 AM	2	1	0	0	3	20	2	0	0	22	0	13	0	1	13	38
11:30 AM	2	0	0	0	2	19	0	0	0	19	2	15	0	0	17	38
11:45 AM	1	0	0	0	1	26	1	0	0	27	0	13	0	0	13	41
Hourly Total	6	1	0	0	7	92	3	0	0	95	3	67	0	1	70	172
12:00 PM	2	1	0	0	3	23	2	0	0	25	0	22	0	1	22	50
12:15 PM	0	0	0	0	0	20	0	0	0	20	2	18	0	1	20	40
12:30 PM	1	1	0	0	2	16	2	0	0	18	0	10	0	1	10	30
12:45 PM	5	0	0	0	5	36	1	0	2	37	3	47	0	2	50	92
Hourly Total	8	2	0	0	10	95	5	0	2	100	5	97	0	5	102	212
1:00 PM	0	1	0	0	1	83	1	0	0	84	1	87	0	2	88	173
1:15 PM	0	3	0	0	3	23	0	0	0	23	1	12	0	0	13	39
1:30 PM	1	1	0	0	2	26	1	0	0	27	0	15	0	0	15	44
1:45 PM	1	1	0	0	2	26	0	0	0	26	1	16	0	0	17	45
Hourly Total	2	6	0	0	8	158	2	0	0	160	3	130	0	2	133	301
Grand Total	16	9	0	0	25	345	10	0	2	355	11	294	0	8	305	685
Approach %	64.0	36.0	0.0	-	-	97.2	2.8	0.0	-	-	3.6	96.4	0.0	-	-	-
Total %	2.3	1.3	0.0	-	3.6	50.4	1.5	0.0	-	51.8	1.6	42.9	0.0	-	44.5	-
Motorcycles	0	1	0	-	1	1	0	0	-	1	0	0	0	-	0	2
% Motorcycles	0.0	11.1	-	-	4.0	0.3	0.0	-	-	0.3	0.0	0.0	-	-	0.0	0.3
Cars & Light Goods	15	8	0	-	23	342	10	0	-	352	6	290	0	-	296	671
% Cars & Light Goods	93.8	88.9	-	-	92.0	99.1	100.0	-	-	99.2	54.5	98.6	-	-	97.0	98.0
Buses	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Buses	0.0	0.0	-	-	0.0	0.3	0.0	-	-	0.3	0.0	0.0	-	-	0.0	0.1
Single-Unit Trucks	0	0	0	-	0	1	0	0	-	1	0	3	0	-	3	4
% Single-Unit Trucks	0.0	0.0	-	-	0.0	0.3	0.0	-	-	0.3	0.0	1.0	-	-	1.0	0.6
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.3	-	-	0.3	0.1
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	5	0	0	-	5	6
% Bicycles on Road	6.3	0.0	-	-	4.0	0.0	0.0	-	-	0.0	45.5	0.0	-	-	1.6	0.9
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	50.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	8	-	-
% Pedestrians	-	-	-	-	-	-	-	-	50.0	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Mellanby Avenue & Lock 8 Park Driveway - Saturday
Site Code: 220766
Start Date: 08/12/2023



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Mellanby Avenue & Lock 8 Park Driveway - Saturday
Site Code: 220766
Start Date: 08/12/2023

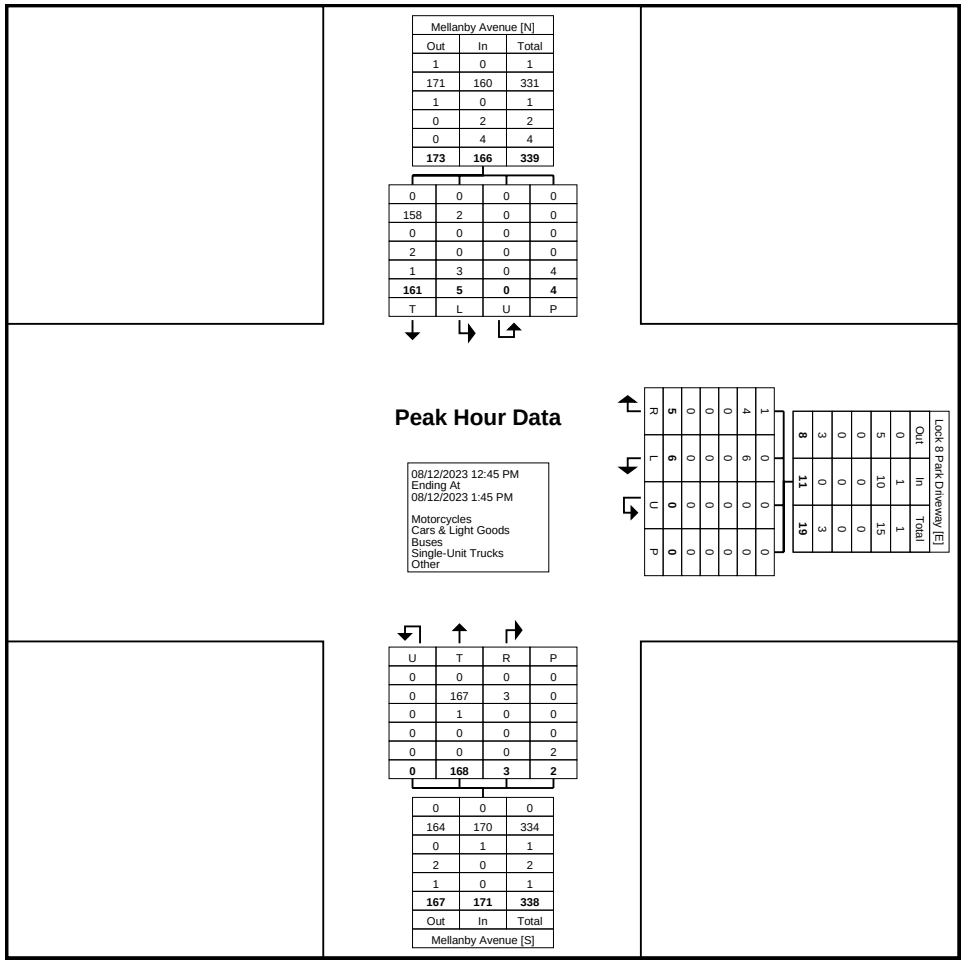
Turning Movement Peak Hour Data (12:45 PM)

Start Time	Lock 8 Park Driveway Westbound					Mellanby Avenue Northbound					Mellanby Avenue Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
12:45 PM	5	0	0	0	5	36	1	0	2	37	3	47	0	2	50	92
1:00 PM	0	1	0	0	1	83	1	0	0	84	1	87	0	2	88	173
1:15 PM	0	3	0	0	3	23	0	0	0	23	1	12	0	0	13	39
1:30 PM	1	1	0	0	2	26	1	0	0	27	0	15	0	0	15	44
Total	6	5	0	0	11	168	3	0	2	171	5	161	0	4	166	348
Approach %	54.5	45.5	0.0	-	-	98.2	1.8	0.0	-	-	3.0	97.0	0.0	-	-	-
Total %	1.7	1.4	0.0	-	3.2	48.3	0.9	0.0	-	49.1	1.4	46.3	0.0	-	47.7	-
PHF	0.300	0.417	0.000	-	0.550	0.506	0.750	0.000	-	0.509	0.417	0.463	0.000	-	0.472	0.503
Motorcycles	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Motorcycles	0.0	20.0	-	-	9.1	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.3
Cars & Light Goods	6	4	0	-	10	167	3	0	-	170	2	158	0	-	160	340
% Cars & Light Goods	100.0	80.0	-	-	90.9	99.4	100.0	-	-	99.4	40.0	98.1	-	-	96.4	97.7
Buses	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Buses	0.0	0.0	-	-	0.0	0.6	0.0	-	-	0.6	0.0	0.0	-	-	0.0	0.3
Single-Unit Trucks	0	0	0	-	0	0	0	0	-	0	0	2	0	-	2	2
% Single-Unit Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	1.2	-	-	1.2	0.6
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.6	-	-	0.6	0.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	3	0	0	-	3	3
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	60.0	0.0	-	-	1.8	0.9
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	50.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	50.0	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Mellanby Avenue & Lock 8 Park Driveway - Saturday
Site Code: 220766
Start Date: 08/12/2023



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Mellanby Avenue & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

Turning Movement Data

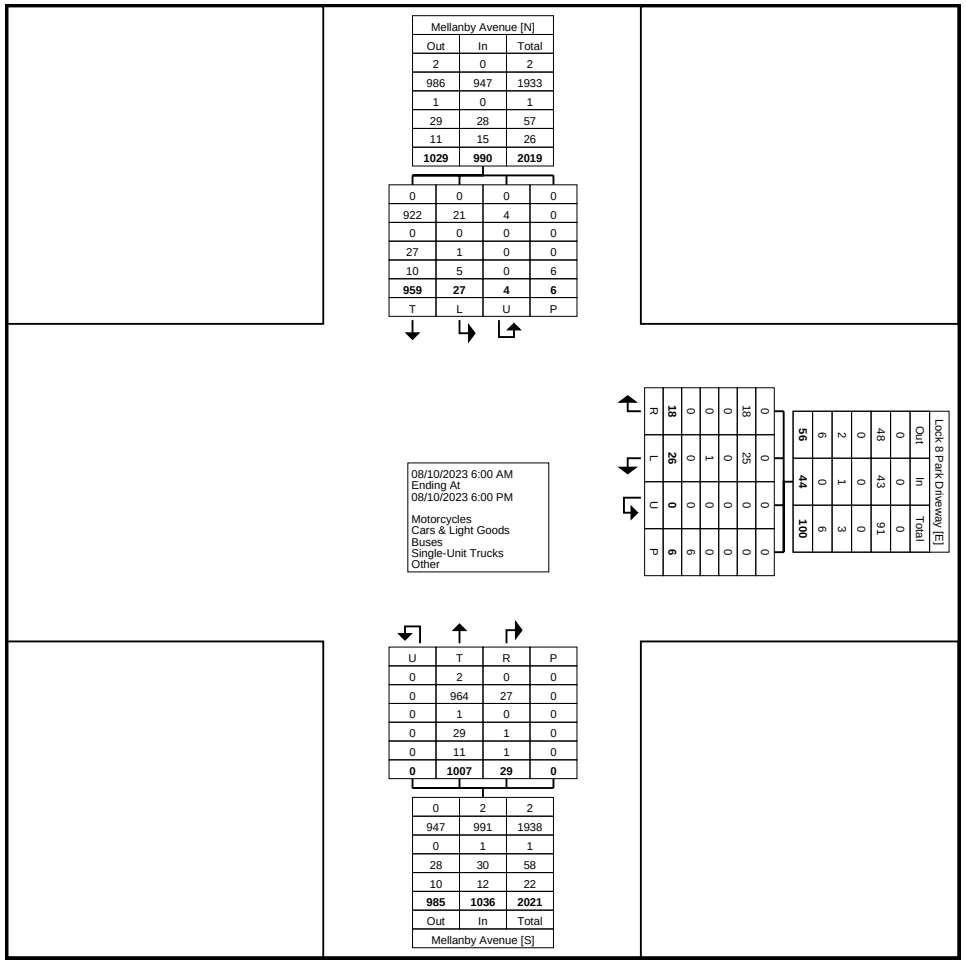
Start Time	Lock 8 Park Driveway Westbound					Mellanby Avenue Northbound					Mellanby Avenue Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
6:00 AM	0	0	0	0	0	12	0	0	0	12	0	2	0	0	2	14
6:15 AM	0	0	0	0	0	14	0	0	0	14	0	5	0	0	5	19
6:30 AM	0	0	0	0	0	16	0	0	0	16	0	15	0	0	15	31
6:45 AM	0	0	0	0	0	22	2	0	0	24	0	20	0	0	20	44
Hourly Total	0	0	0	0	0	64	2	0	0	66	0	42	0	0	42	108
7:00 AM	0	1	0	0	1	17	0	0	0	17	1	14	0	0	15	33
7:15 AM	0	1	0	0	1	27	0	0	0	27	1	11	0	0	12	40
7:30 AM	1	2	0	0	3	28	2	0	0	30	0	34	0	0	34	67
7:45 AM	0	0	0	0	0	13	1	0	0	14	0	20	0	0	20	34
Hourly Total	1	4	0	0	5	85	3	0	0	88	2	79	0	0	81	174
8:00 AM	0	1	0	0	1	18	1	0	0	19	1	17	0	0	18	38
8:15 AM	0	0	0	2	0	25	1	0	0	26	2	30	0	0	32	58
8:30 AM	1	0	0	0	1	13	0	0	0	13	0	15	0	0	15	29
8:45 AM	0	0	0	0	0	23	0	0	0	23	1	29	0	0	30	53
Hourly Total	1	1	0	2	2	79	2	0	0	81	4	91	0	0	95	178
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	0	0	0	0	24	1	0	0	25	2	12	1	2	15	40
11:15 AM	1	0	0	1	1	22	0	0	0	22	1	16	0	2	17	40
11:30 AM	2	0	0	0	2	20	1	0	0	21	2	24	0	1	26	49
11:45 AM	1	0	0	0	1	18	0	0	0	18	2	28	0	0	30	49
Hourly Total	4	0	0	1	4	84	2	0	0	86	7	80	1	5	88	178
12:00 PM	1	1	0	0	2	21	1	0	0	22	0	16	0	0	16	40
12:15 PM	0	0	0	1	0	18	2	0	0	20	0	26	0	0	26	46
12:30 PM	1	0	0	0	1	29	2	0	0	31	1	39	0	1	40	72
12:45 PM	0	0	0	0	0	87	1	0	0	88	0	76	1	0	77	165
Hourly Total	2	1	0	1	3	155	6	0	0	161	1	157	1	1	159	323
1:00 PM	1	1	0	1	2	44	5	0	0	49	0	65	0	0	65	116
1:15 PM	2	3	0	0	5	27	1	0	0	28	3	31	0	0	34	67
1:30 PM	3	1	0	0	4	38	1	0	0	39	3	19	0	0	22	65
1:45 PM	3	0	0	0	3	23	3	0	0	26	2	20	0	0	22	51
Hourly Total	9	5	0	1	14	132	10	0	0	142	8	135	0	0	143	299
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	0	2	0	0	2	32	0	0	0	32	0	22	0	0	22	56
3:15 PM	1	1	0	0	2	24	0	0	0	24	1	33	0	0	34	60
3:30 PM	0	0	0	0	0	48	1	0	0	49	0	16	0	0	16	65
3:45 PM	2	1	0	0	3	47	0	0	0	47	1	28	1	0	30	80

Hourly Total	3	4	0	0	7	151	1	0	0	152	2	99	1	0	102	261
4:00 PM	3	0	0	0	3	59	0	0	0	59	1	64	0	0	65	127
4:15 PM	1	0	0	0	1	77	1	0	0	78	1	71	0	0	72	151
4:30 PM	0	1	0	1	1	33	0	0	0	33	1	26	0	0	27	61
4:45 PM	1	0	0	0	1	20	1	0	0	21	0	22	1	0	23	45
Hourly Total	5	1	0	1	6	189	2	0	0	191	3	183	1	0	187	384
5:00 PM	0	1	0	0	1	20	1	0	0	21	0	30	0	0	30	52
5:15 PM	1	0	0	0	1	23	0	0	0	23	0	20	0	0	20	44
5:30 PM	0	0	0	0	0	13	0	0	0	13	0	24	0	0	24	37
5:45 PM	0	1	0	0	1	12	0	0	0	12	0	19	0	0	19	32
Hourly Total	1	2	0	0	3	68	1	0	0	69	0	93	0	0	93	165
Grand Total	26	18	0	6	44	1007	29	0	0	1036	27	959	4	6	990	2070
Approach %	59.1	40.9	0.0	-	-	97.2	2.8	0.0	-	-	2.7	96.9	0.4	-	-	-
Total %	1.3	0.9	0.0	-	2.1	48.6	1.4	0.0	-	50.0	1.3	46.3	0.2	-	47.8	-
Motorcycles	0	0	0	-	0	2	0	0	-	2	0	0	0	-	0	2
% Motorcycles	0.0	0.0	-	-	0.0	0.2	0.0	-	-	0.2	0.0	0.0	0.0	-	0.0	0.1
Cars & Light Goods	25	18	0	-	43	964	27	0	-	991	21	922	4	-	947	1981
% Cars & Light Goods	96.2	100.0	-	-	97.7	95.7	93.1	-	-	95.7	77.8	96.1	100.0	-	95.7	95.7
Buses	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Buses	0.0	0.0	-	-	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	1	0	0	-	1	29	1	0	-	30	1	27	0	-	28	59
% Single-Unit Trucks	3.8	0.0	-	-	2.3	2.9	3.4	-	-	2.9	3.7	2.8	0.0	-	2.8	2.9
Articulated Trucks	0	0	0	-	0	10	0	0	-	10	0	7	0	-	7	17
% Articulated Trucks	0.0	0.0	-	-	0.0	1.0	0.0	-	-	1.0	0.0	0.7	0.0	-	0.7	0.8
Bicycles on Road	0	0	0	-	0	1	1	0	-	2	5	3	0	-	8	10
% Bicycles on Road	0.0	0.0	-	-	0.0	0.1	3.4	-	-	0.2	18.5	0.3	0.0	-	0.8	0.5
Bicycles on Crosswalk	-	-	-	2	-	-	-	-	0	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	33.3	-	-	-	-	-	-	-	-	-	50.0	-	-
Pedestrians	-	-	-	4	-	-	-	-	0	-	-	-	-	3	-	-
% Pedestrians	-	-	-	66.7	-	-	-	-	-	-	-	-	-	50.0	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Mellanby Avenue & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023
Page No: 3



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Mellanby Avenue & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

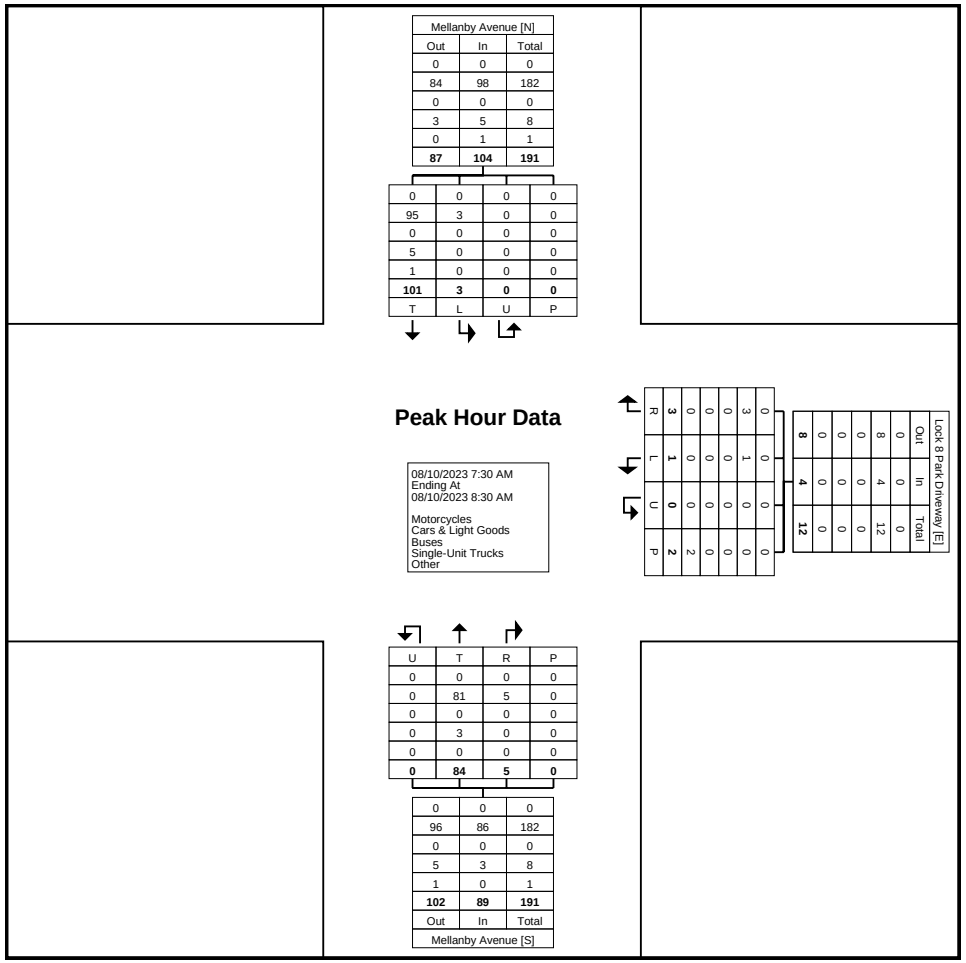
Turning Movement Peak Hour Data (7:30 AM)

Start Time	Lock 8 Park Driveway Westbound					Mellanby Avenue Northbound					Mellanby Avenue Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
7:30 AM	1	2	0	0	3	28	2	0	0	30	0	34	0	0	34	67
7:45 AM	0	0	0	0	0	13	1	0	0	14	0	20	0	0	20	34
8:00 AM	0	1	0	0	1	18	1	0	0	19	1	17	0	0	18	38
8:15 AM	0	0	0	2	0	25	1	0	0	26	2	30	0	0	32	58
Total	1	3	0	2	4	84	5	0	0	89	3	101	0	0	104	197
Approach %	25.0	75.0	0.0	-	-	94.4	5.6	0.0	-	-	2.9	97.1	0.0	-	-	-
Total %	0.5	1.5	0.0	-	2.0	42.6	2.5	0.0	-	45.2	1.5	51.3	0.0	-	52.8	-
PHF	0.250	0.375	0.000	-	0.333	0.750	0.625	0.000	-	0.742	0.375	0.743	0.000	-	0.765	0.735
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	1	3	0	-	4	81	5	0	-	86	3	95	0	-	98	188
% Cars & Light Goods	100.0	100.0	-	-	100.0	96.4	100.0	-	-	96.6	100.0	94.1	-	-	94.2	95.4
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	0	0	-	0	3	0	0	-	3	0	5	0	-	5	8
% Single-Unit Trucks	0.0	0.0	-	-	0.0	3.6	0.0	-	-	3.4	0.0	5.0	-	-	4.8	4.1
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	1.0	-	-	1.0	0.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Mellanby Avenue & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023



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

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Mellanby Avenue & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

Turning Movement Peak Hour Data (12:30 PM)

Start Time	Lock 8 Park Driveway Westbound					Mellanby Avenue Northbound					Mellanby Avenue Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
12:30 PM	1	0	0	0	1	29	2	0	0	31	1	39	0	1	40	72
12:45 PM	0	0	0	0	0	87	1	0	0	88	0	76	1	0	77	165
1:00 PM	1	1	0	1	2	44	5	0	0	49	0	65	0	0	65	116
1:15 PM	2	3	0	0	5	27	1	0	0	28	3	31	0	0	34	67
Total	4	4	0	1	8	187	9	0	0	196	4	211	1	1	216	420
Approach %	50.0	50.0	0.0	-	-	95.4	4.6	0.0	-	-	1.9	97.7	0.5	-	-	-
Total %	1.0	1.0	0.0	-	1.9	44.5	2.1	0.0	-	46.7	1.0	50.2	0.2	-	51.4	-
PHF	0.500	0.333	0.000	-	0.400	0.537	0.450	0.000	-	0.557	0.333	0.694	0.250	-	0.701	0.636
Motorcycles	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Motorcycles	0.0	0.0	-	-	0.0	0.5	0.0	-	-	0.5	0.0	0.0	0.0	-	0.0	0.2
Cars & Light Goods	3	4	0	-	7	175	9	0	-	184	3	206	1	-	210	401
% Cars & Light Goods	75.0	100.0	-	-	87.5	93.6	100.0	-	-	93.9	75.0	97.6	100.0	-	97.2	95.5
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	1	0	0	-	1	9	0	0	-	9	1	5	0	-	6	16
% Single-Unit Trucks	25.0	0.0	-	-	12.5	4.8	0.0	-	-	4.6	25.0	2.4	0.0	-	2.8	3.8
Articulated Trucks	0	0	0	-	0	2	0	0	-	2	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	-	-	0.0	1.1	0.0	-	-	1.0	0.0	0.0	0.0	-	0.0	0.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	100.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	0.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
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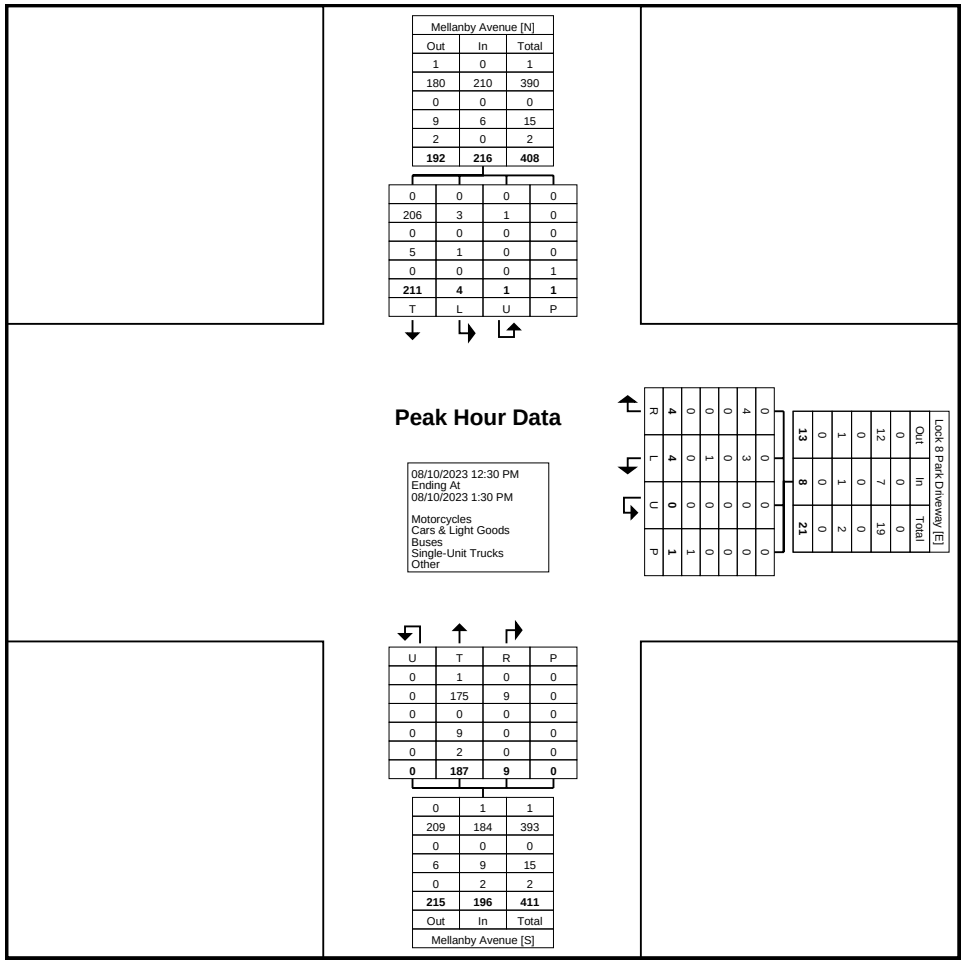
519-896-3163 cbowness@ptsl.com

Count Name: Mellanby Avenue & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023



Turning Movement Peak Hour Data Plot (12:30 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Mellanby Avenue & Lock 8 Park Driveway
Site Code: 220766
Start Date: 08/10/2023

Turning Movement Peak Hour Data (3:30 PM)

Start Time	Lock 8 Park Driveway Westbound					Mellanby Avenue Northbound					Mellanby Avenue Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
3:30 PM	0	0	0	0	0	48	1	0	0	49	0	16	0	0	16	65
3:45 PM	2	1	0	0	3	47	0	0	0	47	1	28	1	0	30	80
4:00 PM	3	0	0	0	3	59	0	0	0	59	1	64	0	0	65	127
4:15 PM	1	0	0	0	1	77	1	0	0	78	1	71	0	0	72	151
Total	6	1	0	0	7	231	2	0	0	233	3	179	1	0	183	423
Approach %	85.7	14.3	0.0	-	-	99.1	0.9	0.0	-	-	1.6	97.8	0.5	-	-	-
Total %	1.4	0.2	0.0	-	1.7	54.6	0.5	0.0	-	55.1	0.7	42.3	0.2	-	43.3	-
PHF	0.500	0.250	0.000	-	0.583	0.750	0.500	0.000	-	0.747	0.750	0.630	0.250	-	0.635	0.700
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	6	1	0	-	7	227	2	0	-	229	3	174	1	-	178	414
% Cars & Light Goods	100.0	100.0	-	-	100.0	98.3	100.0	-	-	98.3	100.0	97.2	100.0	-	97.3	97.9
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	0	0	0	-	0	2	0	0	-	2	0	3	0	-	3	5
% Single-Unit Trucks	0.0	0.0	-	-	0.0	0.9	0.0	-	-	0.9	0.0	1.7	0.0	-	1.6	1.2
Articulated Trucks	0	0	0	-	0	2	0	0	-	2	0	2	0	-	2	4
% Articulated Trucks	0.0	0.0	-	-	0.0	0.9	0.0	-	-	0.9	0.0	1.1	0.0	-	1.1	0.9
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Count Name: Mellanby Avenue & Lock 8 Park Driveway
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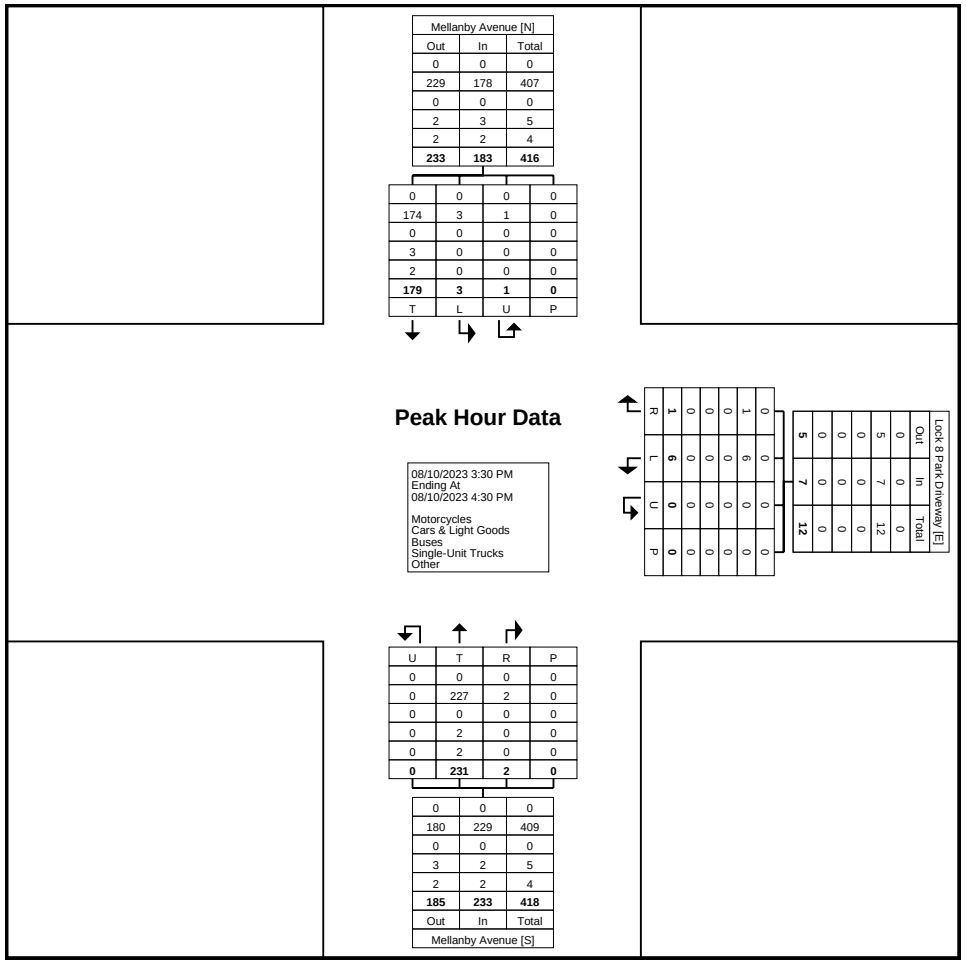


Turning Movement Peak Hour Data Plot (3:30 PM)

Appendix C

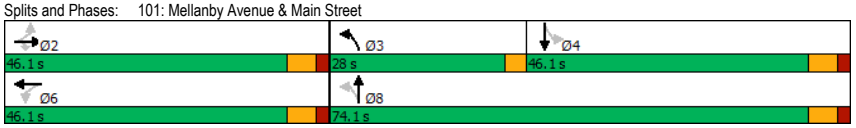
Base Year Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	299	17	86	247	59	3	2	1
Future Volume (vph)	2	299	17	86	247	59	3	2	1
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		2			6	3	8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	2	2	2	6	6	3	8	4	4
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1		6.1
Lead/Lag						Lead		Lag	Lag
Lead-Lag Optimize?						Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	50.9	50.9	50.9	50.9	50.9	12.5	10.5		8.1
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74	0.18	0.15		0.12
v/c Ratio	0.00	0.31	0.03	0.17	0.30	0.29	0.17		0.05
Control Delay	6.0	6.4	0.4	6.6	6.7	25.8	12.1		21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	6.0	6.4	0.4	6.6	6.7	25.8	12.1		21.7
LOS	A	A	A	A	A	C	B		C
Approach Delay		6.1			6.7		21.4		21.7
Approach LOS		A			A		C		C

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 69.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.31
Intersection Signal Delay: 8.3 Intersection LOS: A
Intersection Capacity Utilization 52.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	2	352	20	101	292	69	33	8
v/c Ratio	0.00	0.31	0.03	0.17	0.30	0.29	0.17	0.05
Control Delay	6.0	6.4	0.4	6.6	6.7	25.8	12.1	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	6.4	0.4	6.6	6.7	25.8	12.1	21.7
Queue Length 50th (m)	0.1	14.4	0.0	3.6	11.9	8.8	0.5	0.4
Queue Length 95th (m)	0.9	42.6	0.4	14.6	37.1	15.0	5.9	4.1
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	643	1142	730	580	962	486	1057	815
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.31	0.03	0.17	0.30	0.14	0.03	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	299	17	86	247	1	59	3	25	2	1	4
Future Volume (vph)	2	299	17	86	247	1	59	3	25	2	1	4
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.87			0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1429	1551	981	1362	1309		1333	1105			1381	
Flt Permitted	0.58	1.00	1.00	0.55	1.00		0.89	1.00			1.00	
Satd. Flow (perm)	874	1551	981	788	1309		1247	1105			1398	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	2	352	20	101	291	1	69	4	29	2	1	5
RTOR Reduction (vph)	0	0	7	0	0	0	0	24	0	0	5	0
Lane Group Flow (vph)	2	352	13	101	292	0	69	9	0	0	3	0
Confl. Peds. (#/hr)			7	7			1		1	1		1
Heavy Vehicles (%)	0%	5%	13%	4%	6%	0%	7%	67%	4%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	49.5	49.5	49.5	49.5	49.5		13.0	13.0			1.5	
Effective Green, g (s)	49.5	49.5	49.5	49.5	49.5		13.0	13.0			1.5	
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66		0.17	0.17			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	579	1027	650	522	867		226	192			28	
v/s Ratio Prot		c0.23			0.22		c0.03	0.01				
v/s Ratio Perm	0.00		0.01	0.13			c0.02				0.00	
v/c Ratio	0.00	0.34	0.02	0.19	0.34		0.31	0.05			0.11	
Uniform Delay, d1	4.3	5.5	4.3	4.9	5.5		26.9	25.7			35.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	0.9	0.1	0.8	1.1		0.6	0.1			1.3	
Delay (s)	4.3	6.4	4.4	5.7	6.5		27.4	25.8			37.2	
Level of Service	A	A	A	A	A		C	C			D	
Approach Delay (s)		6.3			6.3			26.9			37.2	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	74.7	Sum of lost time (s)	15.2
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	326	0	0	333	1	1
Future Volume (Veh/h)	326	0	0	333	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	384	0	0	392	1	1
Pedestrians				1		
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)	68					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			384		776	385
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			276		706	277
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	100
cM capacity (veh/h)			1184		370	698

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	384	392	2
Volume Left	0	0	1
Volume Right	0	0	1
cSH	1700	1184	483
Volume to Capacity	0.23	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	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	0.0		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	3	84	5	3	101
Future Volume (Veh/h)	1	3	84	5	3	101
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	1	4	114	7	4	136
Pedestrians	2					
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)						99
pX, platoon unblocked						
vC, conflicting volume	264	120			123	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	264	120			123	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	727	936			1474	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	5	121	140
Volume Left	1	0	4
Volume Right	4	7	0
cSH	885	1700	1474
Volume to Capacity	0.01	0.07	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	9.1	0.0	0.2
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	0.2
Approach LOS	A		

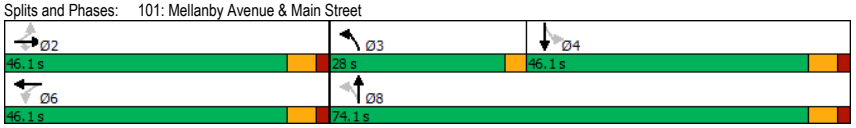
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	6	381	23	159	546	147	2	1	0
Future Volume (vph)	6	381	23	159	546	147	2	1	0
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		2			6	3	8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	2	2	2	6	6	3	8	4	4
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1		6.1
Lead/Lag						Lead		Lag	Lag
Lead-Lag Optimize?						Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	43.7	43.7	43.7	43.7	43.7	14.6	11.4		8.1
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.65	0.22	0.17		0.12
v/c Ratio	0.02	0.37	0.03	0.33	0.63	0.49	0.31		0.03
Control Delay	7.0	8.2	0.8	9.6	13.7	27.2	8.7		0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	7.0	8.2	0.8	9.6	13.7	27.2	8.7		0.2
LOS	A	A	A	A	B	C	A		A
Approach Delay		7.8			12.8		20.4		0.2
Approach LOS		A			B		C		A

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 67.5
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 12.5 Intersection LOS: B
Intersection Capacity Utilization 79.9% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	6	389	23	162	557	150	87	6
v/c Ratio	0.02	0.37	0.03	0.33	0.63	0.49	0.31	0.03
Control Delay	7.0	8.2	0.8	9.6	13.7	27.2	8.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	8.2	0.8	9.6	13.7	27.2	8.7	0.2
Queue Length 50th (m)	0.2	16.2	0.0	6.5	29.8	16.1	0.2	0.0
Queue Length 95th (m)	2.3	59.0	1.0	30.4	#128.1	30.2	9.6	0.0
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	375	1045	741	490	881	548	1185	845
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.37	0.03	0.33	0.63	0.27	0.07	0.01

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	381	23	159	546	0	147	2	83	1	0	5
Future Volume (vph)	6	381	23	159	546	0	147	2	83	1	0	5
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1429	1613	1119	1410	1361		1429	1237			1363	
Flt Permitted	0.39	1.00	1.00	0.51	1.00		0.91	1.00			1.00	
Satd. Flow (perm)	579	1613	1119	757	1361		1367	1237			1375	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	6	389	23	162	557	0	150	2	85	1	0	5
RTOR Reduction (vph)	0	0	9	0	0	0	0	66	0	0	6	0
Lane Group Flow (vph)	6	389	14	162	557	0	150	21	0	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	0%	1%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	43.8	43.8	43.8	43.8	43.8		16.5	16.5			1.4	
Effective Green, g (s)	43.8	43.8	43.8	43.8	43.8		16.5	16.5			1.4	
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60		0.23	0.23			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	349	974	676	457	822		321	281			26	
v/s Ratio Prot		0.24			c0.41		c0.08	0.02				
v/s Ratio Perm	0.01		0.01	0.21			c0.03				0.00	
v/c Ratio	0.02	0.40	0.02	0.35	0.68		0.47	0.08			0.00	
Uniform Delay, d1	5.7	7.5	5.8	7.2	9.6		24.2	22.0			34.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.1	1.2	0.1	2.1	4.5		0.8	0.1			0.0	
Delay (s)	5.8	8.7	5.8	9.4	14.1		25.0	22.1			34.9	
Level of Service	A	A	A	A	B		C	C			C	
Approach Delay (s)		8.5			13.0			23.9			34.9	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	15.2
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	464	1	4	702	3	2
Future Volume (Veh/h)	464	1	4	702	3	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	469	1	4	709	3	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	68					
pX, platoon unblocked			0.88		0.88	0.88
vC, conflicting volume			470		1186	470
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			333		1145	332
tC, single (s)			4.3		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			978		196	630

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	470	713	5
Volume Left	0	4	3
Volume Right	1	0	2
cSH	1700	978	270
Volume to Capacity	0.28	0.00	0.02
Queue Length 95th (m)	0.0	0.1	0.5
Control Delay (s)	0.0	0.1	18.6
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	18.6
Approach LOS			C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	1	231	2	3	179
Future Volume (Veh/h)	6	1	231	2	3	179
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	9	1	330	3	4	256
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						99
pX, platoon unblocked	0.99					
vC, conflicting volume	596	332			333	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	584	332			333	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	470	715			1238	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	10	333	260
Volume Left	9	0	4
Volume Right	1	3	0
cSH	486	1700	1238
Volume to Capacity	0.02	0.20	0.00
Queue Length 95th (m)	0.5	0.0	0.1
Control Delay (s)	12.6	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	12.6	0.0	0.2
Approach LOS	B		

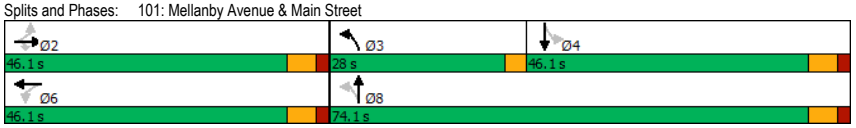
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	28.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Configurations								
Traffic Volume (vph)	3	361	37	127	422	113	0	2
Future Volume (vph)	3	361	37	127	422	113	0	2
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	NA
Protected Phases		2			6	3	8	4
Permitted Phases	2		2	6		8		
Detector Phase	2	2	2	6	6	3	8	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1	6.1
Lead/Lag						Lead		Lag
Lead-Lag Optimize?						Yes		Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None
Act Effct Green (s)	45.2	45.2	45.2	45.2	45.2	14.0	10.9	8.1
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.20	0.16	0.12
v/c Ratio	0.01	0.36	0.05	0.28	0.49	0.41	0.16	0.02
Control Delay	6.7	7.7	1.9	8.4	9.7	26.0	0.8	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	7.7	1.9	8.4	9.7	26.0	0.8	23.8
LOS	A	A	A	A	A	C	A	C
Approach Delay		7.1			9.4		17.3	23.8
Approach LOS		A			A		B	C

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 68.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.49
Intersection Signal Delay: 9.9 — Intersection LOS: A
Intersection Capacity Utilization 68.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	3	380	39	134	447	119	63	4
v/c Ratio	0.01	0.36	0.05	0.28	0.49	0.41	0.16	0.02
Control Delay	6.7	7.7	1.9	8.4	9.7	26.0	0.8	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	7.7	1.9	8.4	9.7	26.0	0.8	23.8
Queue Length 50th (m)	0.1	15.8	0.0	5.2	20.9	13.0	0.0	0.2
Queue Length 95th (m)	1.5	54.6	3.1	23.6	74.8	24.8	0.0	3.1
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	465	1054	776	486	906	534	1157	853
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.36	0.05	0.28	0.49	0.22	0.05	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	361	37	127	422	3	113	0	60	0	2	2
Future Volume (vph)	3	361	37	127	422	3	113	0	60	0	2	2
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1427	1597	1148	1348	1373		1429	1196			1444	
Flt Permitted	0.47	1.00	1.00	0.52	1.00		0.91	1.00			1.00	
Satd. Flow (perm)	704	1597	1148	737	1373		1367	1196			1444	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	380	39	134	444	3	119	0	63	0	2	2
RTOR Reduction (vph)	0	0	15	0	0	0	0	49	0	0	2	0
Lane Group Flow (vph)	3	380	24	134	447	0	119	14	0	0	2	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	0%	2%	0%	6%	1%	0%	0%	0%	3%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA			NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	45.2	45.2	45.2	45.2	45.2		15.9	15.9			1.4	
Effective Green, g (s)	45.2	45.2	45.2	45.2	45.2		15.9	15.9			1.4	
Actuated g/C Ratio	0.62	0.62	0.62	0.62	0.62		0.22	0.22			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	434	984	707	454	846		306	259			27	
v/s Ratio Prot		0.24			c0.33		c0.06	0.01			0.00	
v/s Ratio Perm	0.00		0.02	0.18			c0.02					
v/c Ratio	0.01	0.39	0.03	0.30	0.53		0.39	0.05			0.08	
Uniform Delay, d1	5.4	7.1	5.5	6.6	8.0		24.5	22.7			35.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	1.1	0.1	1.7	2.4		0.6	0.1			0.9	
Delay (s)	5.4	8.2	5.6	8.2	10.3		25.1	22.8			36.2	
Level of Service	A	A	A	A	B		C	C			D	
Approach Delay (s)		8.0			9.9			24.3			36.2	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	73.3	Sum of lost time (s)	15.2
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	420	1	4	550	2	0
Future Volume (Veh/h)	420	1	4	550	2	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	447	1	4	585	2	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	68					
pX, platoon unblocked			0.89		0.89	0.89
vC, conflicting volume			448		1040	448
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			316		983	315
tC, single (s)			4.1		6.9	6.2
tC, 2 stage (s)						
tF (s)			2.2		4.0	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1116		200	648

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	448	589	2
Volume Left	0	4	2
Volume Right	1	0	0
cSH	1700	1116	200
Volume to Capacity	0.26	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.2
Control Delay (s)	0.0	0.1	23.1
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	23.1
Approach LOS			C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	5	168	3	5	161
Future Volume (Veh/h)	6	5	168	3	5	161
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50
Hourly flow rate (vph)	12	10	336	6	10	322
Pedestrians			1			4
Lane Width (m)			3.6			3.6
Walking Speed (m/s)			1.2			1.2
Percent Blockage			0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						99
pX, platoon unblocked						
vC, conflicting volume	682	343			342	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	682	343			342	
tC, single (s)	6.6	6.2			4.7	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.7	
p0 queue free %	97	99			99	
cM capacity (veh/h)	385	702			955	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	22	342	332
Volume Left	12	0	10
Volume Right	10	6	0
cSH	484	1700	955
Volume to Capacity	0.05	0.20	0.01
Queue Length 95th (m)	1.1	0.0	0.3
Control Delay (s)	12.8	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	12.8	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix D

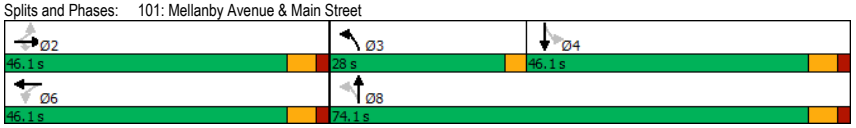
Background Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	330	19	95	273	65	3	2	1
Future Volume (vph)	2	330	19	95	273	65	3	2	1
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		2			6	3	8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	2	2	2	6	6	3	8	4	4
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1		6.1
Lead/Lag						Lead		Lag	Lag
Lead-Lag Optimize?						Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	50.3	50.3	50.3	50.3	50.3	12.6	10.6		8.1
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.18	0.15		0.12
v/c Ratio	0.00	0.34	0.03	0.20	0.34	0.32	0.19		0.05
Control Delay	6.0	6.8	0.6	7.0	7.1	25.9	11.5		21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	6.0	6.8	0.6	7.0	7.1	25.9	11.5		21.6
LOS	A	A	A	A	A	C	B		C
Approach Delay		6.5			7.1		21.2		21.6
Approach LOS		A			A		C		C

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 68.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.34
Intersection Signal Delay: 8.6 Intersection LOS: A
Intersection Capacity Utilization 55.2% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	2	388	22	112	322	76	37	8
v/c Ratio	0.00	0.34	0.03	0.20	0.34	0.32	0.19	0.05
Control Delay	6.0	6.8	0.6	7.0	7.1	25.9	11.5	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	6.8	0.6	7.0	7.1	25.9	11.5	21.6
Queue Length 50th (m)	0.1	16.3	0.0	4.2	13.5	9.4	0.5	0.4
Queue Length 95th (m)	0.9	48.7	0.6	16.7	42.3	16.2	6.3	3.9
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	623	1136	727	550	960	489	1067	822
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.34	0.03	0.20	0.34	0.16	0.03	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	330	19	95	273	1	65	3	28	2	1	4
Future Volume (vph)	2	330	19	95	273	1	65	3	28	2	1	4
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.87			0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1429	1551	982	1363	1309		1333	1111			1381	
Flt Permitted	0.57	1.00	1.00	0.52	1.00		0.89	1.00			1.00	
Satd. Flow (perm)	851	1551	982	750	1309		1247	1111			1398	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	2	388	22	112	321	1	76	4	33	2	1	5
RTOR Reduction (vph)	0	0	8	0	0	0	0	27	0	0	5	0
Lane Group Flow (vph)	2	388	14	112	322	0	76	10	0	0	3	0
Confl. Peds. (#/hr)			7	7			1		1	1		1
Heavy Vehicles (%)	0%	5%	13%	4%	6%	0%	7%	67%	4%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	48.9	48.9	48.9	48.9	48.9		13.1	13.1			1.5	
Effective Green, g (s)	48.9	48.9	48.9	48.9	48.9		13.1	13.1			1.5	
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66		0.18	0.18			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	560	1022	647	494	862		230	196			28	
v/s Ratio Prot		c0.25			0.25		c0.04	0.01				
v/s Ratio Perm	0.00		0.01	0.15			c0.02				0.00	
v/c Ratio	0.00	0.38	0.02	0.23	0.37		0.33	0.05			0.11	
Uniform Delay, d1	4.3	5.8	4.4	5.1	5.7		26.7	25.4			35.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	1.1	0.1	1.1	1.2		0.6	0.1			1.3	
Delay (s)	4.3	6.8	4.4	6.1	7.0		27.3	25.5			37.0	
Level of Service	A	A	A	A	A		C	C			D	
Approach Delay (s)		6.7			6.7			26.7			37.0	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	74.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	360	0	0	369	1	1
Future Volume (Veh/h)	360	0	0	369	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	424	0	0	434	1	1
Pedestrians				1		
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)	68					
pX, platoon unblocked			0.90		0.90	0.90
vC, conflicting volume			424		858	425
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			300		784	301
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	100
cM capacity (veh/h)			1141		327	666

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	424	434	2
Volume Left	0	0	1
Volume Right	0	0	1
cSH	1700	1141	439
Volume to Capacity	0.25	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	13.2
Lane LOS			B
Approach Delay (s)	0.0	0.0	13.2
Approach LOS			B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	3	93	6	3	113
Future Volume (Veh/h)	1	3	93	6	3	113
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	1	4	126	8	4	153
Pedestrians	2					
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)						99
pX, platoon unblocked						
vC, conflicting volume	293	132			136	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	293	132			136	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	699	921			1458	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	5	134	157
Volume Left	1	0	4
Volume Right	4	8	0
cSH	866	1700	1458
Volume to Capacity	0.01	0.08	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	9.2	0.0	0.2
Lane LOS	A		A
Approach Delay (s)	9.2	0.0	0.2
Approach LOS	A		

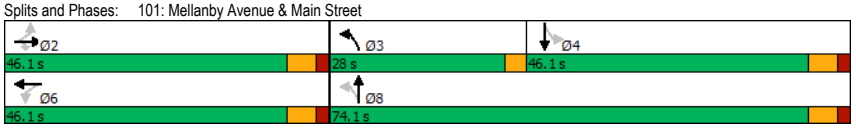
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	22.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	421	25	176	603	162	2	1	0
Future Volume (vph)	7	421	25	176	603	162	2	1	0
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		2			6	3	8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	2	2	2	6	6	3	8	4	4
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1		6.1
Lead/Lag						Lead		Lag	Lag
Lead-Lag Optimize?						Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	43.1	43.1	43.1	43.1	43.1	14.9	11.7		8.1
Actuated g/C Ratio	0.64	0.64	0.64	0.64	0.64	0.22	0.17		0.12
v/c Ratio	0.02	0.42	0.04	0.40	0.70	0.53	0.33		0.03
Control Delay	7.4	9.0	1.1	11.2	16.4	27.9	8.4		0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	7.4	9.0	1.1	11.2	16.4	27.9	8.4		0.3
LOS	A	A	A	B	B	C	A		A
Approach Delay		8.5			15.3		20.7		0.3
Approach LOS		A			B		C		A

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 67.2
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 14.1 Intersection LOS: B
Intersection Capacity Utilization 85.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	7	430	26	180	615	165	96	7
v/c Ratio	0.02	0.42	0.04	0.40	0.70	0.53	0.33	0.03
Control Delay	7.4	9.0	1.1	11.2	16.4	27.9	8.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	9.0	1.1	11.2	16.4	27.9	8.4	0.3
Queue Length 50th (m)	0.2	18.9	0.0	7.8	36.2	17.9	0.2	0.0
Queue Length 95th (m)	2.5	68.7	1.5	37.1	#151.9	33.0	10.1	0.0
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	329	1035	734	454	873	553	1189	846
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.42	0.04	0.40	0.70	0.30	0.08	0.01

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	421	25	176	603	0	162	2	92	1	0	6
Future Volume (vph)	7	421	25	176	603	0	162	2	92	1	0	6
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1429	1613	1119	1410	1361		1429	1237			1360	
Flt Permitted	0.34	1.00	1.00	0.48	1.00		0.91	1.00			1.00	
Satd. Flow (perm)	514	1613	1119	707	1361		1367	1237			1370	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	7	430	26	180	615	0	165	2	94	1	0	6
RTOR Reduction (vph)	0	0	10	0	0	0	0	72	0	0	7	0
Lane Group Flow (vph)	7	430	16	180	615	0	165	24	0	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	0%	1%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	43.2	43.2	43.2	43.2	43.2		16.9	16.9			1.4	
Effective Green, g (s)	43.2	43.2	43.2	43.2	43.2		16.9	16.9			1.4	
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.60		0.23	0.23			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	307	963	668	422	813		330	289			26	
v/s Ratio Prot		0.27			c0.45		c0.09	0.02				
v/s Ratio Perm	0.01		0.01	0.25			c0.03				0.00	
v/c Ratio	0.02	0.45	0.02	0.43	0.76		0.50	0.08			0.01	
Uniform Delay, d1	5.9	8.0	5.9	7.9	10.7		24.0	21.6			34.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.1	1.5	0.1	3.1	6.5		0.9	0.1			0.1	
Delay (s)	6.1	9.5	6.0	11.0	17.2		24.9	21.7			34.8	
Level of Service	A	A	A	B	B		C	C			C	
Approach Delay (s)		9.2			15.8			23.7			34.8	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	15.2
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	512	1	4	776	3	2
Future Volume (Veh/h)	512	1	4	776	3	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	517	1	4	784	3	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	68					
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			518		1310	518
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			360		1279	359
tC, single (s)			4.3		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			932		159	594

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	518	788	5
Volume Left	0	4	3
Volume Right	1	0	2
cSH	1700	932	224
Volume to Capacity	0.30	0.00	0.02
Queue Length 95th (m)	0.0	0.1	0.5
Control Delay (s)	0.0	0.1	21.4
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	21.4
Approach LOS			C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	7	1	255	2	3	199
Future Volume (Veh/h)	7	1	255	2	3	199
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	10	1	364	3	4	284
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						99
pX, platoon unblocked	0.98					
vC, conflicting volume	658	366			367	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	638	366			367	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	433	684			1203	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	11	367	288
Volume Left	10	0	4
Volume Right	1	3	0
cSH	447	1700	1203
Volume to Capacity	0.02	0.22	0.00
Queue Length 95th (m)	0.6	0.0	0.1
Control Delay (s)	13.2	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	13.2	0.0	0.1
Approach LOS	B		

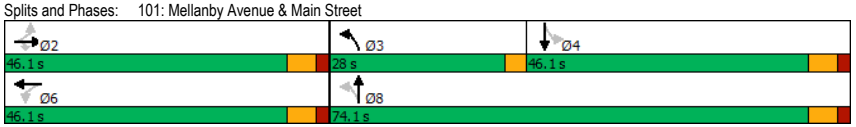
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Configurations								
Traffic Volume (vph)	3	399	41	141	466	125	0	2
Future Volume (vph)	3	399	41	141	466	125	0	2
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	NA
Protected Phases		2			6	3	8	4
Permitted Phases	2		2	6		8		
Detector Phase	2	2	2	6	6	3	8	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1	6.1
Lead/Lag						Lead		Lag
Lead-Lag Optimize?						Yes		Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None
Act Effct Green (s)	44.5	44.5	44.5	44.5	44.5	14.2	11.1	8.1
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.21	0.16	0.12
v/c Ratio	0.01	0.40	0.06	0.33	0.55	0.45	0.19	0.02
Control Delay	6.7	8.3	2.2	9.5	10.9	26.5	1.1	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	8.3	2.2	9.5	10.9	26.5	1.1	24.0
LOS	A	A	A	A	B	C	A	C
Approach Delay		7.7			10.6		17.8	24.0
Approach LOS		A			B		B	C

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 67.9
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 10.7 Intersection LOS: B
Intersection Capacity Utilization 72.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	3	420	43	148	494	132	69	4
v/c Ratio	0.01	0.40	0.06	0.33	0.55	0.45	0.19	0.02
Control Delay	6.7	8.3	2.2	9.5	10.9	26.5	1.1	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	8.3	2.2	9.5	10.9	26.5	1.1	24.0
Queue Length 50th (m)	0.1	18.1	0.0	6.0	24.4	14.2	0.0	0.2
Queue Length 95th (m)	1.5	63.5	3.6	28.0	89.6	26.9	0.0	3.1
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	426	1046	771	453	899	541	1154	860
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.40	0.06	0.33	0.55	0.24	0.06	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	399	41	141	466	3	125	0	66	0	2	2
Future Volume (vph)	3	399	41	141	466	3	125	0	66	0	2	2
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1428	1597	1148	1348	1373		1429	1196			1444	
Flt Permitted	0.43	1.00	1.00	0.49	1.00		0.91	1.00			1.00	
Satd. Flow (perm)	650	1597	1148	692	1373		1367	1196			1444	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	420	43	148	491	3	132	0	69	0	2	2
RTOR Reduction (vph)	0	0	17	0	0	0	0	54	0	0	2	0
Lane Group Flow (vph)	3	420	26	148	494	0	132	15	0	0	2	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	0%	2%	0%	6%	1%	0%	0%	0%	3%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA			NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	44.5	44.5	44.5	44.5	44.5		16.1	16.1			1.4	
Effective Green, g (s)	44.5	44.5	44.5	44.5	44.5		16.1	16.1			1.4	
Actuated g/C Ratio	0.61	0.61	0.61	0.61	0.61		0.22	0.22			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	397	976	701	422	839		312	264			27	
v/s Ratio Prot		0.26			c0.36		c0.07	0.01			0.00	
v/s Ratio Perm	0.00		0.02	0.21			c0.03					
v/c Ratio	0.01	0.43	0.04	0.35	0.59		0.42	0.06			0.08	
Uniform Delay, d1	5.5	7.5	5.6	7.0	8.6		24.3	22.4			35.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	1.4	0.1	2.3	3.0		0.7	0.1			0.9	
Delay (s)	5.6	8.8	5.7	9.3	11.6		25.0	22.4			35.9	
Level of Service	A	A	A	A	B		C	C			D	
Approach Delay (s)		8.5			11.1			24.1			35.9	
Approach LOS		A			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	15.2
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	465	1	4	608	2	0
Future Volume (Veh/h)	465	1	4	608	2	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	495	1	4	647	2	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	68					
pX, platoon unblocked			0.87		0.87	0.87
vC, conflicting volume			496		1150	496
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			344		1098	343
tC, single (s)			4.1		6.9	6.2
tC, 2 stage (s)						
tF (s)			2.2		4.0	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1065		165	611

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	496	651	2
Volume Left	0	4	2
Volume Right	1	0	0
cSH	1700	1065	165
Volume to Capacity	0.29	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.3
Control Delay (s)	0.0	0.1	27.0
Lane LOS		A	D
Approach Delay (s)	0.0	0.1	27.0
Approach LOS			D

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	7	6	185	3	6	178
Future Volume (Veh/h)	7	6	185	3	6	178
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50
Hourly flow rate (vph)	14	12	370	6	12	356
Pedestrians			1			4
Lane Width (m)			3.6			3.6
Walking Speed (m/s)			1.2			1.2
Percent Blockage			0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						99
pX, platoon unblocked	1.00					
vC, conflicting volume	754	377			376	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	752	377			376	
tC, single (s)	6.6	6.2			4.7	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.7	
p0 queue free %	96	98			99	
cM capacity (veh/h)	347	672			925	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	376	368
Volume Left	14	0	12
Volume Right	12	6	0
cSH	447	1700	925
Volume to Capacity	0.06	0.22	0.01
Queue Length 95th (m)	1.5	0.0	0.3
Control Delay (s)	13.6	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	13.6	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E

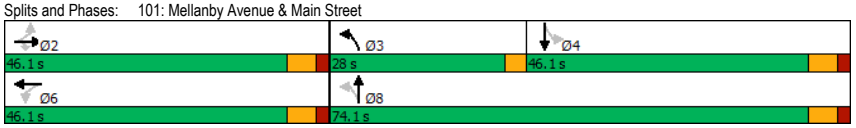
Total Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	332	23	95	278	73	3	2	1
Future Volume (vph)	2	332	23	95	278	73	3	2	1
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		2			6	3	8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	2	2	2	6	6	3	8	4	4
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1		6.1
Lead/Lag						Lead		Lag	Lag
Lead-Lag Optimize?						Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	49.8	49.8	49.8	49.8	49.8	12.6	10.7		8.1
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.18	0.16		0.12
v/c Ratio	0.00	0.35	0.04	0.21	0.34	0.35	0.18		0.05
Control Delay	6.0	7.0	1.0	7.2	7.3	26.4	11.4		21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	6.0	7.0	1.0	7.2	7.3	26.4	11.4		21.6
LOS	A	A	A	A	A	C	B		C
Approach Delay		6.6			7.3		21.9		21.6
Approach LOS		A			A		C		C

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 68.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.35
Intersection Signal Delay: 8.9 Intersection LOS: A
Intersection Capacity Utilization 55.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	2	391	27	112	328	86	37	8
v/c Ratio	0.00	0.35	0.04	0.21	0.34	0.35	0.18	0.05
Control Delay	6.0	7.0	1.0	7.2	7.3	26.4	11.4	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	7.0	1.0	7.2	7.3	26.4	11.4	21.6
Queue Length 50th (m)	0.1	16.6	0.0	4.2	13.8	10.4	0.5	0.4
Queue Length 95th (m)	1.0	50.0	1.2	17.1	44.0	17.8	6.3	4.0
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	616	1131	724	544	956	493	1070	827
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.35	0.04	0.21	0.34	0.17	0.03	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	332	23	95	278	1	73	3	28	2	1	4
Future Volume (vph)	2	332	23	95	278	1	73	3	28	2	1	4
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.87			0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1429	1551	982	1363	1309		1333	1111			1381	
Flt Permitted	0.56	1.00	1.00	0.52	1.00		0.89	1.00			1.00	
Satd. Flow (perm)	846	1551	982	747	1309		1247	1111			1398	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	2	391	27	112	327	1	86	4	33	2	1	5
RTOR Reduction (vph)	0	0	9	0	0	0	0	27	0	0	5	0
Lane Group Flow (vph)	2	391	18	112	328	0	86	10	0	0	3	0
Confl. Peds. (#/hr)			7	7			1		1	1		1
Heavy Vehicles (%)	0%	5%	13%	4%	6%	0%	7%	67%	4%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	48.4	48.4	48.4	48.4	48.4		13.2	13.2			1.5	
Effective Green, g (s)	48.4	48.4	48.4	48.4	48.4		13.2	13.2			1.5	
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66		0.18	0.18			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	554	1017	644	489	858		233	198			28	
v/s Ratio Prot		c0.25			0.25		c0.04	0.01				
v/s Ratio Perm	0.00		0.02	0.15			c0.02				0.00	
v/c Ratio	0.00	0.38	0.03	0.23	0.38		0.37	0.05			0.11	
Uniform Delay, d1	4.4	5.8	4.5	5.1	5.8		26.6	25.1			35.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	1.1	0.1	1.1	1.3		0.7	0.1			1.3	
Delay (s)	4.4	6.9	4.5	6.2	7.1		27.3	25.2			36.8	
Level of Service	A	A	A	A	A		C	C			D	
Approach Delay (s)		6.8			6.9			26.7			36.8	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	15.2
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	360	2	6	369	6	14
Future Volume (Veh/h)	360	2	6	369	6	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	424	2	7	434	7	16
Pedestrians				1		
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)	68					
pX, platoon unblocked			0.89		0.89	0.89
vC, conflicting volume			426		873	426
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			299		799	299
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1139		318	666

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	426	441	23
Volume Left	0	7	7
Volume Right	2	0	16
cSH	1700	1139	499
Volume to Capacity	0.25	0.01	0.05
Queue Length 95th (m)	0.0	0.1	1.2
Control Delay (s)	0.0	0.2	12.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	12.6
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	11	93	7	7	113
Future Volume (Veh/h)	6	11	93	7	7	113
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	8	15	126	9	9	153
Pedestrians	2					
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)						99
pX, platoon unblocked						
vC, conflicting volume	304	132			137	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	304	132			137	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			99	
cM capacity (veh/h)	687	921			1457	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	23	135	162
Volume Left	8	0	9
Volume Right	15	9	0
cSH	823	1700	1457
Volume to Capacity	0.03	0.08	0.01
Queue Length 95th (m)	0.7	0.0	0.1
Control Delay (s)	9.5	0.0	0.5
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	0.5
Approach LOS	A		

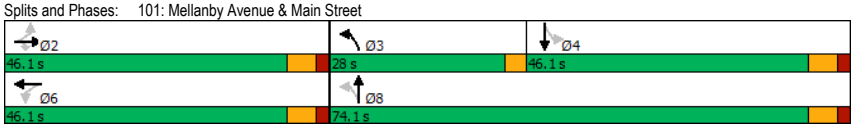
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	428	35	176	609	172	2	1	0
Future Volume (vph)	7	428	35	176	609	172	2	1	0
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		2			6	3	8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	2	2	2	6	6	3	8	4	4
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1		6.1
Lead/Lag						Lead		Lag	Lag
Lead-Lag Optimize?						Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	42.7	42.7	42.7	42.7	42.7	15.2	12.0		8.1
Actuated g/C Ratio	0.64	0.64	0.64	0.64	0.64	0.23	0.18		0.12
v/c Ratio	0.02	0.43	0.05	0.41	0.72	0.55	0.32		0.03
Control Delay	7.7	9.3	1.9	11.7	17.1	28.3	8.3		0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	7.7	9.3	1.9	11.7	17.1	28.3	8.3		0.3
LOS	A	A	A	B	B	C	A		A
Approach Delay		8.7			15.9		21.2		0.3
Approach LOS		A			B		C		A

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 67.1
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 14.6 Intersection LOS: B
Intersection Capacity Utilization 86.2% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	7	437	36	180	621	176	96	7
v/c Ratio	0.02	0.43	0.05	0.41	0.72	0.55	0.32	0.03
Control Delay	7.7	9.3	1.9	11.7	17.1	28.3	8.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.7	9.3	1.9	11.7	17.1	28.3	8.3	0.3
Queue Length 50th (m)	0.2	19.9	0.0	8.1	37.9	19.2	0.2	0.0
Queue Length 95th (m)	2.5	71.4	2.9	38.3	#156.0	35.0	10.0	0.0
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	321	1027	729	444	866	556	1192	847
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.43	0.05	0.41	0.72	0.32	0.08	0.01

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	428	35	176	609	0	172	2	92	1	0	6
Future Volume (vph)	7	428	35	176	609	0	172	2	92	1	0	6
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1429	1613	1119	1410	1361		1429	1237			1360	
Flt Permitted	0.34	1.00	1.00	0.47	1.00		0.91	1.00			1.00	
Satd. Flow (perm)	504	1613	1119	697	1361		1367	1237			1370	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	7	437	36	180	621	0	176	2	94	1	0	6
RTOR Reduction (vph)	0	0	15	0	0	0	0	72	0	0	7	0
Lane Group Flow (vph)	7	437	21	180	621	0	176	24	0	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	0%	1%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	42.8	42.8	42.8	42.8	42.8		17.2	17.2			1.4	
Effective Green, g (s)	42.8	42.8	42.8	42.8	42.8		17.2	17.2			1.4	
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.59		0.24	0.24			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	298	956	663	413	806		336	294			26	
v/s Ratio Prot		0.27			c0.46		c0.09	0.02				
v/s Ratio Perm	0.01		0.02	0.26			c0.03				0.00	
v/c Ratio	0.02	0.46	0.03	0.44	0.77		0.52	0.08			0.01	
Uniform Delay, d1	6.1	8.2	6.1	8.1	11.0		23.9	21.4			34.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.1	1.6	0.1	3.3	7.0		1.1	0.1			0.1	
Delay (s)	6.2	9.8	6.2	11.4	18.0		25.0	21.5			34.8	
Level of Service	A	A	A	B	B		C	C			C	
Approach Delay (s)		9.5			16.5			23.8			34.8	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	512	8	17	776	9	8
Future Volume (Veh/h)	512	8	17	776	9	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	517	8	17	784	9	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	68					
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			525		1339	521
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			361		1312	356
tC, single (s)			4.3		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.3
p0 queue free %			98		94	99
cM capacity (veh/h)			925		148	593

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	525	801	17
Volume Left	0	17	9
Volume Right	8	0	8
cSH	1700	925	229
Volume to Capacity	0.31	0.02	0.07
Queue Length 95th (m)	0.0	0.4	1.9
Control Delay (s)	0.0	0.5	21.9
Lane LOS		A	C
Approach Delay (s)	0.0	0.5	21.9
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	11	255	7	13	199
Future Volume (Veh/h)	11	11	255	7	13	199
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	16	16	364	10	19	284
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						99
pX, platoon unblocked	0.98					
vC, conflicting volume	691	369			374	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	672	369			374	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			98	
cM capacity (veh/h)	408	681			1196	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	374	303
Volume Left	16	0	19
Volume Right	16	10	0
cSH	510	1700	1196
Volume to Capacity	0.06	0.22	0.02
Queue Length 95th (m)	1.6	0.0	0.4
Control Delay (s)	12.5	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	12.5	0.0	0.6
Approach LOS	B		

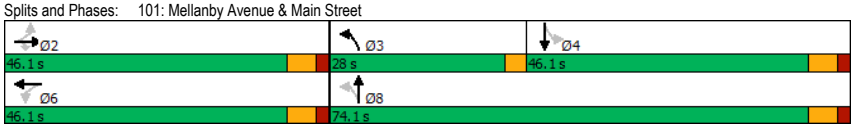
Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Configurations								
Traffic Volume (vph)	3	403	46	141	472	134	0	2
Future Volume (vph)	3	403	46	141	472	134	0	2
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	NA
Protected Phases		2			6	3	8	4
Permitted Phases	2		2	6		8		
Detector Phase	2	2	2	6	6	3	8	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1	6.1
Lead/Lag						Lead		Lag
Lead-Lag Optimize?						Yes		Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None
Act Effct Green (s)	44.2	44.2	44.2	44.2	44.2	14.4	11.2	8.1
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.65	0.21	0.17	0.12
v/c Ratio	0.01	0.41	0.06	0.33	0.56	0.47	0.19	0.02
Control Delay	7.0	8.5	2.5	9.7	11.3	27.0	1.1	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	8.5	2.5	9.7	11.3	27.0	1.1	24.0
LOS	A	A	A	A	B	C	A	C
Approach Delay		7.9			10.9		18.5	24.0
Approach LOS		A			B		B	C

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 67.8
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 11.1 Intersection LOS: B
Intersection Capacity Utilization 73.9% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	3	424	48	148	500	141	69	4
v/c Ratio	0.01	0.41	0.06	0.33	0.56	0.47	0.19	0.02
Control Delay	7.0	8.5	2.5	9.7	11.3	27.0	1.1	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	8.5	2.5	9.7	11.3	27.0	1.1	24.0
Queue Length 50th (m)	0.1	18.2	0.0	6.0	24.8	15.1	0.0	0.2
Queue Length 95th (m)	1.4	65.1	4.3	28.5	92.8	28.6	0.0	3.0
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	418	1041	768	448	895	543	1153	861
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.41	0.06	0.33	0.56	0.26	0.06	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	403	46	141	472	3	134	0	66	0	2	2
Future Volume (vph)	3	403	46	141	472	3	134	0	66	0	2	2
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1428	1597	1148	1348	1373		1429	1196			1444	
Flt Permitted	0.43	1.00	1.00	0.48	1.00		0.91	1.00			1.00	
Satd. Flow (perm)	642	1597	1148	686	1373		1367	1196			1444	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	424	48	148	497	3	141	0	69	0	2	2
RTOR Reduction (vph)	0	0	19	0	0	0	0	54	0	0	2	0
Lane Group Flow (vph)	3	424	29	148	500	0	141	15	0	0	2	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	0%	2%	0%	6%	1%	0%	0%	0%	3%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA			NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	44.3	44.3	44.3	44.3	44.3		16.3	16.3			1.4	
Effective Green, g (s)	44.3	44.3	44.3	44.3	44.3		16.3	16.3			1.4	
Actuated g/C Ratio	0.61	0.61	0.61	0.61	0.61		0.22	0.22			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	390	971	698	417	835		316	267			27	
v/s Ratio Prot		0.27			c0.36		c0.07	0.01			0.00	
v/s Ratio Perm	0.00		0.03	0.22			c0.03					
v/c Ratio	0.01	0.44	0.04	0.35	0.60		0.45	0.06			0.08	
Uniform Delay, d1	5.6	7.6	5.7	7.1	8.8		24.3	22.2			35.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	1.4	0.1	2.4	3.2		0.7	0.1			0.9	
Delay (s)	5.6	9.0	5.8	9.5	11.9		25.1	22.3			35.9	
Level of Service	A	A	A	A	B		C	C			D	
Approach Delay (s)		8.7			11.4			24.1			35.9	
Approach LOS		A			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	15.2
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	465	5	17	608	8	7
Future Volume (Veh/h)	465	5	17	608	8	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	495	5	18	647	9	7
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	68					
pX, platoon unblocked			0.87		0.87	0.87
vC, conflicting volume			500		1180	498
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			345		1131	342
tC, single (s)			4.1		6.9	6.2
tC, 2 stage (s)						
tF (s)			2.2		4.0	3.3
p0 queue free %			98		94	99
cM capacity (veh/h)			1061		155	611

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	500	665	16
Volume Left	0	18	9
Volume Right	5	0	7
cSH	1700	1061	230
Volume to Capacity	0.29	0.02	0.07
Queue Length 95th (m)	0.0	0.4	1.8
Control Delay (s)	0.0	0.5	21.8
Lane LOS		A	C
Approach Delay (s)	0.0	0.5	21.8
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	15	185	7	11	178
Future Volume (Veh/h)	11	15	185	7	11	178
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50
Hourly flow rate (vph)	22	30	370	14	22	356
Pedestrians			1			4
Lane Width (m)			3.6			3.6
Walking Speed (m/s)			1.2			1.2
Percent Blockage			0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						99
pX, platoon unblocked	1.00					
vC, conflicting volume	778	381			384	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	776	381			384	
tC, single (s)	6.6	6.2			4.7	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.7	
p0 queue free %	93	96			98	
cM capacity (veh/h)	332	668			918	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	52	384	378
Volume Left	22	0	22
Volume Right	30	14	0
cSH	468	1700	918
Volume to Capacity	0.11	0.23	0.02
Queue Length 95th (m)	3.0	0.0	0.6
Control Delay (s)	13.7	0.0	0.8
Lane LOS	B		A
Approach Delay (s)	13.7	0.0	0.8
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix F

OTM Traffic Signal Justification Warrants

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

Horizon Year: Total Traffic
Region/City/Township: City of Port Colborne

Major Street: Main Street West
Minor Street: Lock 8 Park

North/South: N

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

PM Forecast Only? N

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

Time Period	Major Street						Minor Street						Peds Crossing Main Road
	Main Street West						Lock 8 Park						
	Eastbound			Westbound			Northbound			Southbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour		358	2	6	365		6		14				1
PM Peak Hour		486	7	18	737		10		8				0
Average Hourly Volume	**0**	**211**	**2**	**6**	**276**	**0**	**4**	**0**	**6**	**0**	**0**	**0**	**0**

Warrant	AHV
1A - All	504
1B - Mino	10
2A - Majo	495
2B - Cros	4

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	504
					% Fulfilled	70.0%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	10
					% Fulfilled	3.7%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	495
					% Fulfilled	68.7%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	4
					% Fulfilled	5.7%

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

Horizon Year: Total Traffic
Region/City/Township: City of Port Colborne

Major Street: Mellanby Avenue
Minor Street: Lock 8 Driveway
North/South: Y

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

PM Forecast Only? N

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

Time Period	Major Street						Minor Street						Peds Crossing Main Road
	Mellanby Avenue						Lock 8 Driveway						
	Northbound			Southbound			Eastbound			Westbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour		92	7	7	109					6		11	0
PM Peak Hour		182	7	13	154					10		11	0
Average Hourly Volume	**0**	**69**	**4**	**5**	**66**	**0**	**0**	**0**	**0**	**4**	**0**	**6**	**0**

Warrant	AHV
1A - All	152
1B - Mino	10
2A - Majo	143
2B - Cros	4

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	152
					% Fulfilled	**21.1%**

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	10
					% Fulfilled	**3.7%**

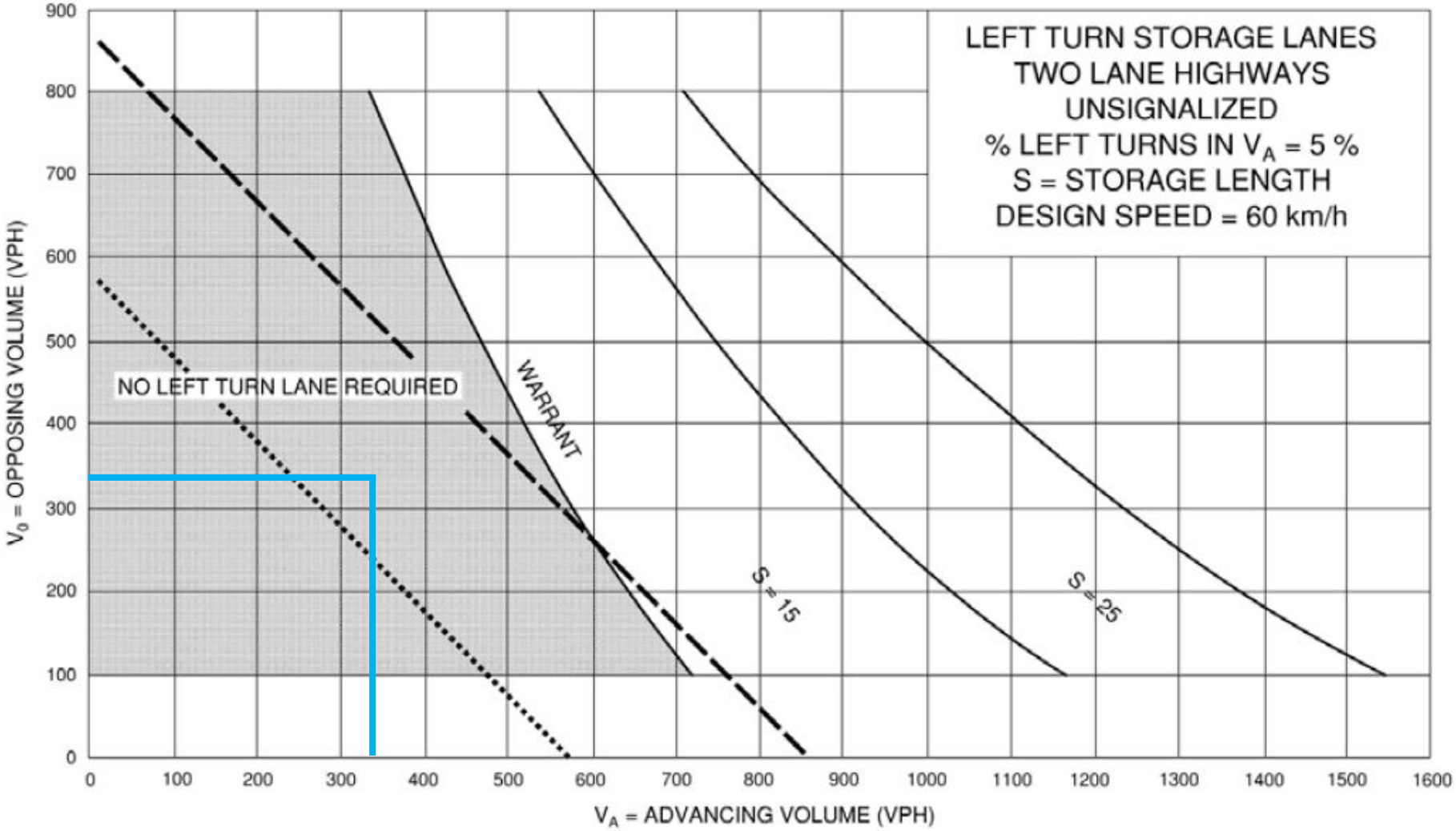
Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	143
					% Fulfilled	**19.8%**

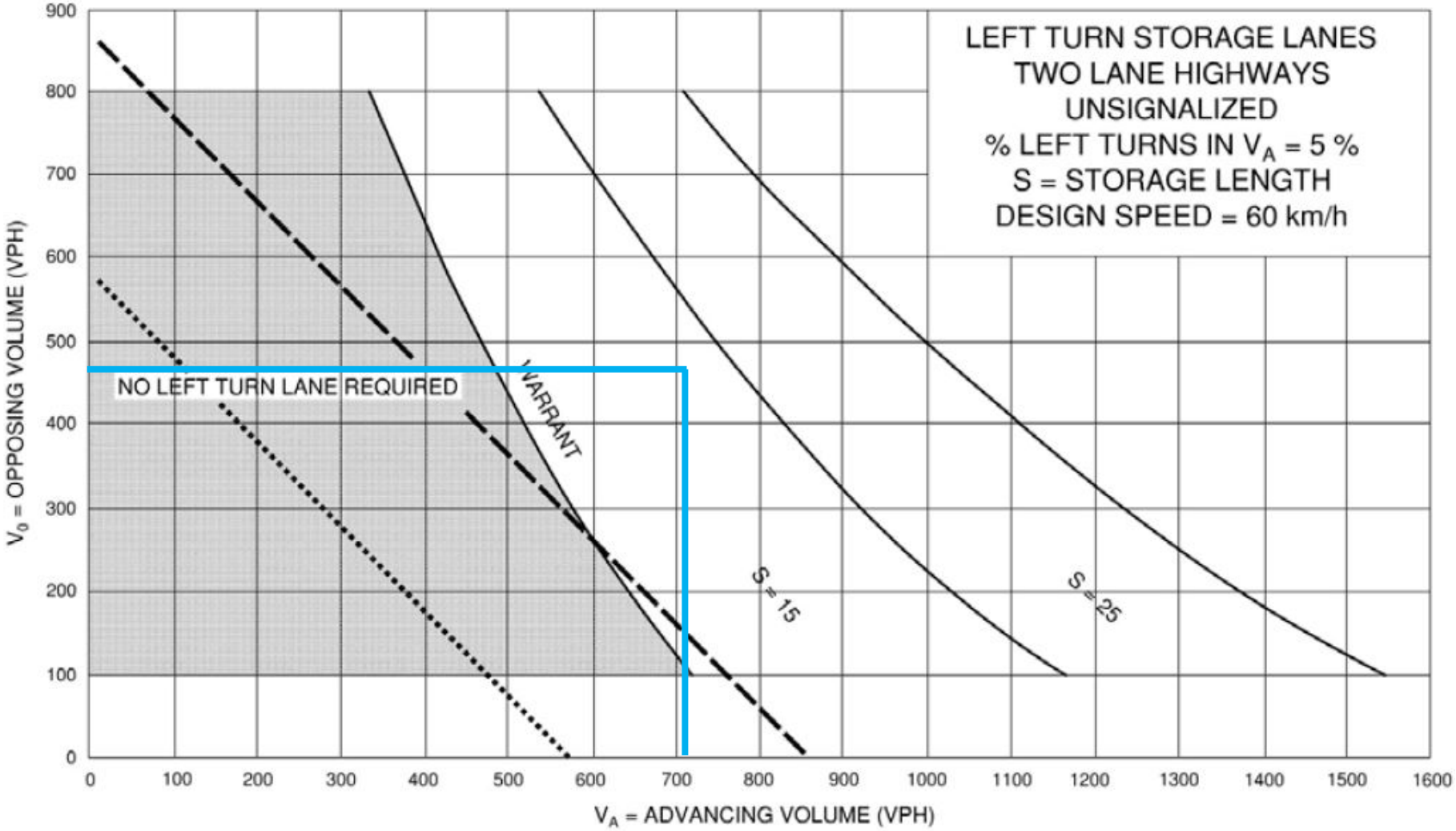
2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	4
					% Fulfilled	**5.3%**

Appendix G

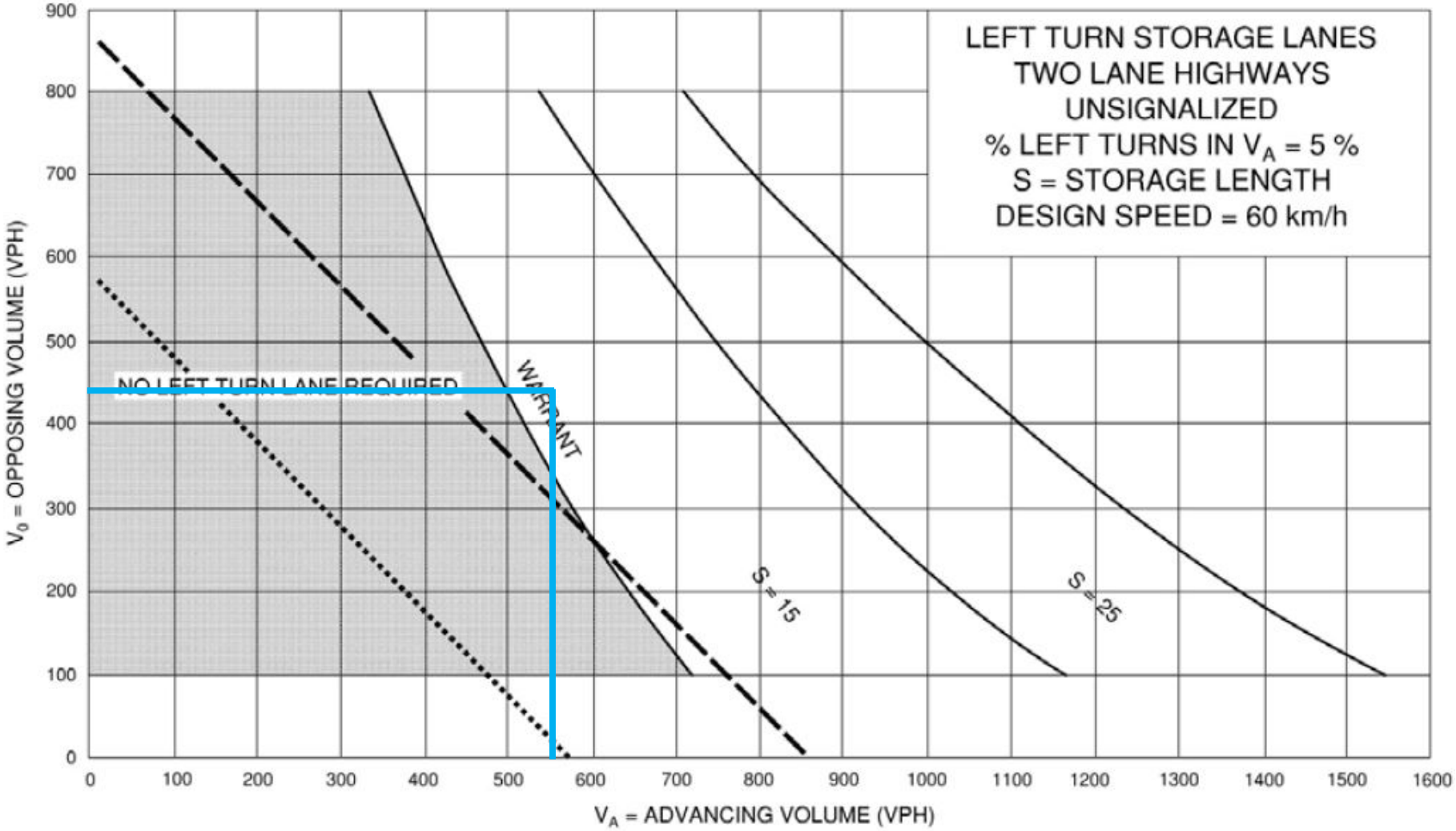
Remedial – Total Traffic Operations Reports



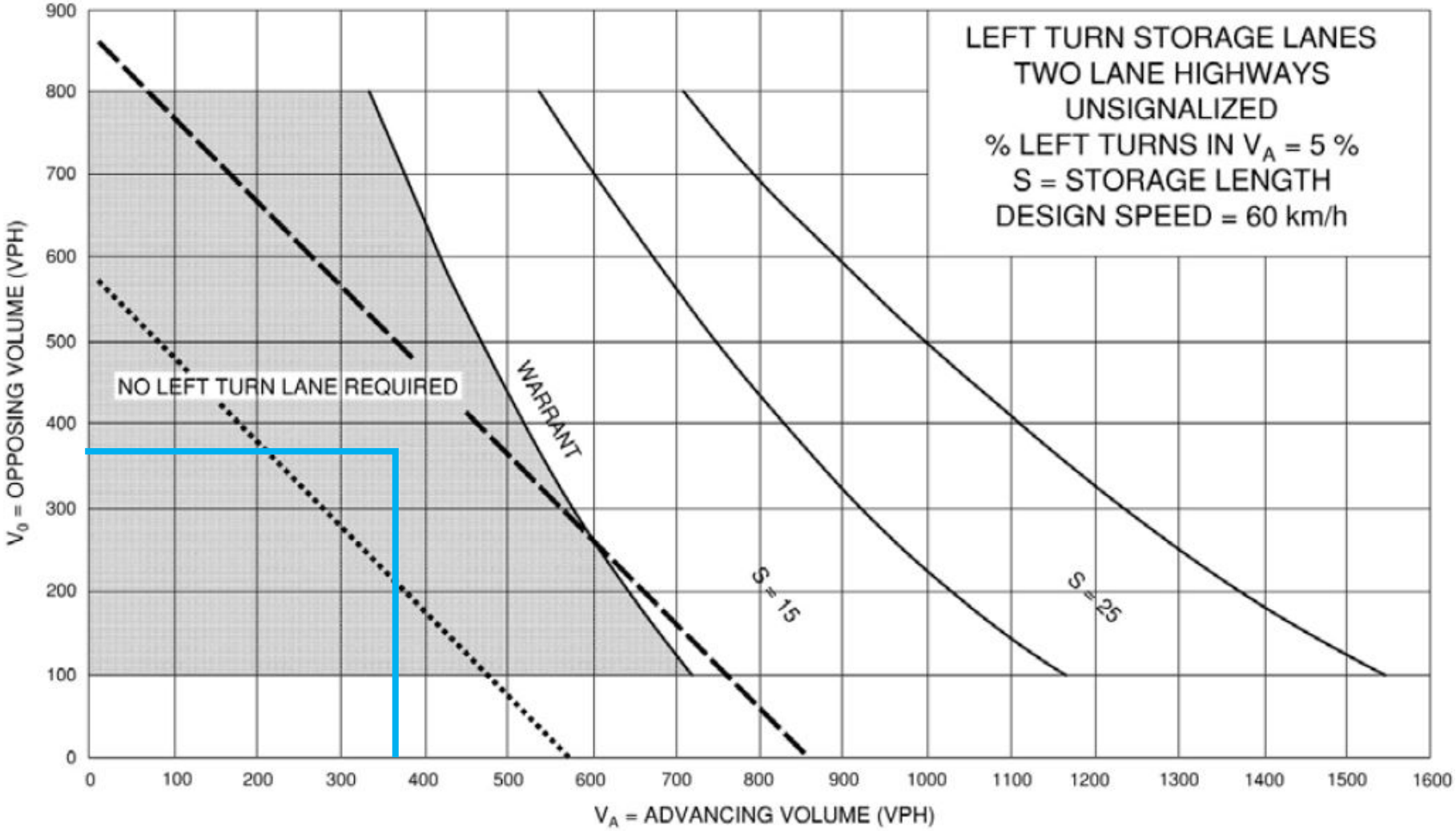
Main Street West at Lock 8 Park Driveway
AM Peak Hour – Base Traffic Horizon



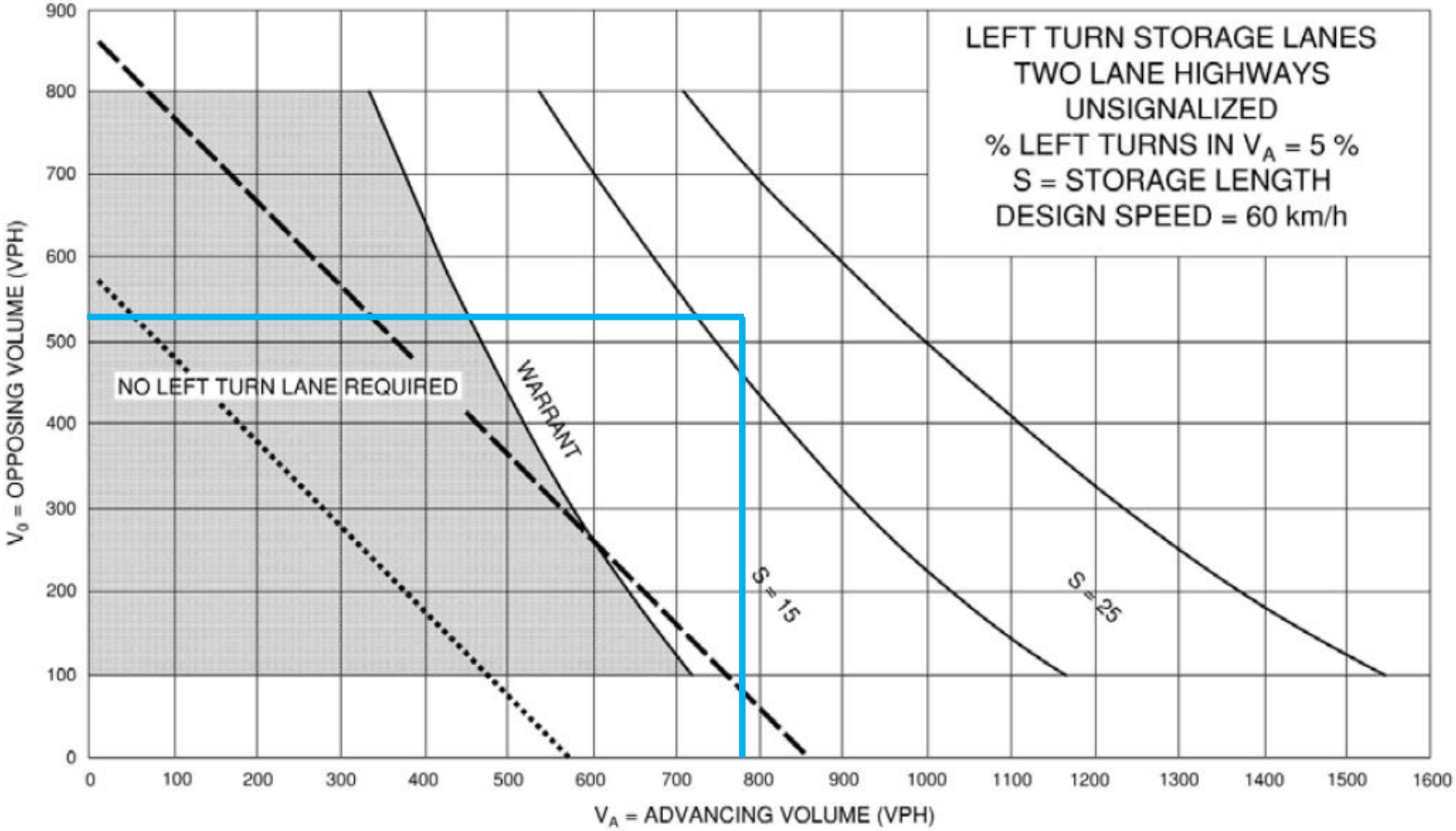
Main Street West at Lock 8 Park Driveway
PM Peak Hour – Base Traffic Horizon



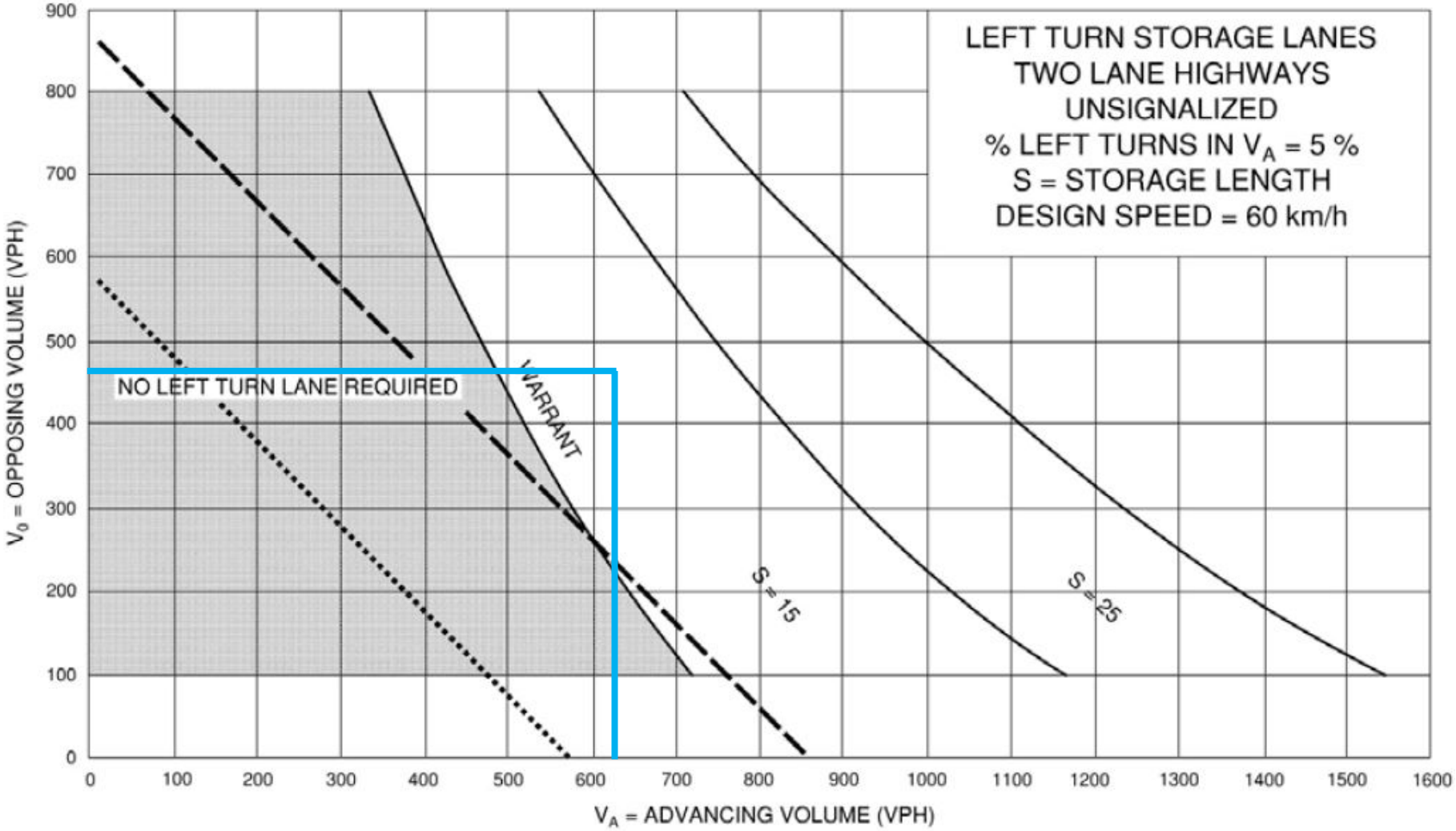
Main Street West at Lock 8 Park Driveway
Saturday Peak Hour – Base Traffic Horizon



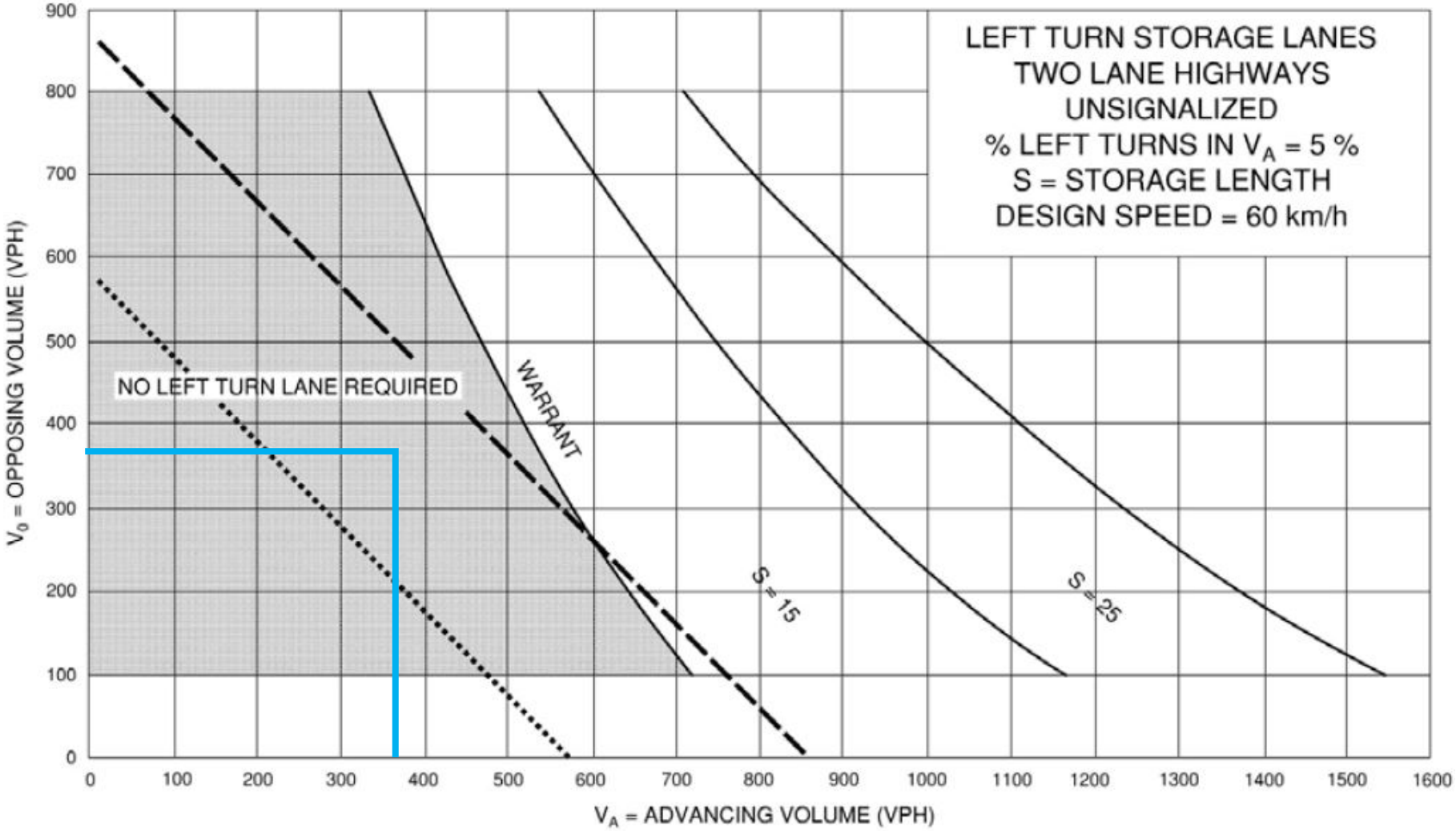
Main Street West at Lock 8 Park Driveway
AM Peak Hour – Background Traffic Horizon



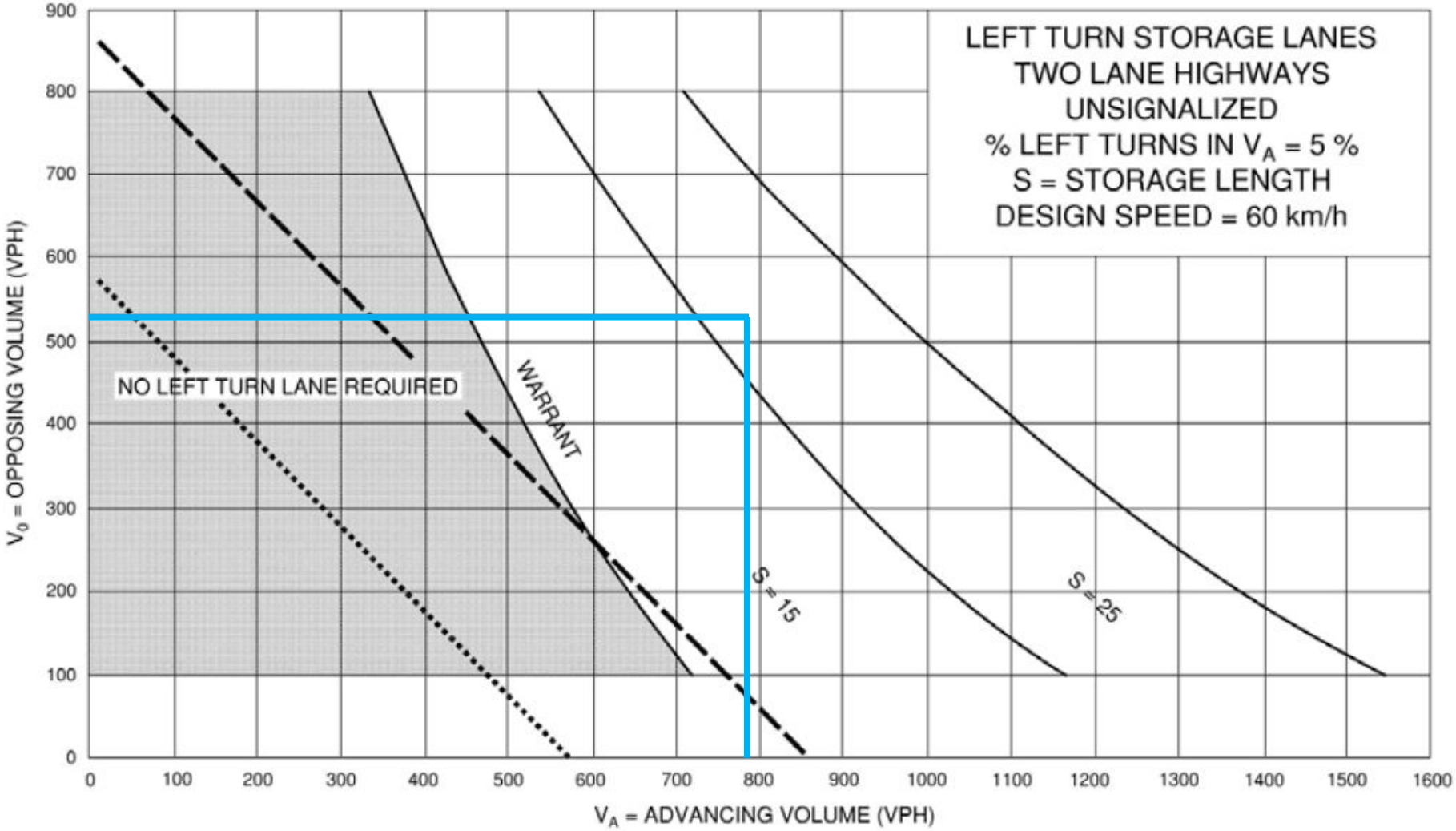
Main Street West at Lock 8 Park Driveway
PM Peak Hour – Background Traffic Horizon



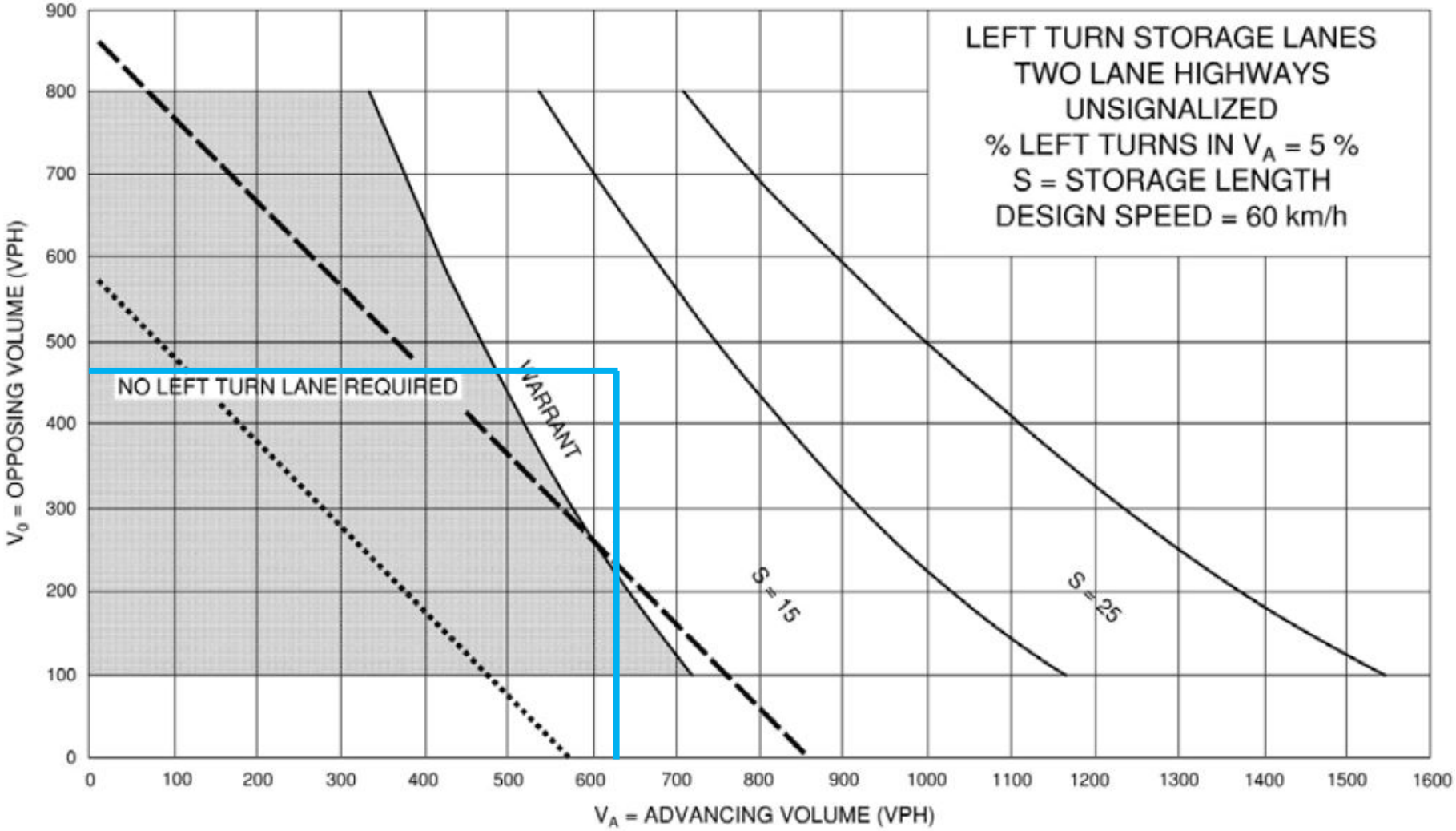
Main Street West at Lock 8 Park Driveway
Saturday Peak Hour – Background Traffic Horizon



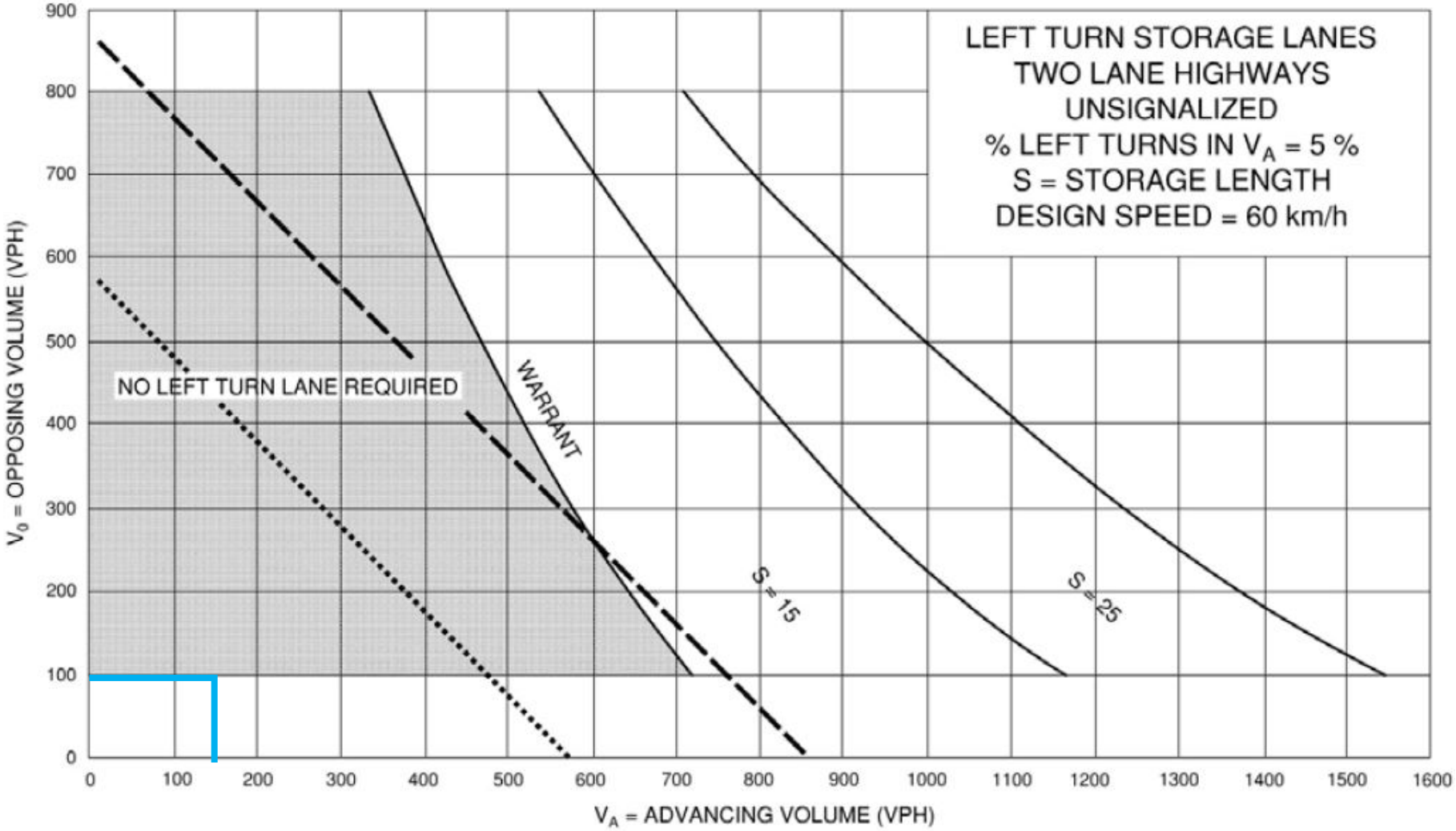
Main Street West at Lock 8 Park Driveway
AM Peak Hour – Total Traffic Horizon



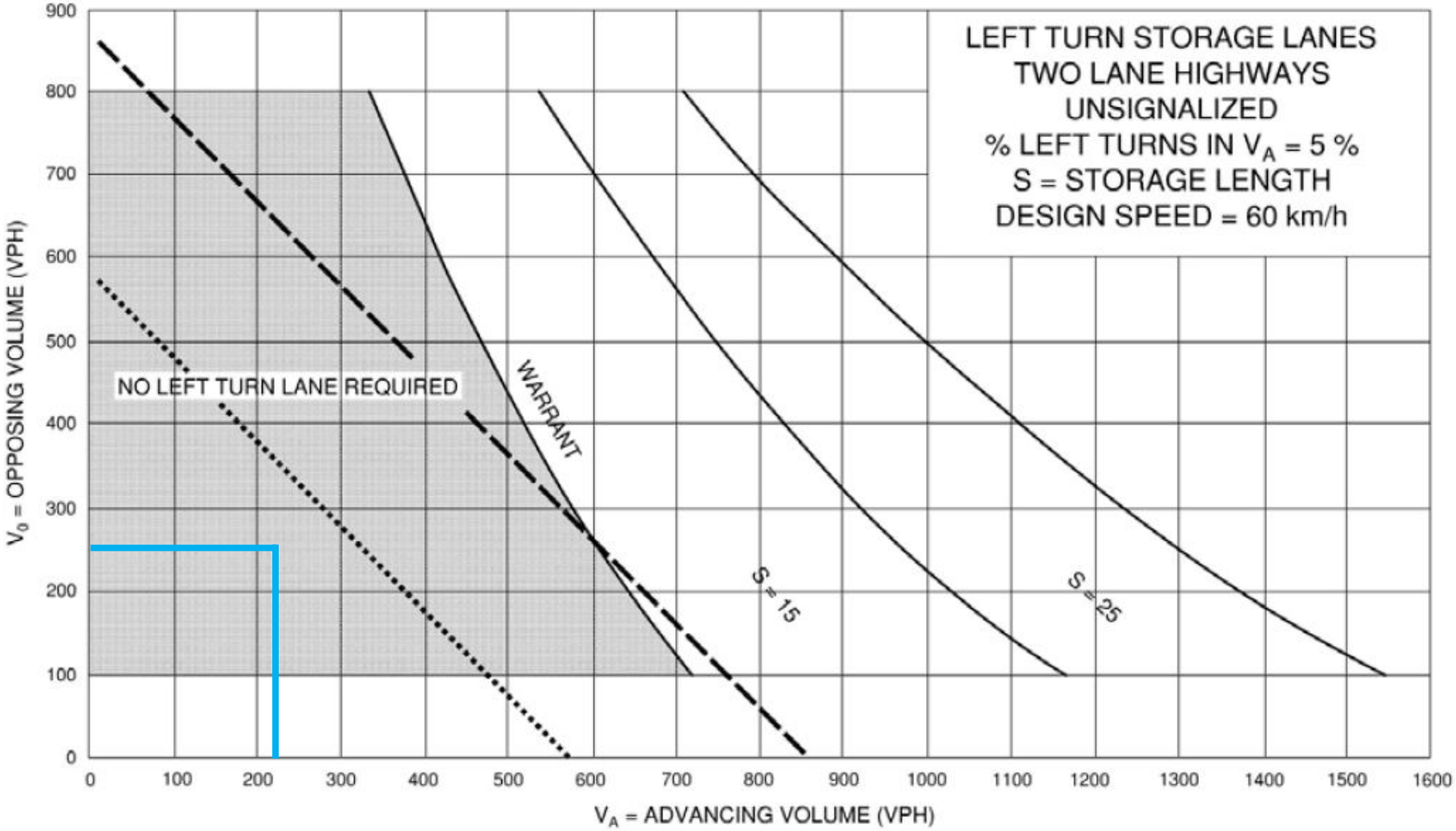
Main Street West at Lock 8 Park Driveway
PM Peak Hour – Total Traffic Horizon



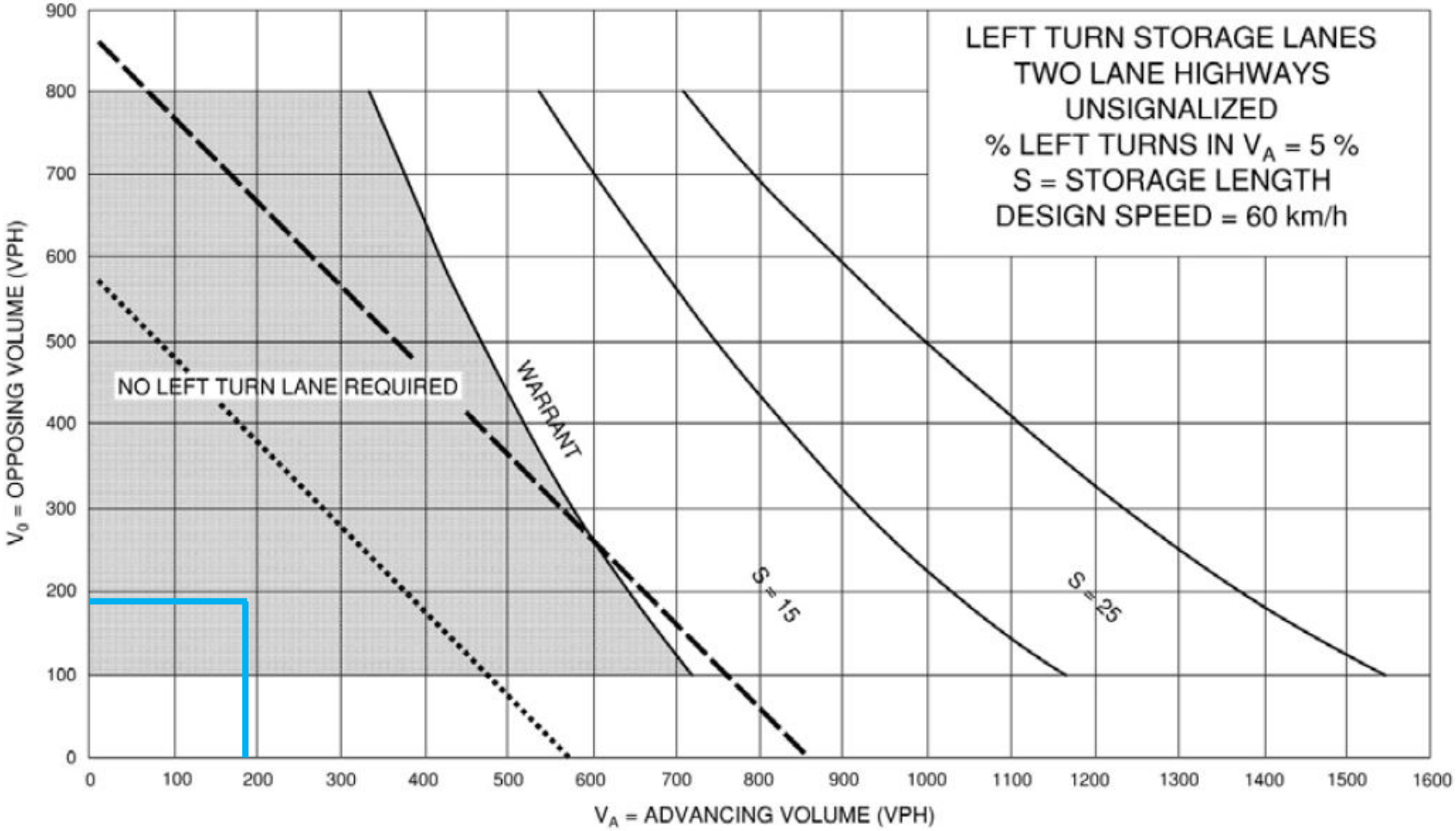
Main Street West at Lock 8 Park Driveway
Saturday Peak Hour – Total Traffic Horizon



Mellanby Avenue at Lock 8 Park Driveway
AM Peak Period – Base Traffic Horizon



Mellanby Avenue at Lock 8 Park Driveway
PM Peak Period – Base Traffic Horizon



Mellanby Avenue at Lock 8 Park Driveway
Saturday Peak Period – Base Traffic Horizon

Appendix H

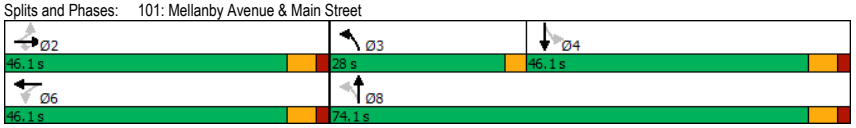
Left Turn Lane Warrant Nomograph

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	330	25	101	272	79	3	2	1
Future Volume (vph)	2	330	25	101	272	79	3	2	1
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		2			6	3	8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	2	2	2	6	6	3	8	4	4
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1		6.1
Lead/Lag						Lead		Lag	Lag
Lead-Lag Optimize?						Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	48.6	48.6	48.6	48.6	48.6	12.7	10.7		8.1
Actuated g/C Ratio	0.72	0.72	0.72	0.72	0.72	0.19	0.16		0.12
v/c Ratio	0.00	0.35	0.04	0.22	0.34	0.37	0.24		0.05
Control Delay	6.5	7.1	1.2	7.5	7.4	26.2	10.5		21.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	6.5	7.1	1.2	7.5	7.4	26.2	10.5		21.4
LOS	A	A	A	A	A	C	B		C
Approach Delay		6.7			7.4		20.5		21.4
Approach LOS		A			A		C		C

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 67.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.37
Intersection Signal Delay: 9.1 — Intersection LOS: A
Intersection Capacity Utilization 56.1% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	2	388	29	119	321	93	53	8
v/c Ratio	0.00	0.35	0.04	0.22	0.34	0.37	0.24	0.05
Control Delay	6.5	7.1	1.2	7.5	7.4	26.2	10.5	21.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	7.1	1.2	7.5	7.4	26.2	10.5	21.4
Queue Length 50th (m)	0.1	16.3	0.0	4.5	13.5	10.6	0.5	0.4
Queue Length 95th (m)	1.0	50.4	1.5	18.4	43.5	19.1	7.3	4.0
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	615	1122	719	542	948	503	1085	840
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.35	0.04	0.22	0.34	0.18	0.05	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	330	25	101	272	1	79	3	42	2	1	4
Future Volume (vph)	2	330	25	101	272	1	79	3	42	2	1	4
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.86			0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1429	1551	982	1363	1309		1333	1125			1381	
Flt Permitted	0.57	1.00	1.00	0.52	1.00		0.91	1.00			1.00	
Satd. Flow (perm)	851	1551	982	749	1309		1276	1125			1398	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	2	388	29	119	320	1	93	4	49	2	1	5
RTOR Reduction (vph)	0	0	10	0	0	0	0	40	0	0	5	0
Lane Group Flow (vph)	2	388	19	119	321	0	93	13	0	0	3	0
Confl. Peds. (#/hr)			7	7			1		1	1		1
Heavy Vehicles (%)	0%	5%	13%	4%	6%	0%	7%	67%	4%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	47.3	47.3	47.3	47.3	47.3		13.3	13.3			1.4	
Effective Green, g (s)	47.3	47.3	47.3	47.3	47.3		13.3	13.3			1.4	
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.65		0.18	0.18			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	552	1007	638	486	850		240	205			26	
v/s Ratio Prot		c0.25			0.25		c0.05	0.01				
v/s Ratio Perm	0.00		0.02	0.16			c0.02				0.00	
v/c Ratio	0.00	0.39	0.03	0.24	0.38		0.39	0.06			0.12	
Uniform Delay, d1	4.5	6.0	4.6	5.3	5.9		26.1	24.6			35.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	1.1	0.1	1.2	1.3		0.8	0.1			1.5	
Delay (s)	4.5	7.1	4.6	6.5	7.2		26.9	24.7			36.6	
Level of Service	A	A	A	A	A		C	C			D	
Approach Delay (s)		6.9			7.0			26.1			36.6	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	15.2
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	374	0	0	375	0	0
Future Volume (Veh/h)	374	0	0	375	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	440	0	0	441	0	0
Pedestrians				1		
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)	68					
pX, platoon unblocked			0.89		0.89	0.89
vC, conflicting volume			440		881	441
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			314		807	315
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	100
cM capacity (veh/h)			1124		316	652

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	440	441	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1124	1700
Volume to Capacity	0.26	0.00	0.05
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	31	93	7	15	113
Future Volume (Veh/h)	6	31	93	7	15	113
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	8	42	126	9	20	153
Pedestrians	2					
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)						99
pX, platoon unblocked						
vC, conflicting volume	326	132			137	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	326	132			137	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	95			99	
cM capacity (veh/h)	662	921			1457	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	50	135	173
Volume Left	8	0	20
Volume Right	42	9	0
cSH	867	1700	1457
Volume to Capacity	0.06	0.08	0.01
Queue Length 95th (m)	1.5	0.0	0.3
Control Delay (s)	9.4	0.0	1.0
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	1.0
Approach LOS	A		

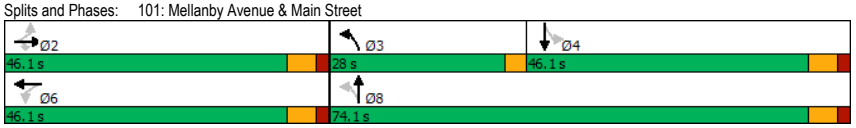
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	418	43	193	600	181	2	1	0
Future Volume (vph)	7	418	43	193	600	181	2	1	0
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		2			6	3	8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	2	2	2	6	6	3	8	4	4
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1		6.1
Lead/Lag						Lead		Lag	Lag
Lead-Lag Optimize?						Yes		Yes	Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	42.2	42.2	42.2	42.2	42.2	15.5	12.3		8.1
Actuated g/C Ratio	0.63	0.63	0.63	0.63	0.63	0.23	0.18		0.12
v/c Ratio	0.02	0.42	0.06	0.44	0.71	0.56	0.34		0.03
Control Delay	7.9	9.4	2.5	12.7	17.2	28.4	8.0		0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	7.9	9.4	2.5	12.7	17.2	28.4	8.0		0.3
LOS	A	A	A	B	B	C	A		A
Approach Delay		8.8			16.1		21.1		0.3
Approach LOS		A			B		C		A

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 66.9
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 14.7 — Intersection LOS: B
Intersection Capacity Utilization 86.1% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	7	427	44	197	612	185	104	7
v/c Ratio	0.02	0.42	0.06	0.44	0.71	0.56	0.34	0.03
Control Delay	7.9	9.4	2.5	12.7	17.2	28.4	8.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	9.4	2.5	12.7	17.2	28.4	8.0	0.3
Queue Length 50th (m)	0.2	20.0	0.0	9.4	38.2	20.4	0.2	0.0
Queue Length 95th (m)	2.6	70.6	4.0	43.5	#154.7	36.7	10.2	0.0
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	321	1018	723	447	859	561	1198	850
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.42	0.06	0.44	0.71	0.33	0.09	0.01

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	418	43	193	600	0	181	2	100	1	0	6
Future Volume (vph)	7	418	43	193	600	0	181	2	100	1	0	6
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1429	1613	1119	1410	1361		1429	1236			1360	
Flt Permitted	0.34	1.00	1.00	0.48	1.00		0.93	1.00			1.00	
Satd. Flow (perm)	510	1613	1119	706	1361		1399	1236			1370	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	7	427	44	197	612	0	185	2	102	1	0	6
RTOR Reduction (vph)	0	0	18	0	0	0	0	77	0	0	7	0
Lane Group Flow (vph)	7	427	26	197	612	0	185	27	0	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	0%	1%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	42.2	42.2	42.2	42.2	42.2		17.4	17.4			1.3	
Effective Green, g (s)	42.2	42.2	42.2	42.2	42.2		17.4	17.4			1.3	
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.59		0.24	0.24			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	299	948	657	414	799		344	299			24	
v/s Ratio Prot		0.26			c0.45		c0.10	0.02				
v/s Ratio Perm	0.01		0.02	0.28			c0.03				0.00	
v/c Ratio	0.02	0.45	0.04	0.48	0.77		0.54	0.09			0.01	
Uniform Delay, d1	6.2	8.3	6.2	8.5	11.1		23.7	21.1			34.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.1	1.5	0.1	3.9	6.9		1.3	0.1			0.1	
Delay (s)	6.3	9.8	6.4	12.4	18.0		24.9	21.2			34.7	
Level of Service	A	A	A	B	B		C	C			C	
Approach Delay (s)		9.5			16.6			23.6			34.7	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	15.2
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	518	0	0	793	0	0
Future Volume (Veh/h)	518	0	0	793	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	523	0	0	801	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	68					
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			523		1324	523
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			363		1295	363
tC, single (s)			4.3		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			927		155	590

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	523	801	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	927	1700
Volume to Capacity	0.31	0.00	0.07
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	28	255	7	38	199
Future Volume (Veh/h)	11	28	255	7	38	199
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	16	40	364	10	54	284
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						99
pX, platoon unblocked	0.97					
vC, conflicting volume	761	369			374	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	737	369			374	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	94			95	
cM capacity (veh/h)	359	681			1196	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	56	374	338
Volume Left	16	0	54
Volume Right	40	10	0
cSH	542	1700	1196
Volume to Capacity	0.10	0.22	0.05
Queue Length 95th (m)	2.7	0.0	1.1
Control Delay (s)	12.4	0.0	1.7
Lane LOS	B		A
Approach Delay (s)	12.4	0.0	1.7
Approach LOS	B		

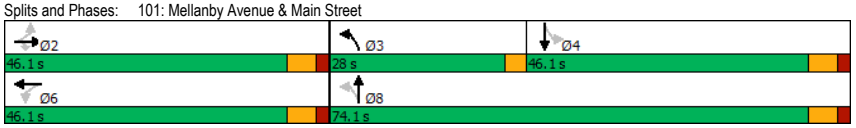
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Configurations								
Traffic Volume (vph)	3	360	48	143	420	128	0	2
Future Volume (vph)	3	360	48	143	420	128	0	2
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	NA
Protected Phases		2			6	3	8	4
Permitted Phases	2		2	6		8		
Detector Phase	2	2	2	6	6	3	8	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	6.0	8.0	8.0
Minimum Split (s)	24.1	24.1	24.1	24.1	24.1	10.5	24.1	24.1
Total Split (s)	46.1	46.1	46.1	46.1	46.1	28.0	74.1	46.1
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	23.3%	61.6%	38.4%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	4.1	4.1
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.1	3.0	6.1	6.1
Lead/Lag						Lead		Lag
Lead-Lag Optimize?						Yes		Yes
Recall Mode	Max	Max	Max	Max	Max	None	None	None
Act Effct Green (s)	44.3	44.3	44.3	44.3	44.3	14.2	11.1	8.1
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.65	0.21	0.16	0.12
v/c Ratio	0.01	0.36	0.07	0.31	0.50	0.45	0.18	0.02
Control Delay	6.7	7.9	2.6	9.2	10.0	26.6	1.0	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	7.9	2.6	9.2	10.0	26.6	1.0	24.0
LOS	A	A	A	A	B	C	A	C
Approach Delay		7.3			9.8		17.6	24.0
Approach LOS		A			A		B	C

Intersection Summary

Cycle Length: 120.2
Actuated Cycle Length: 67.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.50
Intersection Signal Delay: 10.3 — Intersection LOS: B
Intersection Capacity Utilization 69.7% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 101: Mellanby Avenue & Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	3	379	51	151	445	135	73	4
v/c Ratio	0.01	0.36	0.07	0.31	0.50	0.45	0.18	0.02
Control Delay	6.7	7.9	2.6	9.2	10.0	26.6	1.0	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	7.9	2.6	9.2	10.0	26.6	1.0	24.0
Queue Length 50th (m)	0.1	15.7	0.0	6.0	20.8	14.4	0.0	0.2
Queue Length 95th (m)	1.4	55.8	4.6	27.6	76.3	27.5	0.0	3.1
Internal Link Dist (m)		87.4			44.1		75.3	78.5
Turn Bay Length (m)	20.0		40.0	35.0		35.0		
Base Capacity (vph)	460	1044	769	481	897	543	1156	862
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.36	0.07	0.31	0.50	0.25	0.06	0.00

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	360	48	143	420	3	128	0	69	0	2	2
Future Volume (vph)	3	360	48	143	420	3	128	0	69	0	2	2
Ideal Flow (vphpl)	1504	1629	1351	1504	1388	1388	1504	1388	1388	1483	1483	1483
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	4.0	3.6	3.6	4.0	3.6
Total Lost time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1427	1597	1148	1348	1373		1429	1196			1444	
Flt Permitted	0.47	1.00	1.00	0.52	1.00		0.91	1.00			1.00	
Satd. Flow (perm)	704	1597	1148	736	1373		1367	1196			1444	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	379	51	151	442	3	135	0	73	0	2	2
RTOR Reduction (vph)	0	0	20	0	0	0	0	57	0	0	2	0
Lane Group Flow (vph)	3	379	31	151	445	0	135	16	0	0	2	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	0%	2%	0%	6%	1%	0%	0%	0%	3%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA			NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	44.3	44.3	44.3	44.3	44.3		16.2	16.2			1.4	
Effective Green, g (s)	44.3	44.3	44.3	44.3	44.3		16.2	16.2			1.4	
Actuated g/C Ratio	0.61	0.61	0.61	0.61	0.61		0.22	0.22			0.02	
Clearance Time (s)	6.1	6.1	6.1	6.1	6.1		3.0	6.1			6.1	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5			2.5	
Lane Grp Cap (vph)	428	973	699	448	836		314	266			27	
v/s Ratio Prot		0.24			c0.32		c0.07	0.01			0.00	
v/s Ratio Perm	0.00		0.03	0.21			c0.03					
v/c Ratio	0.01	0.39	0.04	0.34	0.53		0.43	0.06			0.08	
Uniform Delay, d1	5.6	7.3	5.7	7.0	8.2		24.2	22.3			35.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	1.2	0.1	2.0	2.4		0.7	0.1			0.9	
Delay (s)	5.6	8.4	5.8	9.0	10.6		24.9	22.3			35.9	
Level of Service	A	A	A	A	B		C	C			D	
Approach Delay (s)		8.1			10.2			24.0			35.9	
Approach LOS		A			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	15.2
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	429	0	0	566	0	0
Future Volume (Veh/h)	429	0	0	566	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	456	0	0	602	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	68					
pX, platoon unblocked			0.89		0.89	0.89
vC, conflicting volume			456		1058	456
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			323		1001	323
tC, single (s)			4.1		6.9	6.2
tC, 2 stage (s)						
tF (s)			2.2		4.0	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1107		195	641

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	456	602	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1107	1700
Volume to Capacity	0.27	0.00	0.07
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	29	168	6	32	161
Future Volume (Veh/h)	10	29	168	6	32	161
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50
Hourly flow rate (vph)	20	58	336	12	64	322
Pedestrians			1			4
Lane Width (m)			3.6			3.6
Walking Speed (m/s)			1.2			1.2
Percent Blockage			0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						99
pX, platoon unblocked	1.00					
vC, conflicting volume	793	346			348	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	790	346			348	
tC, single (s)	6.6	6.2			4.7	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.7	
p0 queue free %	94	92			93	
cM capacity (veh/h)	311	699			949	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	78	348	386
Volume Left	20	0	64
Volume Right	58	12	0
cSH	530	1700	949
Volume to Capacity	0.15	0.20	0.07
Queue Length 95th (m)	4.1	0.0	1.7
Control Delay (s)	13.0	0.0	2.1
Lane LOS	B		A
Approach Delay (s)	13.0	0.0	2.1
Approach LOS	B		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		