187 Dorchester Road
Transportation Impact Study

Paradigm Transportation Solutions Limited

June 2019

ptsl.com

Project Summary

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187 Dorchester Road Transportation Impact Study

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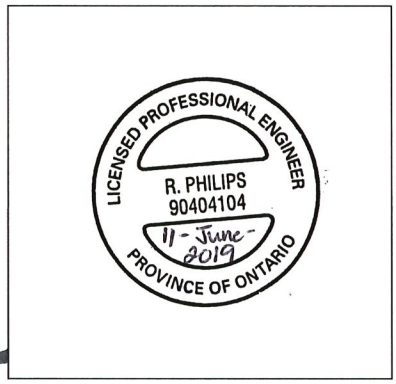

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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained by Sifton Properties Limited to conduct this Transportation Impact Study for a proposed mixed residential and commercial development at 187 Dorchester Road, in the community of Dorchester, Municipality of Thames Centre, Ontario.

This Transportation Impact Study describes the study area road system, analyzes existing traffic conditions, describes the proposed development, forecasts future background and total traffic volumes for three horizon years comprising opening year, five years beyond opening year and ten years beyond opening year, identifies any necessary remedial measures to mitigate the forecast traffic impacts, and provides recommendations for improvements to accommodate future traffic conditions, as appropriate.

Development Concept

The subject site is generally located on the southeast corner of Byron Avenue and Dorchester Road, and comprises an area of 20.86 hectares (51.55 acres). The lands are currently vacant and proposed to be developed to include 191 single detached residential dwellings, 1.34 hectares of medium density residential dwellings, and 1.65 hectares of commercial land uses. The development is anticipated to be fully built-out by 2023.

Since the completion of the TIS in November 2018, the Conceptual Plan of Subdivision has been revised and it currently includes 190 single detached residential dwellings, 1.46 hectares of medium density residential dwellings, and 1.32 hectares of commercial land uses. However, the trip generation based on the new conceptual subdivision plan is lower than that based on the previous plan. The analysis and results as originally completed are presented in this report, along with the new subdivision plan.

Vehicular access to the site is proposed via two new street connections; one each to Dorchester Road (Street A), and Byron Avenue (Street C). Street A is proposed to be located approximately 330 metres south of Byron Avenue (centreline to centreline), and Street C is proposed to be located immediately opposite Canterbury Drive, east of Dorchester Road.

Conclusions

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

- Under existing conditions all intersections in the study area are operating at acceptable levels of service during the weekday AM and PM peak hours, with no individual problem movements;

- Upon build-out of the subject lands, the site is forecast to generate 182 new trips in the weekday AM peak hour, and 291 new trips in the weekday PM peak hour;
- Under opening-year, five-year post build-out, and ten-year post build-out horizon years, all intersections in the study area are forecast to operate with acceptable levels of service during the weekday AM and PM peak hours, with the exception of the following critical movement:
  - The westbound left-turn movement on Byron Avenue at Dorchester Road is forecast to operate at LOS E at all three horizon years, with a maximum v/c ratio of 0.60 at the ten-year horizon.
- Investigation of Remedial Measures indicates following:
  - Traffic control signals are not warranted at Byron Avenue & Dorchester Road at the ten-year total traffic horizon or any preceding horizon year;
  - A southbound left-turn lane on Dorchester Road at Street A with 15 metres of storage is warranted; and
  - A westbound left-turn lane on Byron Avenue at Street C with 15 metres of storage is warranted, opposite the existing eastbound left-turn lane to Canterbury Drive.
- Adequate sight distances are available on Dorchester Road and Byron Avenue for vehicles exiting and entering the subject development via Street A or Street C.

Recommendations

Based on the findings of this study it is recommended that the development be approved as proposed, with the following modifications:

- The provision of a southbound left-turn lane on Dorchester Road at Street A with 15 metres of storage; and
- The provision of a westbound left-turn lane on Byron Avenue at Street C with 15 metres of storage, opposite the existing eastbound left-turn lane to Canterbury Drive.

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1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) has been retained by Sifton Properties Limited to complete this Transportation Impact Study for a proposed mixed-use development at 187 Dorchester Road in the Municipality of Thames Centre, County of Middlesex, Ontario. **Figure 1.1** illustrates the location of the subject site.

The subject site is generally located on the southeast corner of Byron Avenue and Dorchester Road, measuring approximately 20.86 hectares (51.55 acres) and is currently vacant. The lands are proposed to be built-out to include 191 single detached residential dwellings, 1.34 hectares of medium density residential units, and 1.65 hectares of commercial land uses.

Vehicular access to the subject site is proposed via two (2) new street connections; one opposite Canterbury Drive on Byron Avenue, and another located on Dorchester Road approximately 315 metres south of Byron Avenue. The subject site is proposed to be build-out by 2023.

Since the completion of the TIS in November 2018, the Conceptual Plan of Subdivision has been revised and it currently includes 190 single detached residential dwellings, 1.46 hectares of medium density residential dwellings, and 1.32 hectares of commercial land uses. However, the trip generation based on the new conceptual subdivision plan is lower than that based on the previous plan. The analysis and results as originally completed are presented in this report, along with the new subdivision plan.

The terms of reference for the TIS, including principles and assumptions, were submitted to the Municipality of Thames Centre and the County of Middlesex in May 2018. **Appendix A** contains the terms of reference submitted for review. This study has been carried out in general accordance with the Ontario Ministry of Transportation's Traffic Impact Study Guidelines.[1]

1.2 Purpose and Scope

The purpose of this report is to identify and assess the potential traffic impacts resulting from the proposed development. The report analyzes existing traffic conditions, describes the proposed development, forecasts future traffic volumes at the opening year horizon (2023), five years beyond opening year (2028) and ten years beyond opening year (2033) with and without the proposed development, investigates what, if any, remedial

[1] Ministry of Transportation, Ontario (MTO). September 2014. *Traffic Impact Study Guidelines.*

measures are needed to mitigate potential traffic impacts and provides recommendations to implement such remedial measures.

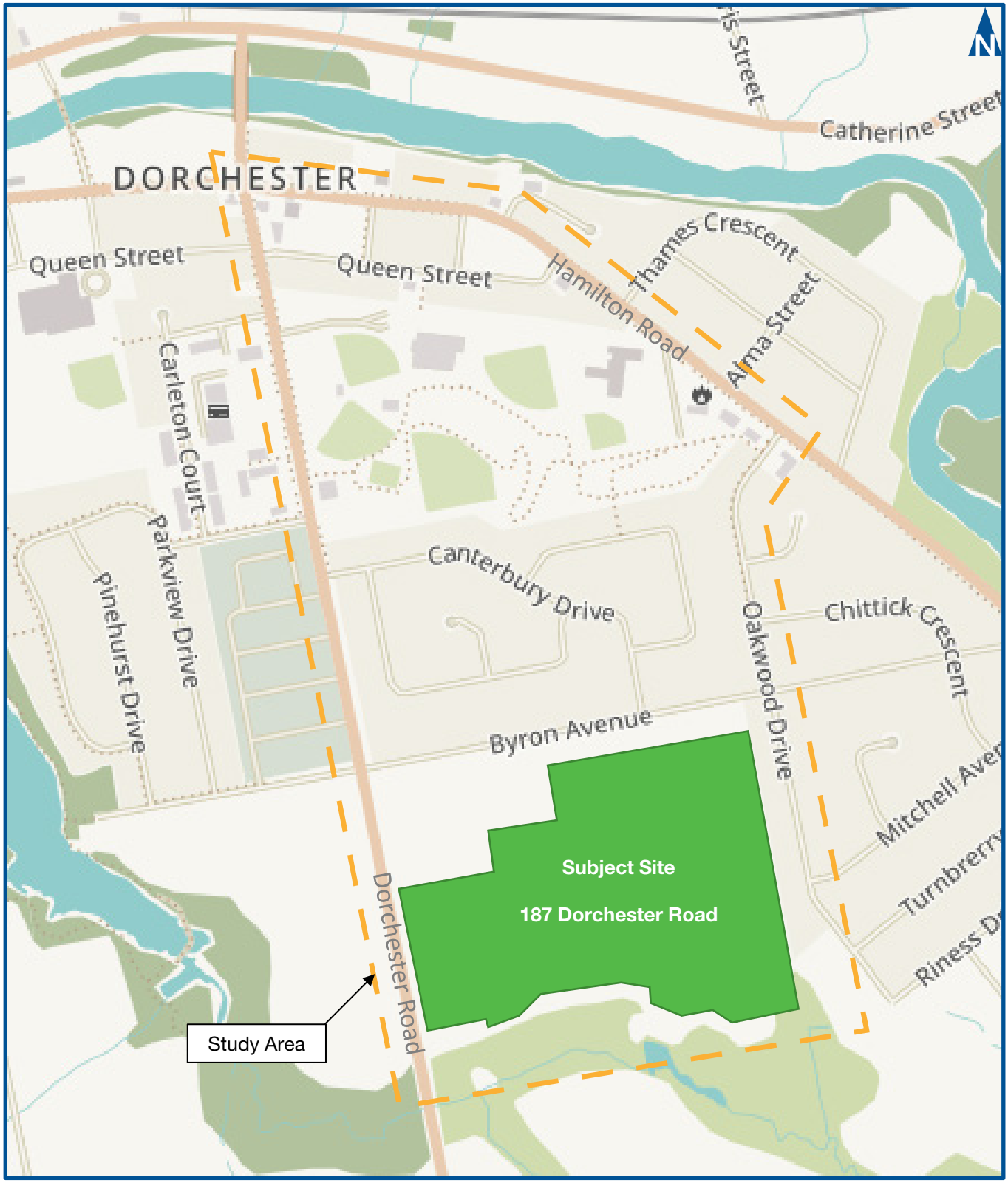
The scope of this study includes the following:

- Document current traffic and site conditions in the vicinity of the proposed development;
- Estimate the background traffic growth in the area including both road traffic and traffic from other new developments in the study area;
- Estimate the additional traffic forecast to be generated by the proposed development;
- Assign the traffic forecasts to the surrounding road network based on existing traffic patterns within the study area;
- Assess future traffic conditions, with and without the development, at the opening year horizon (2023), five years post-build-out (2028), and ten-years post-build-out (2033) and
- Identify any operational concerns and/or mitigation measures that may be required to improve operations.

1.3 Study Area

The intersections analysed in this study that are most likely to be impacted by the development include the following:

- Hamilton Road and Dorchester Road;
- Hamilton Road and Oakwood Drive;
- Byron Avenue and Dorchester Road;
- Byron Avenue and Canterbury Drive; and
- Byron Avenue and Hamilton Road.



paradigm TRANSPORTATION SOLUTIONS LIMITED

Location of Subject Site and Study Area
Municipality of Thames Centre

187 Dorchester Road TRIS
180123

Figure 1.1

2 Existing Conditions

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

2.1 Existing Roadways

The main roadways in the vicinity of the subject site that have been assessed include Dorchester Road, Hamilton Road, Byron Avenue, Canterbury Drive, and Oakwood Drive. The characteristics of these roadways are as follows:

- **Dorchester Road** (Middlesex Road 32) is a north-south, two-lane road that operates under the jurisdiction of Middlesex County. The roadway is classified as an arterial road in the County's Official Plan.[2] Within the study area, the roadway has a rural cross-section and a posted speed limit of 50 kilometres per hour. No parking is permitted on either side of the roadway north of Canterbury Drive.
- **Hamilton Road (**Middlesex Road 29) is an east-west, two-lane roadway that operates under the jurisdiction of the County. The roadway is classified as an arterial road in the County's Official Plan. Within the study area, the roadway has a rural cross-section and a posted speed limit of 50 kilometres per hour. Parking is not permitted on the south side of the roadway between Dorchester Road and Oakwood Drive.
- **Byron Avenue** is an east-west, two-lane roadway that operates under the jurisdiction of the Municipality of Thames-Centre. The roadway is classified as a local roadway in the Municipality's Official Plan.[3] Within the study area, the roadway has an urban cross-section and a posted speed limit of 50 kilometres per hour. Truck restrictions are in place, prohibiting trucks on the entirety of the roadway.
- **Canterbury Drive** is an east-west to north-south, two-lane roadway that operates under the jurisdiction of the Municipality. The roadway is classified as a local roadway in the Municipality's Official Plan. Within the study area, the roadway has a rural cross-section, and trucks are prohibited. The speed limit is unposted and is assumed to be 50 kilometres per hour. Parking restrictions are enforced under the Municipality's parking and traffic by-law.[4]

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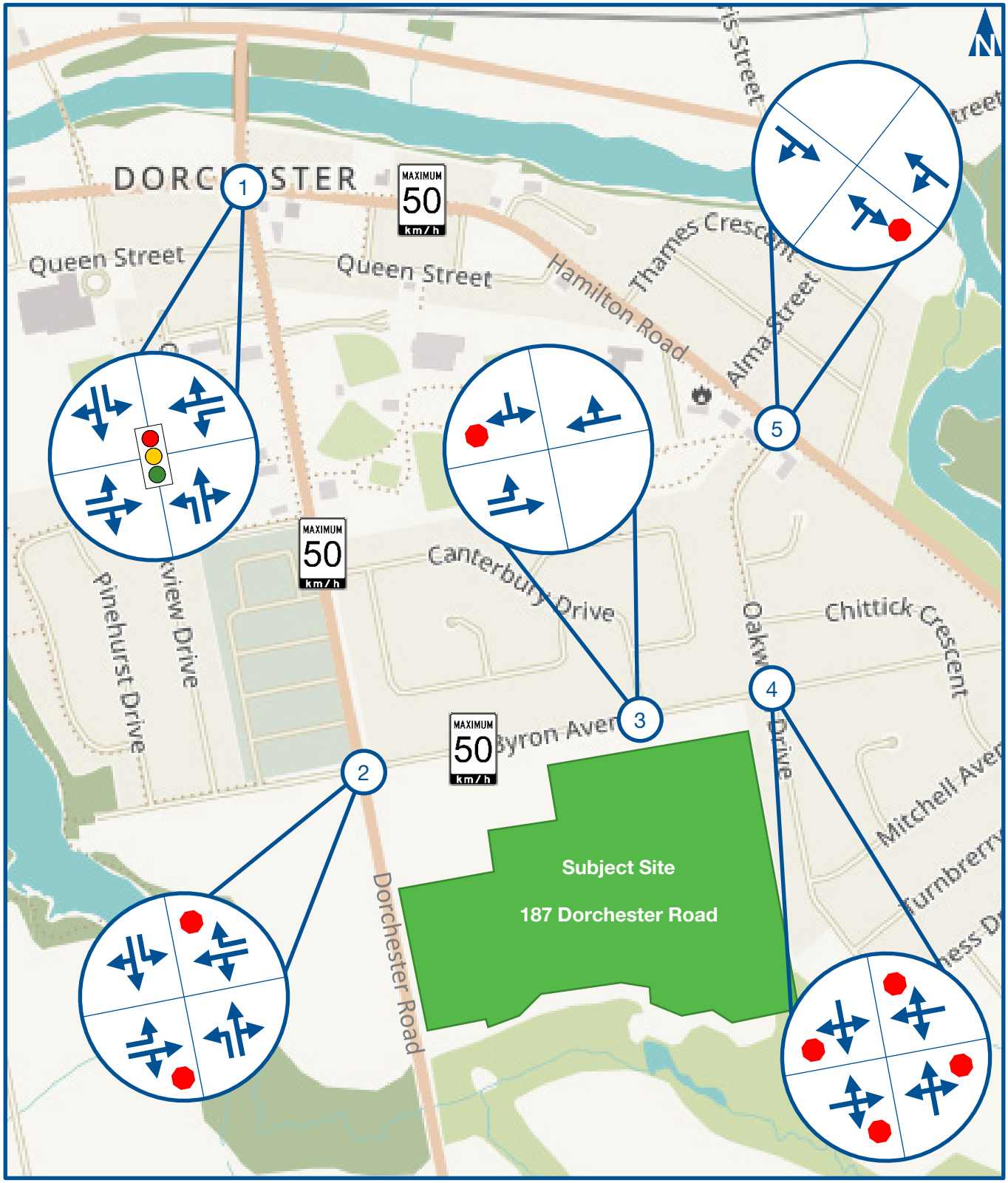
[2] County of Middlesex Official Plan (OP). *Schedule B: Transportation*. Consolidated August 2006.
[3] Municipality of Thames Centre Official Plan (OP). *Schedule C: Transportation Plan.* Consolidated December 2016.
[4] Corporation of the Municipality of Thames Centre. *By-Law 35-2017: Parking and Traffic By-Law.* n.d.

- **Oakwood Drive** is a north-south, two-lane roadway that operates under the jurisdiction of the Municipality. The roadway is classified as a local roadway under the Municipality's Official Plan. Within the study area, the roadway has an urban cross-section, and trucks are prohibited. The speed limit is unposted and is assumed to be 50 kilometres per hour. Parking restrictions are enforced under the Municipality's parking and traffic by-law.

Figure 2.1 details the existing lane configurations and traffic control at the study area intersections. Of the five study area intersections, only the intersection of Dorchester Road and Hamilton Road is under traffic signal control.



Existing Lane Configurations and Traffic Control

187 Dorchester Road TRIS
180123

Figure 2.1

2.2 Existing Alternative Transportation Systems

2.2.1 Transit

The subject site is not located within close proximity of any public transit services.

2.2.2 Walking

The existing roadway system generally includes a sidewalk on at least one side of the roadway. Along the frontage of the subject site, a continuous sidewalk is provided on the south side of Byron Avenue from Dorchester Road to Oakwood Drive. A sidewalk is also provided on the east side of Dorchester Road terminating at the existing Shoppers Drug Mart driveway.

2.2.3 Cycling

The existing roadway system does not provide dedicated cycling facilities in the form of bike lanes or multi-use paths requiring cyclists to share the roadway with motorists. The Thames Centre Trails and Cycling Master Plan[5] identifies a cycling route on Byron Avenue from Dorchester Road to Hamilton Road, and identifies a future cycling route on Dorchester Road south towards Highway 401.

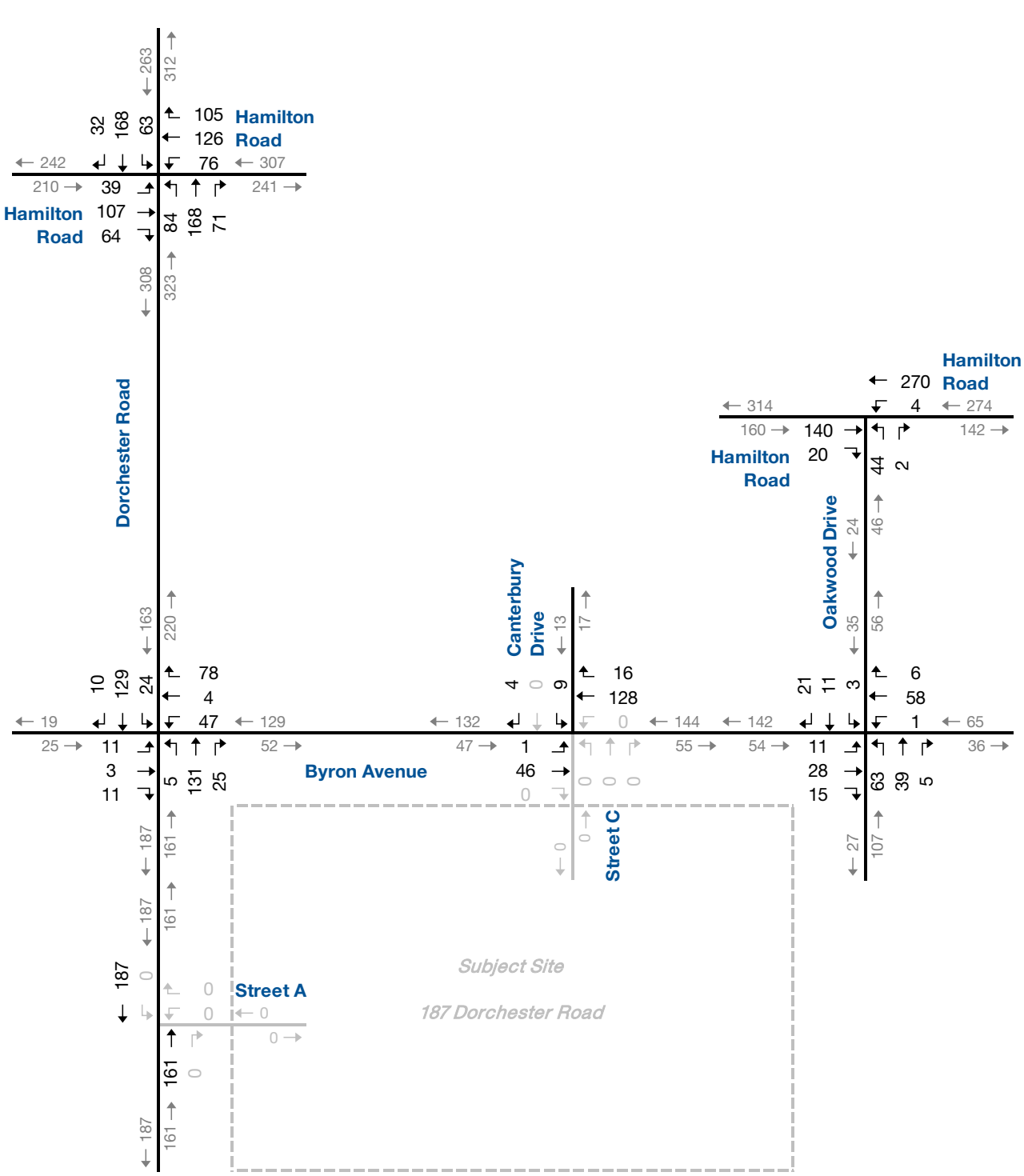
2.3 Existing Traffic Volumes

To assess intersection operations, turning movement counts are used to quantify the movement of vehicles through an intersection. Existing traffic data at an intersection or on a road segment forms the foundation for the analysis. The counts are usually taken during weekday peak periods at an intersection to complete the level of service analysis under worst-case peak hour operating conditions.

Paradigm conducted eight-hour turning movement counts at the study area intersections on Wednesday, 16 May 2018 from 6:00 AM to 9:00 AM, 11:00 AM to 1:00 PM, and 3:00 PM to 6:00 PM. All traffic movements, including pedestrian crossings, if present, were counted in 15-minute intervals and vehicles were classified by type.

Figure 2.2 and **Figure 2.3** illustrate the existing peak hour traffic volumes in the weekday AM and PM peak hours respectively. **Appendix B** contains the raw turning movement count data.

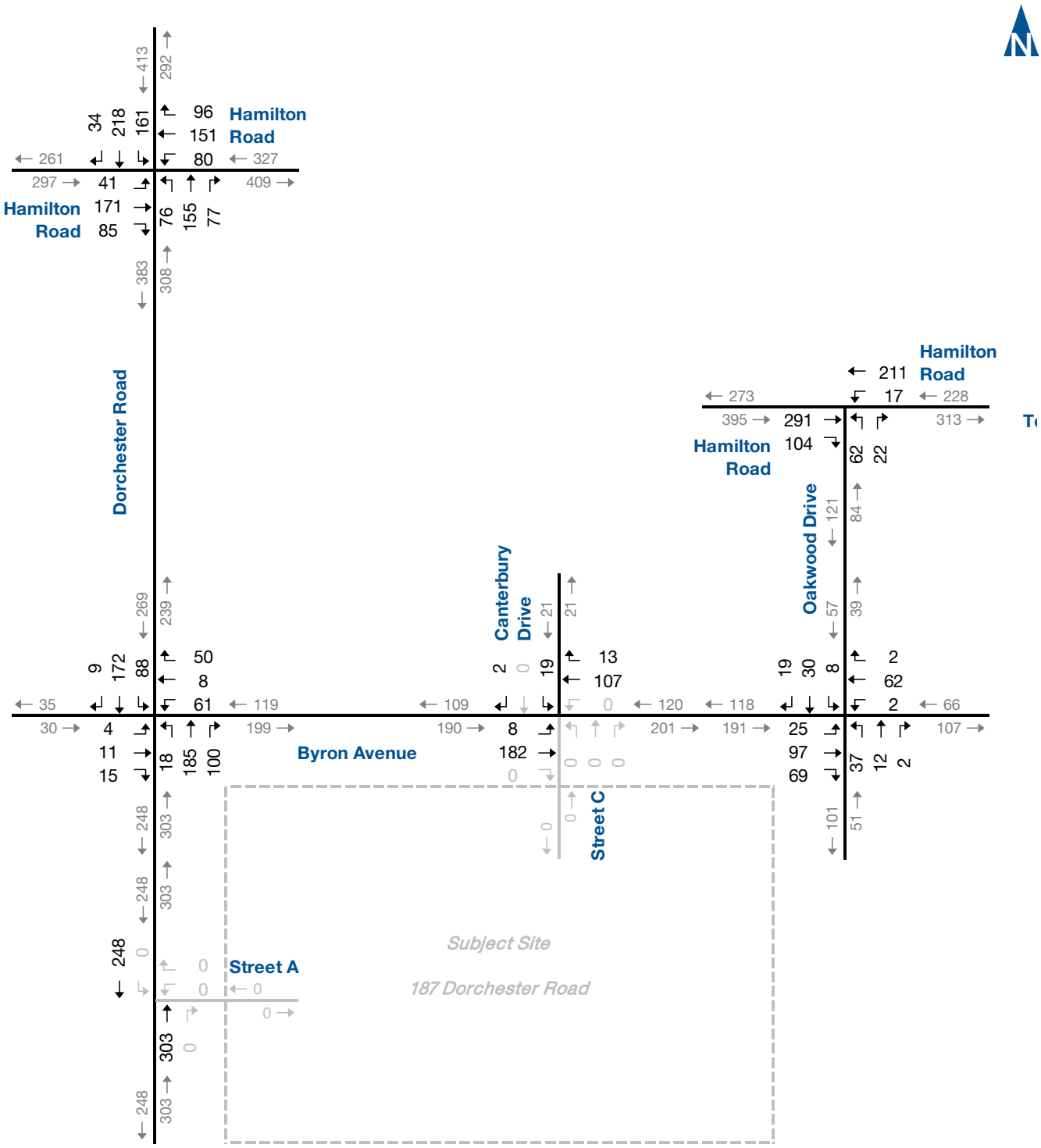
[5] Municipality of Thames Centre. Trails and Cycling Master Plan. May 2015.



Existing Traffic Volumes
AM Peak Hour

187 Dorchester Road TRIS
180123

Figure 2.2



Existing Traffic Volumes
PM Peak Hour

187 Dorchester Road TRIS
180123

Figure 2.3

2.3 Existing Traffic Operations

The operations of the intersections in the study area were evaluated using the existing lane configurations, traffic controls and the existing traffic peak volumes.

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 at an intersection. The delay is related to the number of vehicles desiring to make a movement, compared to the estimated capacity for that movement. The capacity is based on several criteria, including, but not limited to, vehicle headways, intersection geometry, vehicle composition, opposing traffic flows, and for signalized intersections, signal timing.

Table 2.1 summarizes the level of service criteria for signalized and stop controlled intersections. The highest possible rating is LOS A, under which the average total delay I equal to or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections, or when the volume to capacity ratio is greater than 1.00, the movement is classed LOS F and remedial measures are usually implemented, if feasible.

TABLE 2.1: VEHICLE LEVEL OF SERVICE DEFINITIONS

Level of Service	Signalized Intersections Average Total Delay (sec/veh)	Unsignalized Intersections Average Total Delay (sec/veh)
A	< = 10	< = 10
B	> 10 & < = 20	> 10 & < = 15
C	> 20 & < = 35	> 15 & < = 25
D	> 35 & < = 55	> 25 & < = 35
E	> 55 & < = 80	> 35 & < = 50
F	> 80	> 50

The level of service conditions on the existing road network have been assessed using Synchro 9 with HCM 2000 procedures. As per MTO TIS guidelines, movements are considered critical under the following conditions:

- Volume to capacity (v/c) ratios for overall intersection operation, through movements or shared/turning movements increased to 0.85 or above.

The key parameters used in the analysis include:

- Existing lane configurations and traffic control as documented during the site visit;

- Heavy vehicle percentages, and conflicting pedestrian volumes as derived from the existing turning movement counts;
- Traffic signal timing as provided by the Municipality and included in **Appendix B** for reference; and
- Synchro default values for all other inputs.

Table 2.2 summarizes the level of service details. The results of the analysis indicate the study area intersections are operating with acceptable levels of service and well within capacity.

Appendix C contains the supporting detailed Synchro 9 output.

TABLE 2.2: EXISTING TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	**A**	A	A	>	**A**	B	B	>	**B**	B	B	>	**B**	**B**
			Delay	7	7	>	**7**	7	8	>	**8**	15	17	>	**17**	15	16	>	**16**	**12**
			V/C	0.08	0.19	>		0.15	0.25	>		0.26	0.45	>		0.24	0.39	>		**0.33**
			Q	6	14	>		10	17	>		16	33	>		13	30	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		10	-	>		14	-	>		37	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	**B**	B	A	>	**B**	A	A	>	**A**	A	A	>	**A**	
			Delay	<	12	>	**12**	12	10	>	**11**	8	0	>	**0**	8	0	>	**1**	
			V/C	<	0.05	>		0.10	0.10	>		0.00	0.10	>		0.02	0.09	>		
			Q	<	1	>		3	3	>		0	0	>		1	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		77	-	>		40	-	>		35	-	>		
	3 - Byron Aavenue & Canterbury Drive	TWSC	LOS	A	A		**A**		A	>	**A**	**Approach Not Applicable**				<	A	>	**A**	
			Delay	8	0		**0**		0	>	**0**					<	10	>	**10**	
			V/C	0.00	0.03				0.09	>						<	0.02	>		
			Q	0	0				0	>						<	0	>		
			Ex	90	-				-	>						<	-	>		
			Avail.	90	-				-	>						<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	8	>	**8**	<	8	>	**8**	<	8	>	**8**	<	7	>	**7**	
			V/C	<	0.07	>		<	0.08	>		<	0.14	>		<	0.04	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	**A**	<	A		**A**	<	B	>	**B**	**Approach Not Applicable**				
			Delay		0	>	**0**	<	0		**0**	<	12	>	**12**					
			V/C		0.10	>		<	0.00			<	0.09	>						
			Q		0	>		<	0			<	2	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						
PM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	**A**	A	A	>	**A**	B	B	>	**B**	C	B	>	**B**	**B**
			Delay	7	8	>	**8**	7	8	>	**8**	16	17	>	**16**	21	17	>	**19**	**13**
			V/C	0.08	0.28	>		0.16	0.26	>		0.27	0.42	>		0.54	0.48	>		**0.37**
			Q	6	21	>		10	19	>		15	31	>		30	37	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		10	-	>		15	-	>		20	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	**B**	C	A	>	**C**	A	A	>	**A**	A	A	>	**A**	
			Delay	<	14	>	**14**	20	10	>	**16**	8	0	>	**1**	8	0	>	**3**	
			V/C	<	0.07	>		0.24	0.07	>		0.01	0.18	>		0.08	0.12	>		
			Q	<	2	>		7	2	>		0	0	>		2	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		73	-	>		40	-	>		33	-	>		
	3 - Byron Aavenue & Canterbury Drive	TWSC	LOS	A	A		**A**		A	>	**A**	**Approach Not Applicable**				<	B	>	**B**	
			Delay	8	0		**0**		0	>	**0**					<	11	>	**11**	
			V/C	0.01	0.12				0.08	>						<	0.03	>		
			Q	0	0				0	>						<	1	>		
			Ex	90	-				-	>						<	-	>		
			Avail.	90	-				-	>						<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	<	A	>	**A**	
			Delay	<	8	>	**8**	<	8	>	**8**	<	8	>	**8**	<	8	>	**8**	
			V/C	<	0.23	>		<	0.09	>		<	0.07	>		<	0.08	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	**A**	<	A		**A**	<	B	>	**B**	**Approach Not Applicable**				
			Delay		0	>	**0**	<	1		**1**	<	14	>	**14**					
			V/C		0.25	>		<	0.02			<	0.19	>						
			Q		0	>		<	0			<	6	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

3 Development Concept

3.1 Site Description

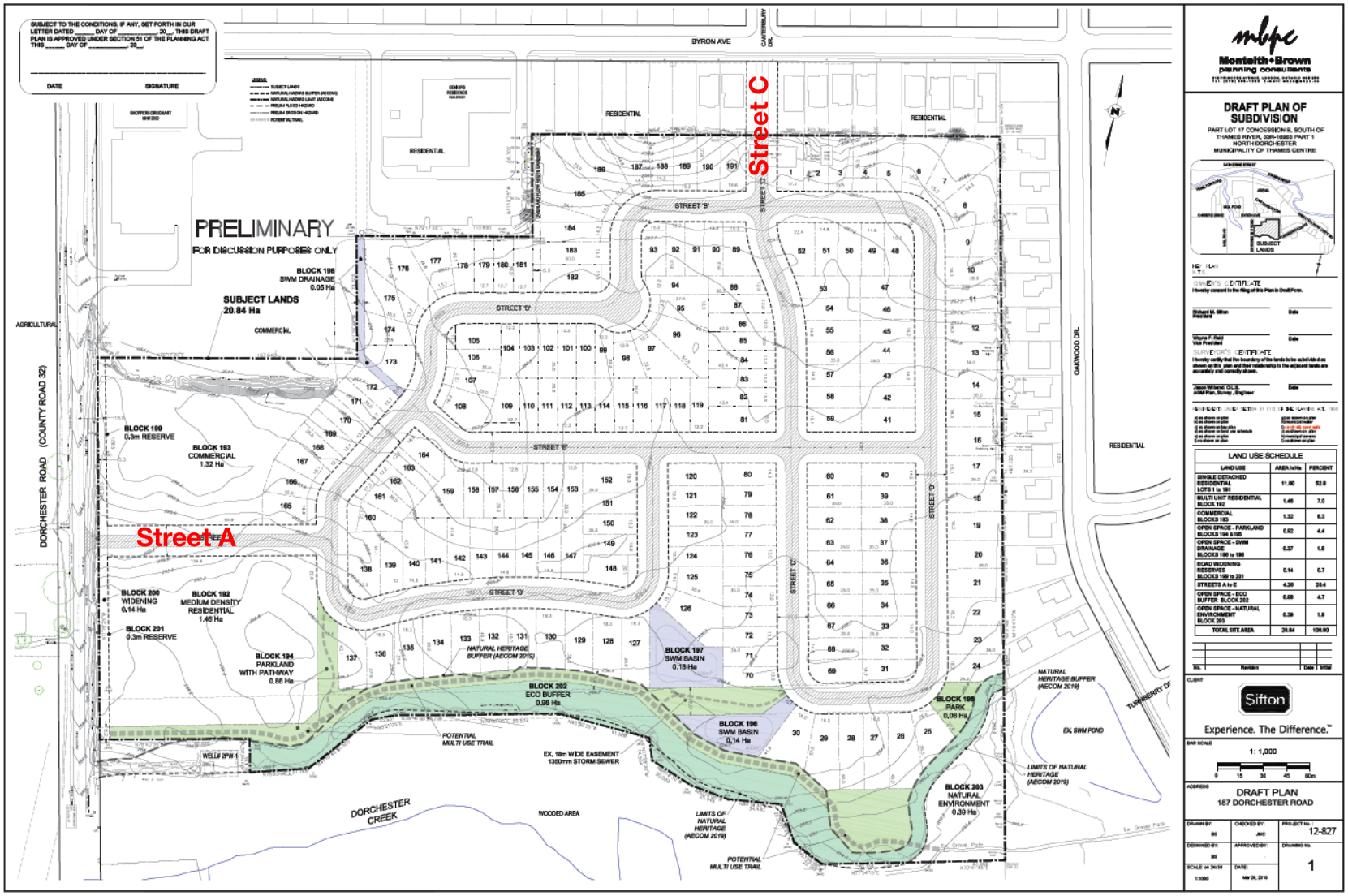
The subject site is located on lands known municipally as 187 Dorchester Road in the Municipality of Thames Centre, County of Middlesex, Ontario. The subject site measures approximately 20.86 hectares (51.55 acres) and is currently vacant.

The build-out of the lands is proposed to comprise 191 single detached residential dwellings, 1.34 hectares of medium density residential units, and 1.65 hectares of commercial lands uses.

Since the completion of the TIS in November 2018, the Conceptual Plan of Subdivision has been revised and it currently includes 190 single detached residential dwellings, 1.46 hectares of medium density residential dwellings, and 1.32 hectares of commercial land uses. However, the trip generation based on the new Conceptual Plan is lower than that based on the previous plan. The analysis and results as originally completed are presented in this report, along with the new conceptual subdivision plan.

Vehicular access to the site is proposed via two new street connections; one each to Dorchester Road (Street A), and Byron Avenue (Street C) respectively. Street A is proposed to be located approximately 330 metres south of Byron Avenue (centreline to centreline), and Street C is proposed to be located immediately opposite Canterbury Drive, east of Dorchester Road

Figure 3.1 illustrates the Conceptual Plan of Subdivision. The site is proposed to be built-out by 2023.



Conceptual Plan of Subdivision

187 Dorchester Road TRIS
180123

Figure 3.1

3.2 Development Trip Generation

Trip generation information is used to forecast the anticipated level of new vehicular activity to occur as a result of the development of the subject site. The Institute of Transportation Engineers' (ITE) Trip Generation Manual[6] was used to estimate the AM and PM peak hour traffic volumes generated by the development. The following land use codes were referenced:

- **LUC 210 (Single-Family Detached Housing)**: Single family detached housing includes all single-family detached homes on individual lots. A typical site surveyed is a suburban subdivision.
- **LUC 221 (Multi-Family Housing – Mid Rise)**: This land use code is described as apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have between three (3) and ten (10) levels (floors).
- **LUC 820 (Shopping Centre**): A shopping centre is an integrated group of commercial establishments that is planned, developed, owned and managed as a unit. A shopping centre's composition is related to its market area in terms of size, location and type of stores.

In lieu of more definitive land use statistics the following assumptions have been made regarding development of the subject lands:

- Commercial Block (shopping centre): 20% coverage = 35,521 square feet; and
- Medium-Density Residential (Mid-Rise): 27 units, assuming 20 units per hectare.

The base trip generation for the subject lands has been developed based on the regression equations for the residential land uses, and the average rates for the commercial land use. **Table 3.1** summarizes the trip generation estimates, and indicates the development is anticipated to generate 182 new vehicle trips in the AM peak hour, and 291 trips (excluding 46 pass-by trips) in the PM peak hour.

[6] Institute of Transportation Engineers. 2017. Trip Generation Manual (10th Edition). Washington, D.C.

TABLE 3.1: TRIP GENERATION ESTIMATES

Land Use Code	Quantity		AM Peak Hour				PM Peak Hour			
	Units	GFA (sq. ft.)	Rate	In	Out	Total	Rate	In	Out	Total
LUC 210 - Single-Family Detached Housing	191	-	Eqn.[1]	35	105	**140**	Eqn.[1]	119	70	**189**
LUC 221 - Multifamily Housing (Mid-Rise)	27	-	Eqn.[2]	2	7	**9**	Eqn.[2]	8	5	**13**
LUC 820 - Shopping Centre[3]	-	35,521	0.94	20	13	**33**	3.81	65	70	**135**
Total New Trip Generation				**57**	**125**	**182**		**192**	**145**	**337**
LUC 820 - Shopping Centre (Pass-by Trips)			*0%*	*0*	*0*	***0***	*34%*	*23*	*23*	***46***
Net New Trip Generation				**57**	**125**	**182**		**169**	**122**	**291**

1 - LUC 210 - AM: T = 0.71(X) + 4.80 | PM: Ln(T) = 0.96(Ln(X)) + 0.20, ITE Trip Generation Manual (10th Edition)
2 - LUC 221 - AM: Ln(T) = 0.98(Ln(X)) - 0.98 | PM: Ln(T) = 0.96(Ln(X)) - 0.63, ITE Trip Generation Manual (10th Edition)
3 - LUC 820 - AM: Average Rate (0.94) | PM: Average Rate (3.81), ITE Trip Generation Manual (10th Edition)

3.3 Development Trip Distribution

The directional distribution of traffic approaching and departing the development is a function of several variables, including population distribution, existing travel patterns and the efficiency of the roadways leading to the site.

The trip distribution for the subject site was developed based on the existing travel patterns, and the most logical routes to and from the site. **Table 3.2** summarizes the trip distribution used for this study.

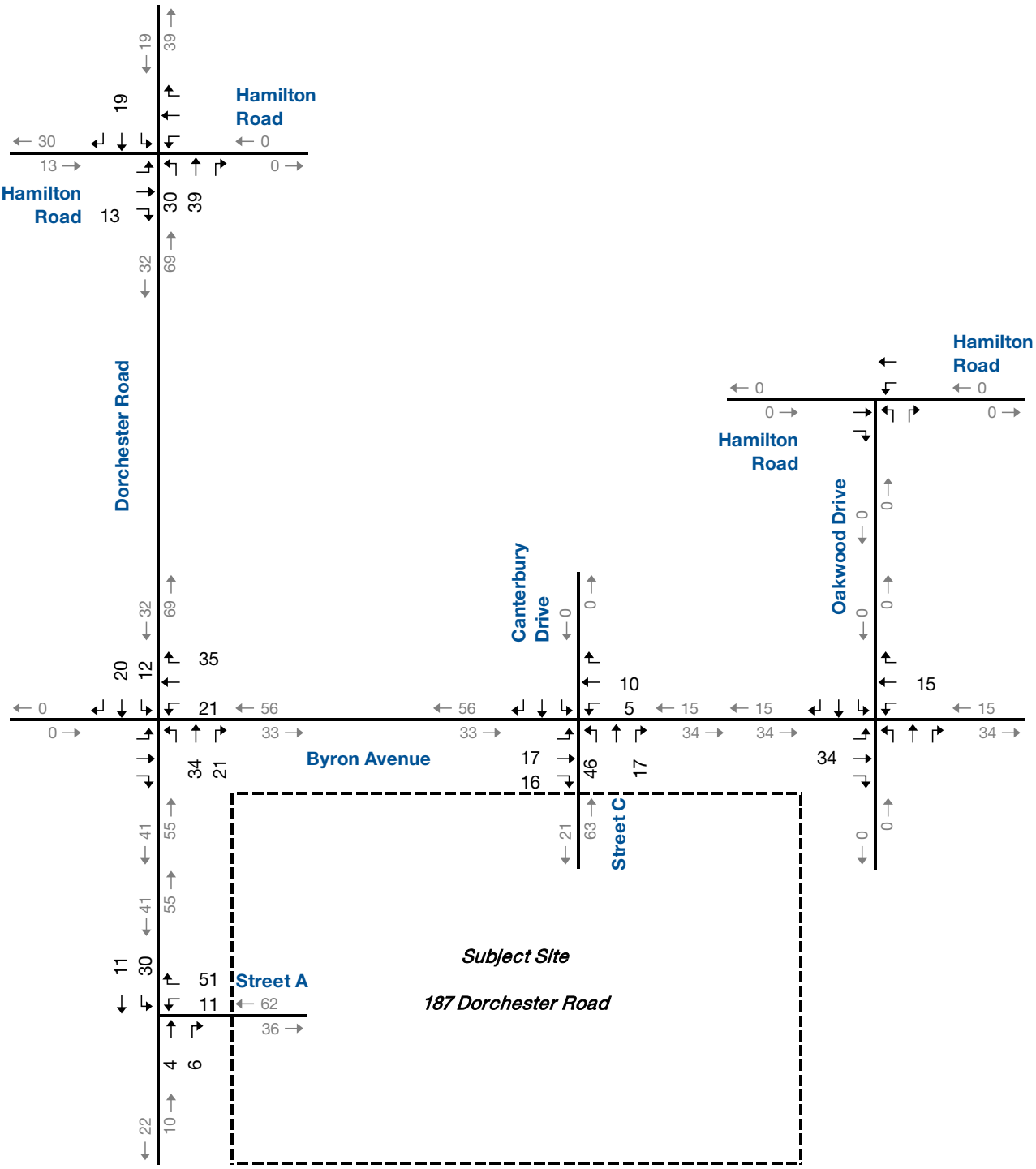
TABLE 3.2: TRIP DISTRIBUTION ESTIMATES

Origin/Destination	AM	PM
North via Dorchester Road	31%	28%
East via Hamilton Road/Byron Road	27%	28%
South via Dorchester Road	18%	22%
West via Hamilton Road	24%	22%
Total	**100%**	**100%**

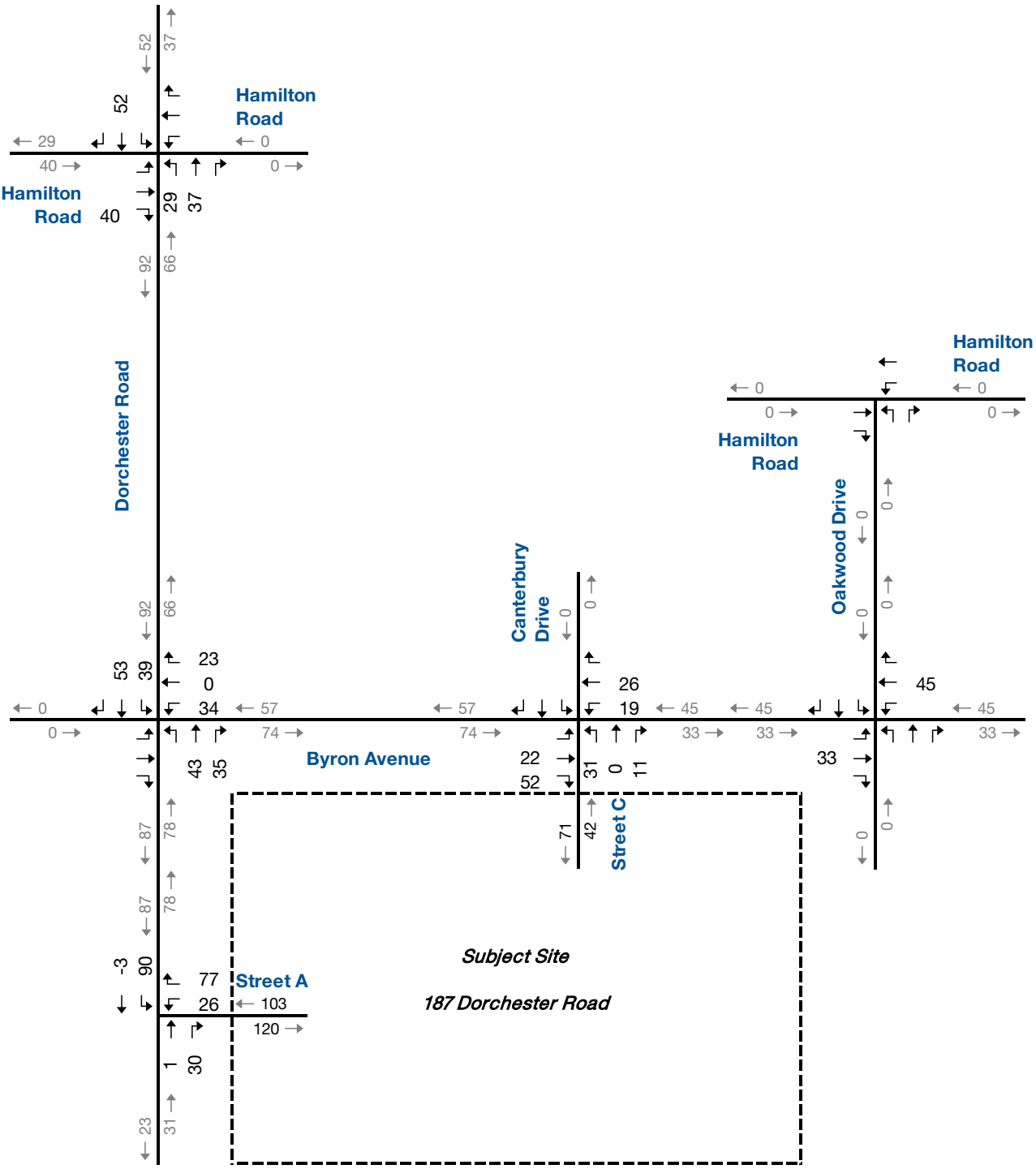
3.4 Development Trip Assignment

The site generated traffic was assigned to study road network using the trip distribution outlined in **Table 3.2**. For the purposes of this study, all traffic related to the mid-rise residential, and commercial land uses have been assigned to the Street A connection to Dorchester Road. Trips associated with the single-family detached land uses have been distributed between the Street A and Street C connections, in a 40%/60% split, respectively.

Figure 3.2 and **Figure 3.3** illustrate the site-generated traffic assignments for the weekday AM and PM peak hours, respectively.



Site Generated Traffic Forecast
AM Peak Hour



Site Generated Traffic Forecast
PM Peak Hour

4 Future Traffic Conditions

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

4.1 Future Background Traffic Forecast

Three horizon years have been assessed to determine the traffic impacts of the subject site:

- Opening Date Horizon (2023);
- Five-Year Post-build-out Horizon (2028); and
- Ten-Year Post-build-out Horizon (2033).

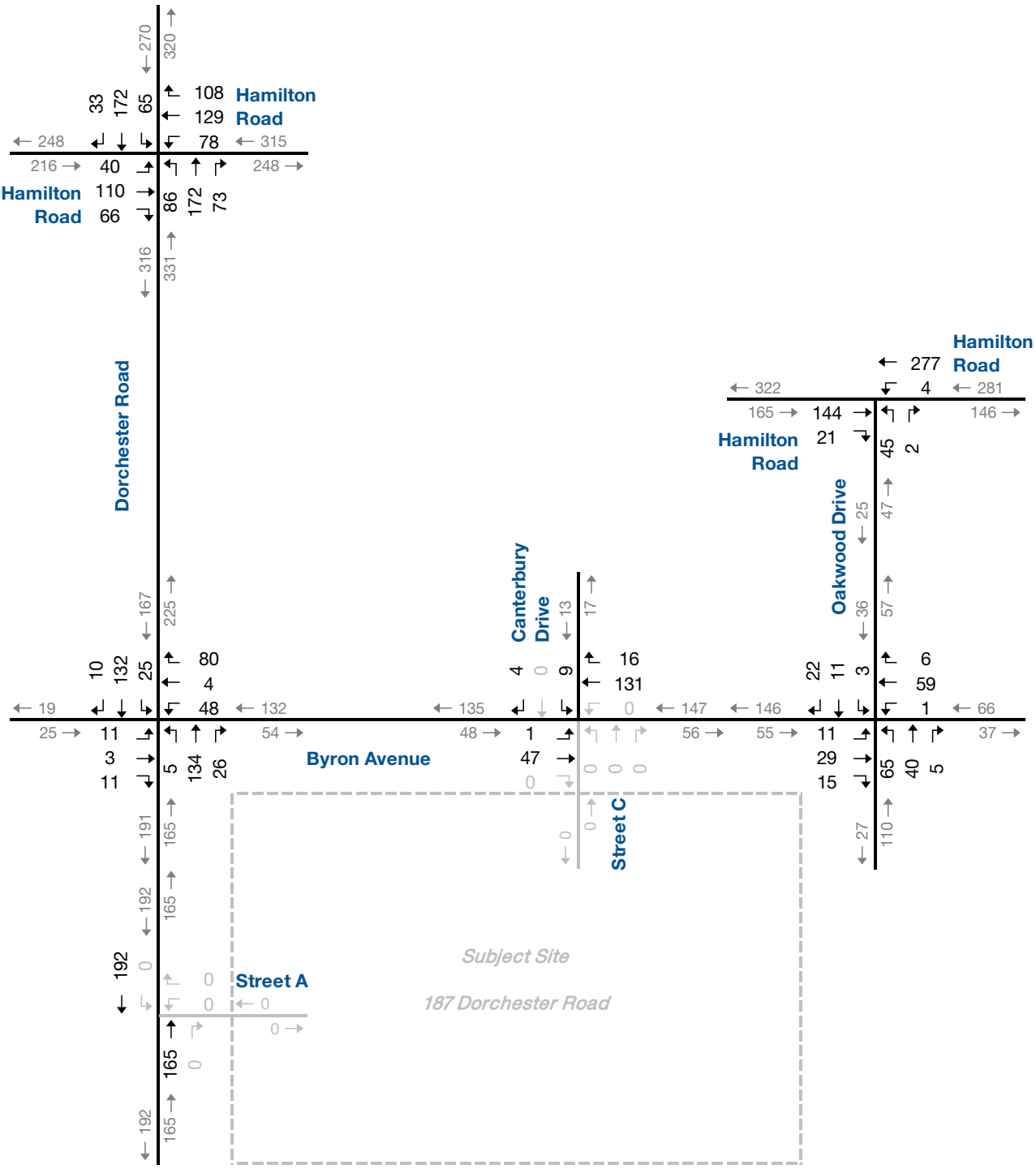
The future traffic volumes near the subject site will consist of:

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

The increased non-site traffic estimates were derived by applying a growth rate of 0.5 percent compounded per annum to the existing traffic volumes.[7]

Figure 4.1 and **Figure 4.2** illustrate the forecast 2023 - Opening Year AM and PM Background Traffic volumes, respectively. **Figure 4.3** and **Figure 4.4** detail the forecast 2028 - Five-Year AM and PM Background Traffic volumes, respectively. **Figure 4.5** and **Figure 4.6** detail the forecast 2033 - Ten-Year AM and PM Background Traffic volumes, respectively.

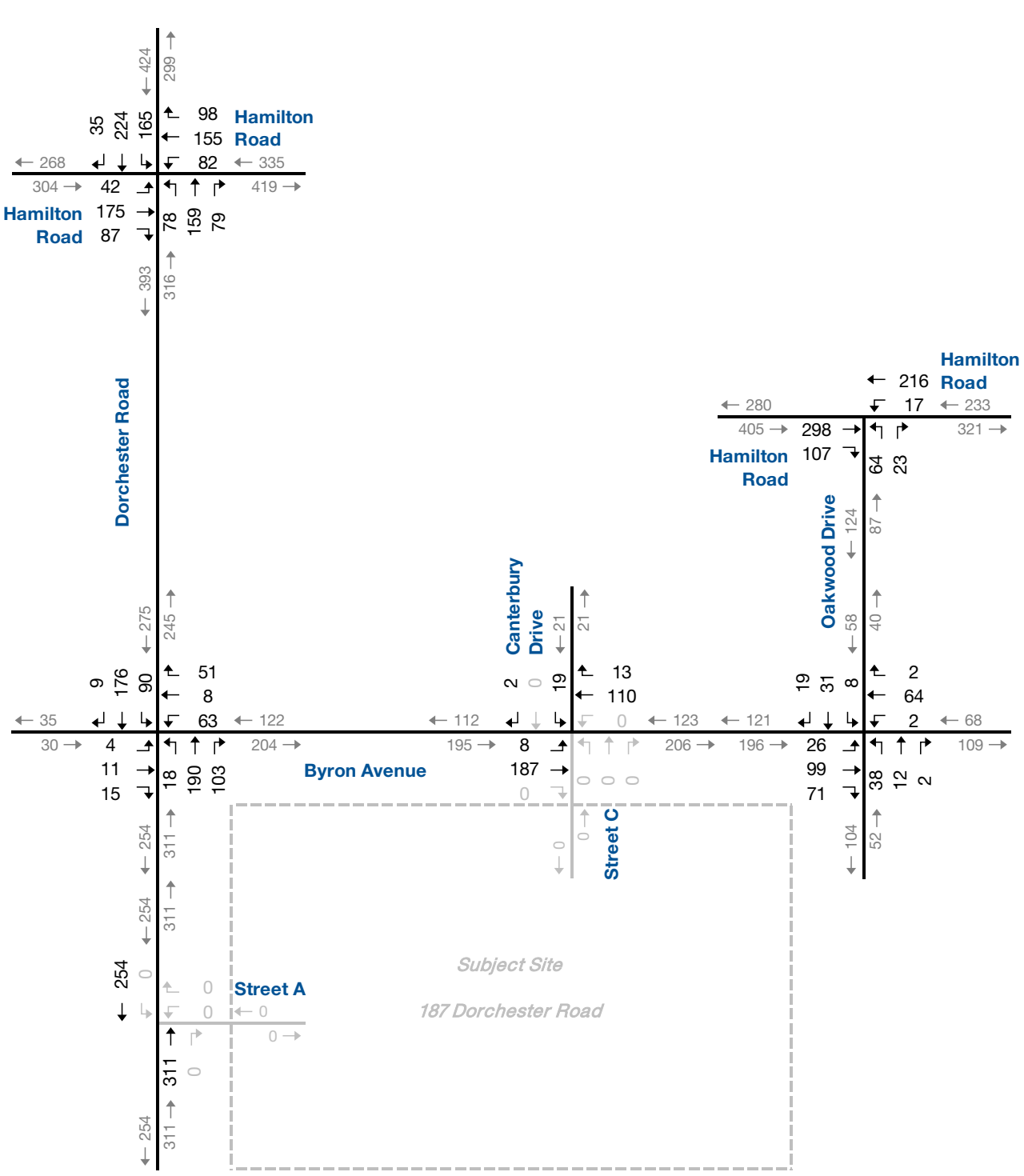
[7] Recommended by City Staff to reflect citywide population and employment growth



Opening-Year Background Traffic Forecast AM Peak Hour

187 Dorchester Road TRIS
180123

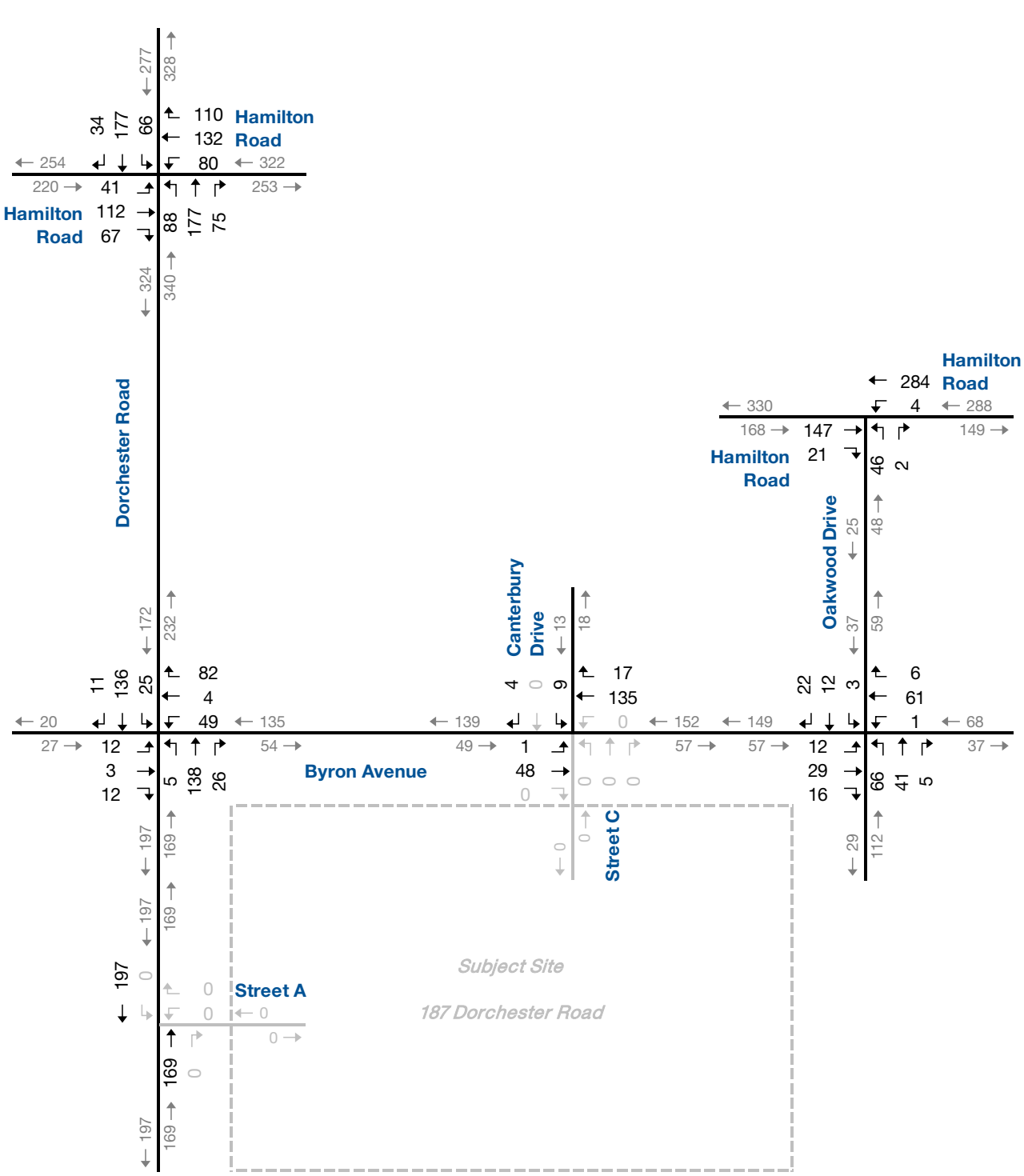
Figure 4.1



Opening-Year Background Traffic Forecast PM Peak Hour

187 Dorchester Road TRIS
180123

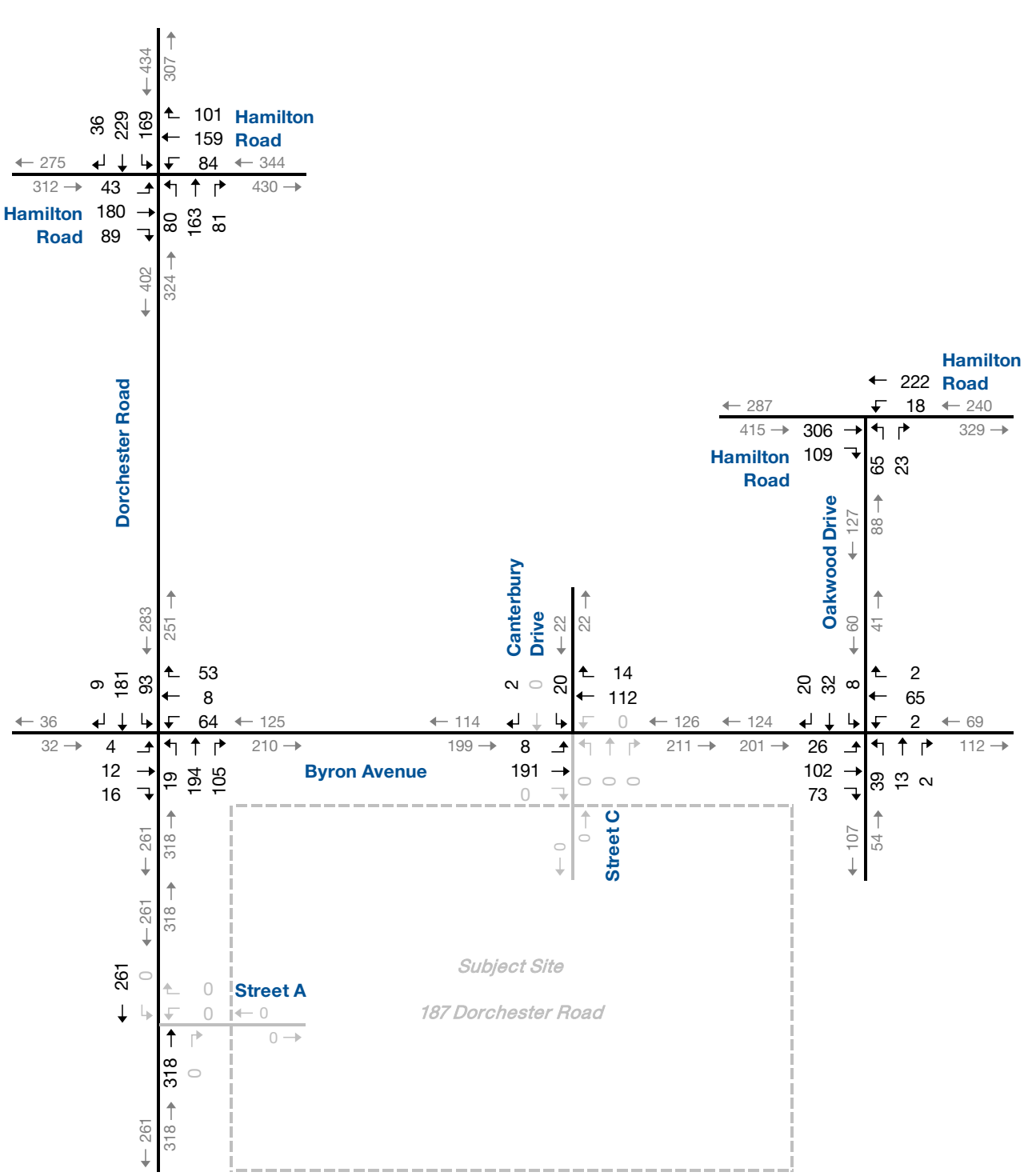
Figure 4.2



Five-Year Background Traffic Forecast AM Peak Hour

187 Dorchester Road TRIS
180123

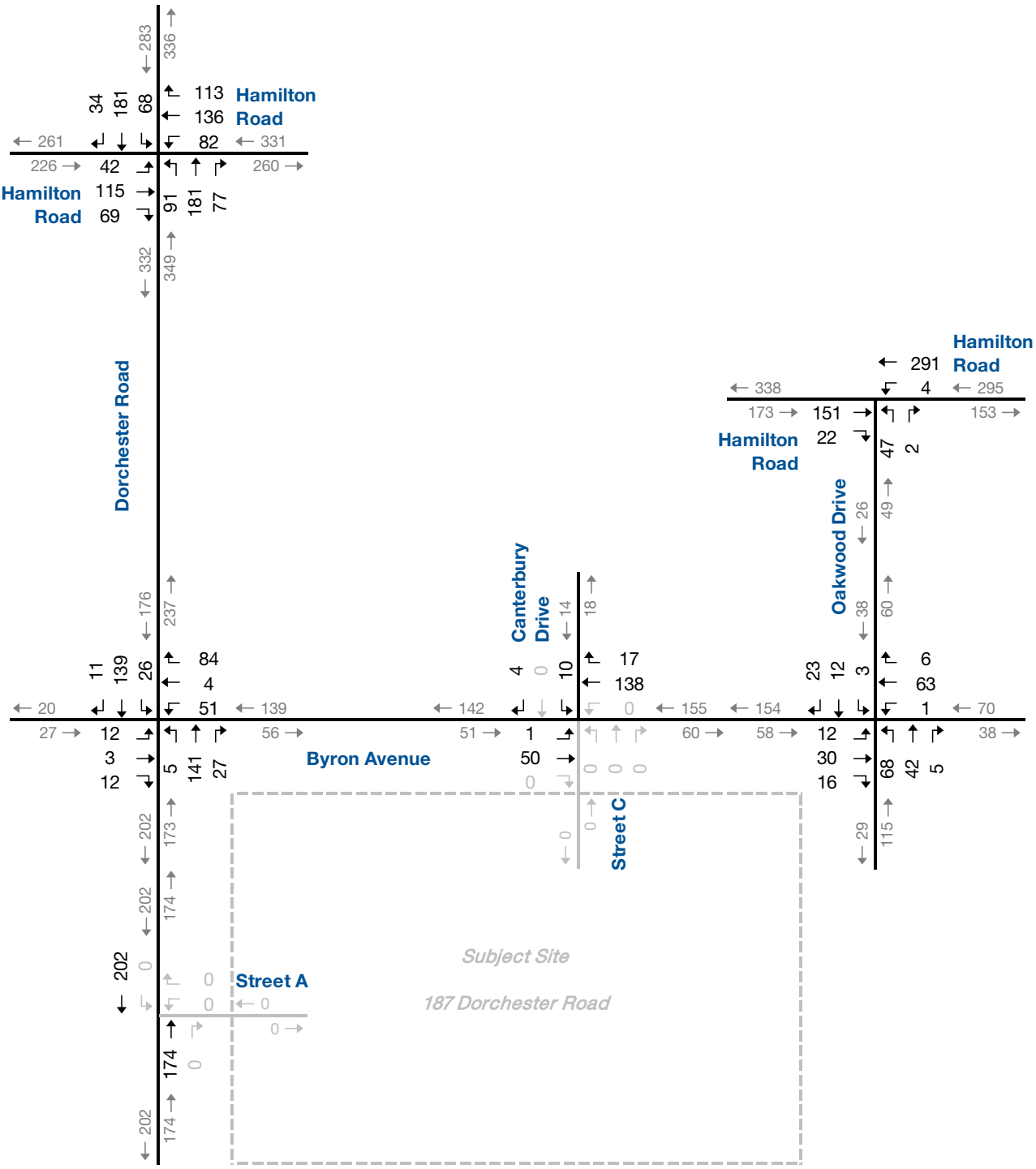
Figure 4.3



Five-Year Background Traffic Forecast PM Peak Hour

187 Dorchester Road TRIS
180123

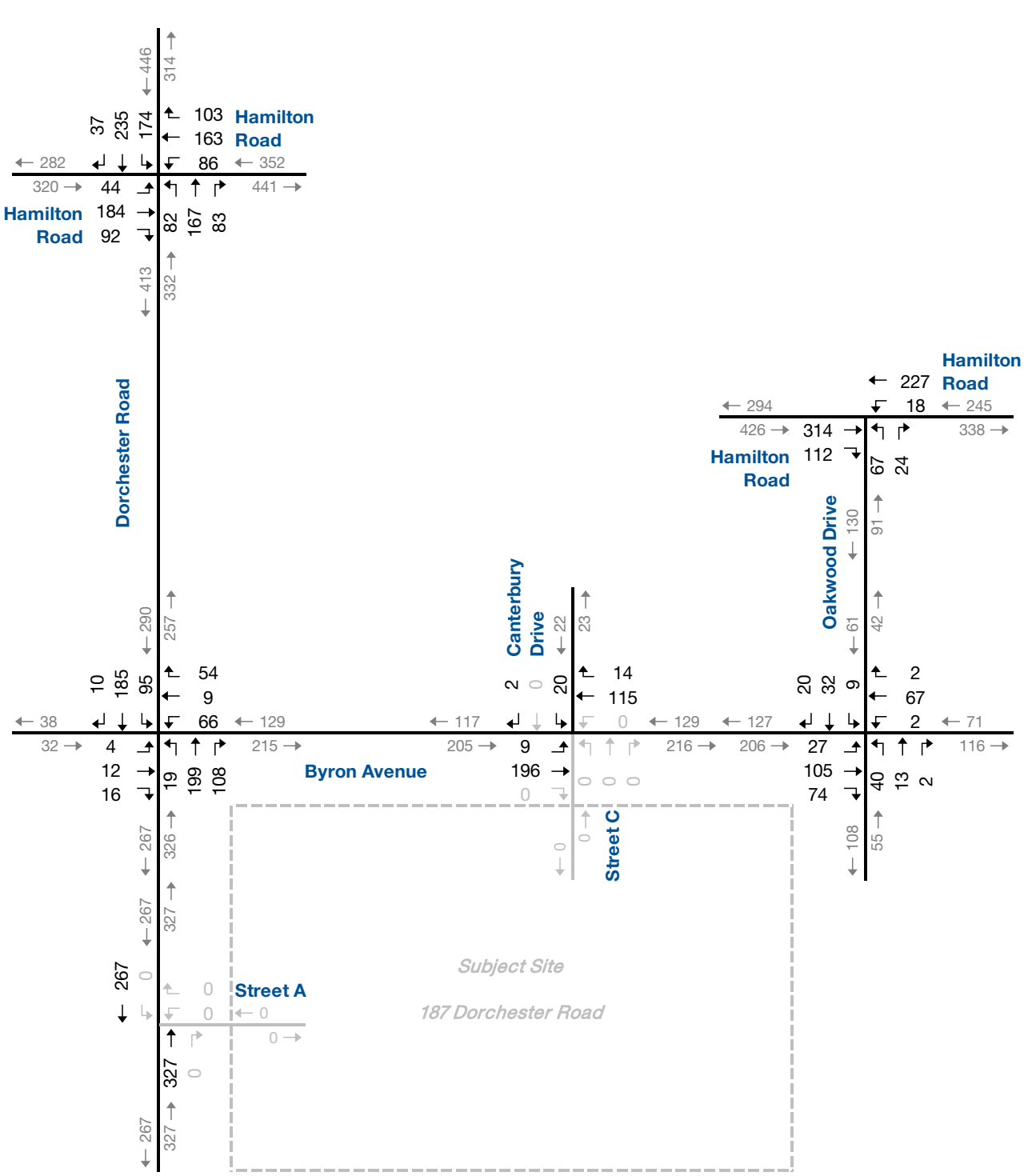
Figure 4.4



Ten-Year Background Traffic Forecast AM Peak Hour

187 Dorchester Road TRIS
180123

Figure 4.5



Ten-Year Background Traffic Forecast PM Peak Hour

4.2 Background Traffic Operations

4.2.1 Background Traffic Operations - Opening Year

The opening year (2023) background traffic operations were evaluated using Synchro 9 with HCM 2000 procedures. No roadway or traffic control improvements within the study area were assumed to be in place.

Table 4.1 details the 2023 background traffic level of service conditions. The analyses indicate the intersections in the study area are forecast to operate at similar levels of service to existing conditions. All intersections are forecast to operate with acceptable levels of service with no critical movements.

Appendix D contains the detailed Synchro 9 output.

TABLE 4.1: BACKGROUND TRAFFIC OPERATIONS – OPENING YEAR HORIZON

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	B	B	>	B	B	B	>	B	B
			Delay	7	8	>	7	7	8	>	8	15	17	>	17	16	16	>	16	12
			V/C	0.08	0.20	>		0.16	0.26	>		0.26	0.47	>		0.26	0.40	>		0.34
			Q	6	14	>		10	17	>		16	34	>		14	30	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		10	-	>		14	-	>		37	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	B	B	A	>	B	A	A	>	A	A	A	>	A	
			Delay	<	12	>	12	12	10	>	11	8	0	>	0	8	0	>	1	
			V/C	<	0.05	>		0.10	0.10	>		0.00	0.10	>		0.02	0.09	>		
			Q	<	1	>		3	3	>		0	0	>		1	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		77	-	>		40	-	>		35	-	>		
	3 - Byron Aavenue & Canterbury Drive	TWSC	LOS	A	A		A		A	>	A	Approach Not Applicable				<	A	>	A	
			Delay	8	0		0		0	>	0					<	10	>	10	
			V/C	0.00	0.03				0.09	>						<	0.02	>		
			Q	0	0				0	>						<	0	>		
			Ex	90	-				-	>						<	-	>		
			Avail.	90	-				-	>						<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	7	>	7	
			V/C	<	0.07	>		<	0.09	>		<	0.15	>		<	0.04	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	B	>	B	Approach Not Applicable				
			Delay		0	>	0	<	0		0	<	12	>	12					
			V/C		0.11	>		<	0.00			<	0.09	>						
			Q		0	>		<	0			<	3	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						
PM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	B	B	>	B	C	B	>	B	B
			Delay	7	8	>	8	7	8	>	8	16	17	>	17	22	18	>	19	13
			V/C	0.08	0.29	>		0.16	0.26	>		0.29	0.43	>		0.56	0.50	>		0.39
			Q	6	22	>		10	19	>		16	32	>		32	39	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		10	-	>		15	-	>		18	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	B	C	B	>	C	A	A	>	A	A	A	>	A	
			Delay	<	14	>	14	21	10	>	16	8	0	>	1	8	0	>	3	
			V/C	<	0.07	>		0.25	0.07	>		0.01	0.19	>		0.08	0.12	>		
			Q	<	2	>		8	2	>		0	0	>		2	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		72	-	>		40	-	>		33	-	>		
	3 - Byron Aavenue & Canterbury Drive	TWSC	LOS	A	A		A		A	>	A	Approach Not Applicable				<	B	>	B	
			Delay	8	0		0		0	>	0					<	11	>	11	
			V/C	0.01	0.12				0.08	>						<	0.04	>		
			Q	0	0				0	>						<	1	>		
			Ex	90	-				-	>						<	-	>		
			Avail.	90	-				-	>						<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	8	>	8	
			V/C	<	0.24	>		<	0.09	>		<	0.07	>		<	0.08	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	B	>	B	Approach Not Applicable				
			Delay		0	>	0	<	1		1	<	15	>	15					
			V/C		0.26	>		<	0.02			<	0.20	>						
			Q		0	>		<	0			<	6	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

4.2.2 Background Traffic Operations - Five-Year Horizon

The five-year (2028) background traffic operations were evaluated using Synchro 9 with HCM 2000 procedures. No roadway or traffic control improvements within the study area were assumed to be in place.

Table 4.2 details the 2028 background traffic level of service conditions. The analyses indicate the intersections in the study area are forecast to operate at similar levels of service to existing conditions. All intersections are forecast to operate with acceptable levels of service with no critical movements.

Appendix E contains the detailed Synchro 9 output.

TABLE 4.2: BACKGROUND TRAFFIC OPERATIONS – FIVE-YEAR HORIZON

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	B	B	>	B	B	B	>	B	B
			Delay	7	8	>	7	7	8	>	8	15	18	>	17	16	16	>	16	12
			V/C	0.08	0.20	>		0.16	0.26	>		0.28	0.48	>		0.27	0.41	>		0.34
			Q	6	14	>		10	17	>		17	36	>		14	31	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		10	-	>		14	-	>		36	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	B	B	A	>	B	A	A	>	A	A	A	>	A	
			Delay	<	12	>	12	13	10	>	11	8	0	>	0	8	0	>	1	
			V/C	<	0.05	>		0.11	0.10	>		0.00	0.10	>		0.02	0.09	>		
			Q	<	1	>		3	3	>		0	0	>		1	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		77	-	>		40	-	>		35	-	>		
	3 - Byron Aavenue & Canterbury Drive	TWSC	LOS	A	A		A		A	>	A	Approach Not Applicable				<	A	>	A	
			Delay	8	0		0		0	>	0					<	10	>	10	
			V/C	0.00	0.03				0.10	>						<	0.02	>		
			Q	0	0				0	>						<	0	>		
			Ex	90	-				-	>						<	-	>		
			Avail.	90	-				-	>						<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	7	>	7	
			V/C	<	0.08	>		<	0.09	>		<	0.15	>		<	0.04	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	B	>	B	Approach Not Applicable				
			Delay		0	>	0	<	0		0	<	13	>	13					
			V/C		0.11	>		<	0.00			<	0.10	>						
			Q		0	>		<	0			<	3	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						
PM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	B	B	>	B	C	B	>	B	B
			Delay	7	8	>	8	8	8	>	8	16	17	>	17	23	18	>	20	14
			V/C	0.09	0.29	>		0.17	0.27	>		0.30	0.44	>		0.58	0.51	>		0.40
			Q	6	23	>		11	20	>		16	33	>		37	40	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		10	-	>		14	-	>		14	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	B	C	B	>	C	A	A	>	A	A	A	>	A	
			Delay	<	14	>	14	22	10	>	17	8	0	>	1	8	0	>	3	
			V/C	<	0.08	>		0.27	0.08	>		0.02	0.19	>		0.08	0.12	>		
			Q	<	2	>		9	2	>		0	0	>		2	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		72	-	>		40	-	>		33	-	>		
	3 - Byron Aavenue & Canterbury Drive	TWSC	LOS	A	A		A		A	>	A	Approach Not Applicable				<	B	>	B	
			Delay	8	0		0		0	>	0					<	11	>	11	
			V/C	0.01	0.12				0.08	>						<	0.04	>		
			Q	0	0				0	>						<	1	>		
			Ex	90	-				-	>						<	-	>		
			Avail.	90	-				-	>						<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	8	>	8	
			V/C	<	0.25	>		<	0.09	>		<	0.08	>		<	0.08	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	C	>	C	Approach Not Applicable				
			Delay		0	>	0	<	1		1	<	15	>	15					
			V/C		0.27	>		<	0.02			<	0.21	>						
			Q		0	>		<	0			<	6	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

4.2.3 Background Traffic Operations - Ten-Year Horizon

The ten-year (2033) background traffic operations were evaluated using Synchro 9 with HCM 2000 procedures. No roadway or traffic control improvements within the study area were assumed to be in place.

Table 4.3 details the 2033 background traffic level of service conditions. The analyses indicate the intersections in the study area are forecast to operate at similar levels of service to existing conditions. All intersections are forecast to operate with acceptable levels of service with no critical movements.

Appendix F contains the detailed Synchro 9 output.

TABLE 4.3: BACKGROUND TRAFFIC OPERATIONS – TEN-YEAR HORIZON

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	B	C	>	C	C	B	>	B	B
			Delay	7	8	>	8	8	9	>	9	19	21	>	20	21	18	>	19	14
			V/C	0.11	0.26	>		0.22	0.36	>		0.42	0.63	>		0.44	0.53	>		0.46
			Q	7	18	>		13	25	>		22	50	>		18	40	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	8	-	>		7	-	>		8	-	>		32	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	B	B	B	>	B	A	A	>	A	A	A	>	A	
			Delay	<	13	>	13	15	10	>	12	8	0	>	0	8	0	>	1	
			V/C	<	0.08	>		0.16	0.14	>		0.01	0.13	>		0.03	0.12	>		
			Q	<	2	>		5	4	>		0	0	>		1	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		75	-	>		40	-	>		34	-	>		
	3 - Byron Aavenue & Canterbury Drive	TWSC	LOS	A	A		A		A	>	A	Approach Not Applicable				<	A	>	A	
			Delay	8	0		0		0	>	0					<	10	>	10	
			V/C	0.00	0.04				0.12	>						<	0.02	>		
			Q	0	0				0	>						<	1	>		
			Ex	90	-				-	>						<	-	>		
			Avail.	90	-				-	>						<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	9	>	9	<	7	>	7	
			V/C	<	0.10	>		<	0.12	>		<	0.20	>		<	0.06	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	B	>	B	Approach Not Applicable				
			Delay		0	>	0	<	0		0	<	14	>	14					
			V/C		0.14	>		<	0.00			<	0.15	>						
			Q		0	>		<	0			<	4	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						
PM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	B	B	>	B	C	B	>	C	B
			Delay	7	8	>	8	8	8	>	8	16	17	>	17	24	18	>	20	14
			V/C	0.09	0.30	>		0.17	0.28	>		0.31	0.46	>		0.61	0.52	>		0.42
			Q	6	23	>		11	21	>		16	34	>		39	41	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		9	-	>		14	-	>		11	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	B	C	B	>	C	A	A	>	A	A	A	>	A	
			Delay	<	14	>	14	22	10	>	17	8	0	>	1	8	0	>	3	
			V/C	<	0.08	>		0.29	0.08	>		0.02	0.20	>		0.08	0.12	>		
			Q	<	2	>		9	2	>		0	0	>		2	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		71	-	>		40	-	>		33	-	>		
	3 - Byron Aavenue & Canterbury Drive	TWSC	LOS	A	A		A		A	>	A	Approach Not Applicable				<	B	>	B	
			Delay	8	0		0		0	>	0					<	11	>	11	
			V/C	0.01	0.13				0.08	>						<	0.04	>		
			Q	0	0				0	>						<	1	>		
			Ex	90	-				-	>						<	-	>		
			Avail.	90	-				-	>						<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	9	>	9	<	8	>	8	<	8	>	8	<	8	>	8	
			V/C	<	0.25	>		<	0.09	>		<	0.08	>		<	0.08	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	C	>	C	Approach Not Applicable				
			Delay		0	>	0	<	1		1	<	15	>	15					
			V/C		0.27	>		<	0.02			<	0.22	>						
			Q		0	>		<	0			<	7	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						

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

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

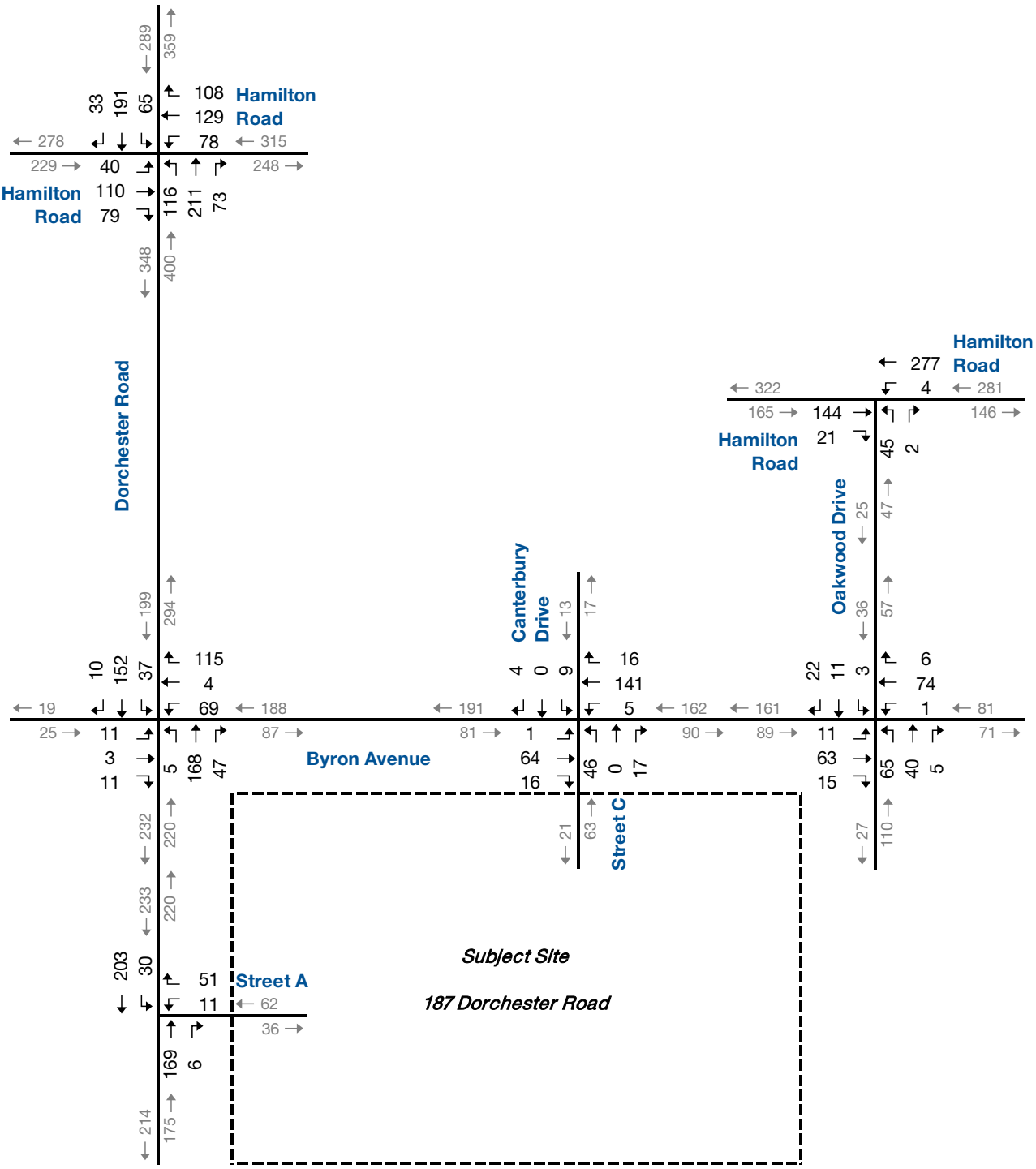
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
AWSC - All-Way Stop Control

<- Shared Left/Through Lane
>- Shared Right/Through Lane

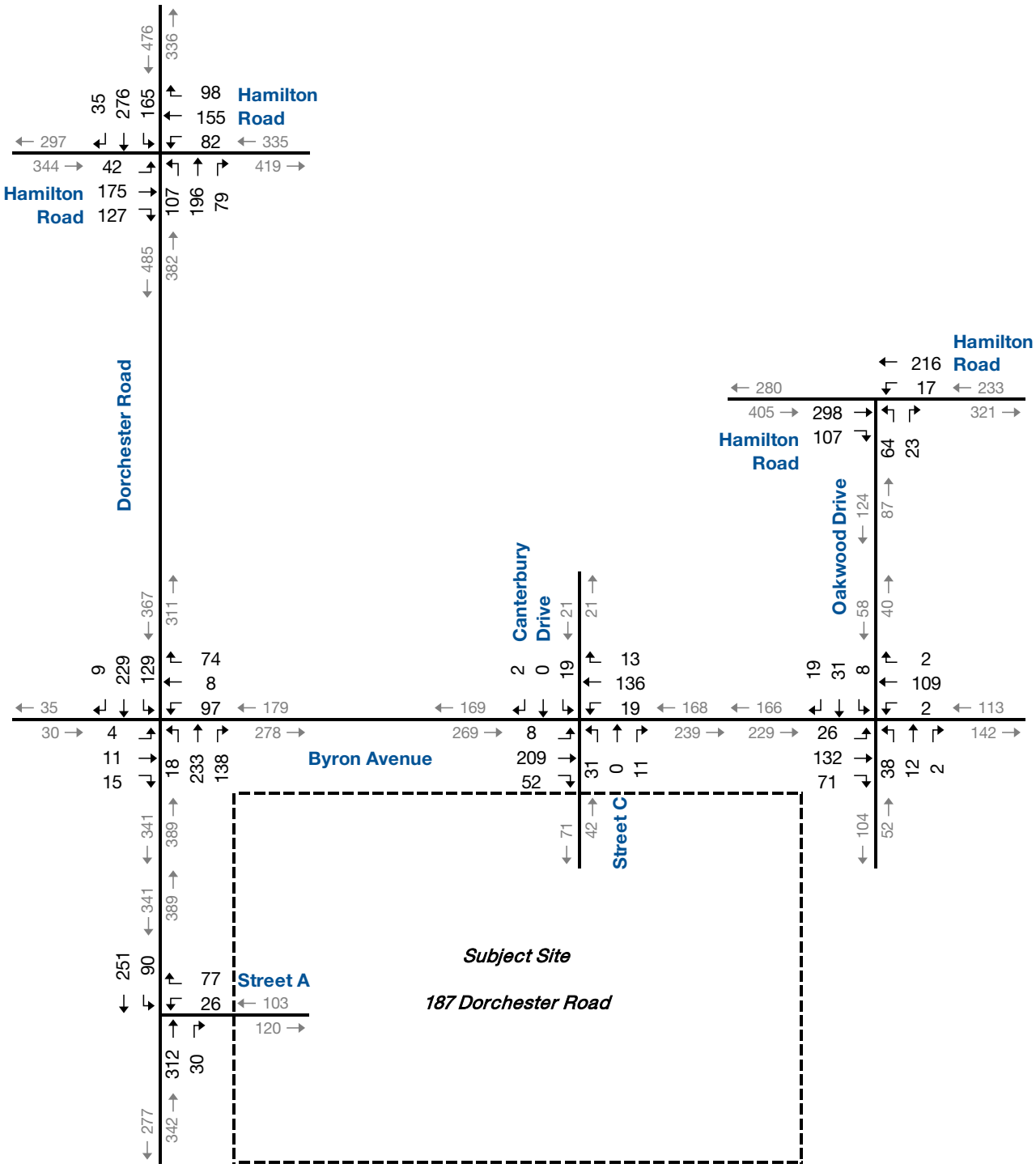
4.3 Future Total Traffic Forecast

Total traffic volumes include background traffic volumes corresponding to each of the three horizon years and site generated development traffic.

Figure 4.7 and **Figure 4.8** detail the forecast 2023 - Opening Year AM and PM Total Traffic volumes, respectively**. Figure 4.9** and **Figure 4.10** detail the forecast 2028 - Five-Year AM and PM Total Traffic volumes, respectively. **Figure 4.**11 and **Figure 4.1** detail the forecast 2033 - Ten-Year AM and PM Total Traffic volumes, respectively.



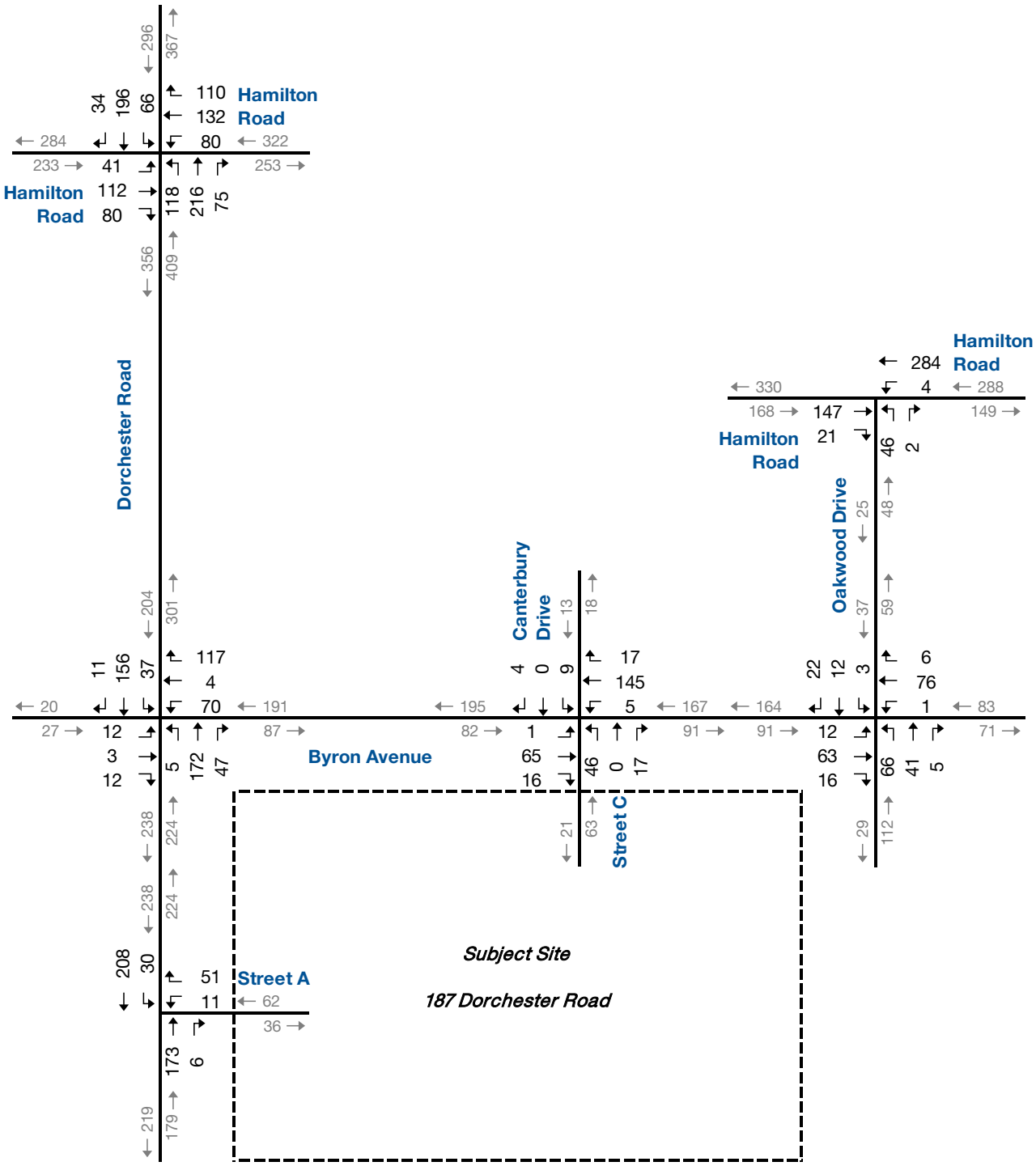
Opening-Year Total Traffic Forecast AM Peak Hour



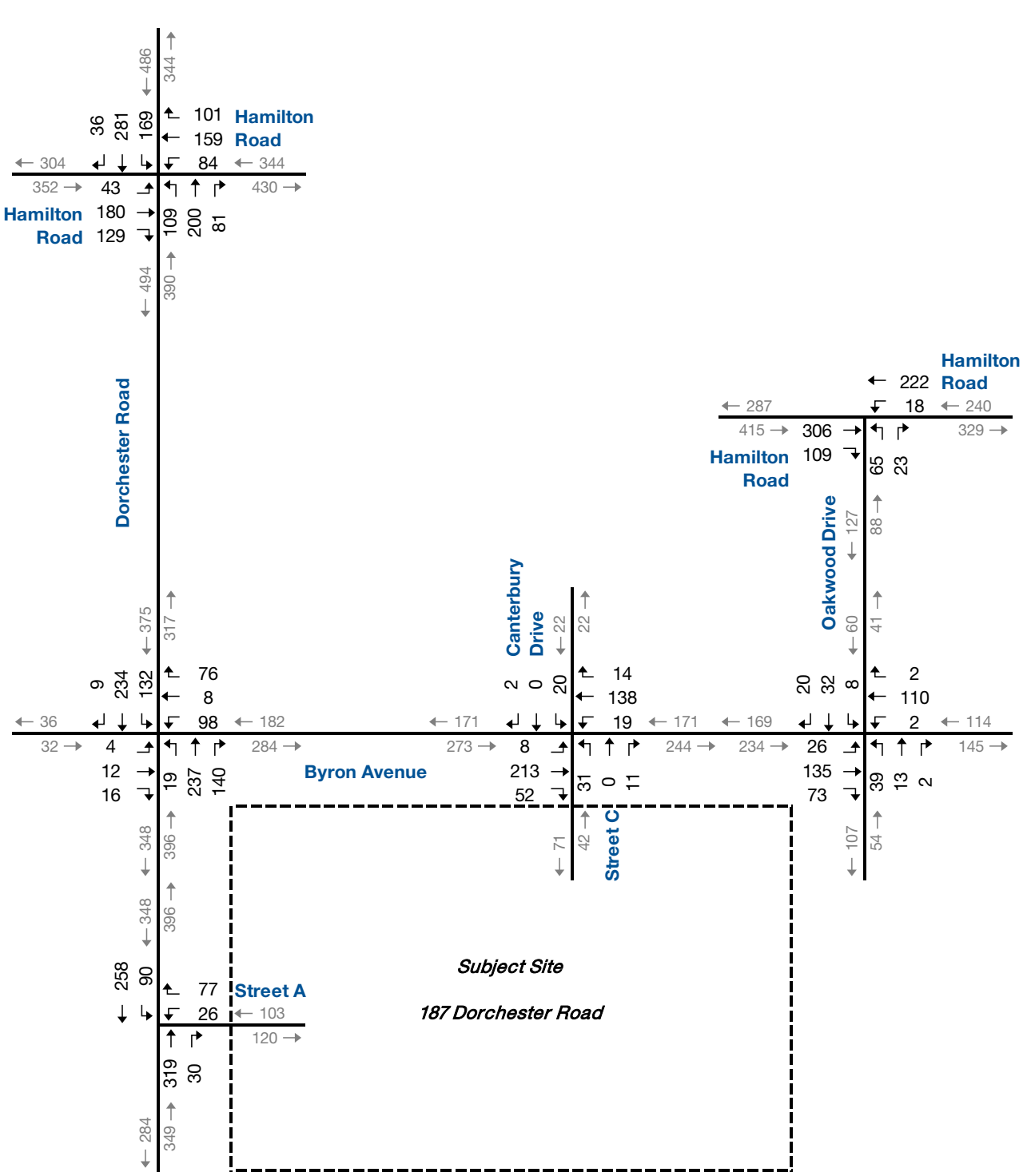
Opening-Year Total Traffic Forecast PM Peak Hour

187 Dorchester Road TRIS
180123

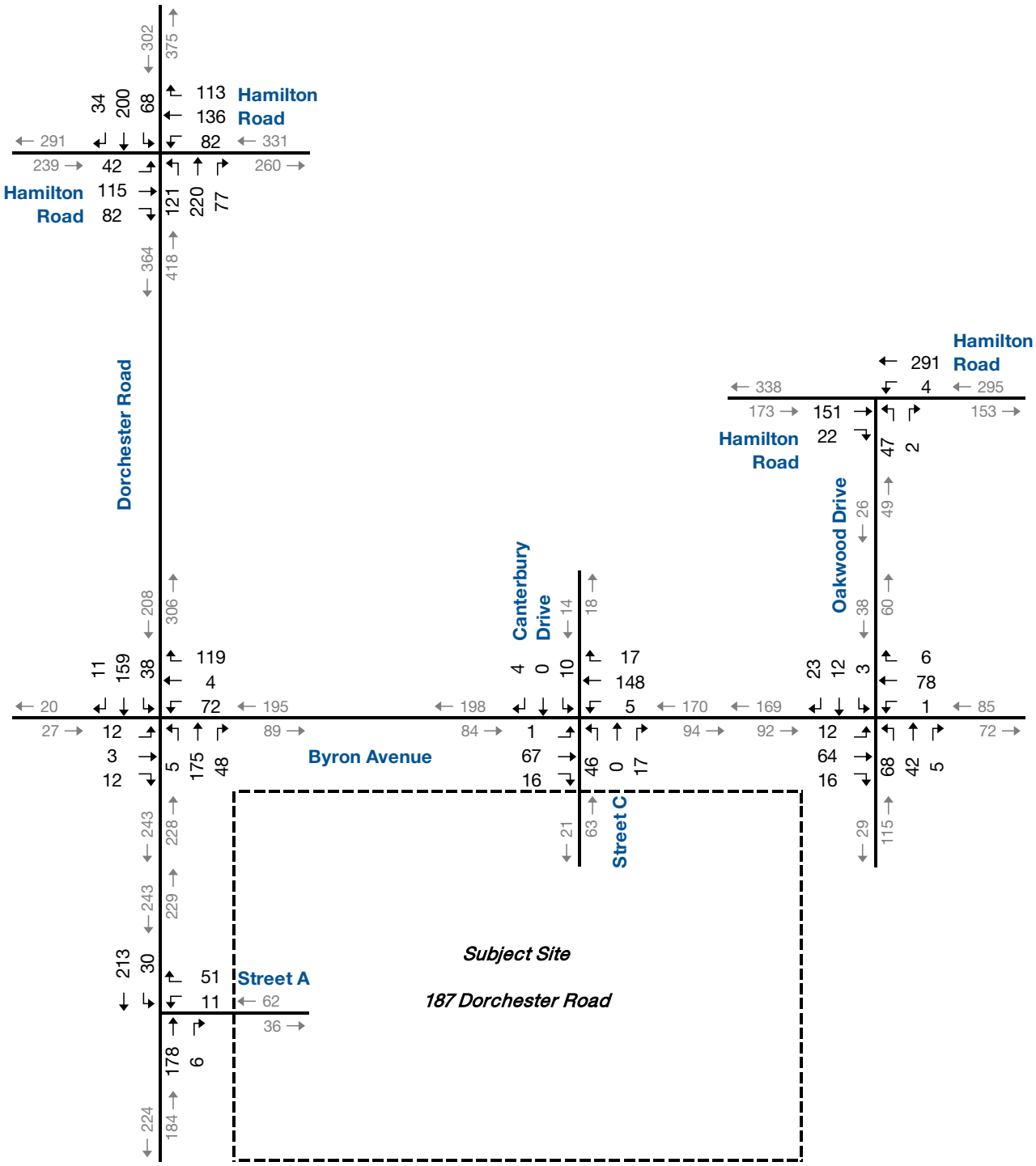
Figure 4.8



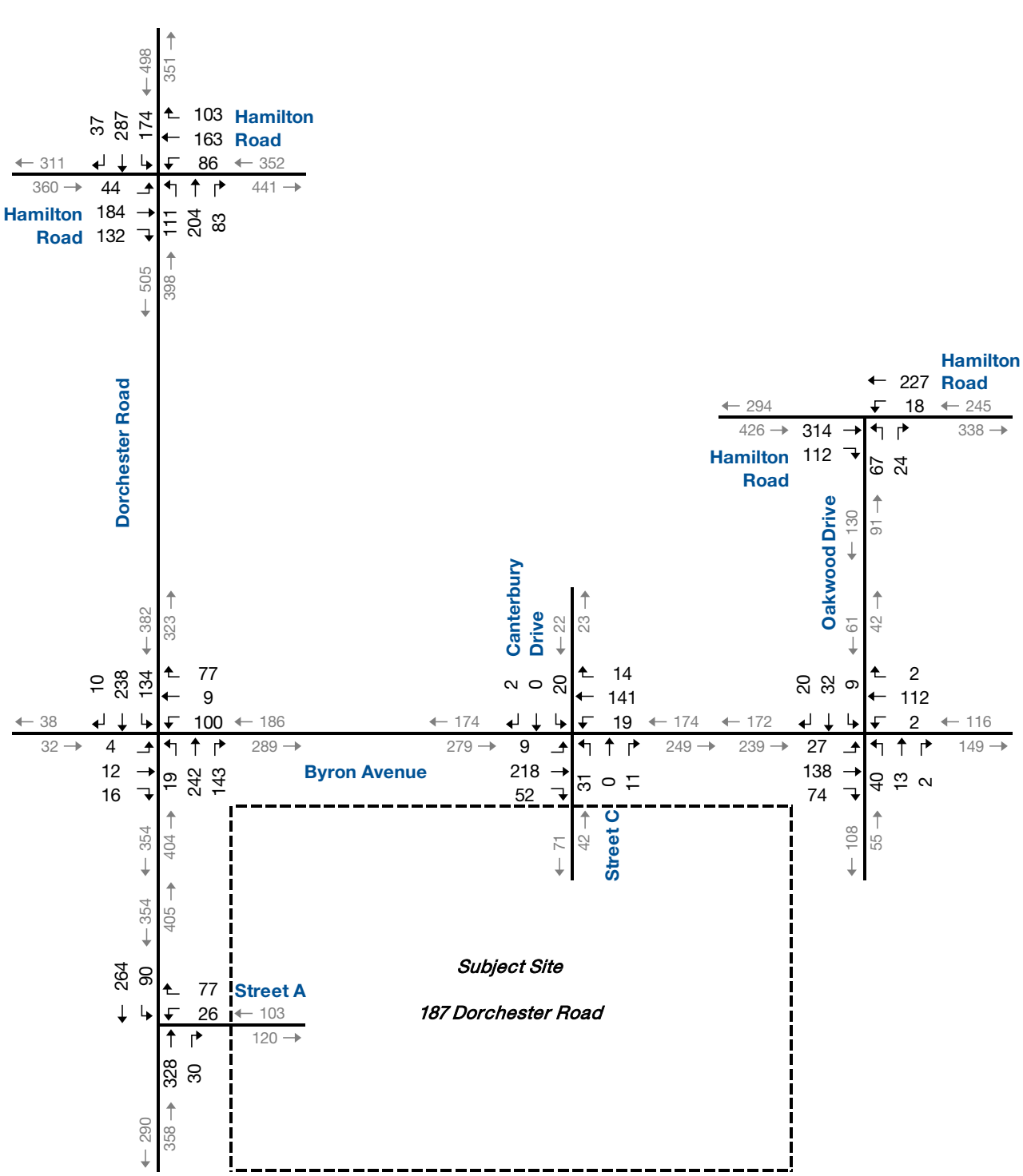
Five-Year Total Traffic Forecast AM Peak Hour



Five-Year Total Traffic Forecast PM Peak Hour



Ten-Year Total Traffic Forecast AM Peak Hour



Ten-Year Total Traffic Forecast PM Peak Hour

187 Dorchester Road TRIS
180123

Figure 4.12

4.4 Future Total Traffic Operations

4.4.1 Total Traffic Operations - Opening Year (2023)

The opening-year (2023) total traffic operations were evaluated using Synchro 9 with HCM 2000 procedures. The proposed street connections to Dorchester Road and Byron Avenue were each assumed to operate with one inbound lane and one outbound lane. There is an existing eastbound left-turn lane on Byron Avenue at Canterbury Drive, and the analysis herein assumes an opposing westbound left-turn lane to be in place on Byron Avenue with 15 metres of storage.

Table 4.4 details the 2023 total traffic level of service conditions. The analyses indicate the intersections in the study area are generally forecast to operate at acceptable levels of service; however, the following critical movement is noted:

- In the PM peak hour, the westbound left-turn movement on Byron Avenue at Dorchester Road is forecast to operate at LOS E with a v/c ratio of 0.54.

The proposed street connections to Dorchester Road and Byron Avenue are forecast to operate with acceptable levels of service and well within capacity during the weekday peak hours.

Appendix G contains the detailed Synchro 9 output.

TABLE 4.4: TOTAL TRAFFIC OPERATIONS – OPENING YEAR HORIZON

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	B	B	>	B	B	B	>	B	B
			Delay	7	8	>	7	7	8	>	8	17	19	>	18	17	17	>	17	13
			V/C	0.08	0.21	>		0.16	0.26	>		0.38	0.55	>		0.29	0.44	>		0.37
			Q	6	14	>		10	17	>		21	42	>		14	33	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		10	-	>		9	-	>		36	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	B	B	B	>	B	A	A	>	A	A	A	>	A	
			Delay	<	13	>	13	14	10	>	12	8	0	>	0	8	0	>	2	
			V/C	<	0.06	>		0.17	0.15	>		0.00	0.14	>		0.03	0.10	>		
			Q	<	1	>		5	4	>		0	0	>		1	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		75	-	>		40	-	>		34	-	>		
	3 - Byron Aavenue & Canterbury Drive/Street C	TWSC	LOS	A	A	>	A	A	A	>	A	<	B	>	B	<	B	>	B	
			Delay	8	0	>	0	7	0	>	0	<	10	>	10	<	10	>	10	
			V/C	0.00	0.05	>		0.00	0.10	>		<	0.09	>		<	0.02	>		
			Q	0	0	>		0	0	>		<	2	>		<	1	>		
			Ex	90	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	90	-	>		15	-	>		<	-	>		<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	7	>	7	
			V/C	<	0.12	>		<	0.11	>		<	0.15	>		<	0.04	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	B	>	B	Approach Not Applicable				
			Delay		0	>	0	<	0		0	<	12	>	12					
			V/C		0.11	>		<	0.00			<	0.09	>						
			Q		0	>		<	0			<	3	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						
	6 - Dorchester Road & Street A	TWSC	LOS	Approach Not Applicable				<	B	>	B		A	>	A	<	A		A	
			Delay					<	10	>	10		0	>	0	<	1		1	
			V/C					<	0.09	>			0.11	>		<	0.02			
			Q					<	2	>			0	>		<	1			
			Ex					<	-	>			-	>		<	-			
			Avail.					<	-	>			-	>		<	-			
PM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	C	B	>	B	C	B	>	C	B
			Delay	7	8	>	8	8	8	>	8	21	18	>	19	25	20	>	22	15
			V/C	0.08	0.32	>		0.17	0.26	>		0.47	0.52	>		0.63	0.60	>		0.43
			Q	6	23	>		10	19	>		22	39	>		38	48	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		10	-	>		8	-	>		12	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	C	>	C	E	B	>	D	A	A	>	A	A	A	>	A	
			Delay	<	17	>	17	40	11	>	28	8	0	>	0	9	0	>	3	
			V/C	<	0.10	>		0.54	0.11	>		0.02	0.24	>		0.12	0.15	>		
			Q	<	3	>		23	3	>		0	0	>		3	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		57	-	>		40	-	>		32	-	>		
	3 - Byron Aavenue & Canterbury Drive/Street C	TWSC	LOS	A	A	>	A	A	A	>	A	<	B	>	B	<	B	>	B	
			Delay	8	0	>	0	8	0	>	1	<	12	>	12	<	12	>	12	
			V/C	0.01	0.17	>		0.02	0.10	>		<	0.08	>		<	0.04	>		
			Q	0	0	>		0	0	>		<	2	>		<	1	>		
			Ex	90	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	90	-	>		15	-	>		<	-	>		<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	9	>	9	<	8	>	8	<	8	>	8	<	8	>	8	
			V/C	<	0.29	>		<	0.15	>		<	0.08	>		<	0.08	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	B	>	B	Approach Not Applicable				
			Delay		0	>	0	<	1		1	<	15	>	15					
			V/C		0.26	>		<	0.02			<	0.20	>						
			Q		0	>		<	0			<	6	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						
	6 - Dorchester Road & Street A	TWSC	LOS	Approach Not Applicable				<	B	>	B		A	>	A	<	A		A	
			Delay					<	14	>	14		0	>	0	<	3		3	
			V/C					<	0.21	>			0.22	>		<	0.08			
			Q					<	6	>			0	>		<	2			
			Ex					<	-	>			-	>		<	-			
			Avail.					<	-	>			-	>		<	-			

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

4.4.2 Total Traffic Operations - Five-Year Horizon (2028)

The five-year (2028) total traffic operations were evaluated using Synchro 9 with HCM 2000 procedures. The proposed street connections to Dorchester Road and Byron Avenue were each assumed to operate with one inbound lane and one outbound lane. There is an existing eastbound left-turn lane on Byron Avenue at Canterbury Drive, and the analysis herein assumes an opposing westbound left-turn lane to be in place on Byron Avenue with 15 metres of storage.

Table 4.5 details the 2028 total traffic level of service conditions. The analyses indicate the intersections in the study area are generally forecast to operate at acceptable levels of service; however, the following critical movement is noted:

- In the PM peak hour, the westbound left-turn movement on Byron Avenue at Dorchester Road is forecast to operate at LOS E with a v/c ratio of 0.57.

The proposed street connections to Dorchester Road and Byron Avenue are forecast to operate with acceptable levels of service and well within capacity during the weekday peak hours.

Appendix H contains the detailed Synchro 9 output.

TABLE 4.5: TOTAL TRAFFIC OPERATIONS – FIVE-YEAR HORIZON

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	B	B	>	B	B	B	>	B	B
			Delay	7	8	>	7	8	8	>	8	17	19	>	19	17	17	>	17	13
			V/C	0.08	0.21	>		0.16	0.26	>		0.39	0.57	>		0.31	0.45	>		0.38
			Q	6	15	>		10	17	>		22	43	>		14	34	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		10	-	>		8	-	>		36	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	B	B	B	>	B	A	A	>	A	A	A	>	A	
			Delay	<	13	>	13	15	10	>	12	8	0	>	0	8	0	>	1	
			V/C	<	0.06	>		0.17	0.16	>		0.00	0.14	>		0.03	0.11	>		
			Q	<	2	>		5	4	>		0	0	>		1	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		75	-	>		40	-	>		34	-	>		
	3 - Byron Aavenue & Canterbury Drive/Street C	TWSC	LOS	A	A	>	A	A	A	>	A	<	B	>	B	<	B	>	B	
			Delay	8	0	>	0	7	0	>	0	<	10	>	10	<	10	>	10	
			V/C	0.00	0.05	>		0.00	0.10	>		<	0.09	>		<	0.02	>		
			Q	0	0	>		0	0	>		<	2	>		<	1	>		
			Ex	90	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	90	-	>		15	-	>		<	-	>		<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	7	>	7	
			V/C	<	0.12	>		<	0.11	>		<	0.15	>		<	0.05	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	B	>	B	Approach Not Applicable				
			Delay		0	>	0	<	0		0	<	13	>	13					
			V/C		0.11	>		<	0.00			<	0.10	>						
			Q		0	>		<	0			<	3	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						
	6 - Dorchester Road & Street A	TWSC	LOS	Approach Not Applicable				<	B	>	B		A	>	A	<	A		A	
			Delay					<	10	>	10		0	>	0	<	1		1	
			V/C					<	0.09	>			0.11	>		<	0.02			
			Q					<	2	>			0	>		<	1			
			Ex					<	-	>			-	>		<	-			
			Avail.					<	-	>			-	>		<	-			
PM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	C	B	>	B	C	C	>	C	B
			Delay	7	9	>	8	8	8	>	8	21	18	>	19	27	20	>	22	15
			V/C	0.09	0.33	>		0.18	0.27	>		0.49	0.53	>		0.66	0.61	>		0.45
			Q	6	24	>		11	20	>		22	40	>		40	48	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		9	-	>		8	-	>		10	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	C	>	C	E	B	>	D	A	A	>	A	A	A	>	A	
			Delay	<	18	>	18	44	11	>	30	8	0	>	0	9	0	>	3	
			V/C	<	0.11	>		0.57	0.12	>		0.02	0.24	>		0.12	0.16	>		
			Q	<	3	>		25	3	>		0	0	>		3	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		55	-	>		40	-	>		32	-	>		
	3 - Byron Aavenue & Canterbury Drive/Street C	TWSC	LOS	A	A	>	A	A	A	>	A	<	B	>	B	<	B	>	B	
			Delay	8	0	>	0	8	0	>	1	<	12	>	12	<	12	>	12	
			V/C	0.01	0.17	>		0.02	0.10	>		<	0.08	>		<	0.05	>		
			Q	0	0	>		0	0	>		<	2	>		<	1	>		
			Ex	90	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	90	-	>		15	-	>		<	-	>		<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	9	>	9	<	8	>	8	<	9	>	9	<	8	>	8	
			V/C	<	0.30	>		<	0.15	>		<	0.08	>		<	0.09	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	C	>	C	Approach Not Applicable				
			Delay		0	>	0	<	1		1	<	15	>	15					
			V/C		0.27	>		<	0.02			<	0.21	>						
			Q		0	>		<	0			<	6	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						
	6 - Dorchester Road & Street A	TWSC	LOS	Approach Not Applicable				<	B	>	B		A	>	A	<	A		A	
			Delay					<	14	>	14		0	>	0	<	3		3	
			V/C					<	0.21	>			0.22	>		<	0.08			
			Q					<	6	>			0	>		<	2			
			Ex					<	-	>			-	>		<	-			
			Avail.					<	-	>			-	>		<	-			

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

4.4.3 Total Traffic Operations - Ten-Year Horizon (2033)

The ten-year (2033) total traffic operations were evaluated using Synchro 9 with HCM 2000 procedures. The proposed street connections to Dorchester Road and Byron Avenue were each assumed to operate with one inbound lane and one outbound lane. There is an existing eastbound left-turn lane on Byron Avenue at Canterbury Drive, and the analysis herein assumes an opposing westbound left-turn lane to be in place on Byron Avenue with 15 metres of storage.

Table 4.6 details the 2033 total traffic level of service conditions. The analyses indicate the intersections in the study area are generally forecast to operate at acceptable levels of service; however, the following critical movement is noted:

- In the PM peak hour, the westbound left-turn movement on Byron Avenue at Dorchester Road is forecast to operate at LOS E with a v/c ratio of 0.60.

The proposed street connections to Dorchester Road and Byron Avenue are forecast to operate with acceptable levels of service and well within capacity during the weekday peak hours.

Appendix I contains the detailed Synchro 9 output.

TABLE 4.6: TOTAL TRAFFIC OPERATIONS – TEN-YEAR HORIZON

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	B	B	>	B	B	B	>	B	B
			Delay	7	8	>	8	8	8	>	8	18	20	>	19	17	17	>	17	14
			V/C	0.08	0.21	>		0.17	0.27	>		0.41	0.58	>		0.32	0.46	>		0.39
			Q	6	15	>		10	18	>		22	44	>		15	35	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		10	-	>		8	-	>		35	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	B	>	B	B	B	>	B	A	A	>	A	A	A	>	A	
			Delay	<	13	>	13	15	10	>	12	8	0	>	0	8	0	>	1	
			V/C	<	0.06	>		0.18	0.16	>		0.00	0.14	>		0.03	0.11	>		
			Q	<	2	>		5	5	>		0	0	>		1	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		75	-	>		40	-	>		34	-	>		
	3 - Byron Aavenue & Canterbury Drive/Street C	TWSC	LOS	A	A	>	A	A	A	>	A	<	B	>	B	<	B	>	B	
			Delay	8	0	>	0	7	0	>	0	<	10	>	10	<	10	>	10	
			V/C	0.00	0.05	>		0.00	0.11	>		<	0.09	>		<	0.02	>		
			Q	0	0	>		0	0	>		<	2	>		<	1	>		
			Ex	90	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	90	-	>		15	-	>		<	-	>		<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	8	>	8	<	8	>	8	<	8	>	8	<	7	>	7	
			V/C	<	0.12	>		<	0.11	>		<	0.16	>		<	0.05	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	B	>	B	Approach Not Applicable				
			Delay		0	>	0	<	0		0	<	13	>	13					
			V/C		0.11	>		<	0.00			<	0.10	>						
			Q		0	>		<	0			<	3	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						
	6 - Dorchester Road & Street A	TWSC	LOS	Approach Not Applicable				<	B	>	B		A	>	A	<	A		A	
			Delay					<	10	>	10		0	>	0	<	1		1	
			V/C					<	0.09	>			0.12	>		<	0.02			
			Q					<	2	>			0	>		<	1			
			Ex					<	-	>			-	>		<	-			
			Avail.					<	-	>			-	>		<	-			
PM Peak Hour	1 - Hamilton Road & Dorchester Road	TCS	LOS	A	A	>	A	A	A	>	A	C	B	>	B	C	C	>	C	B
			Delay	7	9	>	8	8	8	>	8	22	19	>	20	29	21	>	23	16
			V/C	0.09	0.34	>		0.18	0.28	>		0.51	0.54	>		0.69	0.63	>		0.47
			Q	6	25	>		11	21	>		25	41	>		42	50	>		
			Ex	15	-	>		20	-	>		30	-	>		50	-	>		
			Avail.	9	-	>		9	-	>		5	-	>		8	-	>		
	2 - Dorchester Road & Byronn Avenue	TWSC	LOS	<	C	>	C	E	B	>	D	A	A	>	A	A	A	>	A	
			Delay	<	18	>	18	48	11	>	33	8	0	>	0	9	0	>	3	
			V/C	<	0.11	>		0.60	0.12	>		0.02	0.25	>		0.13	0.16	>		
			Q	<	3	>		27	3	>		0	0	>		4	0	>		
			Ex	<	-	>		80	-	>		40	-	>		35	-	>		
			Avail.	<	-	>		53	-	>		40	-	>		32	-	>		
	3 - Byron Aavenue & Canterbury Drive/Street C	TWSC	LOS	A	A	>	A	A	A	>	A	<	B	>	B	<	B	>	B	
			Delay	8	0	>	0	8	0	>	1	<	12	>	12	<	13	>	13	
			V/C	0.01	0.17	>		0.02	0.10	>		<	0.09	>		<	0.05	>		
			Q	0	0	>		0	0	>		<	2	>		<	1	>		
			Ex	90	-	>		15	-	>		<	-	>		<	-	>		
			Avail.	90	-	>		15	-	>		<	-	>		<	-	>		
	4 - Byron Avenue & Oakwood Drive	AWSC	LOS	<	A	>	A	<	A	>	A	<	A	>	A	<	A	>	A	
			Delay	<	9	>	9	<	8	>	8	<	9	>	9	<	8	>	8	
			V/C	<	0.30	>		<	0.16	>		<	0.08	>		<	0.09	>		
			Q	<	-	>		<	-	>		<	-	>		<	-	>		
			Ex	<	-	>		<	-	>		<	-	>		<	-	>		
			Avail.	<	-	>		<	-	>		<	-	>		<	-	>		
	5 - Oakwood Road & Hamilton Road	TWSC	LOS		A	>	A	<	A		A	<	C	>	C	Approach Not Applicable				
			Delay		0	>	0	<	1		1	<	15	>	15					
			V/C		0.27	>		<	0.02			<	0.22	>						
			Q		0	>		<	0			<	7	>						
			Ex		-	>		<	-			<	-	>						
			Avail.		-	>		<	-			<	-	>						
	6 - Dorchester Road & Street A	TWSC	LOS	Approach Not Applicable				<	B	>	B		A	>	A	<	A		A	
			Delay					<	14	>	14		0	>	0	<	3		3	
			V/C					<	0.22	>			0.23	>		<	0.08			
			Q					<	7	>			0	>		<	2			
			Ex					<	-	>			-	>		<	-			
			Avail.					<	-	>			-	>		<	-			

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

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

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

<- Shared Left/Through Lane
>- Shared Right/Through Lane

5 Remedial Measures

The intersection operational analyses outlined in **Section 2.5, Section 4.2** and **Section 4.4** indicate the development traffic generated by the subject lands will have a relatively minor impact on the surrounding road network. The noted critical movement, i.e. the westbound left-turn movement on Byron Avenue at Dorchester Road, is anticipated to operate at LOS E during all three horizons; however, the movement is still forecast to operate within capacity, with a maximum v/c ratio of 0.60.

The need for potential remedial measures including traffic control improvements and auxiliary turn lanes, was investigated as summarized in this section.

5.1 Auxiliary Turn Lanes

5.1.1 Dorchester Road and Street A

The need for a southbound left-turn lane on Dorchester Road at Street A was reviewed based on the warrants for left-turn lanes summarized in the MTO's Geometric Design Standards Manual[8]. A design speed of 60 kilometres per hour and a two-lane cross-section were assumed in the warrant analysis, corresponding to the ten-year post build-out (2033) traffic conditions. **Appendix J** contains the warrant analysis and our findings indicate the following:

- A southbound left-turn lane with 15 metres of storage is warranted in the weekday PM peak hour.

It is noted that this movement is forecast to operate at an excellent level of service (LOS A) at the ten-year horizon and is warranted based on projected traffic volumes rather than poor traffic operations on Dorchester Road.

5.1.2 Byron Avenue and Street C/Canterbury Drive

The need for a westbound left-turn lane on Byron Avenue at Street C/Canterbury Drive was reviewed based on the warrants for left-turn lanes summarized in the MTO's Geometric Design Standards Manual. A design speed of 60 kilometres per hour and a two-lane cross-section were assumed in the warrant analysis, corresponding to the ten-year post build-out (2033) traffic conditions. **Appendix J** contains the warrant analysis and our findings indicate the following:

- A westbound left-turn lane is not warranted on Byron Avenue at Street C/Canterbury Drive.

[8] MTO Geometric Design Standards for Ontario Highways, Chapter E, 1976

However, given the existing eastbound left-turn lane on Byron Avenue at this intersection, an opposing westbound lane could also be provided.

It is noted that this movement is forecast to operate at an excellent level of service (LOS A) at the ten-year horizon and is warranted based on projected traffic volumes rather than poor traffic operations on Dorchester Road.

5.1.3 Auxiliary Right-Turn Lanes

Exclusive right-turn lanes are generally considered for implementation when the volume of right turning vehicles is between 10-20[9] percent of the through volume, subject to a minimum of 60 vehicles per hour in the design hour[10] or when turning traffic creates a hazard.

The forecast Ten-Year Horizon traffic volumes indicate right-turns lanes at either proposed street connection are not warranted.

5.2 Traffic Control Improvements

The operational analysis contained in **Section 4.4** (total traffic conditions) suggests that the westbound left-turn movement on Byron Avenue at Dorchester Road is forecast to operate at LOS E at the opening year horizon. Although the movement is forecast to operate within capacity, intersection improvements in the form of traffic control signals could be implemented to reduce delay.

To address delay related concerns, the Dorchester Road/Byron Avenue intersection has been assessed using the Ontario Traffic Manual signal warrant guidelines.[11]. **Table 5.1** summarizes the results of the warrant analysis. **Appendix K** contains the warrant analysis worksheets. Based on the warrant analysis, traffic control signals are not warranted at the intersection of Byron Avenue/Dorchester Road at the ten-year horizon year, or any preceding horizon year.

TABLE 5.1: OTM WARRANT SUMMARY

Intersection	Horizon Year	OTM Warrant				
		1A	1B	2A	2B	Warranted
Dorchester Road & Byron Avenue	Opening- Year Total	55%	62%	41%	66%	No
	Five-Year Total	57%	64%	42%	68%	No
	Ten-Year Total	58%	65%	42%	69%	No

[9] Highway Capacity Manual, Special Report 209, Third Edition (1998) Transportation Research Board, National Research Council, Washington, Page 9-97.
[10] Geometric Design Standards for Ontario Highways
[11] OTM Book 12 – Traffic Signals

5.3 Sight Distance Assessment

5.3.1 Methodology

Paradigm staff completed a field assessment in June 2018 to document sight distance measurements at the proposed new street connections to Dorchester Road and Byron Avenue. The assessment was completed in accordance with the methodology contained in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads.[12] The following object heights were utilized in the field measurements:

- Object Height (Vehicle tail or brake light) – 0.60 metres;
- Driver Eye Height – 1.08 metres; and
- Top of Car – 1.30 metres.

The main measurements for outbound traffic were taken three (3) metres back from the existing edge of pavement for vehicles exiting the subject lands, representing the approximate position of a driver executing a turning movement. The main measurements for inbound traffic were taken from within the centre of the travel lane, assuming a vehicle position perpendicular to the proposed street's centreline (i.e. slowing down in the travel lane to execute a turning movement).

The sight distance requirements for the street connections based on a design speed of 60 kilometres per hour (10 kilometres per hour above the posted speed limit) are as follows:

- Minimum stopping sight distance[13]: 85 metres
- Decision sight distance – Left Turn from Stop[14]: 130 metres
- Decision sight distance – Right Turn from Stop[15]: 110 metres.

5.3.2 Dorchester Road and Street A

The topography of Dorchester Road north and south of the proposed Street A connection is considered relatively straight and flat, with a slight grade in the northbound direction. Sightlines are unobstructed to and beyond the intersection of Byron Avenue/Dorchester Road, approximately 330 metres. Sightlines are also unobstructed to the south at a distance beyond 300 metres. The field measurements appear to satisfy the minimum sight distances suggested by TAC for a stop-controlled condition under a 60 kilometre per hour design speed.

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[12] TAC. *Geometric Design Guide for Canadian Roads.* 2017.
[13] Ibid. Table 2.5.2: Stopping Sight Distance on Level Roadways for Automobiles.
[14] Ibid. Table 9.9.5: Design Intersection Sight Distance – Vase B1, Left Turn from Stop
[15] Ibid. Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop.

5.3.3 Byron Avenue and Street C/Canterbury Drive

The topography of Byron Avenue east and west of the proposed Street C connection is considered relatively straight and flat, with a slight grade in the westbound direction. Sightlines are unobstructed to and beyond the intersection of Byron Avenue/Dorchester Road, approximately 445 metres. Sightlines are also unobstructed to and beyond the intersection of Byron Avenue/Chittick Crescent, approximately 500 metres. The field measurements appear to satisfy the minimum sight distances suggested by TAC for a stop-controlled condition under a 60 kilometre per hour design speed.

6 Conclusions and Recommendations

6.1 Conclusions

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

- Under existing conditions all intersections in the study area are operating at acceptable levels of service during the weekday AM and PM peak hours, with no individual problem movements;
- Upon build-out of the subject lands, the site is forecast to generate 182 new trips in the weekday AM peak hour, and 291 new trips in the weekday PM peak hour;
- Under opening-year, five-year post build-out, and ten-year post build-out horizon years, all intersections in the study area are forecast to operate with acceptable levels of service during the weekday AM and PM peak hours, with the exception of the following critical movement:
  - The westbound left-turn movement on Byron Avenue at Dorchester Road is forecast to operate at LOS E at all three horizon years, with a maximum v/c ratio of 0.60 at the ten-year horizon.
- Investigation of Remedial Measures indicates following:
  - Traffic control signals are not warranted at Byron Avenue & Dorchester Road at the ten-year total traffic horizon or any preceding horizon year;
  - A southbound left-turn lane on Dorchester Road at Street A with 15 metres of storage is warranted; and
  - A westbound left-turn lane on Byron Avenue at Street C with 15 metres of storage is warranted, opposite the existing eastbound left-turn lane to Canterbury Drive.
- Adequate sight distances are available on Dorchester Road and Byron Avenue for vehicles exiting and entering the subject development via Street A or Street C.

6.2 Recommendations

Based on the findings of this study it is recommended that the development be approved as proposed, with the following modifications:

- The provision of a southbound left-turn lane on Dorchester Road at Street A with 15 metres of storage; and
- The provision of a westbound left-turn lane on Byron Avenue at Street C with 15 metres of storage, opposite the existing eastbound left-turn lane to Canterbury Drive.

Appendix A

Pre-Study Consultation

Andrew Steinsky

From: Andrew Steinsky
Sent: May 29, 2018 11:01 AM
To: Ryan Hillinger
Cc: Chris Traini; Rajan Philips
Subject: 180123 - 187 Byron Avenue TRIS Scope of Work
Attachments: 12-827 Concept D Jan 17 2018.pdf

Hi Ryan,

Paradigm Transportation Solutions Limited has been retained to prepare a Transportation Impact Study for the proposed redevelopment of the lands located at 187 Byron Avenue in Dorchester, Ontario. The following details our understanding of the assignment, and our proposed work plan to carry out the study. We would appreciate any comments on this work plan no later than **Friday 1 June, 2018**.

Project Understanding & Work Plan

The site is bounded by Dorchester Road and Byron Avenue and is currently vacant. The site is planned to be developed to comprise 201 single detached residential dwellings, 2.08 hectares of medium density residential units, and 1.28 hectares of commercial land uses. Vehicular access to the site is proposed via two new municipal street connections; one to County Road 32 (opposite an existing farm lane) and one to Byron Avenue (opposite Canterbury Drive). The site plan is attached for your reference. In assessing the transportation impacts, we intend to analyze the operation of any proposed new street connections (2) and the following five (5) intersections:

- Hamilton Road and Dorchester Road (signalized);
- Hamilton Road and Oakwood Drive (unsignalized)
- Byron Avenue and Dorchester Road (unsignalized);
- Byron Avenue and Canterbury Drive (unsignalized); and
- Byron Avenue and Oakwood Drive (unsignalized).

We will complete the TIS in accordance with the *Ministry of Transportation Traffic Impact Study Guidelines (September 2014)* and*,* and any further direction provided by County staff. The following outlines our proposed work plan to carry out this assignment:

- **Task 1 – Data Collection:** Paradigm will arrange for eight-hour traffic counts to be conducted on a weekday at the five municipal intersections. We will conduct a site visit to view and assess current road and transportation conditions in the study area during the typical peak periods for commuter flow traffic (weekday morning (AM) and afternoon (PM) peak hours). We will contact the agencies to obtain relevant background data (including signal timing, collision data, etc.) as needed.

- **Task 2 – Traffic Forecasting:** According to the TIS guidelines, we have assumed that we will be requested to develop traffic forecasts for the weekday AM and PM peak hours for future horizon years at opening date (2023), five (5) years from the date of full occupancy (2028), and 10 years from full development and occupancy (estimated 2033) as outlined in the TIS requirements. The components of the traffic forecasts are as follows:

  - Existing (Base Year) – We will develop Existing (2018) vehicle traffic volumes for the AM and PM peak hours from available counts for the study area intersections.

- Future (Horizon Year) Background – We will estimate Future Background (2023, 2028, 2033) vehicle traffic volumes for the AM and PM peak hours by applying a growth rate to the Existing volumes and adding anticipated trips from nearby approved developments. A review of 2016 Census data demonstrates a growth rate of 0.5% to 1% compounded per annum would account for population and employment growth within the study area. **Please confirm if this growth rate is acceptable, or provide an alternate growth rate.**
- Future (Horizon Year) Total – We will forecast the AM and PM peak hour vehicle traffic volumes generated by the proposed development based on a combination of data collected by Paradigm from similar sites or the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition) as appropriate. The site vehicle trips will be distributed to the adjacent road network based on existing traffic patterns, and added to the Future Background estimates to produce Future Total traffic volumes for each horizon year.

- **Task 3 – Operational Analyses:** We will evaluate the operation of the study area intersections and proposed site driveway for the Existing, Future Background and Future Total AM and PM peak hour traffic conditions for each horizon year. The operational analyses will assess volume-to-capacity (v/c) ratios, Level of Service (LOS) and queuing conditions. Based on the analysis results, we will identify any existing deficiencies, as well as the net impact of the proposed development on the study area road network. The need for road improvements (e.g., provision of auxiliary turn lanes) and/or modifications to traffic control devices (e.g., addition of traffic control signals) to address any deficiencies will be determined. An assessment of whether these measures are required due to non-site traffic (i.e. Existing or Future Background) or the increase in traffic resulting from the proposed development will be completed. In addition, a qualitative assessment of the potential impact on transit services and active transportation facilities (i.e. walking and cycling modes) will be provided.

- **Task 4 – New Intersections:** The new intersections (2) will be evaluated in terms of capacity, safety and adequacy of queue storage capacity, pedestrian safety. Any access points will be checked for conflicts with utilities, other driveway locations (including those of other sites), bus stop locations, on-street weaving problems, pedestrian/ bicycle safety, etc. Any on-site parking/circulation systems will be evaluated to demonstrate a high safety-factor with respect to the possibility of queues backing onto municipal roads, the need for vehicles to back onto roads etc. Sight-lines for roads and access points to the multi-family and commercial blocks will be evaluated to ensure safe conditions in accordance with accepted standards where these are affected by the site design. Service vehicle/ truck loading facilities and access to these facilities will be evaluated to ensure that they are adequately sized, designed, and provided with suitable access so that they will not adversely affect traffic operations on municipal roads. Any required turning or other restrictions will be identified.

- **Task 5 – Safety Analysis:** Paradigm will prepare a Safety Analysis section within the overall TIS report to identify potential safety issues as detailed in the TIS Guidelines. If the proposed development is near an intersection or roadway with identified safety problems, existing collision data will be reviewed and an assessment of the impact of the proposed development will be provided.

- **Task 6 – Report:** Paradigm will prepare a detailed report documenting our investigations, findings and recommendations, including appendices containing relevant traffic data as well as the detailed output generated by the operational analysis software.

If you have any questions on the above work plan, please do not hesitate to contact myself, or my colleague Rajan (cc'd on this email).

Regards,

Andrew Steinsky, B.Eng., EIT
Transportation Consultant

Paradigm Transportation Solutions Limited
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Appendix B

Turning Movement Count Data and Signal Timing Plans

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Hamilton Road & Dorchester Road
Site Code:
Start Date: 05/23/2018

Turning Movement Data

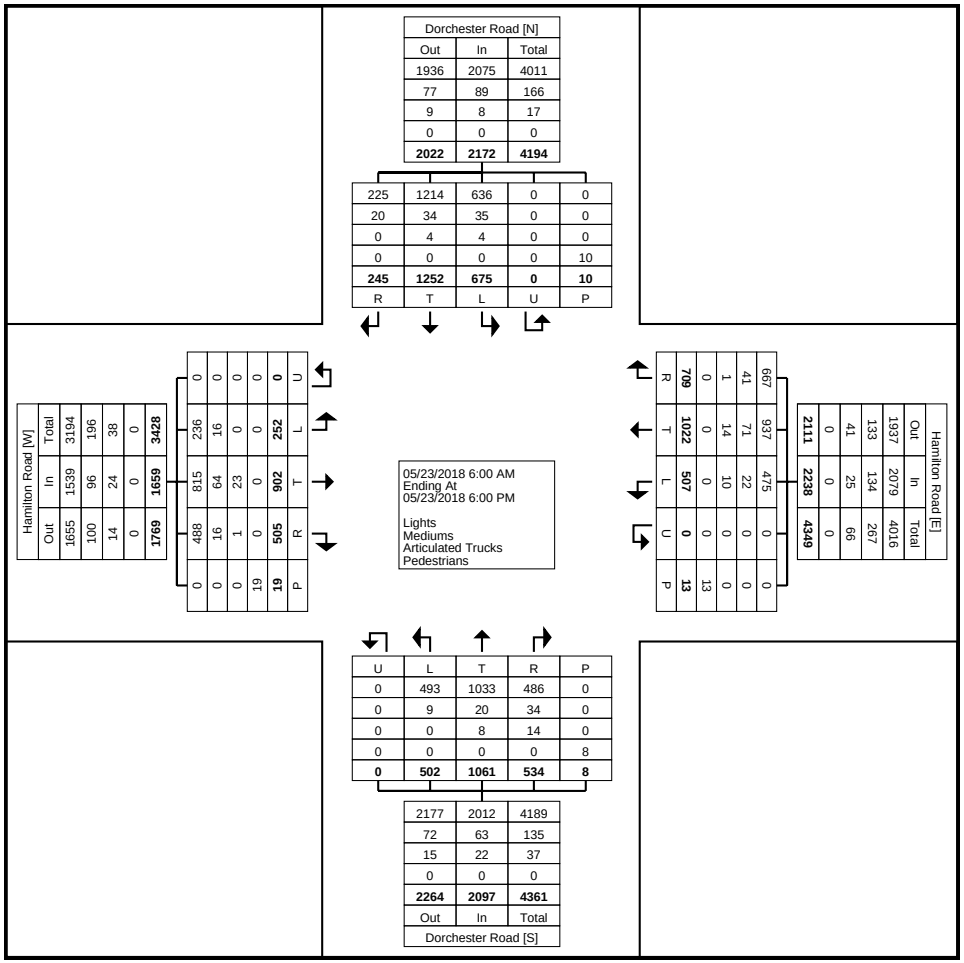
Start Time	Hamilton Road Eastbound						Hamilton Road Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:00 AM	2	12	3	0	1	17	2	15	9	0	0	26	2	9	5	0	2	16	7	8	0	0	0	15	74
6:15 AM	1	16	7	0	0	24	4	9	6	0	0	19	10	16	7	0	0	33	4	15	5	0	0	24	100
6:30 AM	4	12	8	0	0	24	14	22	20	0	1	56	10	21	11	0	0	42	3	14	6	0	0	23	145
6:45 AM	1	9	8	0	0	18	5	26	10	0	1	41	8	19	7	0	0	34	6	20	4	0	0	30	123
Hourly Total	8	49	26	0	1	83	25	72	45	0	2	142	30	65	30	0	2	125	20	57	15	0	0	92	442
7:00 AM	4	14	11	0	3	29	9	22	18	0	0	49	15	29	7	0	0	51	7	25	8	0	0	40	169
7:15 AM	3	16	7	0	0	26	13	49	20	0	0	82	13	33	4	0	0	50	11	29	7	0	0	47	205
7:30 AM	8	8	12	0	0	28	7	39	28	0	0	74	22	40	10	0	0	72	9	39	4	0	0	52	226
7:45 AM	15	24	10	0	2	49	19	35	28	0	1	82	16	42	16	0	0	74	7	42	9	0	0	58	263
Hourly Total	30	62	40	0	5	132	48	145	94	0	1	287	66	144	37	0	0	247	34	135	28	0	0	197	863
8:00 AM	10	23	10	0	0	43	27	46	26	0	0	99	18	32	17	0	0	67	10	42	10	0	0	62	271
8:15 AM	15	31	18	0	0	64	13	32	20	0	2	65	15	32	14	0	0	61	11	44	6	0	0	61	251
8:30 AM	11	25	15	0	0	51	14	28	26	0	1	68	18	48	24	0	0	90	13	36	6	0	2	55	264
8:45 AM	3	28	21	0	0	52	22	20	33	0	0	75	13	46	16	0	0	75	29	46	10	0	0	85	287
Hourly Total	39	107	64	0	0	210	76	126	105	0	3	307	64	158	71	0	0	293	63	168	32	0	2	263	1073
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	9	17	12	0	4	38	15	30	19	0	0	64	15	29	28	0	0	72	24	32	11	0	1	67	241
11:15 AM	8	22	13	0	0	43	19	28	17	0	0	64	22	23	22	0	0	67	9	23	10	0	0	42	216
11:30 AM	6	22	15	0	0	43	8	33	15	0	0	56	20	35	12	0	0	67	16	40	8	0	0	64	230
11:45 AM	10	29	23	0	0	62	17	23	30	0	0	70	14	28	18	0	0	60	20	51	12	0	2	83	275
Hourly Total	33	90	63	0	4	186	59	114	81	0	0	254	71	115	80	0	0	266	69	146	41	0	3	256	962
12:00 PM	5	37	20	0	1	62	20	23	32	0	2	75	16	41	25	0	1	82	24	38	4	0	2	66	285
12:15 PM	8	24	13	0	0	45	23	26	20	0	0	69	10	25	22	0	1	57	19	26	6	0	1	51	222
12:30 PM	9	30	19	0	0	58	10	27	14	0	0	51	11	25	19	0	0	55	24	34	13	0	0	71	235
12:45 PM	3	24	19	0	0	46	18	22	21	0	0	61	16	30	23	0	1	69	6	46	5	0	1	57	233
Hourly Total	25	115	71	0	1	211	71	98	87	0	2	256	53	121	89	0	3	263	73	144	28	0	4	245	975
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	5	40	24	0	1	69	12	28	24	0	0	64	18	42	30	0	1	90	26	49	8	0	0	83	306
3:15 PM	13	40	12	0	0	65	16	48	33	0	0	97	19	34	18	0	0	71	25	34	6	0	0	65	298
3:30 PM	9	31	14	0	0	54	29	41	29	0	1	99	18	37	17	0	0	72	46	44	11	0	0	101	326
3:45 PM	13	37	20	0	1	70	18	38	19	0	1	75	11	48	23	0	1	82	35	50	10	0	0	95	322
Hourly Total	40	148	70	0	2	258	75	155	105	0	2	335	66	161	88	0	2	315	132	177	35	0	0	344	1252
4:00 PM	11	35	21	0	0	67	18	36	27	0	1	81	10	43	15	0	0	68	23	51	3	0	0	77	293
4:15 PM	12	37	17	0	1	66	14	41	22	0	0	77	18	39	18	0	0	75	37	56	7	0	0	100	318
4:30 PM	11	59	17	0	0	87	25	34	26	0	0	85	17	30	19	0	1	66	34	50	6	0	0	90	328
4:45 PM	9	33	21	0	0	63	21	34	20	0	0	75	19	44	20	0	0	83	40	61	7	0	0	108	329
Hourly Total	43	164	76	0	1	283	78	145	95	0	1	318	64	156	72	0	1	292	134	218	23	0	0	375	1268

5:00 PM	11	40	25	0	1	76	22	41	31	0	0	94	16	37	17	0	0	70	47	48	12	0	0	107	347
5:15 PM	10	39	22	0	4	71	12	42	19	0	1	73	24	44	21	0	0	89	40	59	9	0	0	108	341
5:30 PM	7	51	24	0	0	82	17	46	23	0	1	86	21	29	13	0	0	63	30	53	14	0	1	97	328
5:45 PM	6	37	24	0	0	67	24	38	24	0	0	86	27	31	16	0	0	74	33	47	8	0	0	88	315
Hourly Total	34	167	95	0	5	296	75	167	97	0	2	339	88	141	67	0	0	296	150	207	43	0	1	400	1331
Grand Total	252	902	505	0	19	1659	507	1022	709	0	13	2238	502	1061	534	0	8	2097	675	1252	245	0	10	2172	8166
Approach %	15.2	54.4	30.4	0.0	-	-	22.7	45.7	31.7	0.0	-	-	23.9	50.6	25.5	0.0	-	-	31.1	57.6	11.3	0.0	-	-	-
Total %	3.1	11.0	6.2	0.0	-	20.3	6.2	12.5	8.7	0.0	-	27.4	6.1	13.0	6.5	0.0	-	25.7	8.3	15.3	3.0	0.0	-	26.6	-
Lights	236	815	488	0	-	1539	475	937	667	0	-	2079	493	1033	486	0	-	2012	636	1214	225	0	-	2075	7705
% Lights	93.7	90.4	96.6	-	-	92.8	93.7	91.7	94.1	-	-	92.9	98.2	97.4	91.0	-	-	95.9	94.2	97.0	91.8	-	-	95.5	94.4
Mediums	16	64	16	0	-	96	22	71	41	0	-	134	9	20	34	0	-	63	35	34	20	0	-	89	382
% Mediums	6.3	7.1	3.2	-	-	5.8	4.3	6.9	5.8	-	-	6.0	1.8	1.9	6.4	-	-	3.0	5.2	2.7	8.2	-	-	4.1	4.7
Articulated Trucks	0	23	1	0	-	24	10	14	1	0	-	25	0	8	14	0	-	22	4	4	0	0	-	8	79
% Articulated Trucks	0.0	2.5	0.2	-	-	1.4	2.0	1.4	0.1	-	-	1.1	0.0	0.8	2.6	-	-	1.0	0.6	0.3	0.0	-	-	0.4	1.0
Pedestrians	-	-	-	-	19	-	-	-	-	-	13	-	-	-	-	-	8	-	-	-	-	-	10	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Hamilton Road & Dorchester Road
Site Code:
Start Date: 05/23/2018



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
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Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Hamilton Road & Dorchester Road
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Hamilton Road Eastbound						Hamilton Road Westbound						Dorchester Road Northbound						Dorchester Road 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	10	23	10	0	0	43	27	46	26	0	0	99	18	32	17	0	0	67	10	42	10	0	0	62	271
8:15 AM	15	31	18	0	0	64	13	32	20	0	2	65	15	32	14	0	0	61	11	44	6	0	0	61	251
8:30 AM	11	25	15	0	0	51	14	28	26	0	1	68	18	48	24	0	0	90	13	36	6	0	2	55	264
8:45 AM	3	28	21	0	0	52	22	20	33	0	0	75	13	46	16	0	0	75	29	46	10	0	0	85	287
Total	39	107	64	0	0	210	76	126	105	0	3	307	64	158	71	0	0	293	63	168	32	0	2	263	1073
Approach %	18.6	51.0	30.5	0.0	-	-	24.8	41.0	34.2	0.0	-	-	21.8	53.9	24.2	0.0	-	-	24.0	63.9	12.2	0.0	-	-	-
Total %	3.6	10.0	6.0	0.0	-	19.6	7.1	11.7	9.8	0.0	-	28.6	6.0	14.7	6.6	0.0	-	27.3	5.9	15.7	3.0	0.0	-	24.5	-
PHF	0.650	0.863	0.762	0.000	-	0.820	0.704	0.685	0.795	0.000	-	0.775	0.889	0.823	0.740	0.000	-	0.814	0.543	0.913	0.800	0.000	-	0.774	0.935
Lights	38	88	61	0	-	187	67	114	85	0	-	266	64	155	59	0	-	278	54	163	26	0	-	243	974
% Lights	97.4	82.2	95.3	-	-	89.0	88.2	90.5	81.0	-	-	86.6	100.0	98.1	83.1	-	-	94.9	85.7	97.0	81.3	-	-	92.4	90.8
Mediums	1	12	3	0	-	16	7	11	20	0	-	38	0	1	9	0	-	10	9	4	6	0	-	19	83
% Mediums	2.6	11.2	4.7	-	-	7.6	9.2	8.7	19.0	-	-	12.4	0.0	0.6	12.7	-	-	3.4	14.3	2.4	18.8	-	-	7.2	7.7
Articulated Trucks	0	7	0	0	-	7	2	1	0	0	-	3	0	2	3	0	-	5	0	1	0	0	-	1	16
% Articulated Trucks	0.0	6.5	0.0	-	-	3.3	2.6	0.8	0.0	-	-	1.0	0.0	1.3	4.2	-	-	1.7	0.0	0.6	0.0	-	-	0.4	1.5
Pedestrians	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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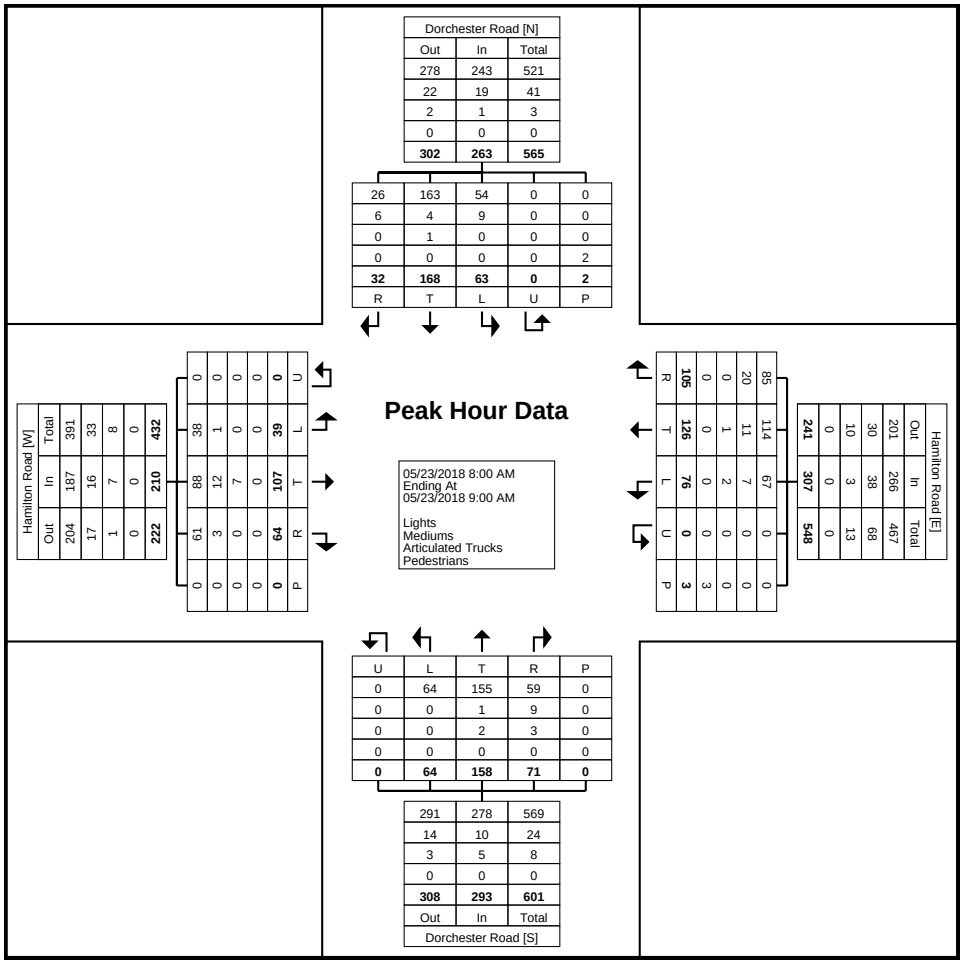

Turning Movement Peak Hour Data Plot (8:00 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Hamilton Road & Dorchester Road
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (11:45 AM)

Start Time	Hamilton Road Eastbound						Hamilton Road Westbound						Dorchester Road Northbound						Dorchester Road 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
11:45 AM	10	29	23	0	0	62	17	23	30	0	0	70	14	28	18	0	0	60	20	51	12	0	2	83	275
12:00 PM	5	37	20	0	1	62	20	23	32	0	2	75	16	41	25	0	1	82	24	38	4	0	2	66	285
12:15 PM	8	24	13	0	0	45	23	26	20	0	0	69	10	25	22	0	1	57	19	26	6	0	1	51	222
12:30 PM	9	30	19	0	0	58	10	27	14	0	0	51	11	25	19	0	0	55	24	34	13	0	0	71	235
Total	32	120	75	0	1	227	70	99	96	0	2	265	51	119	84	0	2	254	87	149	35	0	5	271	1017
Approach %	14.1	52.9	33.0	0.0	-	-	26.4	37.4	36.2	0.0	-	-	20.1	46.9	33.1	0.0	-	-	32.1	55.0	12.9	0.0	-	-	-
Total %	3.1	11.8	7.4	0.0	-	22.3	6.9	9.7	9.4	0.0	-	26.1	5.0	11.7	8.3	0.0	-	25.0	8.6	14.7	3.4	0.0	-	26.6	-
PHF	0.800	0.811	0.815	0.000	-	0.915	0.761	0.917	0.750	0.000	-	0.883	0.797	0.726	0.840	0.000	-	0.774	0.906	0.730	0.673	0.000	-	0.816	0.892
Lights	29	106	74	0	-	209	65	89	96	0	-	250	51	117	78	0	-	246	84	146	32	0	-	262	967
% Lights	90.6	88.3	98.7	-	-	92.1	92.9	89.9	100.0	-	-	94.3	100.0	98.3	92.9	-	-	96.9	96.6	98.0	91.4	-	-	96.7	95.1
Mediums	3	11	1	0	-	15	4	8	0	0	-	12	0	0	4	0	-	4	2	2	3	0	-	7	38
% Mediums	9.4	9.2	1.3	-	-	6.6	5.7	8.1	0.0	-	-	4.5	0.0	0.0	4.8	-	-	1.6	2.3	1.3	8.6	-	-	2.6	3.7
Articulated Trucks	0	3	0	0	-	3	1	2	0	0	-	3	0	2	2	0	-	4	1	1	0	0	-	2	12
% Articulated Trucks	0.0	2.5	0.0	-	-	1.3	1.4	2.0	0.0	-	-	1.1	0.0	1.7	2.4	-	-	1.6	1.1	0.7	0.0	-	-	0.7	1.2
Pedestrians	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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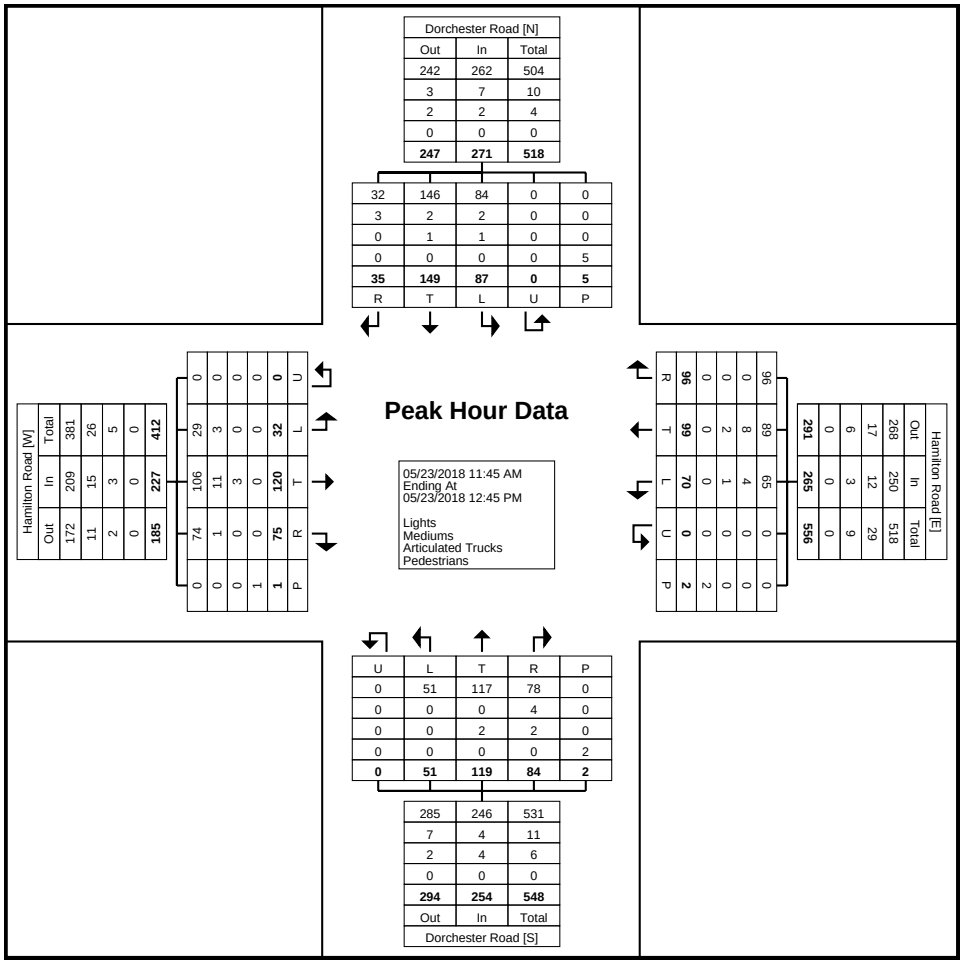


Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Hamilton Road & Dorchester Road
Site Code:
Start Date: 05/23/2018

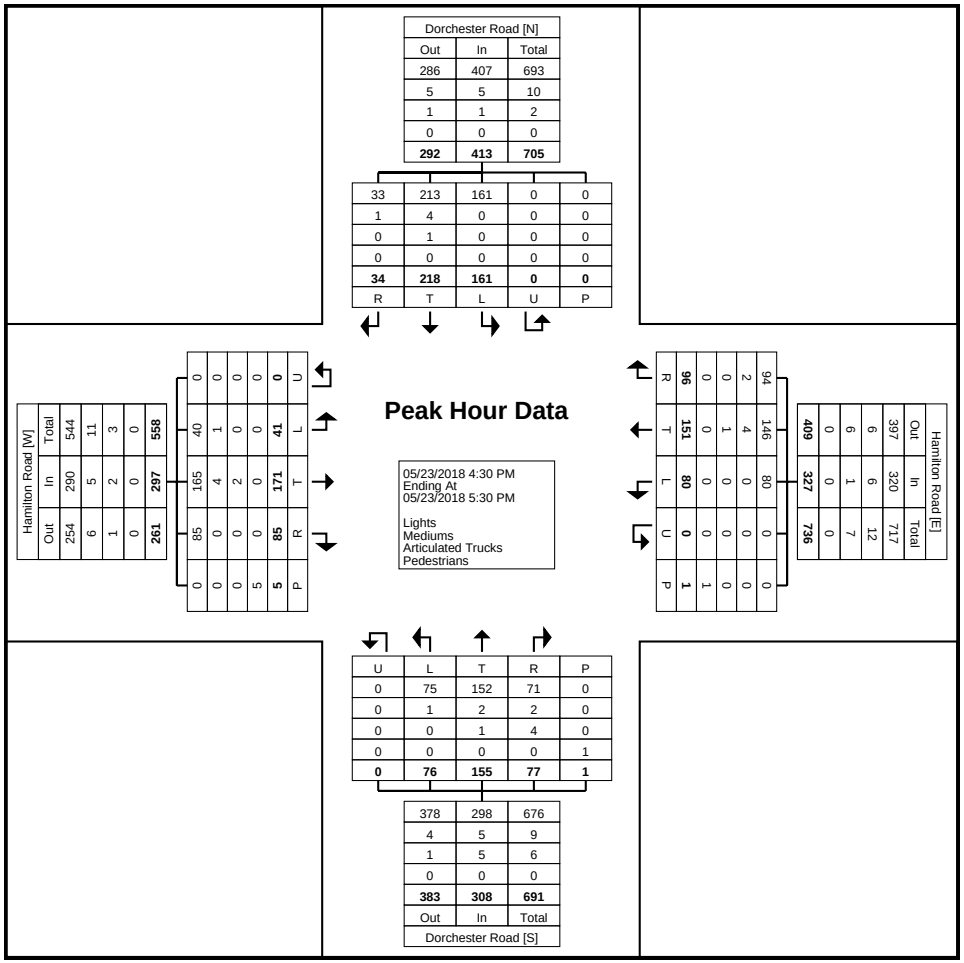
Turning Movement Peak Hour Data (4:30 PM)

Start Time	Hamilton Road Eastbound						Hamilton Road Westbound						Dorchester Road Northbound						Dorchester Road 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	11	59	17	0	0	87	25	34	26	0	0	85	17	30	19	0	1	66	34	50	6	0	0	90	328
4:45 PM	9	33	21	0	0	63	21	34	20	0	0	75	19	44	20	0	0	83	40	61	7	0	0	108	329
5:00 PM	11	40	25	0	1	76	22	41	31	0	0	94	16	37	17	0	0	70	47	48	12	0	0	107	347
5:15 PM	10	39	22	0	4	71	12	42	19	0	1	73	24	44	21	0	0	89	40	59	9	0	0	108	341
Total	41	171	85	0	5	297	80	151	96	0	1	327	76	155	77	0	1	308	161	218	34	0	0	413	1345
Approach %	13.8	57.6	28.6	0.0	-	-	24.5	46.2	29.4	0.0	-	-	24.7	50.3	25.0	0.0	-	-	39.0	52.8	8.2	0.0	-	-	-
Total %	3.0	12.7	6.3	0.0	-	22.1	5.9	11.2	7.1	0.0	-	24.3	5.7	11.5	5.7	0.0	-	22.9	12.0	16.2	2.5	0.0	-	30.7	-
PHF	0.932	0.725	0.850	0.000	-	0.853	0.800	0.899	0.774	0.000	-	0.870	0.792	0.881	0.917	0.000	-	0.865	0.856	0.893	0.708	0.000	-	0.956	0.969
Lights	40	165	85	0	-	290	80	146	94	0	-	320	75	152	71	0	-	298	161	213	33	0	-	407	1315
% Lights	97.6	96.5	100.0	-	-	97.6	100.0	96.7	97.9	-	-	97.9	98.7	98.1	92.2	-	-	96.8	100.0	97.7	97.1	-	-	98.5	97.8
Mediums	1	4	0	0	-	5	0	4	2	0	-	6	1	2	2	0	-	5	0	4	1	0	-	5	21
% Mediums	2.4	2.3	0.0	-	-	1.7	0.0	2.6	2.1	-	-	1.8	1.3	1.3	2.6	-	-	1.6	0.0	1.8	2.9	-	-	1.2	1.6
Articulated Trucks	0	2	0	0	-	2	0	1	0	0	-	1	0	1	4	0	-	5	0	1	0	0	-	1	9
% Articulated Trucks	0.0	1.2	0.0	-	-	0.7	0.0	0.7	0.0	-	-	0.3	0.0	0.6	5.2	-	-	1.6	0.0	0.5	0.0	-	-	0.2	0.7
Pedestrians	-	-	-	-	5	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Hamilton Road & Dorchester Road
Site Code:
Start Date: 05/23/2018



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

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
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Count Name: Hamilton Road & Dorchester Road
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Count Name: Byron Avenue & Dorchester Road
Site Code:
Start Date: 05/23/2018

Turning Movement Data

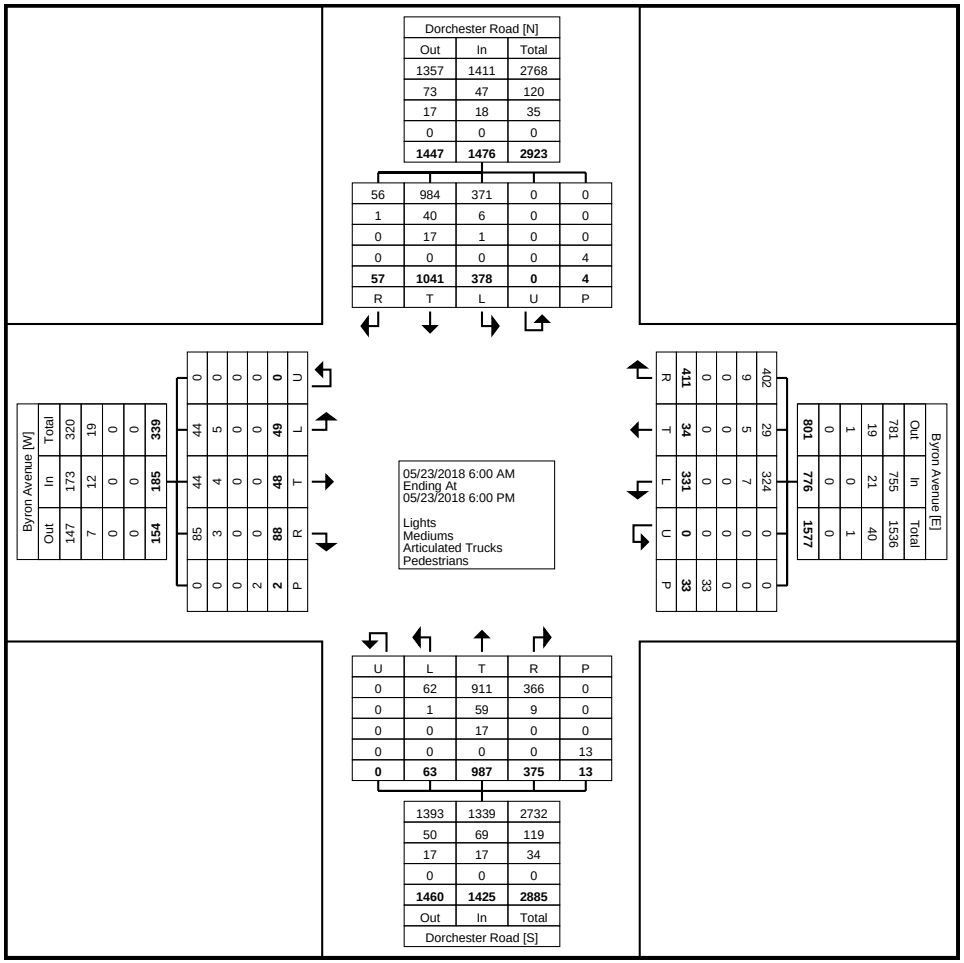
Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:00 AM	0	1	0	0	0	1	2	0	9	0	0	11	0	6	1	0	0	7	0	10	0	0	0	10	29
6:15 AM	1	0	3	0	0	4	6	0	8	0	0	14	0	7	0	0	0	7	0	19	0	0	0	19	44
6:30 AM	1	1	4	0	0	6	7	0	10	0	1	17	0	12	2	0	0	14	6	19	0	0	1	25	62
6:45 AM	3	0	4	0	0	7	12	0	11	0	0	23	0	8	5	0	0	13	2	20	1	0	0	23	66
Hourly Total	5	2	11	0	0	18	27	0	38	0	1	65	0	33	8	0	0	41	8	68	1	0	1	77	201
7:00 AM	1	1	3	0	1	5	10	1	19	0	2	30	0	10	1	0	2	11	4	20	1	0	0	25	71
7:15 AM	0	1	2	0	0	3	11	1	15	0	3	27	0	23	3	0	1	26	8	25	0	0	0	33	89
7:30 AM	0	1	5	0	0	6	17	0	20	0	1	37	1	15	4	0	0	20	7	33	1	0	0	41	104
7:45 AM	2	0	4	0	0	6	13	1	23	0	0	37	0	33	8	0	1	41	10	32	2	0	0	44	128
Hourly Total	3	3	14	0	1	20	51	3	77	0	6	131	1	81	16	0	4	98	29	110	4	0	0	143	392
8:00 AM	3	1	1	0	0	5	15	1	26	0	2	42	1	28	5	0	1	34	5	33	1	0	1	39	120
8:15 AM	0	1	4	0	0	5	13	0	18	0	2	31	0	32	5	0	0	37	8	33	3	0	0	44	117
8:30 AM	3	1	5	0	0	9	10	2	22	0	1	34	0	30	6	0	0	36	5	26	2	0	0	33	112
8:45 AM	5	0	1	0	0	6	9	1	12	0	2	22	4	41	9	0	0	54	6	37	4	0	0	47	129
Hourly Total	11	3	11	0	0	25	47	4	78	0	7	129	5	131	25	0	1	161	24	129	10	0	1	163	478
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	0	0	3	0	0	3	13	1	17	0	2	31	1	23	7	0	0	31	14	40	3	0	0	57	122
11:15 AM	0	0	4	0	0	4	7	1	13	0	0	21	1	25	10	0	0	36	7	31	2	0	2	40	101
11:30 AM	1	4	1	0	0	6	11	0	5	0	0	16	0	39	9	0	0	48	8	31	0	0	0	39	109
11:45 AM	1	2	0	0	0	3	5	1	8	0	0	14	2	34	11	0	2	47	15	38	0	0	0	53	117
Hourly Total	2	6	8	0	0	16	36	3	43	0	2	82	4	121	37	0	2	162	44	140	5	0	2	189	449
12:00 PM	1	2	3	0	0	6	5	1	14	0	0	20	1	38	13	0	0	52	16	25	2	0	0	43	121
12:15 PM	2	2	2	0	0	6	10	2	3	0	1	15	5	27	11	0	0	43	8	34	1	0	0	43	107
12:30 PM	2	0	2	0	0	4	8	2	10	0	1	20	5	26	9	0	2	40	16	32	2	0	0	50	114
12:45 PM	1	2	3	0	0	6	12	1	9	0	2	22	2	33	15	0	0	50	8	34	1	0	0	43	121
Hourly Total	6	6	10	0	0	22	35	6	36	0	4	77	13	124	48	0	2	185	48	125	6	0	0	179	463
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	4	2	5	0	0	11	9	1	8	0	3	18	1	39	15	0	0	55	15	35	3	0	0	53	137
3:15 PM	3	2	3	0	0	8	5	1	13	0	1	19	5	32	8	0	0	45	15	34	6	0	0	55	127
3:30 PM	3	3	2	0	0	8	7	1	16	0	0	24	0	31	19	0	1	50	13	35	3	0	0	51	133
3:45 PM	3	3	1	0	0	7	10	1	10	0	4	21	4	40	15	0	0	59	11	36	2	0	0	49	136
Hourly Total	13	10	11	0	0	34	31	4	47	0	8	82	10	142	57	0	1	209	54	140	14	0	0	208	533
4:00 PM	1	2	2	0	0	5	13	2	11	0	0	26	2	50	28	0	0	80	24	46	3	0	0	73	184
4:15 PM	0	3	1	0	0	4	7	0	9	0	0	16	4	47	17	0	0	68	19	39	0	0	0	58	146
4:30 PM	2	2	5	0	0	9	16	3	16	0	2	35	4	48	26	0	0	78	20	41	3	0	0	64	186
4:45 PM	0	4	3	0	0	7	18	4	13	0	1	35	1	49	29	0	1	79	18	47	3	0	0	68	189
Hourly Total	3	11	11	0	0	25	54	9	49	0	3	112	11	194	100	0	1	305	81	173	9	0	0	263	705

5:00 PM	0	3	4	0	0	7	10	1	11	0	2	22	6	47	22	0	1	75	19	52	2	0	0	73	177
5:15 PM	2	2	3	0	0	7	17	0	10	0	0	27	7	41	23	0	0	71	31	32	1	0	0	64	169
5:30 PM	1	2	2	0	0	5	13	0	11	0	0	24	5	35	21	0	0	61	18	39	4	0	0	61	151
5:45 PM	3	0	3	0	1	6	10	4	11	0	0	25	1	38	18	0	1	57	22	33	1	0	0	56	144
Hourly Total	6	7	12	0	1	25	50	5	43	0	2	98	19	161	84	0	2	264	90	156	8	0	0	254	641
Grand Total	49	48	88	0	2	185	331	34	411	0	33	776	63	987	375	0	13	1425	378	1041	57	0	4	1476	3862
Approach %	26.5	25.9	47.6	0.0	-	-	42.7	4.4	53.0	0.0	-	-	4.4	69.3	26.3	0.0	-	-	25.6	70.5	3.9	0.0	-	-	-
Total %	1.3	1.2	2.3	0.0	-	4.8	8.6	0.9	10.6	0.0	-	20.1	1.6	25.6	9.7	0.0	-	36.9	9.8	27.0	1.5	0.0	-	38.2	-
Lights	44	44	85	0	-	173	324	29	402	0	-	755	62	911	366	0	-	1339	371	984	56	0	-	1411	3678
% Lights	89.8	91.7	96.6	-	-	93.5	97.9	85.3	97.8	-	-	97.3	98.4	92.3	97.6	-	-	94.0	98.1	94.5	98.2	-	-	95.6	95.2
Mediums	5	4	3	0	-	12	7	5	9	0	-	21	1	59	9	0	-	69	6	40	1	0	-	47	149
% Mediums	10.2	8.3	3.4	-	-	6.5	2.1	14.7	2.2	-	-	2.7	1.6	6.0	2.4	-	-	4.8	1.6	3.8	1.8	-	-	3.2	3.9
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	17	0	0	-	17	1	17	0	0	-	18	35
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.7	0.0	-	-	1.2	0.3	1.6	0.0	-	-	1.2	0.9
Pedestrians	-	-	-	-	2	-	-	-	-	-	33	-	-	-	-	-	13	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Dorchester Road
Site Code:
Start Date: 05/23/2018



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Dorchester Road
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Dorchester Road Northbound						Dorchester Road 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	3	1	1	0	0	5	15	1	26	0	2	42	1	28	5	0	1	34	5	33	1	0	1	39	120
8:15 AM	0	1	4	0	0	5	13	0	18	0	2	31	0	32	5	0	0	37	8	33	3	0	0	44	117
8:30 AM	3	1	5	0	0	9	10	2	22	0	1	34	0	30	6	0	0	36	5	26	2	0	0	33	112
8:45 AM	5	0	1	0	0	6	9	1	12	0	2	22	4	41	9	0	0	54	6	37	4	0	0	47	129
Total	11	3	11	0	0	25	47	4	78	0	7	129	5	131	25	0	1	161	24	129	10	0	1	163	478
Approach %	44.0	12.0	44.0	0.0	-	-	36.4	3.1	60.5	0.0	-	-	3.1	81.4	15.5	0.0	-	-	14.7	79.1	6.1	0.0	-	-	-
Total %	2.3	0.6	2.3	0.0	-	5.2	9.8	0.8	16.3	0.0	-	27.0	1.0	27.4	5.2	0.0	-	33.7	5.0	27.0	2.1	0.0	-	34.1	-
PHF	0.550	0.750	0.550	0.000	-	0.694	0.783	0.500	0.750	0.000	-	0.768	0.313	0.799	0.694	0.000	-	0.745	0.750	0.872	0.625	0.000	-	0.867	0.926
Lights	9	3	9	0	-	21	47	3	75	0	-	125	5	114	25	0	-	144	23	117	10	0	-	150	440
% Lights	81.8	100.0	81.8	-	-	84.0	100.0	75.0	96.2	-	-	96.9	100.0	87.0	100.0	-	-	89.4	95.8	90.7	100.0	-	-	92.0	92.1
Mediums	2	0	2	0	-	4	0	1	3	0	-	4	0	13	0	0	-	13	0	7	0	0	-	7	28
% Mediums	18.2	0.0	18.2	-	-	16.0	0.0	25.0	3.8	-	-	3.1	0.0	9.9	0.0	-	-	8.1	0.0	5.4	0.0	-	-	4.3	5.9
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	4	0	0	-	4	1	5	0	0	-	6	10
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	3.1	0.0	-	-	2.5	4.2	3.9	0.0	-	-	3.7	2.1
Pedestrians	-	-	-	-	0	-	-	-	-	-	7	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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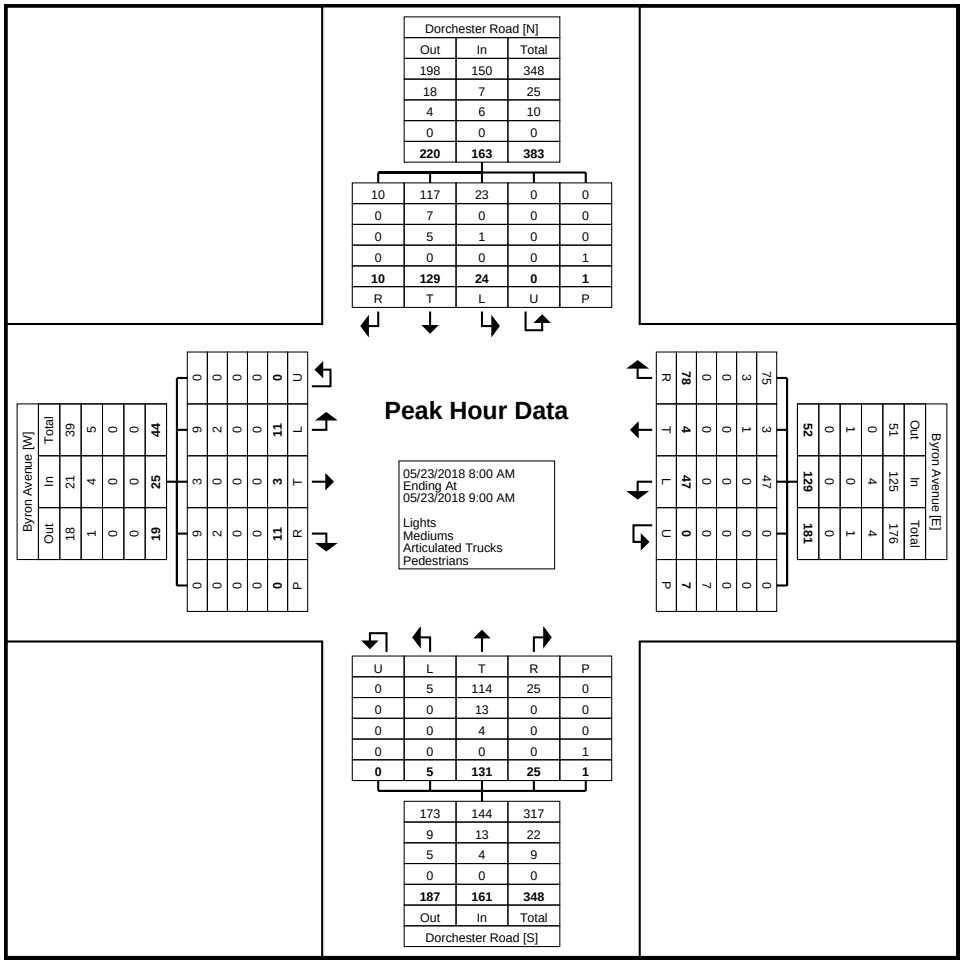

Turning Movement Peak Hour Data Plot (8:00 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Dorchester Road
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. 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	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	1	2	3	0	0	6	5	1	14	0	0	20	1	38	13	0	0	52	16	25	2	0	0	43	121
12:15 PM	2	2	2	0	0	6	10	2	3	0	1	15	5	27	11	0	0	43	8	34	1	0	0	43	107
12:30 PM	2	0	2	0	0	4	8	2	10	0	1	20	5	26	9	0	2	40	16	32	2	0	0	50	114
12:45 PM	1	2	3	0	0	6	12	1	9	0	2	22	2	33	15	0	0	50	8	34	1	0	0	43	121
Total	6	6	10	0	0	22	35	6	36	0	4	77	13	124	48	0	2	185	48	125	6	0	0	179	463
Approach %	27.3	27.3	45.5	0.0	-	-	45.5	7.8	46.8	0.0	-	-	7.0	67.0	25.9	0.0	-	-	26.8	69.8	3.4	0.0	-	-	-
Total %	1.3	1.3	2.2	0.0	-	4.8	7.6	1.3	7.8	0.0	-	16.6	2.8	26.8	10.4	0.0	-	40.0	10.4	27.0	1.3	0.0	-	38.7	-
PHF	0.750	0.750	0.833	0.000	-	0.917	0.729	0.750	0.643	0.000	-	0.875	0.650	0.816	0.800	0.000	-	0.889	0.750	0.919	0.750	0.000	-	0.895	0.957
Lights	5	5	10	0	-	20	34	6	36	0	-	76	13	116	47	0	-	176	48	117	6	0	-	171	443
% Lights	83.3	83.3	100.0	-	-	90.9	97.1	100.0	100.0	-	-	98.7	100.0	93.5	97.9	-	-	95.1	100.0	93.6	100.0	-	-	95.5	95.7
Mediums	1	1	0	0	-	2	1	0	0	0	-	1	0	6	1	0	-	7	0	5	0	0	-	5	15
% Mediums	16.7	16.7	0.0	-	-	9.1	2.9	0.0	0.0	-	-	1.3	0.0	4.8	2.1	-	-	3.8	0.0	4.0	0.0	-	-	2.8	3.2
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	0	3	0	0	-	3	5
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.6	0.0	-	-	1.1	0.0	2.4	0.0	-	-	1.7	1.1
Pedestrians	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	2	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

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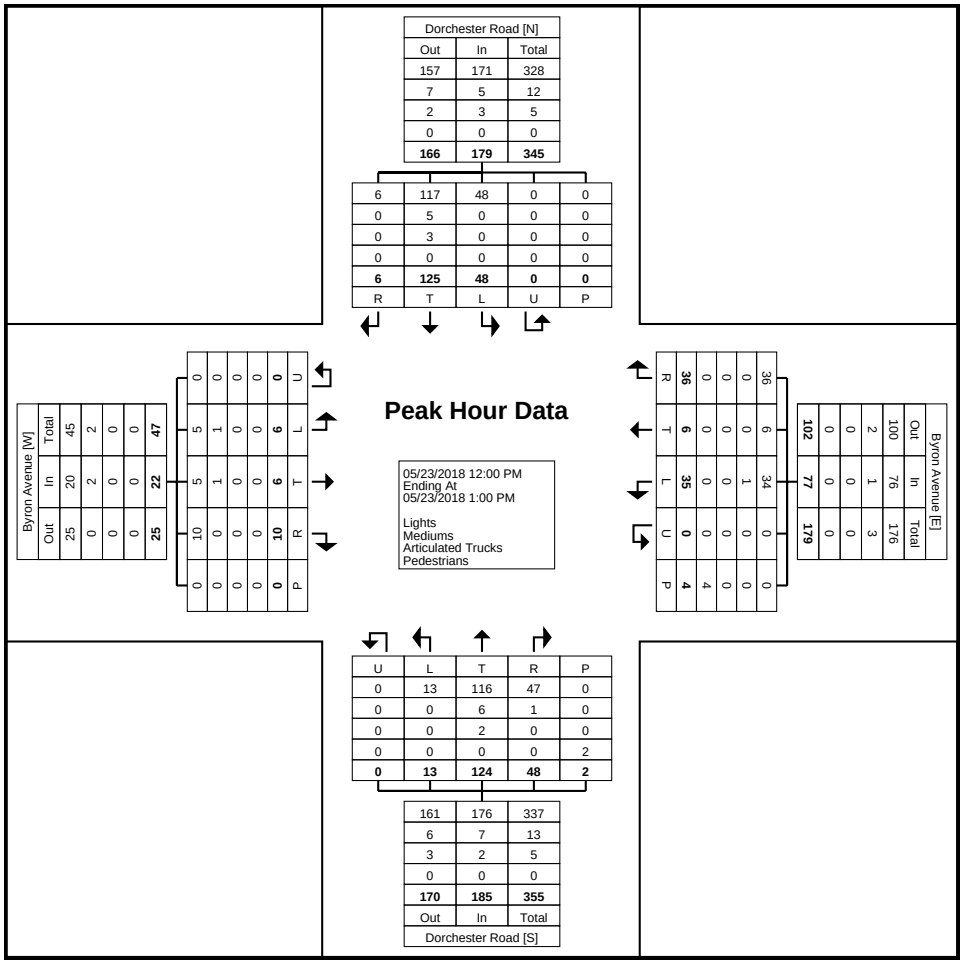

Turning Movement Peak Hour Data Plot (12:00 PM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

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Count Name: Byron Avenue & Dorchester Road
Site Code:
Start Date: 05/23/2018

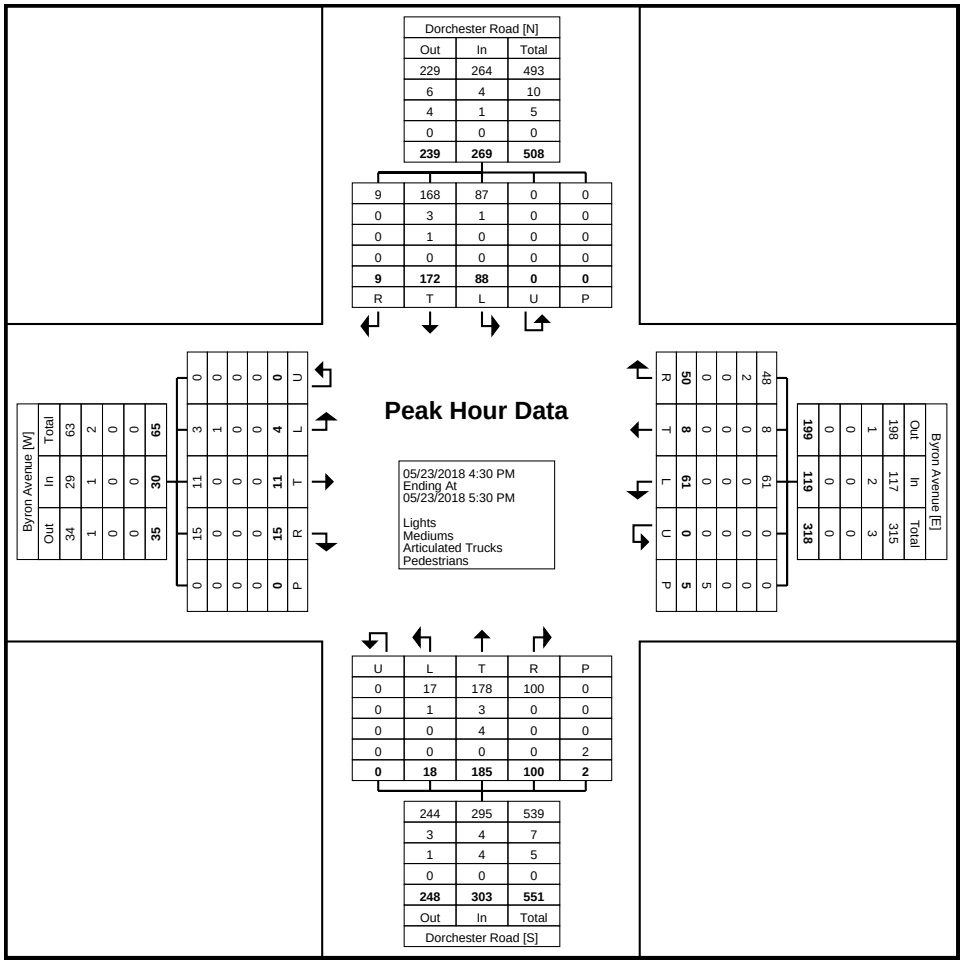
Turning Movement Peak Hour Data (4:30 PM)

Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Dorchester Road Northbound						Dorchester Road 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	2	2	5	0	0	9	16	3	16	0	2	35	4	48	26	0	0	78	20	41	3	0	0	64	186
4:45 PM	0	4	3	0	0	7	18	4	13	0	1	35	1	49	29	0	1	79	18	47	3	0	0	68	189
5:00 PM	0	3	4	0	0	7	10	1	11	0	2	22	6	47	22	0	1	75	19	52	2	0	0	73	177
5:15 PM	2	2	3	0	0	7	17	0	10	0	0	27	7	41	23	0	0	71	31	32	1	0	0	64	169
Total	4	11	15	0	0	30	61	8	50	0	5	119	18	185	100	0	2	303	88	172	9	0	0	269	721
Approach %	13.3	36.7	50.0	0.0	-	-	51.3	6.7	42.0	0.0	-	-	5.9	61.1	33.0	0.0	-	-	32.7	63.9	3.3	0.0	-	-	-
Total %	0.6	1.5	2.1	0.0	-	4.2	8.5	1.1	6.9	0.0	-	16.5	2.5	25.7	13.9	0.0	-	42.0	12.2	23.9	1.2	0.0	-	37.3	-
PHF	0.500	0.688	0.750	0.000	-	0.833	0.847	0.500	0.781	0.000	-	0.850	0.643	0.944	0.862	0.000	-	0.959	0.710	0.827	0.750	0.000	-	0.921	0.954
Lights	3	11	15	0	-	29	61	8	48	0	-	117	17	178	100	0	-	295	87	168	9	0	-	264	705
% Lights	75.0	100.0	100.0	-	-	96.7	100.0	100.0	96.0	-	-	98.3	94.4	96.2	100.0	-	-	97.4	98.9	97.7	100.0	-	-	98.1	97.8
Mediums	1	0	0	0	-	1	0	0	2	0	-	2	1	3	0	0	-	4	1	3	0	0	-	4	11
% Mediums	25.0	0.0	0.0	-	-	3.3	0.0	0.0	4.0	-	-	1.7	5.6	1.6	0.0	-	-	1.3	1.1	1.7	0.0	-	-	1.5	1.5
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	4	0	0	-	4	0	1	0	0	-	1	5
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	2.2	0.0	-	-	1.3	0.0	0.6	0.0	-	-	0.4	0.7
Pedestrians	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	2	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Dorchester Road
Site Code:
Start Date: 05/23/2018



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

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

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Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Canterbury Drive
Site Code:
Start Date: 05/23/2018

Turning Movement Data

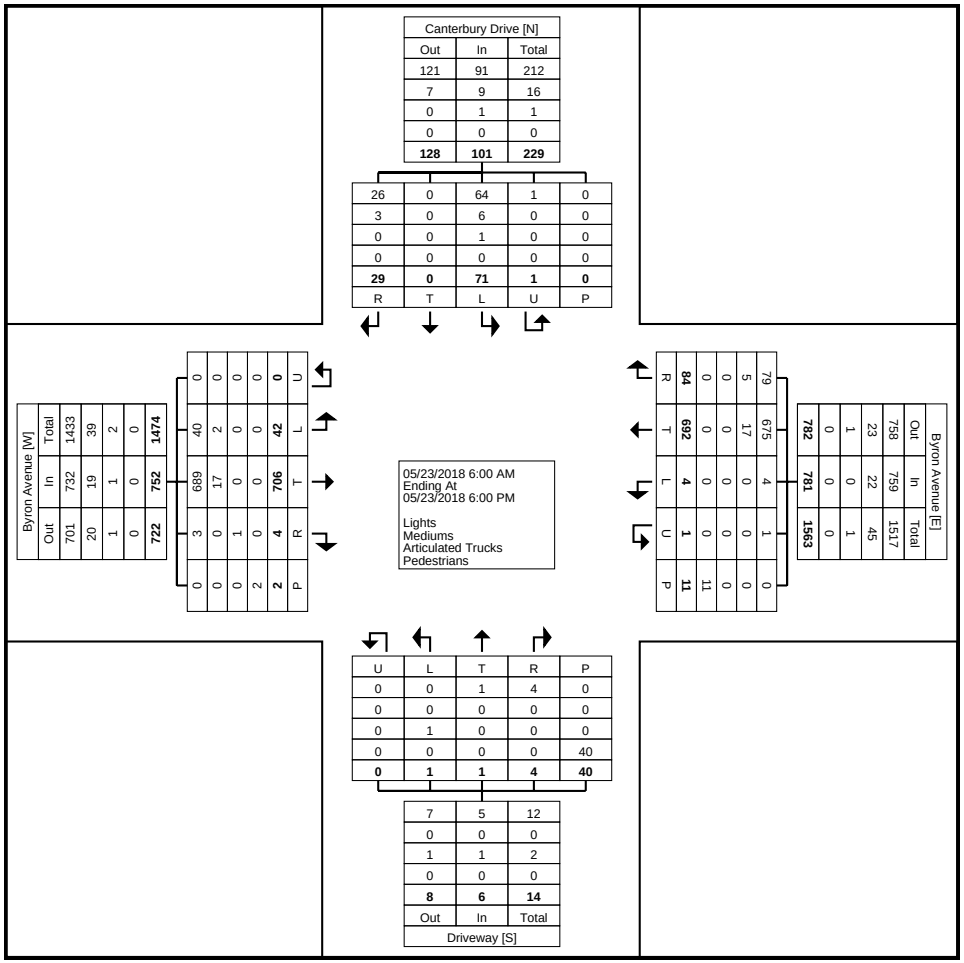
Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Driveway Northbound						Canterbury Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:00 AM	0	2	0	0	0	2	0	10	0	0	0	10	0	0	0	0	0	0	0	0	1	0	0	1	13
6:15 AM	0	1	0	0	0	1	0	12	0	0	0	12	0	0	0	0	0	0	0	0	1	0	0	1	14
6:30 AM	0	6	0	0	0	6	0	18	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	24
6:45 AM	0	7	0	0	0	7	0	24	0	0	0	24	0	0	0	0	3	0	0	0	2	0	0	2	33
Hourly Total	0	16	0	0	0	16	0	64	0	0	0	64	0	0	0	0	3	0	0	0	4	0	0	4	84
7:00 AM	0	9	0	0	0	9	0	27	0	0	0	27	0	0	0	0	3	0	1	0	1	0	0	2	38
7:15 AM	0	10	1	0	0	11	0	31	3	0	0	34	0	0	0	0	2	0	2	0	0	0	0	2	47
7:30 AM	0	10	0	0	0	10	1	26	5	0	0	32	0	0	0	0	1	0	1	0	1	0	0	2	44
7:45 AM	0	14	0	0	0	14	0	33	5	0	2	38	0	0	0	0	2	0	2	0	0	0	0	2	54
Hourly Total	0	43	1	0	0	44	1	117	13	0	2	131	0	0	0	0	8	0	6	0	2	0	0	8	183
8:00 AM	0	11	0	0	0	11	0	40	3	0	0	43	0	0	0	0	1	0	4	0	0	0	0	4	58
8:15 AM	1	11	1	0	0	13	0	29	3	0	0	32	0	0	0	0	1	0	2	0	3	0	0	5	50
8:30 AM	0	10	0	0	0	10	0	28	1	0	0	29	1	0	0	0	0	1	2	0	0	0	0	2	42
8:45 AM	2	12	0	0	0	14	0	20	2	0	0	22	0	0	0	0	1	0	1	0	1	0	0	2	38
Hourly Total	3	44	1	0	0	48	0	117	9	0	0	126	1	0	0	0	3	1	9	0	4	0	0	13	188
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	3	12	0	0	0	15	0	31	5	0	0	36	0	0	0	0	3	0	3	0	1	0	0	4	55
11:15 AM	2	17	0	0	0	19	0	16	2	0	0	18	0	0	0	0	0	0	1	0	1	0	0	2	39
11:30 AM	2	17	0	0	0	19	0	13	0	0	0	13	0	0	0	0	1	0	2	0	1	1	0	4	36
11:45 AM	1	26	0	0	0	27	1	16	0	0	0	17	0	0	2	0	2	2	0	0	0	0	0	0	46
Hourly Total	8	72	0	0	0	80	1	76	7	0	0	84	0	0	2	0	6	2	6	0	3	1	0	10	176
12:00 PM	1	28	0	0	0	29	0	13	2	0	0	15	0	0	0	0	0	0	3	0	1	0	0	4	48
12:15 PM	1	17	0	0	0	18	0	13	2	0	0	15	0	0	0	0	1	0	3	0	1	0	0	4	37
12:30 PM	0	25	0	0	0	25	0	14	2	1	0	17	0	0	0	0	0	0	1	0	0	0	0	1	43
12:45 PM	1	21	1	0	2	23	1	16	1	0	0	18	0	0	0	0	2	0	3	0	2	0	0	5	46
Hourly Total	3	91	1	0	2	95	1	56	7	1	0	65	0	0	0	0	3	0	10	0	4	0	0	14	174
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	6	24	0	0	0	30	0	18	1	0	0	19	0	0	0	0	0	0	3	0	2	0	0	5	54
3:15 PM	1	22	0	0	0	23	1	16	3	0	0	20	0	0	0	0	2	0	1	0	0	0	0	1	44
3:30 PM	3	28	0	0	0	31	0	20	3	0	6	23	0	0	0	0	1	0	3	0	0	0	0	3	57
3:45 PM	2	23	0	0	0	25	0	21	6	0	0	27	0	1	0	0	1	1	2	0	2	0	0	4	57
Hourly Total	12	97	0	0	0	109	1	75	13	0	6	89	0	1	0	0	4	1	9	0	4	0	0	13	212
4:00 PM	3	49	0	0	0	52	0	22	7	0	0	29	0	0	1	0	1	1	2	0	2	0	0	4	86
4:15 PM	0	39	0	0	0	39	0	15	10	0	0	25	0	0	0	0	0	0	4	0	1	0	0	5	69
4:30 PM	2	42	0	0	0	44	0	35	3	0	3	38	0	0	1	0	3	1	6	0	0	0	0	6	89
4:45 PM	2	47	1	0	0	50	0	27	3	0	0	30	0	0	0	0	3	0	5	0	0	0	0	5	85
Hourly Total	7	177	1	0	0	185	0	99	23	0	3	122	0	0	2	0	7	2	17	0	3	0	0	20	329

5:00 PM	2	42	0	0	0	44	0	21	4	0	0	25	0	0	0	0	1	0	7	0	0	0	0	7	76
5:15 PM	2	51	0	0	0	53	0	24	3	0	0	27	0	0	0	0	1	0	1	0	2	0	0	3	83
5:30 PM	3	35	0	0	0	38	0	19	2	0	0	21	0	0	0	0	0	0	4	0	2	0	0	6	65
5:45 PM	2	38	0	0	0	40	0	24	3	0	0	27	0	0	0	0	4	0	2	0	1	0	0	3	70
Hourly Total	9	166	0	0	0	175	0	88	12	0	0	100	0	0	0	0	6	0	14	0	5	0	0	19	294
Grand Total	42	706	4	0	2	752	4	692	84	1	11	781	1	1	4	0	40	6	71	0	29	1	0	101	1640
Approach %	5.6	93.9	0.5	0.0	-	-	0.5	88.6	10.8	0.1	-	-	16.7	16.7	66.7	0.0	-	-	70.3	0.0	28.7	1.0	-	-	-
Total %	2.6	43.0	0.2	0.0	-	45.9	0.2	42.2	5.1	0.1	-	47.6	0.1	0.1	0.2	0.0	-	0.4	4.3	0.0	1.8	0.1	-	6.2	-
Lights	40	689	3	0	-	732	4	675	79	1	-	759	0	1	4	0	-	5	64	0	26	1	-	91	1587
% Lights	95.2	97.6	75.0	-	-	97.3	100.0	97.5	94.0	100.0	-	97.2	0.0	100.0	100.0	-	-	83.3	90.1	-	89.7	100.0	-	90.1	96.8
Mediums	2	17	0	0	-	19	0	17	5	0	-	22	0	0	0	0	-	0	6	0	3	0	-	9	50
% Mediums	4.8	2.4	0.0	-	-	2.5	0.0	2.5	6.0	0.0	-	2.8	0.0	0.0	0.0	-	-	0.0	8.5	-	10.3	0.0	-	8.9	3.0
Articulated Trucks	0	0	1	0	-	1	0	0	0	0	-	0	1	0	0	0	-	1	1	0	0	0	-	1	3
% Articulated Trucks	0.0	0.0	25.0	-	-	0.1	0.0	0.0	0.0	0.0	-	0.0	100.0	0.0	0.0	-	-	16.7	1.4	-	0.0	0.0	-	1.0	0.2
Pedestrians	-	-	-	-	2	-	-	-	-	-	11	-	-	-	-	-	40	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Canterbury Drive
Site Code:
Start Date: 05/23/2018



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Canterbury Drive
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Driveway Northbound						Canterbury Drive Southbound						Int. 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	Left	Thru	Right	U-Turn	Peds	App. Total	
7:30 AM	0	10	0	0	0	10	1	26	5	0	0	32	0	0	0	0	1	0	1	0	1	0	0	2	44
7:45 AM	0	14	0	0	0	14	0	33	5	0	2	38	0	0	0	0	2	0	2	0	0	0	0	2	54
8:00 AM	0	11	0	0	0	11	0	40	3	0	0	43	0	0	0	0	1	0	4	0	0	0	0	4	58
8:15 AM	1	11	1	0	0	13	0	29	3	0	0	32	0	0	0	0	1	0	2	0	3	0	0	5	50
Total	1	46	1	0	0	48	1	128	16	0	2	145	0	0	0	0	5	0	9	0	4	0	0	13	206
Approach %	2.1	95.8	2.1	0.0	-	-	0.7	88.3	11.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	69.2	0.0	30.8	0.0	-	-	-
Total %	0.5	22.3	0.5	0.0	-	23.3	0.5	62.1	7.8	0.0	-	70.4	0.0	0.0	0.0	0.0	-	0.0	4.4	0.0	1.9	0.0	-	6.3	-
PHF	0.250	0.821	0.250	0.000	-	0.857	0.250	0.800	0.800	0.000	-	0.843	0.000	0.000	0.000	0.000	-	0.000	0.563	0.000	0.333	0.000	-	0.650	0.888
Lights	1	44	0	0	-	45	1	124	16	0	-	141	0	0	0	0	-	0	9	0	4	0	-	13	199
% Lights	100.0	95.7	0.0	-	-	93.8	100.0	96.9	100.0	-	-	97.2	-	-	-	-	-	-	100.0	-	100.0	-	-	100.0	96.6
Mediums	0	2	0	0	-	2	0	4	0	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	6
% Mediums	0.0	4.3	0.0	-	-	4.2	0.0	3.1	0.0	-	-	2.8	-	-	-	-	-	-	0.0	-	0.0	-	-	0.0	2.9
Articulated Trucks	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	100.0	-	-	2.1	0.0	0.0	0.0	-	-	0.0	-	-	-	-	-	-	0.0	-	0.0	-	-	0.0	0.5
Pedestrians	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	5	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

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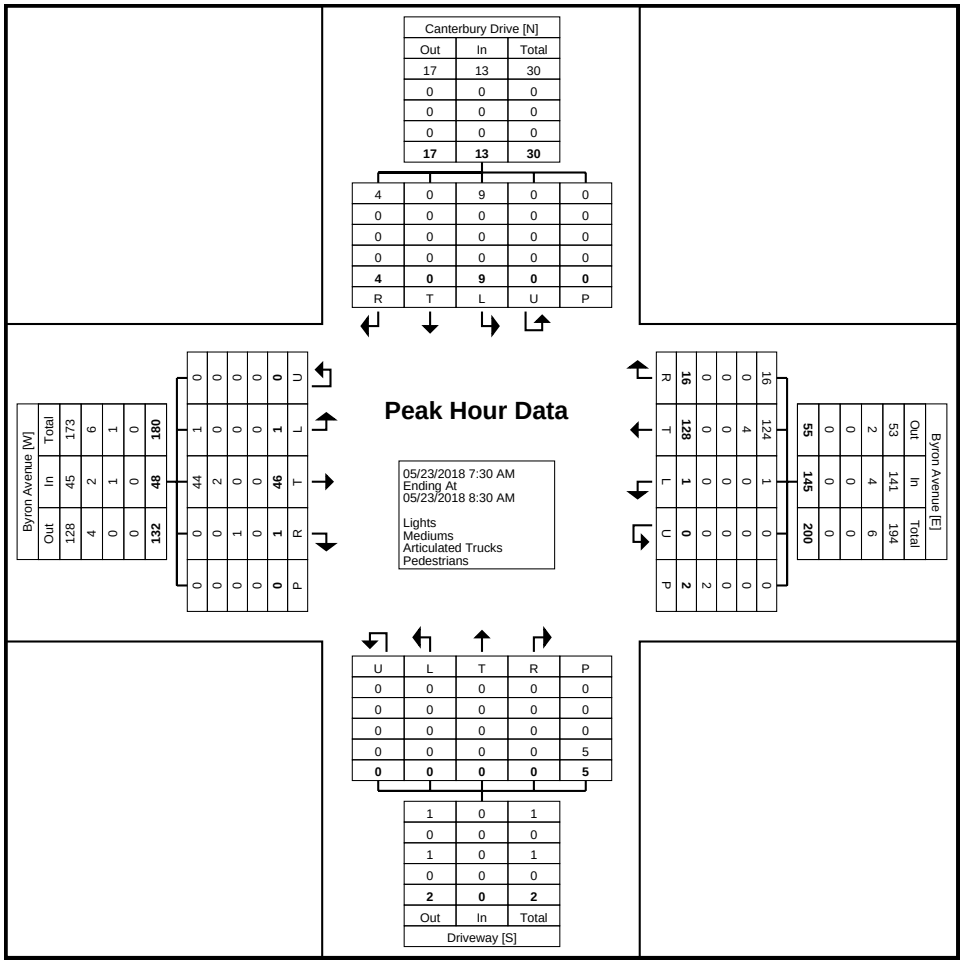

Turning Movement Peak Hour Data Plot (7:30 AM)

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22 King Street South, Suite 300

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519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Canterbury Drive
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (11:00 AM)

Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Driveway Northbound						Canterbury Drive Southbound						Int. 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	Left	Thru	Right	U-Turn	Peds	App. Total	
11:00 AM	3	12	0	0	0	15	0	31	5	0	0	36	0	0	0	0	3	0	3	0	1	0	0	4	55
11:15 AM	2	17	0	0	0	19	0	16	2	0	0	18	0	0	0	0	0	0	1	0	1	0	0	2	39
11:30 AM	2	17	0	0	0	19	0	13	0	0	0	13	0	0	0	0	1	0	2	0	1	1	0	4	36
11:45 AM	1	26	0	0	0	27	1	16	0	0	0	17	0	0	2	0	2	2	0	0	0	0	0	0	46
Total	8	72	0	0	0	80	1	76	7	0	0	84	0	0	2	0	6	2	6	0	3	1	0	10	176
Approach %	10.0	90.0	0.0	0.0	-	-	1.2	90.5	8.3	0.0	-	-	0.0	0.0	100.0	0.0	-	-	60.0	0.0	30.0	10.0	-	-	-
Total %	4.5	40.9	0.0	0.0	-	45.5	0.6	43.2	4.0	0.0	-	47.7	0.0	0.0	1.1	0.0	-	1.1	3.4	0.0	1.7	0.6	-	5.7	-
PHF	0.667	0.692	0.000	0.000	-	0.741	0.250	0.613	0.350	0.000	-	0.583	0.000	0.000	0.250	0.000	-	0.250	0.500	0.000	0.750	0.250	-	0.625	0.800
Lights	6	71	0	0	-	77	1	75	4	0	-	80	0	0	2	0	-	2	3	0	1	1	-	5	164
% Lights	75.0	98.6	-	-	-	96.3	100.0	98.7	57.1	-	-	95.2	-	-	100.0	-	-	100.0	50.0	-	33.3	100.0	-	50.0	93.2
Mediums	2	1	0	0	-	3	0	1	3	0	-	4	0	0	0	0	-	0	2	0	2	0	-	4	11
% Mediums	25.0	1.4	-	-	-	3.8	0.0	1.3	42.9	-	-	4.8	-	-	0.0	-	-	0.0	33.3	-	66.7	0.0	-	40.0	6.3
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	1	1
% Articulated Trucks	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	-	-	0.0	-	-	0.0	16.7	-	0.0	0.0	-	10.0	0.6
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	6	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

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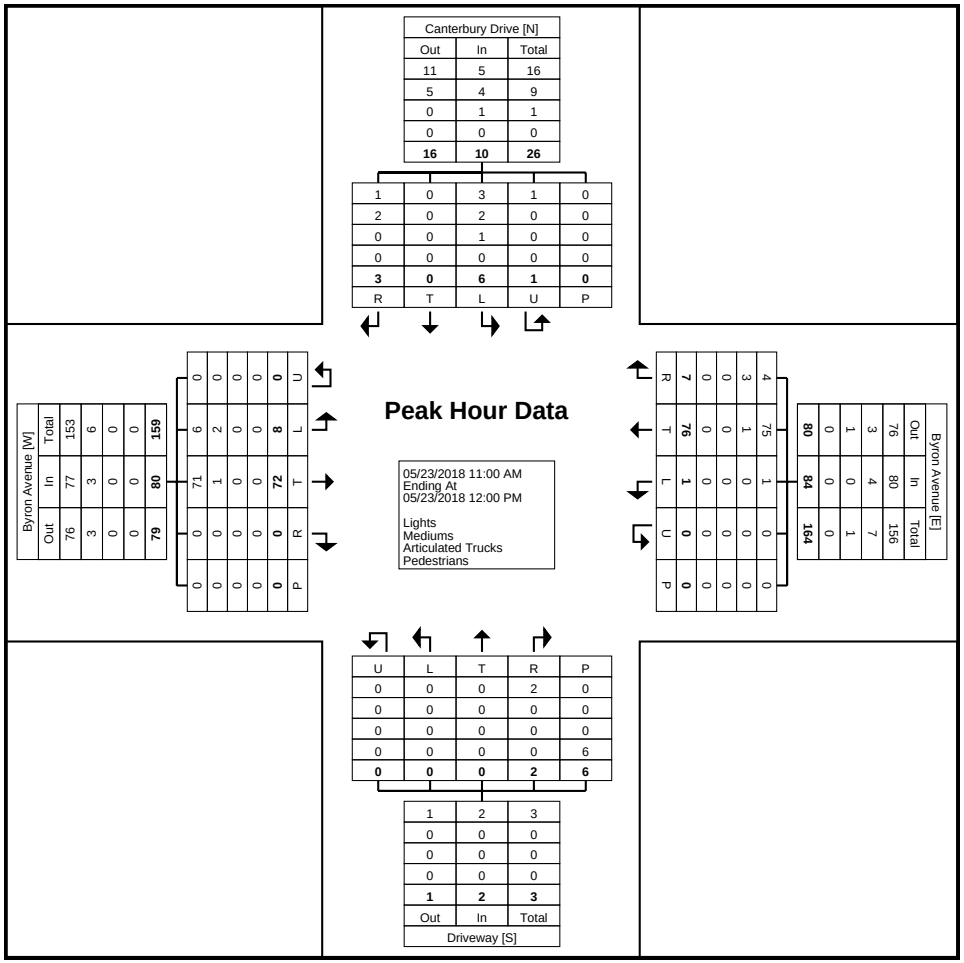

Turning Movement Peak Hour Data Plot (11:00 AM)

Paradigm Transportation Solutions Limited
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Count Name: Byron Avenue & Canterbury Drive
Site Code:
Start Date: 05/23/2018

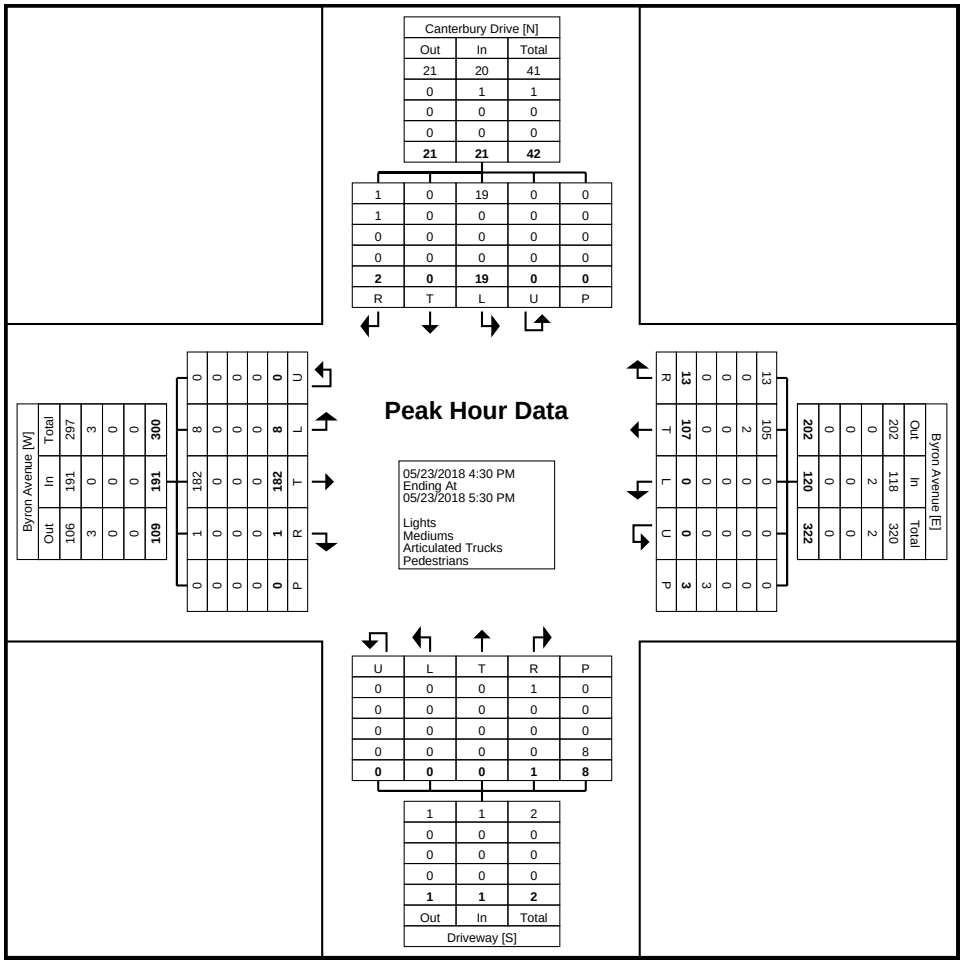
Turning Movement Peak Hour Data (4:30 PM)

Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Driveway Northbound						Canterbury Drive Southbound						Int. 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	Left	Thru	Right	U-Turn	Peds	App. Total	
4:30 PM	2	42	0	0	0	44	0	35	3	0	3	38	0	0	1	0	3	1	6	0	0	0	0	6	89
4:45 PM	2	47	1	0	0	50	0	27	3	0	0	30	0	0	0	0	3	0	5	0	0	0	0	5	85
5:00 PM	2	42	0	0	0	44	0	21	4	0	0	25	0	0	0	0	1	0	7	0	0	0	0	7	76
5:15 PM	2	51	0	0	0	53	0	24	3	0	0	27	0	0	0	0	1	0	1	0	2	0	0	3	83
Total	8	182	1	0	0	191	0	107	13	0	3	120	0	0	1	0	8	1	19	0	2	0	0	21	333
Approach %	4.2	95.3	0.5	0.0	-	-	0.0	89.2	10.8	0.0	-	-	0.0	0.0	100.0	0.0	-	-	90.5	0.0	9.5	0.0	-	-	-
Total %	2.4	54.7	0.3	0.0	-	57.4	0.0	32.1	3.9	0.0	-	36.0	0.0	0.0	0.3	0.0	-	0.3	5.7	0.0	0.6	0.0	-	6.3	-
PHF	1.000	0.892	0.250	0.000	-	0.901	0.000	0.764	0.813	0.000	-	0.789	0.000	0.000	0.250	0.000	-	0.250	0.679	0.000	0.250	0.000	-	0.750	0.935
Lights	8	182	1	0	-	191	0	105	13	0	-	118	0	0	1	0	-	1	19	0	1	0	-	20	330
% Lights	100.0	100.0	100.0	-	-	100.0	-	98.1	100.0	-	-	98.3	-	-	100.0	-	-	100.0	100.0	-	50.0	-	-	95.2	99.1
Mediums	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	0	0	1	0	-	1	3
% Mediums	0.0	0.0	0.0	-	-	0.0	-	1.9	0.0	-	-	1.7	-	-	0.0	-	-	0.0	0.0	-	50.0	-	-	4.8	0.9
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	-	-	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	8	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Canterbury Drive
Site Code:
Start Date: 05/23/2018



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

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Canterbury Drive
Site Code:
Start Date: 05/23/2018

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Oakwood Drive
Site Code:
Start Date: 05/23/2018

Turning Movement Data

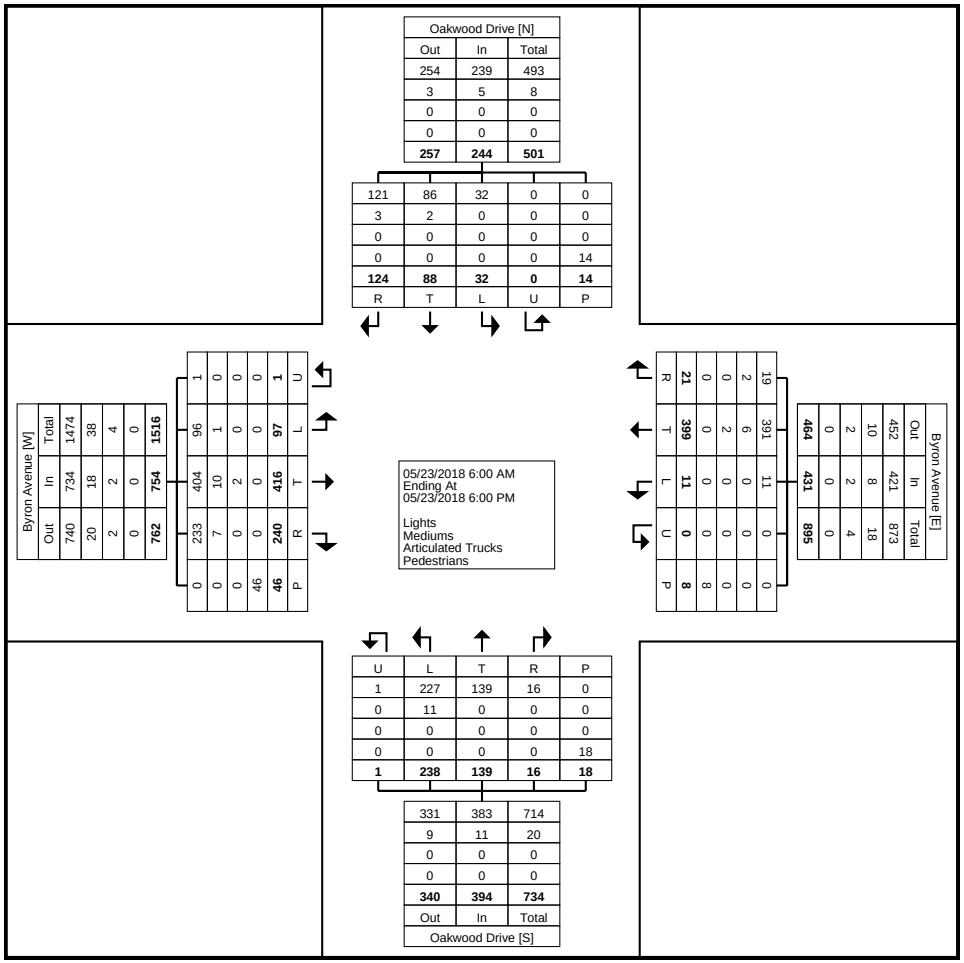
Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Oakwood Drive Northbound						Oakwood Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:00 AM	0	2	0	0	0	2	0	3	0	0	0	3	5	4	0	0	0	9	0	0	1	0	0	1	15
6:15 AM	0	0	0	0	0	0	0	5	0	0	1	5	5	2	1	0	0	8	0	0	1	0	0	1	14
6:30 AM	0	4	2	0	1	6	0	14	0	0	0	14	3	1	0	0	0	4	0	0	1	0	0	1	25
6:45 AM	1	3	0	0	2	4	0	11	0	0	0	11	6	5	0	0	0	11	0	1	6	0	0	7	33
Hourly Total	1	9	2	0	3	12	0	33	0	0	1	33	19	12	1	0	0	32	0	1	9	0	0	10	87
7:00 AM	0	6	6	0	0	12	0	9	2	0	2	11	16	11	2	1	1	30	0	0	2	0	0	2	55
7:15 AM	5	7	3	0	3	15	0	16	2	0	0	18	13	8	1	0	1	22	2	1	4	0	0	7	62
7:30 AM	0	5	4	0	2	9	0	11	1	0	0	12	15	9	0	0	0	24	1	3	5	0	2	9	54
7:45 AM	3	8	4	0	0	15	0	12	1	0	2	13	18	10	2	0	2	30	0	3	7	0	0	10	68
Hourly Total	8	26	17	0	5	51	0	48	6	0	4	54	62	38	5	1	4	106	3	7	18	0	2	28	239
8:00 AM	3	8	4	0	5	15	1	19	2	0	0	22	17	12	2	0	1	31	0	4	5	0	0	9	77
8:15 AM	0	7	5	0	3	12	0	17	0	0	0	17	10	3	1	0	2	14	1	1	3	0	1	5	48
8:30 AM	2	9	2	0	1	13	0	15	1	0	1	16	13	4	0	0	1	17	0	1	0	0	0	1	47
8:45 AM	1	4	7	0	0	12	0	9	1	0	0	10	11	8	0	0	1	19	3	4	3	0	0	10	51
Hourly Total	6	28	18	0	9	52	1	60	4	0	1	65	51	27	3	0	5	81	4	10	11	0	1	25	223
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	1	9	5	0	2	15	0	25	0	0	0	25	6	2	0	0	1	8	1	1	6	0	0	8	56
11:15 AM	2	6	7	0	2	15	0	10	0	0	0	10	5	3	0	0	0	8	0	1	4	0	0	5	38
11:30 AM	0	18	2	0	1	20	0	9	1	0	0	10	3	1	1	0	0	5	0	0	1	0	0	1	36
11:45 AM	4	12	8	0	0	24	0	9	1	0	0	10	2	2	0	0	1	4	2	0	2	0	2	4	42
Hourly Total	7	45	22	0	5	74	0	53	2	0	0	55	16	8	1	0	2	25	3	2	13	0	2	18	172
12:00 PM	6	16	7	0	0	29	0	11	0	0	0	11	4	2	0	0	0	6	0	1	2	0	0	3	49
12:15 PM	2	14	4	0	0	20	0	8	2	0	0	10	2	3	0	0	0	5	2	3	3	0	0	8	43
12:30 PM	5	13	6	0	0	24	0	12	0	0	0	12	4	1	0	0	0	5	0	1	3	0	0	4	45
12:45 PM	4	19	2	0	0	25	2	10	1	0	0	13	3	4	0	0	0	7	0	2	3	0	0	5	50
Hourly Total	17	62	19	0	0	98	2	41	3	0	0	46	13	10	0	0	0	23	2	7	11	0	0	20	187
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	1	15	9	0	2	25	1	9	1	0	0	11	3	1	1	0	0	5	0	2	6	0	0	8	49
3:15 PM	3	16	4	0	1	23	0	17	0	0	0	17	3	4	0	0	1	7	2	4	2	0	0	8	55
3:30 PM	4	18	8	0	1	30	1	13	0	0	0	14	4	0	0	0	3	4	2	7	5	0	2	14	62
3:45 PM	1	15	5	1	1	22	0	15	1	0	0	16	4	0	0	0	0	4	0	5	5	0	0	10	52
Hourly Total	9	64	26	1	5	100	2	54	2	0	0	58	14	5	1	0	4	20	4	18	18	0	2	40	218
4:00 PM	9	26	17	0	4	52	1	16	0	0	0	17	8	5	0	0	0	13	2	1	6	0	2	9	91
4:15 PM	5	18	23	0	3	46	0	13	2	0	0	15	3	6	1	0	0	10	2	5	7	0	0	14	85
4:30 PM	5	23	15	0	2	43	1	20	0	0	0	21	13	2	0	0	1	15	3	4	5	0	2	12	91
4:45 PM	5	30	15	0	2	50	0	13	1	0	0	14	10	2	1	0	1	13	2	9	7	0	2	18	95
Hourly Total	24	97	70	0	11	191	2	62	3	0	0	67	34	15	2	0	2	51	9	19	25	0	6	53	362

5:00 PM	10	23	16	0	3	49	1	14	0	0	0	15	6	2	0	0	1	8	2	7	3	0	1	12	84
5:15 PM	5	21	23	0	1	49	0	15	1	0	2	16	8	6	1	0	0	15	1	10	4	0	0	15	95
5:30 PM	8	21	15	0	0	44	1	6	0	0	0	7	6	8	2	0	0	16	3	3	8	0	0	14	81
5:45 PM	2	20	12	0	4	34	2	13	0	0	0	15	9	8	0	0	0	17	1	4	4	0	0	9	75
Hourly Total	25	85	66	0	8	176	4	48	1	0	2	53	29	24	3	0	1	56	7	24	19	0	1	50	335
Grand Total	97	416	240	1	46	754	11	399	21	0	8	431	238	139	16	1	18	394	32	88	124	0	14	244	1823
Approach %	12.9	55.2	31.8	0.1	-	-	2.6	92.6	4.9	0.0	-	-	60.4	35.3	4.1	0.3	-	-	13.1	36.1	50.8	0.0	-	-	-
Total %	5.3	22.8	13.2	0.1	-	41.4	0.6	21.9	1.2	0.0	-	23.6	13.1	7.6	0.9	0.1	-	21.6	1.8	4.8	6.8	0.0	-	13.4	-
Lights	96	404	233	1	-	734	11	391	19	0	-	421	227	139	16	1	-	383	32	86	121	0	-	239	1777
% Lights	99.0	97.1	97.1	100.0	-	97.3	100.0	98.0	90.5	-	-	97.7	95.4	100.0	100.0	100.0	-	97.2	100.0	97.7	97.6	-	-	98.0	97.5
Mediums	1	10	7	0	-	18	0	6	2	0	-	8	11	0	0	0	-	11	0	2	3	0	-	5	42
% Mediums	1.0	2.4	2.9	0.0	-	2.4	0.0	1.5	9.5	-	-	1.9	4.6	0.0	0.0	0.0	-	2.8	0.0	2.3	2.4	-	-	2.0	2.3
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	0.5	0.0	0.0	-	0.3	0.0	0.5	0.0	-	-	0.5	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Pedestrians	-	-	-	-	46	-	-	-	-	-	8	-	-	-	-	-	18	-	-	-	-	-	14	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Oakwood Drive
Site Code:
Start Date: 05/23/2018



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Oakwood Drive
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Oakwood Drive Northbound						Oakwood Drive Southbound						Int. 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	Left	Thru	Right	U-Turn	Peds	App. Total	
7:15 AM	5	7	3	0	3	15	0	16	2	0	0	18	13	8	1	0	1	22	2	1	4	0	0	7	62
7:30 AM	0	5	4	0	2	9	0	11	1	0	0	12	15	9	0	0	0	24	1	3	5	0	2	9	54
7:45 AM	3	8	4	0	0	15	0	12	1	0	2	13	18	10	2	0	2	30	0	3	7	0	0	10	68
8:00 AM	3	8	4	0	5	15	1	19	2	0	0	22	17	12	2	0	1	31	0	4	5	0	0	9	77
Total	11	28	15	0	10	54	1	58	6	0	2	65	63	39	5	0	4	107	3	11	21	0	2	35	261
Approach %	20.4	51.9	27.8	0.0	-	-	1.5	89.2	9.2	0.0	-	-	58.9	36.4	4.7	0.0	-	-	8.6	31.4	60.0	0.0	-	-	-
Total %	4.2	10.7	5.7	0.0	-	20.7	0.4	22.2	2.3	0.0	-	24.9	24.1	14.9	1.9	0.0	-	41.0	1.1	4.2	8.0	0.0	-	13.4	-
PHF	0.550	0.875	0.938	0.000	-	0.900	0.250	0.763	0.750	0.000	-	0.739	0.875	0.813	0.625	0.000	-	0.863	0.375	0.688	0.750	0.000	-	0.875	0.847
Lights	10	26	14	0	-	50	1	56	6	0	-	63	59	39	5	0	-	103	3	11	21	0	-	35	251
% Lights	90.9	92.9	93.3	-	-	92.6	100.0	96.6	100.0	-	-	96.9	93.7	100.0	100.0	-	-	96.3	100.0	100.0	100.0	-	-	100.0	96.2
Mediums	1	2	1	0	-	4	0	2	0	0	-	2	4	0	0	0	-	4	0	0	0	0	-	0	10
% Mediums	9.1	7.1	6.7	-	-	7.4	0.0	3.4	0.0	-	-	3.1	6.3	0.0	0.0	-	-	3.7	0.0	0.0	0.0	-	-	0.0	3.8
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	-	10	-	-	-	-	-	2	-	-	-	-	-	4	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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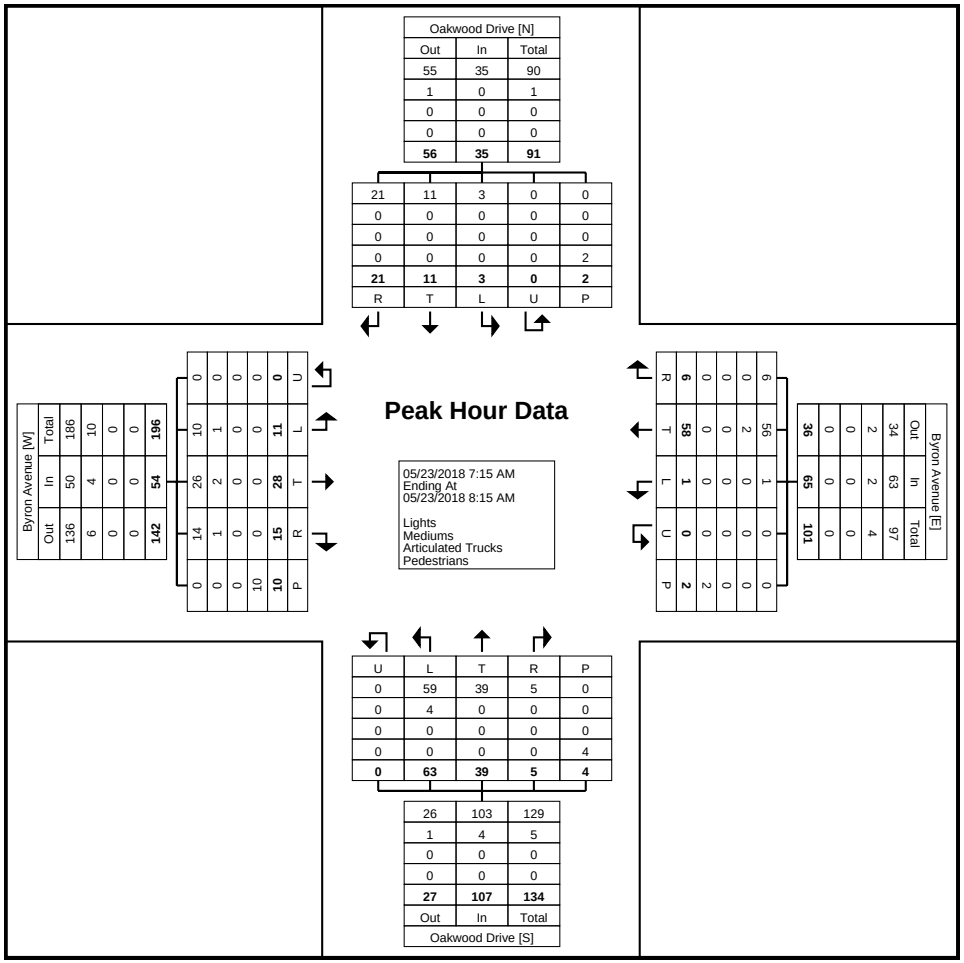

Turning Movement Peak Hour Data Plot (7:15 AM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Oakwood Drive
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Oakwood Drive Northbound						Oakwood Drive Southbound						Int. 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	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	6	16	7	0	0	29	0	11	0	0	0	11	4	2	0	0	0	6	0	1	2	0	0	3	49
12:15 PM	2	14	4	0	0	20	0	8	2	0	0	10	2	3	0	0	0	5	2	3	3	0	0	8	43
12:30 PM	5	13	6	0	0	24	0	12	0	0	0	12	4	1	0	0	0	5	0	1	3	0	0	4	45
12:45 PM	4	19	2	0	0	25	2	10	1	0	0	13	3	4	0	0	0	7	0	2	3	0	0	5	50
Total	17	62	19	0	0	98	2	41	3	0	0	46	13	10	0	0	0	23	2	7	11	0	0	20	187
Approach %	17.3	63.3	19.4	0.0	-	-	4.3	89.1	6.5	0.0	-	-	56.5	43.5	0.0	0.0	-	-	10.0	35.0	55.0	0.0	-	-	-
Total %	9.1	33.2	10.2	0.0	-	52.4	1.1	21.9	1.6	0.0	-	24.6	7.0	5.3	0.0	0.0	-	12.3	1.1	3.7	5.9	0.0	-	10.7	-
PHF	0.708	0.816	0.679	0.000	-	0.845	0.250	0.854	0.375	0.000	-	0.885	0.813	0.625	0.000	0.000	-	0.821	0.250	0.583	0.917	0.000	-	0.625	0.935
Lights	17	62	19	0	-	98	2	39	3	0	-	44	13	10	0	0	-	23	2	7	10	0	-	19	184
% Lights	100.0	100.0	100.0	-	-	100.0	100.0	95.1	100.0	-	-	95.7	100.0	100.0	-	-	-	100.0	100.0	100.0	90.9	-	-	95.0	98.4
Mediums	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	1	0	-	1	2
% Mediums	0.0	0.0	0.0	-	-	0.0	0.0	2.4	0.0	-	-	2.2	0.0	0.0	-	-	-	0.0	0.0	0.0	9.1	-	-	5.0	1.1
Articulated Trucks	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	2.4	0.0	-	-	2.2	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.5
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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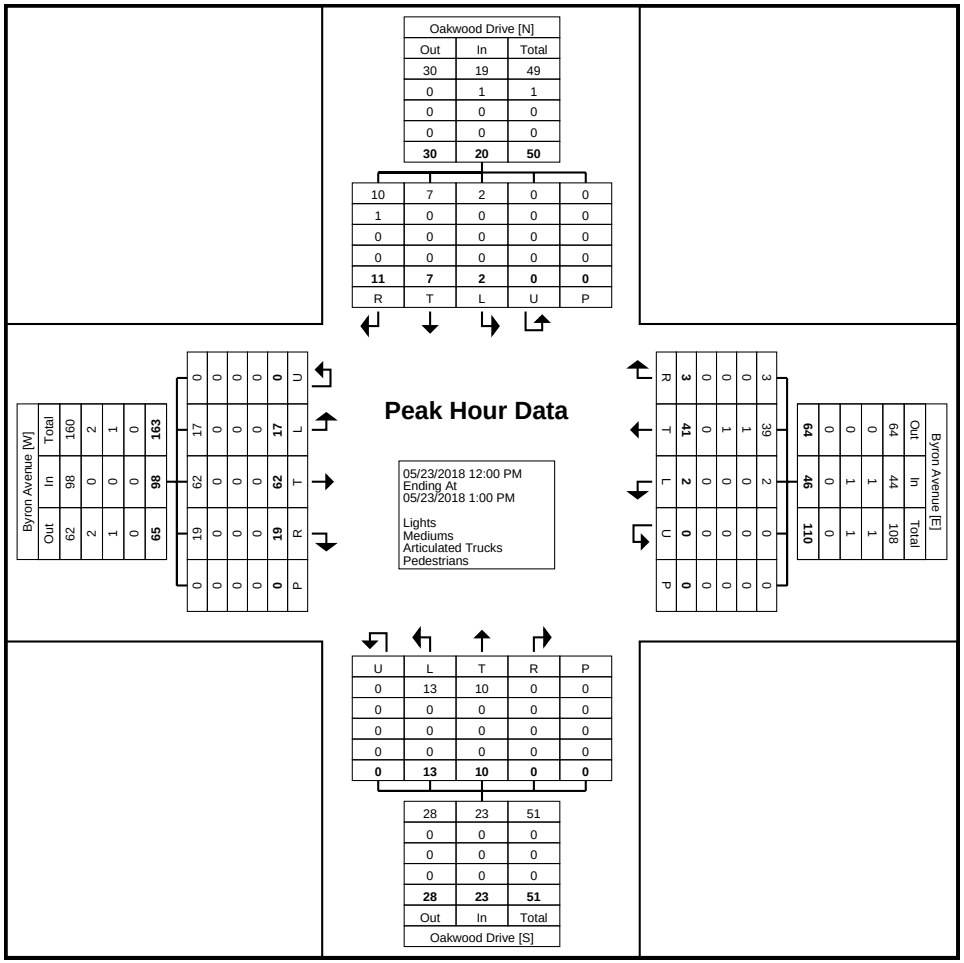

Turning Movement Peak Hour Data Plot (12:00 PM)

Paradigm Transportation Solutions Limited
22 King Street South, Suite 300

Waterloo, Ontario, Canada N2J 1N8
519-896-3163 cbowness@ptsl.com

Count Name: Byron Avenue & Oakwood Drive
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Byron Avenue Eastbound						Byron Avenue Westbound						Oakwood Drive Northbound						Oakwood Drive Southbound						Int. 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	Left	Thru	Right	U-Turn	Peds	App. Total	
4:30 PM	5	23	15	0	2	43	1	20	0	0	0	21	13	2	0	0	1	15	3	4	5	0	2	12	91
4:45 PM	5	30	15	0	2	50	0	13	1	0	0	14	10	2	1	0	1	13	2	9	7	0	2	18	95
5:00 PM	10	23	16	0	3	49	1	14	0	0	0	15	6	2	0	0	1	8	2	7	3	0	1	12	84
5:15 PM	5	21	23	0	1	49	0	15	1	0	2	16	8	6	1	0	0	15	1	10	4	0	0	15	95
Total	25	97	69	0	8	191	2	62	2	0	2	66	37	12	2	0	3	51	8	30	19	0	5	57	365
Approach %	13.1	50.8	36.1	0.0	-	-	3.0	93.9	3.0	0.0	-	-	72.5	23.5	3.9	0.0	-	-	14.0	52.6	33.3	0.0	-	-	-
Total %	6.8	26.6	18.9	0.0	-	52.3	0.5	17.0	0.5	0.0	-	18.1	10.1	3.3	0.5	0.0	-	14.0	2.2	8.2	5.2	0.0	-	15.6	-
PHF	0.625	0.808	0.750	0.000	-	0.955	0.500	0.775	0.500	0.000	-	0.786	0.712	0.500	0.500	0.000	-	0.850	0.667	0.750	0.679	0.000	-	0.792	0.961
Lights	25	97	68	0	-	190	2	62	2	0	-	66	35	12	2	0	-	49	8	30	19	0	-	57	362
% Lights	100.0	100.0	98.6	-	-	99.5	100.0	100.0	100.0	-	-	100.0	94.6	100.0	100.0	-	-	96.1	100.0	100.0	100.0	-	-	100.0	99.2
Mediums	0	0	1	0	-	1	0	0	0	0	-	0	2	0	0	0	-	2	0	0	0	0	-	0	3
% Mediums	0.0	0.0	1.4	-	-	0.5	0.0	0.0	0.0	-	-	0.0	5.4	0.0	0.0	-	-	3.9	0.0	0.0	0.0	-	-	0.0	0.8
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	-	8	-	-	-	-	-	2	-	-	-	-	-	3	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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Site Code:
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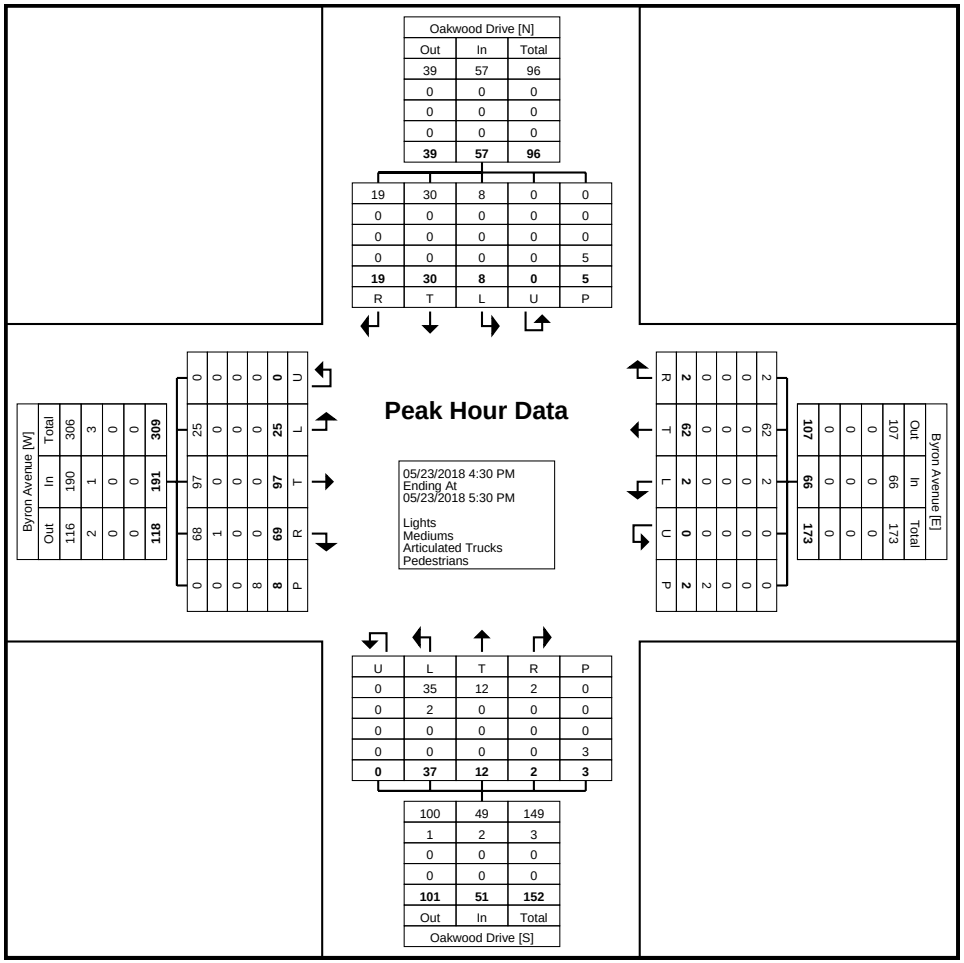

Turning Movement Peak Hour Data Plot (4:30 PM)

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Count Name: Hamilton Road & Oakwood Drive
Site Code:
Start Date: 05/23/2018

Turning Movement Data

Start Time	Hamilton Road Eastbound					Hamilton Road Westbound					Oakwood Drive Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
6:00 AM	21	0	0	0	21	0	16	0	0	16	4	0	0	0	4	41
6:15 AM	23	1	0	0	24	0	16	0	0	16	5	1	0	1	6	46
6:30 AM	25	0	0	0	25	0	40	0	0	40	4	2	0	0	6	71
6:45 AM	16	4	0	0	20	3	25	0	0	28	5	0	0	1	5	53
Hourly Total	85	5	0	0	90	3	97	0	0	100	18	3	0	2	21	211
7:00 AM	22	0	0	0	22	0	33	0	0	33	17	2	0	0	19	74
7:15 AM	23	3	0	0	26	0	54	0	0	54	15	2	0	2	17	97
7:30 AM	19	5	0	0	24	2	56	0	0	58	13	1	0	5	14	96
7:45 AM	33	4	0	0	37	1	57	0	0	58	16	2	0	0	18	113
Hourly Total	97	12	0	0	109	3	200	0	0	203	61	7	0	7	68	380
8:00 AM	32	4	0	1	36	1	88	0	0	89	16	1	0	1	17	142
8:15 AM	31	7	0	0	38	1	60	0	0	61	7	1	0	4	8	107
8:30 AM	31	0	0	0	31	0	65	0	0	65	8	0	0	1	8	104
8:45 AM	46	9	0	0	55	2	57	0	0	59	13	0	0	2	13	127
Hourly Total	140	20	0	1	160	4	270	0	0	274	44	2	0	8	46	480
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	35	10	0	0	45	2	42	0	0	44	4	3	0	0	7	96
11:15 AM	42	9	0	0	51	1	49	0	0	50	5	2	0	1	7	108
11:30 AM	37	6	0	0	43	2	43	0	0	45	8	3	0	0	11	99
11:45 AM	41	5	0	0	46	1	34	0	0	35	12	2	0	1	14	95
Hourly Total	155	30	0	0	185	6	168	0	0	174	29	10	0	2	39	398
12:00 PM	64	6	0	0	70	1	44	0	0	45	7	1	0	0	8	123
12:15 PM	55	10	0	0	65	1	41	0	0	42	8	2	0	0	10	117
12:30 PM	52	8	0	0	60	2	26	0	0	28	7	6	0	2	13	101
12:45 PM	39	4	0	0	43	3	49	0	0	52	5	2	0	0	7	102
Hourly Total	210	28	0	0	238	7	160	0	0	167	27	11	0	2	38	443
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	68	13	0	0	81	4	55	0	0	59	8	4	0	1	12	152
3:15 PM	53	22	0	0	75	7	67	0	0	74	23	8	0	2	31	180
3:30 PM	67	19	0	0	86	5	48	0	0	53	14	2	0	2	16	155
3:45 PM	62	25	0	0	87	5	56	0	0	61	14	3	0	1	17	165
Hourly Total	250	79	0	0	329	21	226	0	0	247	59	17	0	6	76	652
4:00 PM	51	16	0	0	67	1	42	0	0	43	20	9	0	1	29	139
4:15 PM	59	20	0	0	79	5	57	0	0	62	13	5	0	0	18	159
4:30 PM	79	31	0	0	110	2	52	0	0	54	17	7	0	1	24	188
4:45 PM	65	24	0	0	89	4	42	0	0	46	16	5	0	2	21	156
Hourly Total	254	91	0	0	345	12	193	0	0	205	66	26	0	4	92	642
5:00 PM	70	27	0	0	97	8	58	0	0	66	11	6	0	1	17	180

5:15 PM	77	22	0	0	99	3	59	0	0	62	18	4	0	0	22	183
5:30 PM	72	18	0	0	90	5	60	0	0	65	17	6	0	0	23	178
5:45 PM	54	20	0	0	74	4	50	0	0	54	21	5	0	1	26	154
Hourly Total	273	87	0	0	360	20	227	0	0	247	67	21	0	2	88	695
Grand Total	1464	352	0	1	1816	76	1541	0	0	1617	371	97	0	33	468	3901
Approach %	80.6	19.4	0.0	-	-	4.7	95.3	0.0	-	-	79.3	20.7	0.0	-	-	-
Total %	37.5	9.0	0.0	-	46.6	1.9	39.5	0.0	-	41.5	9.5	2.5	0.0	-	12.0	-
Lights	1321	346	0	-	1667	75	1414	0	-	1489	366	93	0	-	459	3615
% Lights	90.2	98.3	-	-	91.8	98.7	91.8	-	-	92.1	98.7	95.9	-	-	98.1	92.7
Mediums	106	4	0	-	110	1	86	0	-	87	3	2	0	-	5	202
% Mediums	7.2	1.1	-	-	6.1	1.3	5.6	-	-	5.4	0.8	2.1	-	-	1.1	5.2
Articulated Trucks	37	2	0	-	39	0	41	0	-	41	2	2	0	-	4	84
% Articulated Trucks	2.5	0.6	-	-	2.1	0.0	2.7	-	-	2.5	0.5	2.1	-	-	0.9	2.2
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	33	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

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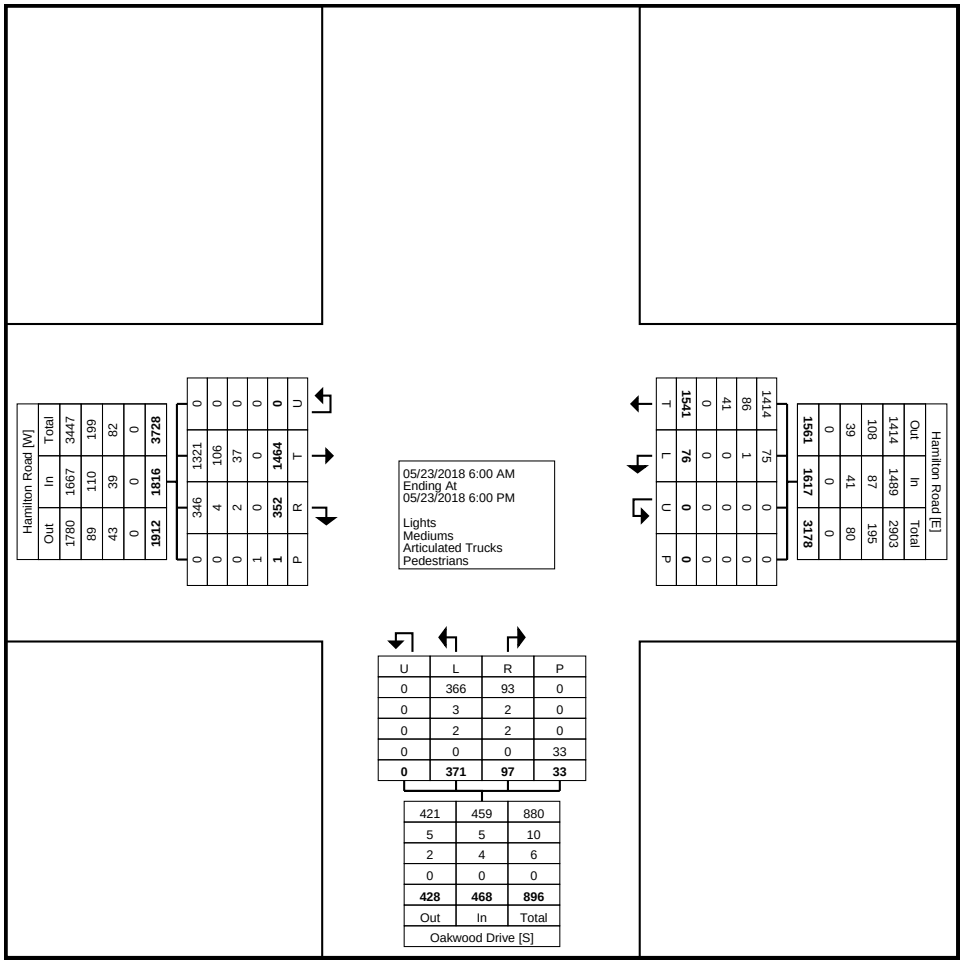
Start Date: 05/23/2018



Turning Movement Data Plot

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Waterloo, Ontario, Canada N2J 1N8
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Count Name: Hamilton Road & Oakwood Drive
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Hamilton Road Eastbound					Hamilton Road Westbound					Oakwood Drive Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
8:00 AM	32	4	0	1	36	1	88	0	0	89	16	1	0	1	17	142
8:15 AM	31	7	0	0	38	1	60	0	0	61	7	1	0	4	8	107
8:30 AM	31	0	0	0	31	0	65	0	0	65	8	0	0	1	8	104
8:45 AM	46	9	0	0	55	2	57	0	0	59	13	0	0	2	13	127
Total	140	20	0	1	160	4	270	0	0	274	44	2	0	8	46	480
Approach %	87.5	12.5	0.0	-	-	1.5	98.5	0.0	-	-	95.7	4.3	0.0	-	-	-
Total %	29.2	4.2	0.0	-	33.3	0.8	56.3	0.0	-	57.1	9.2	0.4	0.0	-	9.6	-
PHF	0.761	0.556	0.000	-	0.727	0.500	0.767	0.000	-	0.770	0.688	0.500	0.000	-	0.676	0.845
Lights	109	19	0	-	128	4	241	0	-	245	42	2	0	-	44	417
% Lights	77.9	95.0	-	-	80.0	100.0	89.3	-	-	89.4	95.5	100.0	-	-	95.7	86.9
Mediums	24	1	0	-	25	0	13	0	-	13	1	0	0	-	1	39
% Mediums	17.1	5.0	-	-	15.6	0.0	4.8	-	-	4.7	2.3	0.0	-	-	2.2	8.1
Articulated Trucks	7	0	0	-	7	0	16	0	-	16	1	0	0	-	1	24
% Articulated Trucks	5.0	0.0	-	-	4.4	0.0	5.9	-	-	5.8	2.3	0.0	-	-	2.2	5.0
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	8	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

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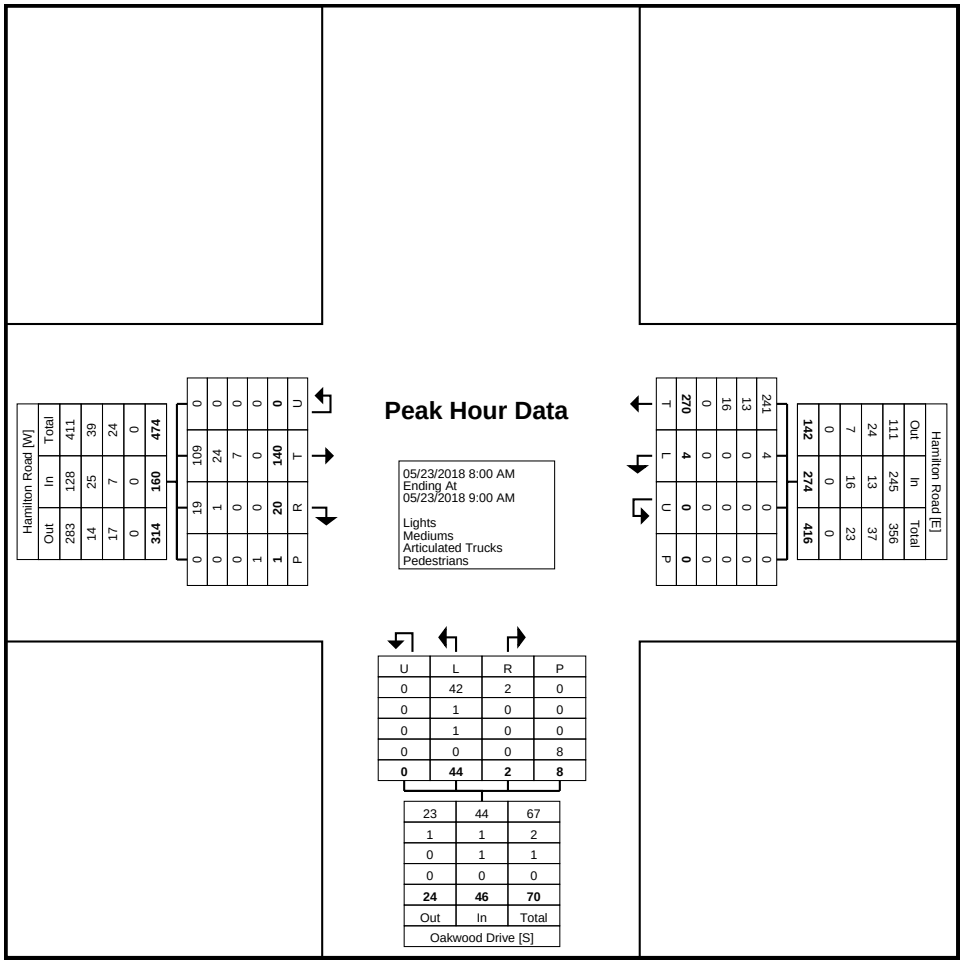

Turning Movement Peak Hour Data Plot (8:00 AM)

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Count Name: Hamilton Road & Oakwood Drive
Site Code:
Start Date: 05/23/2018

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Hamilton Road Eastbound					Hamilton Road Westbound					Oakwood Drive Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
12:00 PM	64	6	0	0	70	1	44	0	0	45	7	1	0	0	8	123
12:15 PM	55	10	0	0	65	1	41	0	0	42	8	2	0	0	10	117
12:30 PM	52	8	0	0	60	2	26	0	0	28	7	6	0	2	13	101
12:45 PM	39	4	0	0	43	3	49	0	0	52	5	2	0	0	7	102
Total	210	28	0	0	238	7	160	0	0	167	27	11	0	2	38	443
Approach %	88.2	11.8	0.0	-	-	4.2	95.8	0.0	-	-	71.1	28.9	0.0	-	-	-
Total %	47.4	6.3	0.0	-	53.7	1.6	36.1	0.0	-	37.7	6.1	2.5	0.0	-	8.6	-
PHF	0.820	0.700	0.000	-	0.850	0.583	0.816	0.000	-	0.803	0.844	0.458	0.000	-	0.731	0.900
Lights	185	28	0	-	213	7	143	0	-	150	27	11	0	-	38	401
% Lights	88.1	100.0	-	-	89.5	100.0	89.4	-	-	89.8	100.0	100.0	-	-	100.0	90.5
Mediums	18	0	0	-	18	0	16	0	-	16	0	0	0	-	0	34
% Mediums	8.6	0.0	-	-	7.6	0.0	10.0	-	-	9.6	0.0	0.0	-	-	0.0	7.7
Articulated Trucks	7	0	0	-	7	0	1	0	-	1	0	0	0	-	0	8
% Articulated Trucks	3.3	0.0	-	-	2.9	0.0	0.6	-	-	0.6	0.0	0.0	-	-	0.0	1.8
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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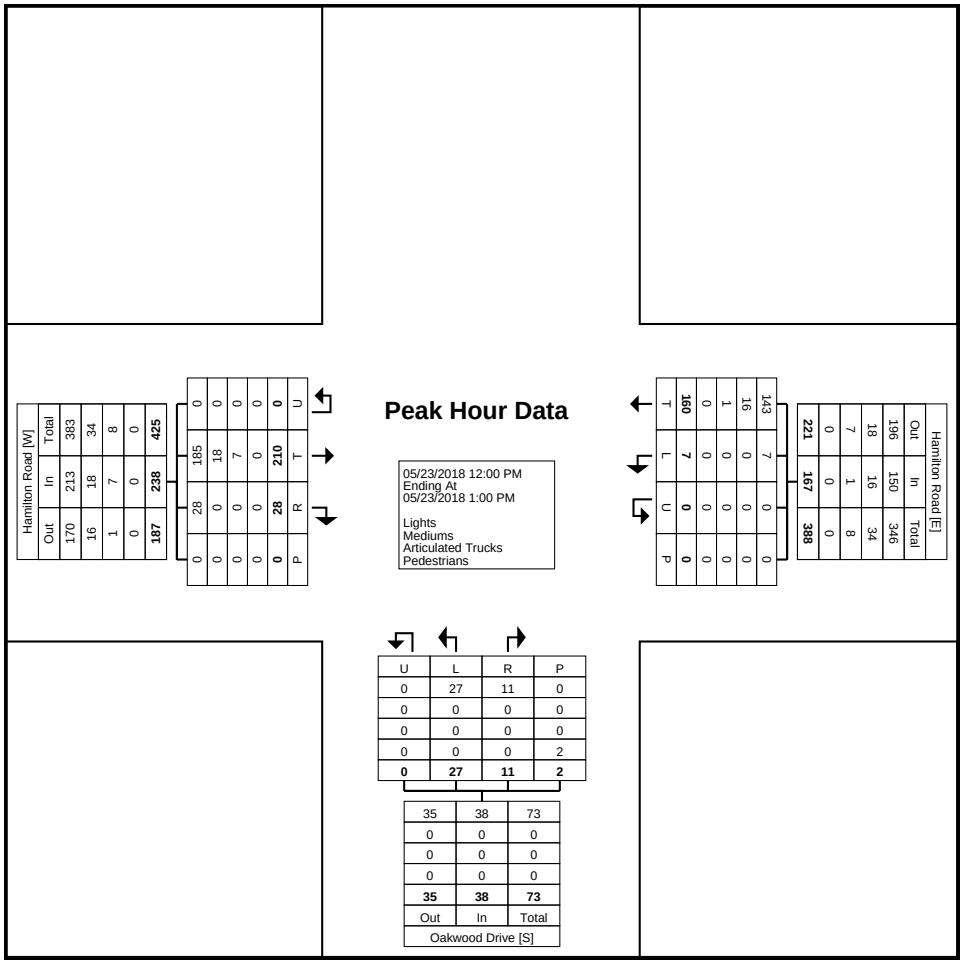

Turning Movement Peak Hour Data Plot (12:00 PM)

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Turning Movement Peak Hour Data (4:30 PM)

Start Time	Hamilton Road Eastbound					Hamilton Road Westbound					Oakwood Drive Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
4:30 PM	79	31	0	0	110	2	52	0	0	54	17	7	0	1	24	188
4:45 PM	65	24	0	0	89	4	42	0	0	46	16	5	0	2	21	156
5:00 PM	70	27	0	0	97	8	58	0	0	66	11	6	0	1	17	180
5:15 PM	77	22	0	0	99	3	59	0	0	62	18	4	0	0	22	183
Total	291	104	0	0	395	17	211	0	0	228	62	22	0	4	84	707
Approach %	73.7	26.3	0.0	-	-	7.5	92.5	0.0	-	-	73.8	26.2	0.0	-	-	-
Total %	41.2	14.7	0.0	-	55.9	2.4	29.8	0.0	-	32.2	8.8	3.1	0.0	-	11.9	-
PHF	0.921	0.839	0.000	-	0.898	0.531	0.894	0.000	-	0.864	0.861	0.786	0.000	-	0.875	0.940
Lights	282	104	0	-	386	17	206	0	-	223	62	22	0	-	84	693
% Lights	96.9	100.0	-	-	97.7	100.0	97.6	-	-	97.8	100.0	100.0	-	-	100.0	98.0
Mediums	3	0	0	-	3	0	4	0	-	4	0	0	0	-	0	7
% Mediums	1.0	0.0	-	-	0.8	0.0	1.9	-	-	1.8	0.0	0.0	-	-	0.0	1.0
Articulated Trucks	6	0	0	-	6	0	1	0	-	1	0	0	0	-	0	7
% Articulated Trucks	2.1	0.0	-	-	1.5	0.0	0.5	-	-	0.4	0.0	0.0	-	-	0.0	1.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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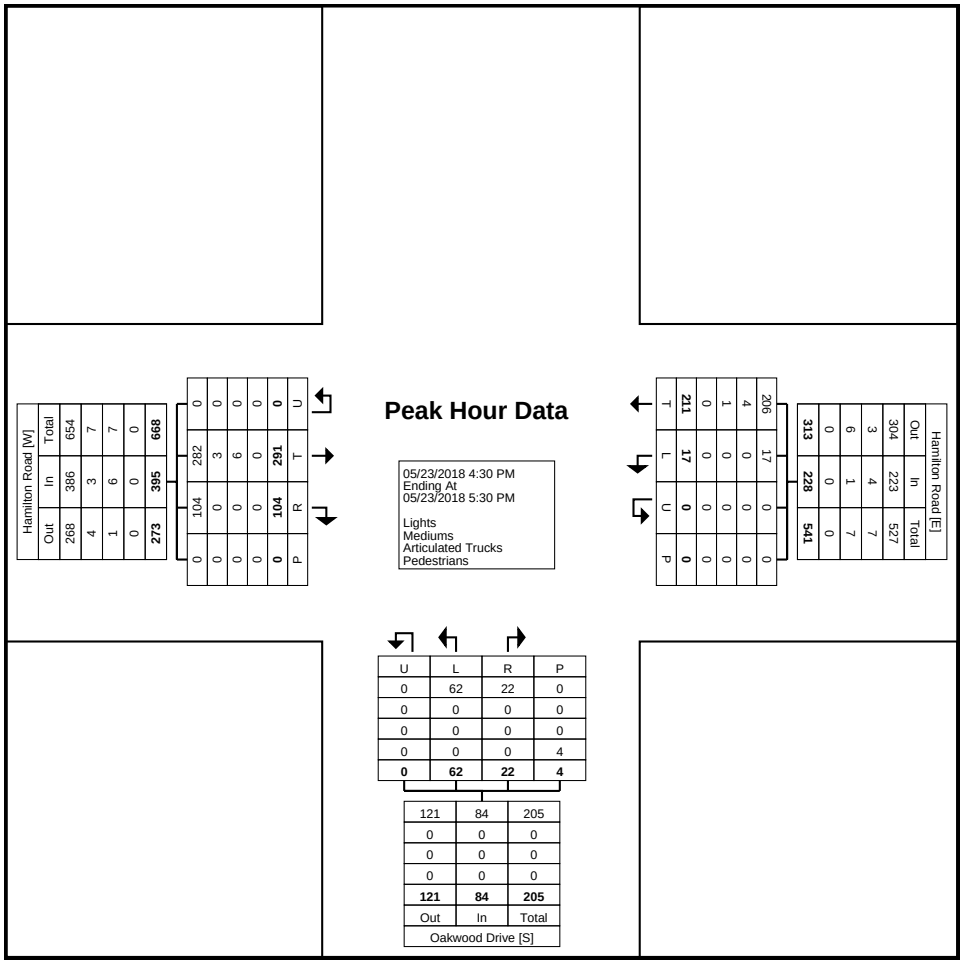

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Count Name: Hamilton Road & Oakwood Drive
Site Code:
Start Date: 05/23/2018

Appendix C

Base Year Traffic Operations Reports

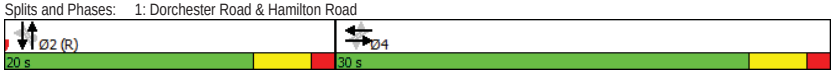
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	107	64	76	126	105	84	168	71	63	168	32
Future Volume (vph)	39	107	64	76	126	105	84	168	71	63	168	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99			0.99		1.00		
Frt		0.944			0.932			0.956			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1586	0	1612	1537	0	1805	1694	0	1583	1757	0
Flt Permitted	0.603			0.640			0.622			0.562		
Satd. Flow (perm)	1111	1586	0	1086	1537	0	1182	1694	0	934	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70			114			43			20	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)	2					2			3	3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Adj. Flow (vph)	42	116	70	83	137	114	91	183	77	68	183	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	186	0	83	251	0	91	260	0	68	218	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.08	0.22		0.15	0.30		0.26	0.48		0.24	0.40	
Control Delay	7.0	5.3		7.7	5.2		15.7	15.5		16.0	15.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.0	5.3		7.7	5.2		15.7	15.5		16.0	15.3	
LOS	A	A		A	A		B	B		B	B	
Approach Delay		5.7			5.8			15.5			15.5	
Approach LOS		A			A			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 10.9 — Intersection LOS: B
Intersection Capacity Utilization 88.3% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Dorchester Road & Hamilton Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	186	83	251	91	260	68	218
v/c Ratio	0.08	0.22	0.15	0.30	0.26	0.48	0.24	0.40
Control Delay	7.0	5.3	7.7	5.2	15.7	15.5	16.0	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	5.3	7.7	5.2	15.7	15.5	16.0	15.3
Queue Length 50th (m)	1.9	5.3	3.8	6.3	6.4	16.0	4.7	14.4
Queue Length 95th (m)	5.6	13.6	9.7	16.5	15.7	33.4	12.9	29.6
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	555	828	543	825	354	538	280	541
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	0.08	0.22	0.15	0.30	0.26	0.48	0.24	0.40

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	107	64	76	126	105	84	168	71	63	168	32
Future Volume (vph)	39	107	64	76	126	105	84	168	71	63	168	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.93		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1585		1612	1537		1805	1693		1579	1756	
Flt Permitted	0.60	1.00		0.64	1.00		0.62	1.00		0.56	1.00	
Satd. Flow (perm)	1112	1585		1086	1537		1182	1693		934	1756	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	116	70	83	137	114	91	183	77	68	183	35
RTOR Reduction (vph)	0	35	0	0	57	0	0	30	0	0	14	0
Lane Group Flow (vph)	42	151	0	83	194	0	91	230	0	68	204	0
Confl. Peds. (#/hr)	2					2			3	3		
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	556	792		543	768		354	507		280	526	
v/s Ratio Prot		0.10			c0.13			c0.14			0.12	
v/s Ratio Perm	0.04			0.08			0.08			0.07		
v/c Ratio	0.08	0.19		0.15	0.25		0.26	0.45		0.24	0.39	
Uniform Delay, d1	6.5	6.9		6.8	7.2		13.3	14.2		13.2	13.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.5		0.6	0.8		1.8	2.9		2.0	2.2	
Delay (s)	6.8	7.4		7.4	7.9		15.0	17.1		15.3	16.0	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		7.3			7.8			16.6			15.8	
Approach LOS		A			A			B			B	

Intersection Summary				
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	88.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

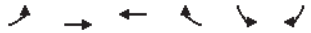
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	3	11	47	4	78	5	131	25	24	129	10
Future Volume (vph)	11	3	11	47	4	78	5	131	25	24	129	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.940				0.850		0.976			0.989	
Flt Protected		0.978			0.956		0.950			0.950		
Satd. Flow (prot)	0	1506	0	0	1784	1553	1805	1672	0	1736	1734	0
Flt Permitted		0.978			0.956		0.950			0.950		
Satd. Flow (perm)	0	1506	0	0	1784	1553	1805	1672	0	1736	1734	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			644.0			916.9	
Travel Time (s)		26.0			31.8			46.4			66.0	
Confl. Peds. (#/hr)			1	1					7	7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	0%	18%	0%	25%	4%	0%	13%	0%	4%	9%	0%
Adj. Flow (vph)	12	3	12	51	4	85	5	142	27	26	140	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	0	0	55	85	5	169	0	26	151	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	3	11	47	4	78	5	131	25	24	129	10
Future Volume (Veh/h)	11	3	11	47	4	78	5	131	25	24	129	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	3	12	51	4	85	5	142	27	26	140	11
Pedestrians					7			1				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	436	384	146	379	376	162	151			176		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	436	384	146	379	376	162	151			176		
tC, single (s)	7.3	6.5	6.4	7.1	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.5	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	97	99	99	91	99	90	100			98		
cM capacity (veh/h)	442	538	859	556	507	872	1442			1380		

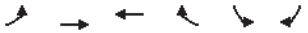
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	27	55	85	5	169	26	151
Volume Left	12	51	0	5	0	26	0
Volume Right	12	0	85	0	27	0	11
cSH	578	552	872	1442	1700	1380	1700
Volume to Capacity	0.05	0.10	0.10	0.00	0.10	0.02	0.09
Queue Length 95th (m)	1.2	2.6	2.6	0.1	0.0	0.5	0.0
Control Delay (s)	11.5	12.2	9.6	7.5	0.0	7.7	0.0
Lane LOS	B	B	A	A		A	
Approach Delay (s)	11.5	10.6		0.2		1.1	
Approach LOS	B	B					

Intersection Summary					
Average Delay	3.9				
Intersection Capacity Utilization	31.2%	ICU Level of Service		A	
Analysis Period (min)	15				



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	46	128	16	9	4
Future Volume (vph)	1	46	128	16	9	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.985		0.961	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1805	1827	1823	0	1764	0
Flt Permitted	0.950				0.966	
Satd. Flow (perm)	1805	1827	1823	0	1764	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		442.1	195.5		166.1	
Travel Time (s)		31.8	14.1		12.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	3%	0%	0%	0%
Adj. Flow (vph)	1	50	139	17	10	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	50	156	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	17.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	46	128	16	9	4
Future Volume (Veh/h)	1	46	128	16	9	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	50	139	17	10	4
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)						
pX, platoon unblocked						
vC, conflicting volume	156				202	148
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	156				202	148
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1436				790	905

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	1	50	156	14
Volume Left	1	0	0	10
Volume Right	0	0	17	4
cSH	1436	1700	1700	819
Volume to Capacity	0.00	0.03	0.09	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.4
Control Delay (s)	7.5	0.0	0.0	9.5
Lane LOS	A			A
Approach Delay (s)	0.1		0.0	9.5
Approach LOS				A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	17.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	28	15	1	58	6	63	39	5	3	11	21
Future Volume (vph)	11	28	15	1	58	6	63	39	5	3	11	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.987			0.994			0.918	
Flt Protected		0.990			0.999			0.971			0.996	
Satd. Flow (prot)	0	1686	0	0	1825	0	0	1771	0	0	1737	0
Flt Permitted		0.990			0.999			0.971			0.996	
Satd. Flow (perm)	0	1686	0	0	1825	0	0	1771	0	0	1737	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	2		4	4		2	10		2	2		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	9%	7%	7%	0%	3%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	12	30	16	1	63	7	68	42	5	3	12	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	58	0	0	71	0	0	115	0	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	29.4%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	28	15	1	58	6	63	39	5	3	11	21
Future Volume (vph)	11	28	15	1	58	6	63	39	5	3	11	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	30	16	1	63	7	68	42	5	3	12	23

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	58	71	115	38
Volume Left (vph)	12	1	68	3
Volume Right (vph)	16	7	5	23
Hadj (s)	0.00	-0.01	0.15	-0.35
Departure Headway (s)	4.3	4.3	4.4	4.0
Degree Utilization, x	0.07	0.08	0.14	0.04
Capacity (veh/h)	797	804	791	868
Control Delay (s)	7.7	7.7	8.1	7.1
Approach Delay (s)	7.7	7.7	8.1	7.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	140	20	4	270	44	2
Future Volume (vph)	140	20	4	270	44	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.983				0.995	
Flt Protected				0.999	0.954	
Satd. Flow (prot)	1570	0	0	1712	1770	0
Flt Permitted				0.999	0.954	
Satd. Flow (perm)	1570	0	0	1712	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		8	8		1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	21%	5%	0%	11%	2%	0%
Adj. Flow (vph)	152	22	4	293	48	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	174	0	0	297	50	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	140	20	4	270	44	2
Future Volume (Veh/h)	140	20	4	270	44	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	152	22	4	293	48	2
Pedestrians	1				8	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			182		473	171
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			182		473	171
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		91	100
cM capacity (veh/h)			1396		544	872

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	174	297	50
Volume Left	0	4	48
Volume Right	22	0	2
cSH	1700	1396	552
Volume to Capacity	0.10	0.00	0.09
Queue Length 95th (m)	0.0	0.1	2.4
Control Delay (s)	0.0	0.1	12.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.2
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

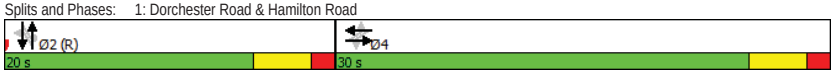
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	171	85	80	151	96	76	155	77	161	218	34
Future Volume (vph)	41	171	85	80	151	96	76	155	77	161	218	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00			1.00	0.99		1.00	1.00	
Frt		0.950			0.942			0.950			0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1746	0	1805	1744	0	1787	1723	0	1805	1816	0
Flt Permitted	0.594			0.589			0.540			0.575		
Satd. Flow (perm)	1106	1746	0	1118	1744	0	1011	1723	0	1091	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71			91			51			16	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)			1	1			5		1	1		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Adj. Flow (vph)	45	186	92	87	164	104	83	168	84	175	237	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	278	0	87	268	0	83	252	0	175	274	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.08	0.31		0.16	0.29		0.27	0.46		0.54	0.49	
Control Delay	7.0	6.5		7.7	5.7		16.3	14.4		21.8	17.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.0	6.5		7.7	5.7		16.3	14.4		21.8	17.2	
LOS	A	A		A	A		B	B		C	B	
Approach Delay		6.6			6.2			14.9			19.0	
Approach LOS		A			A			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 12.2 — Intersection LOS: B
Intersection Capacity Utilization 88.3% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Dorchester Road & Hamilton Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	278	87	268	83	252	175	274
v/c Ratio	0.08	0.31	0.16	0.29	0.27	0.46	0.54	0.49
Control Delay	7.0	6.5	7.7	5.7	16.3	14.4	21.8	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	6.5	7.7	5.7	16.3	14.4	21.8	17.2
Queue Length 50th (m)	2.0	9.9	4.0	8.3	5.8	14.7	13.4	19.4
Queue Length 95th (m)	6.0	21.1	10.0	19.0	15.0	31.4	29.7	37.4
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	553	908	559	917	303	552	327	556
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	0.08	0.31	0.16	0.29	0.27	0.46	0.54	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	171	85	80	151	96	76	155	77	161	218	34
Future Volume (vph)	41	171	85	80	151	96	76	155	77	161	218	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.94		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1747		1804	1744		1778	1723		1803	1816	
Flt Permitted	0.59	1.00		0.59	1.00		0.54	1.00		0.57	1.00	
Satd. Flow (perm)	1107	1747		1118	1744		1012	1723		1091	1816	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	186	92	87	164	104	83	168	84	175	237	37
RTOR Reduction (vph)	0	36	0	0	46	0	0	36	0	0	11	0
Lane Group Flow (vph)	45	243	0	87	223	0	83	216	0	175	263	0
Confl. Peds. (#/hr)			1	1			5		1	1		5
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	553	873		559	872		303	516		327	544	
v/s Ratio Prot		c0.14			0.13			0.13			0.14	
v/s Ratio Perm	0.04			0.08			0.08			c0.16		
v/c Ratio	0.08	0.28		0.16	0.26		0.27	0.42		0.54	0.48	
Uniform Delay, d1	6.5	7.3		6.8	7.2		13.3	14.0		14.6	14.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.8		0.6	0.7		2.2	2.5		6.2	3.1	
Delay (s)	6.8	8.0		7.4	7.9		15.6	16.5		20.7	17.4	
Level of Service	A	A		A	A		B	B		C	B	
Approach Delay (s)		7.9			7.7			16.3			18.7	
Approach LOS		A			A			B			B	

Intersection Summary					
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.37				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	88.3%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

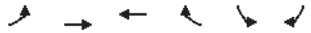
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	11	15	61	8	50	18	185	100	88	172	9
Future Volume (vph)	4	11	15	61	8	50	18	185	100	88	172	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.932				0.850		0.947			0.992	
Flt Protected		0.994			0.958		0.950			0.950		
Satd. Flow (prot)	0	1707	0	0	1820	1553	1703	1754	0	1787	1850	0
Flt Permitted		0.994			0.958		0.950			0.950		
Satd. Flow (perm)	0	1707	0	0	1820	1553	1703	1754	0	1787	1850	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			644.0			916.9	
Travel Time (s)		26.0			31.8			46.4			66.0	
Confl. Peds. (#/hr)			2	2					5	5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	0%	0%	0%	0%	4%	6%	4%	0%	1%	2%	0%
Adj. Flow (vph)	4	12	16	66	9	54	20	201	109	96	187	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	75	54	20	310	0	96	197	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	41.4%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	11	15	61	8	50	18	185	100	88	172	9
Future Volume (Veh/h)	4	11	15	61	8	50	18	185	100	88	172	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	12	16	66	9	54	20	201	109	96	187	10
Pedestrians					5			2				
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)												
pX, platoon unblocked												
vC, conflicting volume	684	739	194	704	690	260	197			315		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	684	739	194	704	690	260	197			315		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	99	96	98	79	97	93	99			92		
cM capacity (veh/h)	282	315	851	312	336	770	1352			1246		

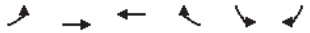
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	32	75	54	20	310	96	197
Volume Left	4	66	0	20	0	96	0
Volume Right	16	0	54	0	109	0	10
cSH	450	314	770	1352	1700	1246	1700
Volume to Capacity	0.07	0.24	0.07	0.01	0.18	0.08	0.12
Queue Length 95th (m)	1.8	7.3	1.8	0.4	0.0	2.0	0.0
Control Delay (s)	13.6	20.0	10.0	7.7	0.0	8.1	0.0
Lane LOS	B	C	B	A		A	
Approach Delay (s)	13.6	15.8		0.5		2.7	
Approach LOS	B	C					

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	41.4%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	182	107	13	19	2
Future Volume (vph)	8	182	107	13	19	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.985		0.988	
Flt Protected	0.950				0.956	
Satd. Flow (prot)	1805	1900	1839	0	1720	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1805	1900	1839	0	1720	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		442.1	195.5		166.1	
Travel Time (s)		31.8	14.1		12.0	
Confl. Peds. (#/hr)					3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	50%
Adj. Flow (vph)	9	198	116	14	21	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	198	130	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	182	107	13	19	2
Future Volume (Veh/h)	8	182	107	13	19	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	198	116	14	21	2
Pedestrians			3			
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)						
pX, platoon unblocked						
vC, conflicting volume	130				342	123
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130				342	123
tC, single (s)	4.1				6.4	6.7
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.8
p0 queue free %	99				97	100
cM capacity (veh/h)	1468				653	814

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	9	198	130	23
Volume Left	9	0	0	21
Volume Right	0	0	14	2
cSH	1468	1700	1700	664
Volume to Capacity	0.01	0.12	0.08	0.03
Queue Length 95th (m)	0.1	0.0	0.0	0.9
Control Delay (s)	7.5	0.0	0.0	10.6
Lane LOS	A			B
Approach Delay (s)	0.3		0.0	10.6
Approach LOS				B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

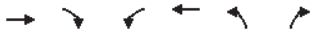
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	97	69	2	62	2	37	12	2	8	30	19
Future Volume (vph)	25	97	69	2	62	2	37	12	2	8	30	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.951			0.996			0.995			0.955	
Flt Protected		0.994			0.999			0.965			0.993	
Satd. Flow (prot)	0	1790	0	0	1891	0	0	1760	0	0	1802	0
Flt Permitted		0.994			0.999			0.965			0.993	
Satd. Flow (perm)	0	1790	0	0	1891	0	0	1760	0	0	1802	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	5		3	3		5	8		2	2		8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	5%	0%	0%	0%	0%	0%
Adj. Flow (vph)	27	105	75	2	67	2	40	13	2	9	33	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	207	0	0	71	0	0	55	0	0	63	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	33.9%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	25	97	69	2	62	2	37	12	2	8	30	19
Future Volume (vph)	25	97	69	2	62	2	37	12	2	8	30	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	105	75	2	67	2	40	13	2	9	33	21

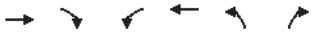
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	207	71	55	63
Volume Left (vph)	27	2	40	9
Volume Right (vph)	75	2	2	21
Hadj (s)	-0.19	-0.01	0.19	-0.17
Departure Headway (s)	4.1	4.4	4.8	4.4
Degree Utilization, x	0.23	0.09	0.07	0.08
Capacity (veh/h)	857	779	706	756
Control Delay (s)	8.3	7.8	8.1	7.8
Approach Delay (s)	8.3	7.8	8.1	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	291	104	17	211	62	22
Future Volume (vph)	291	104	17	211	62	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.964				0.964	
Flt Protected				0.996	0.964	
Satd. Flow (prot)	1792	0	0	1858	1766	0
Flt Permitted				0.996	0.964	
Satd. Flow (perm)	1792	0	0	1858	1766	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	2%	0%	0%
Adj. Flow (vph)	316	113	18	229	67	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	429	0	0	247	91	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	291	104	17	211	62	22
Future Volume (Veh/h)	291	104	17	211	62	22
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	316	113	18	229	67	24
Pedestrians					4	
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)						
pX, platoon unblocked						
vC, conflicting volume			433		642	376
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			433		642	376
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		85	96
cM capacity (veh/h)			1134		433	672

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	429	247	91
Volume Left	0	18	67
Volume Right	113	0	24
cSH	1700	1134	478
Volume to Capacity	0.25	0.02	0.19
Queue Length 95th (m)	0.0	0.4	5.6
Control Delay (s)	0.0	0.7	14.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	14.3
Approach LOS			B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix D

Opening-Year Background Traffic Operations Reports

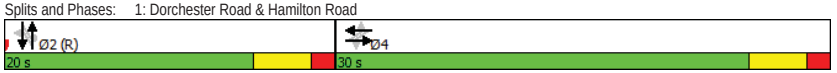
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	110	66	78	129	108	86	172	73	65	172	33
Future Volume (vph)	40	110	66	78	129	108	86	172	73	65	172	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99			0.99		1.00		
Frt		0.944			0.932			0.955			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1586	0	1612	1537	0	1805	1692	0	1583	1756	0
Flt Permitted	0.600			0.637			0.619			0.553		
Satd. Flow (perm)	1106	1586	0	1081	1537	0	1176	1692	0	919	1756	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		72			117			43			20	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)	2					2			3	3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Adj. Flow (vph)	43	120	72	85	140	117	93	187	79	71	187	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	192	0	85	257	0	93	266	0	71	223	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.08	0.23		0.16	0.31		0.26	0.50		0.26	0.41	
Control Delay	7.0	5.4		7.8	5.2		15.8	15.8		16.4	15.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.0	5.4		7.8	5.2		15.8	15.8		16.4	15.5	
LOS	A	A		A	A		B	B		B	B	
Approach Delay		5.7			5.9			15.8			15.7	
Approach LOS		A			A			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.50
Intersection Signal Delay: 11.1 — Intersection LOS: B
Intersection Capacity Utilization 88.3% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Dorchester Road & Hamilton Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	192	85	257	93	266	71	223
v/c Ratio	0.08	0.23	0.16	0.31	0.26	0.50	0.26	0.41
Control Delay	7.0	5.4	7.8	5.2	15.8	15.8	16.4	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	5.4	7.8	5.2	15.8	15.8	16.4	15.5
Queue Length 50th (m)	1.9	5.5	3.9	6.5	6.5	16.5	5.0	14.8
Queue Length 95th (m)	5.8	14.1	9.9	16.8	16.0	34.4	13.5	30.1
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	553	829	540	827	352	537	275	540
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	0.08	0.23	0.16	0.31	0.26	0.50	0.26	0.41

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	110	66	78	129	108	86	172	73	65	172	33
Future Volume (vph)	40	110	66	78	129	108	86	172	73	65	172	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.93		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1585		1612	1536		1805	1693		1579	1756	
Flt Permitted	0.60	1.00		0.64	1.00		0.62	1.00		0.55	1.00	
Satd. Flow (perm)	1106	1585		1080	1536		1176	1693		919	1756	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	120	72	85	140	117	93	187	79	71	187	36
RTOR Reduction (vph)	0	36	0	0	59	0	0	30	0	0	14	0
Lane Group Flow (vph)	43	156	0	85	199	0	93	236	0	71	209	0
Confl. Peds. (#/hr)	2					2			3	3		
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	553	792		540	768		352	507		275	526	
v/s Ratio Prot		0.10			c0.13			c0.14			0.12	
v/s Ratio Perm	0.04			0.08			0.08			0.08		
v/c Ratio	0.08	0.20		0.16	0.26		0.26	0.47		0.26	0.40	
Uniform Delay, d1	6.5	6.9		6.8	7.2		13.3	14.2		13.3	13.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.6		0.6	0.8		1.8	3.1		2.3	2.2	
Delay (s)	6.8	7.5		7.4	8.0		15.1	17.3		15.5	16.1	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		7.4			7.8			16.7			16.0	
Approach LOS		A			A			B			B	

Intersection Summary				
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	88.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

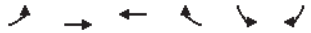
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	3	11	48	4	80	5	134	26	25	132	10
Future Volume (vph)	11	3	11	48	4	80	5	134	26	25	132	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.940				0.850		0.976			0.989	
Flt Protected		0.978			0.956		0.950			0.950		
Satd. Flow (prot)	0	1506	0	0	1785	1553	1805	1672	0	1736	1734	0
Flt Permitted		0.978			0.956		0.950			0.950		
Satd. Flow (perm)	0	1506	0	0	1785	1553	1805	1672	0	1736	1734	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			644.0			916.9	
Travel Time (s)		26.0			31.8			46.4			66.0	
Confl. Peds. (#/hr)			1	1					7	7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	0%	18%	0%	25%	4%	0%	13%	0%	4%	9%	0%
Adj. Flow (vph)	12	3	12	52	4	87	5	146	28	27	143	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	0	0	56	87	5	174	0	27	154	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.4%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	3	11	48	4	80	5	134	26	25	132	10
Future Volume (Veh/h)	11	3	11	48	4	80	5	134	26	25	132	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	3	12	52	4	87	5	146	28	27	143	11
Pedestrians					7			1				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	448	394	150	388	385	167	154			181		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	448	394	150	388	385	167	154			181		
tC, single (s)	7.3	6.5	6.4	7.1	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.5	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	97	99	99	91	99	90	100			98		
cM capacity (veh/h)	433	530	856	547	500	867	1439			1374		

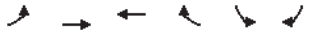
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	27	56	87	5	174	27	154
Volume Left	12	52	0	5	0	27	0
Volume Right	12	0	87	0	28	0	11
cSH	570	544	867	1439	1700	1374	1700
Volume to Capacity	0.05	0.10	0.10	0.00	0.10	0.02	0.09
Queue Length 95th (m)	1.2	2.7	2.7	0.1	0.0	0.5	0.0
Control Delay (s)	11.6	12.4	9.6	7.5	0.0	7.7	0.0
Lane LOS	B	B	A	A		A	
Approach Delay (s)	11.6	10.7		0.2		1.1	
Approach LOS	B	B					

Intersection Summary				
Average Delay	3.9			
Intersection Capacity Utilization	31.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	47	131	16	9	4
Future Volume (vph)	1	47	131	16	9	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.986		0.961	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1805	1827	1825	0	1764	0
Flt Permitted	0.950				0.966	
Satd. Flow (perm)	1805	1827	1825	0	1764	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		442.1	195.5		166.1	
Travel Time (s)		31.8	14.1		12.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	3%	0%	0%	0%
Adj. Flow (vph)	1	51	142	17	10	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	51	159	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

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



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	47	131	16	9	4
Future Volume (Veh/h)	1	47	131	16	9	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	51	142	17	10	4
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)						
pX, platoon unblocked						
vC, conflicting volume	159				206	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	159				206	150
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1433				786	901

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	1	51	159	14
Volume Left	1	0	0	10
Volume Right	0	0	17	4
cSH	1433	1700	1700	816
Volume to Capacity	0.00	0.03	0.09	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.4
Control Delay (s)	7.5	0.0	0.0	9.5
Lane LOS	A			A
Approach Delay (s)	0.1		0.0	9.5
Approach LOS				A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	17.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	29	15	1	59	6	65	40	5	3	11	22
Future Volume (vph)	11	29	15	1	59	6	65	40	5	3	11	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.964			0.987			0.994			0.917	
Flt Protected		0.990			0.999			0.971			0.996	
Satd. Flow (prot)	0	1688	0	0	1825	0	0	1770	0	0	1735	0
Flt Permitted		0.990			0.999			0.971			0.996	
Satd. Flow (perm)	0	1688	0	0	1825	0	0	1770	0	0	1735	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	2		4	4		2	10		2	2		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	9%	7%	7%	0%	3%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	12	32	16	1	64	7	71	43	5	3	12	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	60	0	0	72	0	0	119	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	29	15	1	59	6	65	40	5	3	11	22
Future Volume (vph)	11	29	15	1	59	6	65	40	5	3	11	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	32	16	1	64	7	71	43	5	3	12	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	60	72	119	39
Volume Left (vph)	12	1	71	3
Volume Right (vph)	16	7	5	24
Hadj (s)	0.01	-0.01	0.15	-0.35
Departure Headway (s)	4.3	4.3	4.4	4.0
Degree Utilization, x	0.07	0.09	0.15	0.04
Capacity (veh/h)	793	800	789	866
Control Delay (s)	7.7	7.7	8.1	7.2
Approach Delay (s)	7.7	7.7	8.1	7.2
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	21	4	277	45	2
Future Volume (vph)	144	21	4	277	45	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.983				0.995	
Flt Protected				0.999	0.954	
Satd. Flow (prot)	1570	0	0	1712	1770	0
Flt Permitted				0.999	0.954	
Satd. Flow (perm)	1570	0	0	1712	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		8	8		1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	21%	5%	0%	11%	2%	0%
Adj. Flow (vph)	157	23	4	301	49	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	180	0	0	305	51	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	144	21	4	277	45	2
Future Volume (Veh/h)	144	21	4	277	45	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	157	23	4	301	49	2
Pedestrians	1				8	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			188		486	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			188		486	176
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		91	100
cM capacity (veh/h)			1389		534	866

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	180	305	51
Volume Left	0	4	49
Volume Right	23	0	2
cSH	1700	1389	543
Volume to Capacity	0.11	0.00	0.09
Queue Length 95th (m)	0.0	0.1	2.5
Control Delay (s)	0.0	0.1	12.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.3
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		

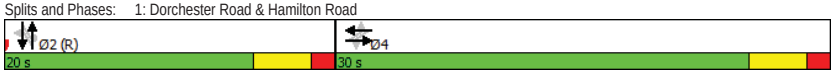
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	175	87	82	155	98	78	159	79	165	224	35
Future Volume (vph)	42	175	87	82	155	98	78	159	79	165	224	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00			1.00	0.99		1.00	1.00	
Frt		0.950			0.942			0.950			0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1746	0	1805	1744	0	1787	1723	0	1805	1816	0
Flt Permitted	0.590			0.585			0.529			0.564		
Satd. Flow (perm)	1099	1746	0	1111	1744	0	990	1723	0	1071	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		72			92			51			16	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)			1	1			5		1	1		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Adj. Flow (vph)	46	190	95	89	168	107	85	173	86	179	243	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	285	0	89	275	0	85	259	0	179	281	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.08	0.31		0.16	0.30		0.29	0.47		0.56	0.51	
Control Delay	7.1	6.6		7.8	5.8		16.6	14.7		22.8	17.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.1	6.6		7.8	5.8		16.6	14.7		22.8	17.4	
LOS	A	A		A	A		B	B		C	B	
Approach Delay		6.6			6.3			15.2			19.5	
Approach LOS		A			A			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 12.5 — Intersection LOS: B
Intersection Capacity Utilization 88.3% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Dorchester Road & Hamilton Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	285	89	275	85	259	179	281
v/c Ratio	0.08	0.31	0.16	0.30	0.29	0.47	0.56	0.51
Control Delay	7.1	6.6	7.8	5.8	16.6	14.7	22.8	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	6.6	7.8	5.8	16.6	14.7	22.8	17.4
Queue Length 50th (m)	2.0	10.3	4.1	8.7	6.0	15.2	13.9	20.0
Queue Length 95th (m)	6.1	21.8	10.2	19.4	15.5	32.3	#31.7	38.5
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	549	909	555	918	297	552	321	556
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	0.08	0.31	0.16	0.30	0.29	0.47	0.56	0.51

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	175	87	82	155	98	78	159	79	165	224	35
Future Volume (vph)	42	175	87	82	155	98	78	159	79	165	224	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.94		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1746		1804	1744		1779	1724		1803	1816	
Flt Permitted	0.59	1.00		0.59	1.00		0.53	1.00		0.56	1.00	
Satd. Flow (perm)	1100	1746		1111	1744		991	1724		1070	1816	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	190	95	89	168	107	85	173	86	179	243	38
RTOR Reduction (vph)	0	36	0	0	46	0	0	36	0	0	11	0
Lane Group Flow (vph)	46	249	0	89	229	0	85	223	0	179	270	0
Confl. Peds. (#/hr)			1	1			5		1	1		5
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	550	873		555	872		297	517		321	544	
v/s Ratio Prot		c0.14			0.13			0.13			0.15	
v/s Ratio Perm	0.04			0.08			0.09			c0.17		
v/c Ratio	0.08	0.29		0.16	0.26		0.29	0.43		0.56	0.50	
Uniform Delay, d1	6.5	7.3		6.8	7.2		13.4	14.1		14.7	14.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.8		0.6	0.7		2.4	2.6		6.8	3.2	
Delay (s)	6.8	8.1		7.4	7.9		15.8	16.7		21.5	17.6	
Level of Service	A	A		A	A		B	B		C	B	
Approach Delay (s)		7.9			7.8			16.5			19.1	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.39				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0		
Intersection Capacity Utilization	88.3%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group

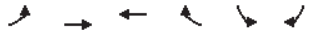
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	11	15	63	8	51	18	190	103	90	176	9
Future Volume (vph)	4	11	15	63	8	51	18	190	103	90	176	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.932				0.850		0.947			0.993	
Flt Protected		0.994			0.958		0.950			0.950		
Satd. Flow (prot)	0	1707	0	0	1820	1553	1703	1754	0	1787	1852	0
Flt Permitted		0.994			0.958		0.950			0.950		
Satd. Flow (perm)	0	1707	0	0	1820	1553	1703	1754	0	1787	1852	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			644.0			916.9	
Travel Time (s)		26.0			31.8			46.4			66.0	
Confl. Peds. (#/hr)			2	2					5	5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	0%	0%	0%	0%	4%	6%	4%	0%	1%	2%	0%
Adj. Flow (vph)	4	12	16	68	9	55	20	207	112	98	191	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	77	55	20	319	0	98	201	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	42.0%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	11	15	63	8	51	18	190	103	90	176	9
Future Volume (Veh/h)	4	11	15	63	8	51	18	190	103	90	176	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	12	16	68	9	55	20	207	112	98	191	10
Pedestrians					5			2				
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)												
pX, platoon unblocked												
vC, conflicting volume	698	756	198	719	705	268	201			324		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	698	756	198	719	705	268	201			324		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	99	96	98	78	97	93	99			92		
cM capacity (veh/h)	274	307	847	304	328	763	1347			1236		

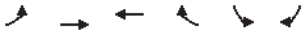
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	32	77	55	20	319	98	201
Volume Left	4	68	0	20	0	98	0
Volume Right	16	0	55	0	112	0	10
cSH	441	306	763	1347	1700	1236	1700
Volume to Capacity	0.07	0.25	0.07	0.01	0.19	0.08	0.12
Queue Length 95th (m)	1.9	7.8	1.9	0.4	0.0	2.1	0.0
Control Delay (s)	13.8	20.7	10.1	7.7	0.0	8.2	0.0
Lane LOS	B	C	B	A		A	
Approach Delay (s)	13.8	16.3		0.5		2.7	
Approach LOS	B	C					

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	42.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	187	110	13	19	2
Future Volume (vph)	8	187	110	13	19	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.986		0.988	
Flt Protected	0.950				0.956	
Satd. Flow (prot)	1805	1900	1840	0	1720	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1805	1900	1840	0	1720	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		442.1	195.5		166.1	
Travel Time (s)		31.8	14.1		12.0	
Confl. Peds. (#/hr)					3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	50%
Adj. Flow (vph)	9	203	120	14	21	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	203	134	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	187	110	13	19	2
Future Volume (Veh/h)	8	187	110	13	19	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	203	120	14	21	2
Pedestrians			3			
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)						
pX, platoon unblocked						
vC, conflicting volume	134				351	127
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	134				351	127
tC, single (s)	4.1				6.4	6.7
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.8
p0 queue free %	99				97	100
cM capacity (veh/h)	1463				645	809

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	9	203	134	23
Volume Left	9	0	0	21
Volume Right	0	0	14	2
cSH	1463	1700	1700	656
Volume to Capacity	0.01	0.12	0.08	0.04
Queue Length 95th (m)	0.1	0.0	0.0	0.9
Control Delay (s)	7.5	0.0	0.0	10.7
Lane LOS	A			B
Approach Delay (s)	0.3		0.0	10.7
Approach LOS				B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	19.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	99	71	2	64	2	38	12	2	8	31	19
Future Volume (vph)	26	99	71	2	64	2	38	12	2	8	31	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.951			0.996			0.995			0.956	
Flt Protected		0.993			0.999			0.965			0.993	
Satd. Flow (prot)	0	1788	0	0	1891	0	0	1760	0	0	1804	0
Flt Permitted		0.993			0.999			0.965			0.993	
Satd. Flow (perm)	0	1788	0	0	1891	0	0	1760	0	0	1804	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	5		3	3		5	8		2	2		8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	5%	0%	0%	0%	0%	0%
Adj. Flow (vph)	28	108	77	2	70	2	41	13	2	9	34	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	213	0	0	74	0	0	56	0	0	64	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.2%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	99	71	2	64	2	38	12	2	8	31	19
Future Volume (vph)	26	99	71	2	64	2	38	12	2	8	31	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	108	77	2	70	2	41	13	2	9	34	21

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	213	74	56	64
Volume Left (vph)	28	2	41	9
Volume Right (vph)	77	2	2	21
Hadj (s)	-0.18	-0.01	0.19	-0.17
Departure Headway (s)	4.1	4.4	4.8	4.4
Degree Utilization, x	0.24	0.09	0.07	0.08
Capacity (veh/h)	854	776	701	751
Control Delay (s)	8.4	7.8	8.2	7.8
Approach Delay (s)	8.4	7.8	8.2	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	298	107	17	216	64	23
Future Volume (vph)	298	107	17	216	64	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.964				0.964	
Flt Protected				0.996	0.964	
Satd. Flow (prot)	1792	0	0	1858	1766	0
Flt Permitted				0.996	0.964	
Satd. Flow (perm)	1792	0	0	1858	1766	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	2%	0%	0%
Adj. Flow (vph)	324	116	18	235	70	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	440	0	0	253	95	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	37.0%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	298	107	17	216	64	23
Future Volume (Veh/h)	298	107	17	216	64	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	324	116	18	235	70	25
Pedestrians					4	
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)						
pX, platoon unblocked						
vC, conflicting volume			444		657	386
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			444		657	386
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		84	96
cM capacity (veh/h)			1123		424	664

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	440	253	95
Volume Left	0	18	70
Volume Right	116	0	25
cSH	1700	1123	469
Volume to Capacity	0.26	0.02	0.20
Queue Length 95th (m)	0.0	0.4	6.0
Control Delay (s)	0.0	0.7	14.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	14.6
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E

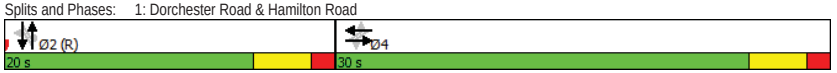
Five-Year Background Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	112	67	80	132	110	88	177	75	66	177	34
Future Volume (vph)	41	112	67	80	132	110	88	177	75	66	177	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99			0.99		1.00		
Frt		0.944			0.932			0.955			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1585	0	1612	1537	0	1805	1692	0	1583	1756	0
Flt Permitted	0.597			0.635			0.612			0.540		
Satd. Flow (perm)	1100	1585	0	1077	1537	0	1163	1692	0	897	1756	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73			120			44			20	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)	2					2			3	3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Adj. Flow (vph)	45	122	73	87	143	120	96	192	82	72	192	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	195	0	87	263	0	96	274	0	72	229	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.08	0.24		0.16	0.32		0.28	0.51		0.27	0.42	
Control Delay	7.1	5.4		7.8	5.3		16.0	16.0		16.6	15.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.1	5.4		7.8	5.3		16.0	16.0		16.6	15.7	
LOS	A	A		A	A		B	B		B	B	
Approach Delay		5.7			5.9			16.0			15.9	
Approach LOS		A			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 88.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Dorchester Road & Hamilton Road



Queues
1: Dorchester Road & Hamilton Road

Five Year Background: AM Peak Hour
180123: 187 Dorchester Road TRIS

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	195	87	263	96	274	72	229
v/c Ratio	0.08	0.24	0.16	0.32	0.28	0.51	0.27	0.42
Control Delay	7.1	5.4	7.8	5.3	16.0	16.0	16.6	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	5.4	7.8	5.3	16.0	16.0	16.6	15.7
Queue Length 50th (m)	2.0	5.6	4.0	6.7	6.8	17.2	5.1	15.3
Queue Length 95th (m)	6.0	14.3	10.1	17.0	16.5	35.5	13.6	31.0
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	550	829	538	828	348	538	269	540
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	0.08	0.24	0.16	0.32	0.28	0.51	0.27	0.42

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Dorchester Road & Hamilton Road

Five Year Background: AM Peak Hour
180123: 187 Dorchester Road TRIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	112	67	80	132	110	88	177	75	66	177	34
Future Volume (vph)	41	112	67	80	132	110	88	177	75	66	177	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.93		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1585		1612	1536		1805	1692		1579	1756	
Flt Permitted	0.60	1.00		0.64	1.00		0.61	1.00		0.54	1.00	
Satd. Flow (perm)	1100	1585		1077	1536		1162	1692		898	1756	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	122	73	87	143	120	96	192	82	72	192	37
RTOR Reduction (vph)	0	37	0	0	60	0	0	31	0	0	14	0
Lane Group Flow (vph)	45	159	0	87	203	0	96	243	0	72	215	0
Confl. Peds. (#/hr)	2					2			3	3		
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	550	792		538	768		348	507		269	526	
v/s Ratio Prot		0.10			c0.13			c0.14			0.12	
v/s Ratio Perm	0.04			0.08			0.08			0.08		
v/c Ratio	0.08	0.20		0.16	0.26		0.28	0.48		0.27	0.41	
Uniform Delay, d1	6.5	6.9		6.8	7.2		13.4	14.3		13.3	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.6		0.6	0.8		2.0	3.2		2.4	2.3	
Delay (s)	6.8	7.5		7.4	8.0		15.3	17.5		15.7	16.3	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		7.4			7.9			17.0			16.2	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	12.4	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.34				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	88.3%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	3	12	49	4	82	5	138	26	25	136	11
Future Volume (vph)	12	3	12	49	4	82	5	138	26	25	136	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.939				0.850		0.976			0.989	
Flt Protected		0.978			0.956		0.950			0.950		
Satd. Flow (prot)	0	1502	0	0	1785	1553	1805	1671	0	1736	1735	0
Flt Permitted		0.978			0.956		0.950			0.950		
Satd. Flow (perm)	0	1502	0	0	1785	1553	1805	1671	0	1736	1735	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			644.0			916.9	
Travel Time (s)		26.0			31.8			46.4			66.0	
Confl. Peds. (#/hr)			1	1					7	7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	0%	18%	0%	25%	4%	0%	13%	0%	4%	9%	0%
Adj. Flow (vph)	13	3	13	53	4	89	5	150	28	27	148	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	29	0	0	57	89	5	178	0	27	160	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.6%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	3	12	49	4	82	5	138	26	25	136	11
Future Volume (Veh/h)	12	3	12	49	4	82	5	138	26	25	136	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	3	13	53	4	89	5	150	28	27	148	12
Pedestrians					7			1				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	459	403	155	398	395	171	160			185		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	459	403	155	398	395	171	160			185		
tC, single (s)	7.3	6.5	6.4	7.1	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.5	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	97	99	98	90	99	90	100			98		
cM capacity (veh/h)	424	524	850	538	493	863	1432			1370		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	29	57	89	5	178	27	160
Volume Left	13	53	0	5	0	27	0
Volume Right	13	0	89	0	28	0	12
cSH	561	535	863	1432	1700	1370	1700
Volume to Capacity	0.05	0.11	0.10	0.00	0.10	0.02	0.09
Queue Length 95th (m)	1.3	2.8	2.8	0.1	0.0	0.5	0.0
Control Delay (s)	11.8	12.5	9.7	7.5	0.0	7.7	0.0
Lane LOS	B	B	A	A		A	
Approach Delay (s)	11.8	10.8		0.2		1.1	
Approach LOS	B	B					

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	31.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	48	135	17	9	4
Future Volume (vph)	1	48	135	17	9	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.985		0.961	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1805	1827	1823	0	1764	0
Flt Permitted	0.950				0.966	
Satd. Flow (perm)	1805	1827	1823	0	1764	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		442.1	195.5		166.1	
Travel Time (s)		31.8	14.1		12.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	3%	0%	0%	0%
Adj. Flow (vph)	1	52	147	18	10	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	52	165	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	48	135	17	9	4
Future Volume (Veh/h)	1	48	135	17	9	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	52	147	18	10	4
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)						
pX, platoon unblocked						
vC, conflicting volume	165				212	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	165				212	156
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1426				779	895

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	1	52	165	14
Volume Left	1	0	0	10
Volume Right	0	0	18	4
cSH	1426	1700	1700	809
Volume to Capacity	0.00	0.03	0.10	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.4
Control Delay (s)	7.5	0.0	0.0	9.5
Lane LOS	A			A
Approach Delay (s)	0.1		0.0	9.5
Approach LOS				A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	29	16	1	61	6	66	41	5	3	12	22
Future Volume (vph)	12	29	16	1	61	6	66	41	5	3	12	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.987			0.994			0.919	
Flt Protected		0.990			0.999			0.971			0.996	
Satd. Flow (prot)	0	1686	0	0	1825	0	0	1771	0	0	1739	0
Flt Permitted		0.990			0.999			0.971			0.996	
Satd. Flow (perm)	0	1686	0	0	1825	0	0	1771	0	0	1739	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	2		4	4		2	10		2	2		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	9%	7%	7%	0%	3%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	32	17	1	66	7	72	45	5	3	13	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	62	0	0	74	0	0	122	0	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	29	16	1	61	6	66	41	5	3	12	22
Future Volume (vph)	12	29	16	1	61	6	66	41	5	3	12	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	32	17	1	66	7	72	45	5	3	13	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	62	74	122	40
Volume Left (vph)	13	1	72	3
Volume Right (vph)	17	7	5	24
Hadj (s)	0.00	-0.01	0.15	-0.34
Departure Headway (s)	4.4	4.3	4.4	4.0
Degree Utilization, x	0.08	0.09	0.15	0.04
Capacity (veh/h)	791	797	787	860
Control Delay (s)	7.7	7.8	8.2	7.2
Approach Delay (s)	7.7	7.8	8.2	7.2
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	147	21	4	284	46	2
Future Volume (vph)	147	21	4	284	46	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.983				0.995	
Flt Protected				0.999	0.954	
Satd. Flow (prot)	1570	0	0	1712	1770	0
Flt Permitted				0.999	0.954	
Satd. Flow (perm)	1570	0	0	1712	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		8	8		1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	21%	5%	0%	11%	2%	0%
Adj. Flow (vph)	160	23	4	309	50	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	183	0	0	313	52	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	147	21	4	284	46	2
Future Volume (Veh/h)	147	21	4	284	46	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	160	23	4	309	50	2
Pedestrians	1				8	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			191		498	180
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		498	180
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		91	100
cM capacity (veh/h)			1385		527	863

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	183	313	52
Volume Left	0	4	50
Volume Right	23	0	2
cSH	1700	1385	535
Volume to Capacity	0.11	0.00	0.10
Queue Length 95th (m)	0.0	0.1	2.6
Control Delay (s)	0.0	0.1	12.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.5
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		

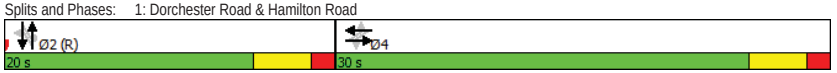
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	180	89	84	159	101	80	163	81	169	229	36
Future Volume (vph)	43	180	89	84	159	101	80	163	81	169	229	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00			1.00	0.99		1.00	1.00	
Frt		0.950			0.942			0.950			0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1746	0	1805	1744	0	1787	1723	0	1805	1816	0
Flt Permitted	0.586			0.581			0.519			0.554		
Satd. Flow (perm)	1092	1746	0	1103	1744	0	972	1723	0	1052	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71			92			51			16	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)			1	1			5		1	1		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Adj. Flow (vph)	47	196	97	91	173	110	87	177	88	184	249	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	293	0	91	283	0	87	265	0	184	288	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.09	0.32		0.17	0.31		0.30	0.48		0.58	0.52	
Control Delay	7.1	6.7		7.8	5.9		16.9	14.9		24.4	17.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.1	6.7		7.8	5.9		16.9	14.9		24.4	17.7	
LOS	A	A		A	A		B	B		C	B	
Approach Delay		6.8			6.4			15.4			20.3	
Approach LOS		A			A			B			C	

Intersection Summary

Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 12.8		Intersection LOS: B	
Intersection Capacity Utilization 88.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Dorchester Road & Hamilton Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	47	293	91	283	87	265	184	288
v/c Ratio	0.09	0.32	0.17	0.31	0.30	0.48	0.58	0.52
Control Delay	7.1	6.7	7.8	5.9	16.9	14.9	24.4	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	6.7	7.8	5.9	16.9	14.9	24.4	17.7
Queue Length 50th (m)	2.1	10.8	4.2	9.1	6.2	15.8	14.4	20.7
Queue Length 95th (m)	6.2	22.5	10.5	20.2	15.7	33.1	#36.5	39.6
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	546	908	551	918	291	552	315	556
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	0.09	0.32	0.17	0.31	0.30	0.48	0.58	0.52

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)	43	180	89	84	159	101	80	163	81	169	229	36
Future Volume (vph)	43	180	89	84	159	101	80	163	81	169	229	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.94		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1746		1804	1744		1779	1724		1803	1816	
Flt Permitted	0.59	1.00		0.58	1.00		0.52	1.00		0.55	1.00	
Satd. Flow (perm)	1092	1746		1103	1744		971	1724		1052	1816	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	196	97	91	173	110	87	177	88	184	249	39
RTOR Reduction (vph)	0	36	0	0	46	0	0	36	0	0	11	0
Lane Group Flow (vph)	47	258	0	91	237	0	87	229	0	184	277	0
Confl. Peds. (#/hr)			1	1			5		1	1		5
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	546	873		551	872		291	517		315	544	
v/s Ratio Prot		c0.15			0.14			0.13			0.15	
v/s Ratio Perm	0.04			0.08			0.09			c0.17		
v/c Ratio	0.09	0.29		0.17	0.27		0.30	0.44		0.58	0.51	
Uniform Delay, d1	6.5	7.3		6.8	7.2		13.5	14.1		14.9	14.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.9		0.6	0.8		2.6	2.7		7.7	3.4	
Delay (s)	6.8	8.2		7.5	8.0		16.1	16.9		22.6	17.8	
Level of Service	A	A		A	A		B	B		C	B	
Approach Delay (s)		8.0			7.9			16.7			19.7	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	13.5	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.40				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	88.5%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

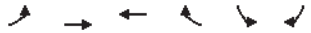
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	12	16	64	8	53	19	194	105	93	181	9
Future Volume (vph)	4	12	16	64	8	53	19	194	105	93	181	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.932				0.850		0.947			0.993	
Flt Protected		0.994			0.958		0.950			0.950		
Satd. Flow (prot)	0	1710	0	0	1820	1553	1703	1754	0	1787	1851	0
Flt Permitted		0.994			0.958		0.950			0.950		
Satd. Flow (perm)	0	1710	0	0	1820	1553	1703	1754	0	1787	1851	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			644.0			916.9	
Travel Time (s)		26.0			31.8			46.4			66.0	
Confl. Peds. (#/hr)			2	2					5	5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	0%	0%	0%	0%	4%	6%	4%	0%	1%	2%	0%
Adj. Flow (vph)	4	13	17	70	9	58	21	211	114	101	197	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	79	58	21	325	0	101	207	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	42.6%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	12	16	64	8	53	19	194	105	93	181	9
Future Volume (Veh/h)	4	12	16	64	8	53	19	194	105	93	181	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	13	17	70	9	58	21	211	114	101	197	10
Pedestrians					5			2				
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)												
pX, platoon unblocked												
vC, conflicting volume	720	776	204	740	724	273	207			330		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	720	776	204	740	724	273	207			330		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	98	96	98	76	97	92	98			92		
cM capacity (veh/h)	263	298	840	292	319	758	1341			1230		

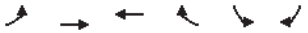
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	34	79	58	21	325	101	207
Volume Left	4	70	0	21	0	101	0
Volume Right	17	0	58	0	114	0	10
cSH	430	295	758	1341	1700	1230	1700
Volume to Capacity	0.08	0.27	0.08	0.02	0.19	0.08	0.12
Queue Length 95th (m)	2.1	8.5	2.0	0.4	0.0	2.1	0.0
Control Delay (s)	14.1	21.6	10.1	7.7	0.0	8.2	0.0
Lane LOS	B	C	B	A		A	
Approach Delay (s)	14.1	16.8		0.5		2.7	
Approach LOS	B	C					

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	42.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	191	112	14	20	2
Future Volume (vph)	8	191	112	14	20	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.985		0.989	
Flt Protected	0.950				0.956	
Satd. Flow (prot)	1805	1900	1839	0	1725	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1805	1900	1839	0	1725	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		442.1	195.5		166.1	
Travel Time (s)		31.8	14.1		12.0	
Confl. Peds. (#/hr)					3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	50%
Adj. Flow (vph)	9	208	122	15	22	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	208	137	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	191	112	14	20	2
Future Volume (Veh/h)	8	191	112	14	20	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	208	122	15	22	2
Pedestrians			3			
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)						
pX, platoon unblocked						
vC, conflicting volume	137				358	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				358	130
tC, single (s)	4.1				6.4	6.7
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.8
p0 queue free %	99				97	100
cM capacity (veh/h)	1459				638	806

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	9	208	137	24
Volume Left	9	0	0	22
Volume Right	0	0	15	2
cSH	1459	1700	1700	650
Volume to Capacity	0.01	0.12	0.08	0.04
Queue Length 95th (m)	0.1	0.0	0.0	0.9
Control Delay (s)	7.5	0.0	0.0	10.8
Lane LOS	A			B
Approach Delay (s)	0.3		0.0	10.8
Approach LOS				B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	102	73	2	65	2	39	13	2	8	32	20
Future Volume (vph)	26	102	73	2	65	2	39	13	2	8	32	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.951			0.996			0.995			0.955	
Flt Protected		0.994			0.999			0.965			0.993	
Satd. Flow (prot)	0	1790	0	0	1891	0	0	1761	0	0	1802	0
Flt Permitted		0.994			0.999			0.965			0.993	
Satd. Flow (perm)	0	1790	0	0	1891	0	0	1761	0	0	1802	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	5		3	3		5	8		2	2		8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	5%	0%	0%	0%	0%	0%
Adj. Flow (vph)	28	111	79	2	71	2	42	14	2	9	35	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	218	0	0	75	0	0	58	0	0	66	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.6%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	102	73	2	65	2	39	13	2	8	32	20
Future Volume (vph)	26	102	73	2	65	2	39	13	2	8	32	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	111	79	2	71	2	42	14	2	9	35	22

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	218	75	58	66
Volume Left (vph)	28	2	42	9
Volume Right (vph)	79	2	2	22
Hadj (s)	-0.19	-0.01	0.19	-0.17
Departure Headway (s)	4.1	4.4	4.8	4.4
Degree Utilization, x	0.25	0.09	0.08	0.08
Capacity (veh/h)	851	773	698	748
Control Delay (s)	8.4	7.9	8.2	7.8
Approach Delay (s)	8.4	7.9	8.2	7.8
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	306	109	18	222	65	23
Future Volume (vph)	306	109	18	222	65	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965				0.965	
Flt Protected				0.996	0.964	
Satd. Flow (prot)	1794	0	0	1858	1767	0
Flt Permitted				0.996	0.964	
Satd. Flow (perm)	1794	0	0	1858	1767	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	2%	0%	0%
Adj. Flow (vph)	333	118	20	241	71	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	451	0	0	261	96	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.2%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	306	109	18	222	65	23
Future Volume (Veh/h)	306	109	18	222	65	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	333	118	20	241	71	25
Pedestrians					4	
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)						
pX, platoon unblocked						
vC, conflicting volume			455		677	396
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			455		677	396
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		83	96
cM capacity (veh/h)			1113		412	656

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	451	261	96
Volume Left	0	20	71
Volume Right	118	0	25
cSH	1700	1113	456
Volume to Capacity	0.27	0.02	0.21
Queue Length 95th (m)	0.0	0.4	6.3
Control Delay (s)	0.0	0.8	15.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.8	15.0
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix F

Ten-Year Background Traffic Operations Reports

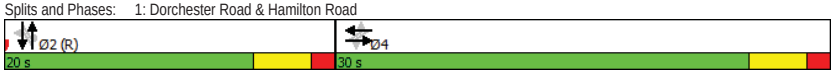
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	115	69	82	136	113	91	181	77	68	181	34
Future Volume (vph)	42	115	69	82	136	113	91	181	77	68	181	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99			0.99		1.00		
Frt		0.944			0.932			0.955			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1586	0	1612	1537	0	1805	1692	0	1583	1757	0
Flt Permitted	0.593			0.632			0.604			0.529		
Satd. Flow (perm)	1093	1586	0	1072	1537	0	1148	1692	0	879	1757	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		75			120			44			19	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)	2					2			3	3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Adj. Flow (vph)	46	125	75	89	148	123	99	197	84	74	197	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	200	0	89	271	0	99	281	0	74	234	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.08	0.24		0.17	0.33		0.29	0.52		0.28	0.43	
Control Delay	7.1	5.4		7.9	5.4		16.2	16.3		16.9	15.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.1	5.4		7.9	5.4		16.2	16.3		16.9	15.9	
LOS	A	A		A	A		B	B		B	B	
Approach Delay		5.7			6.0			16.3			16.2	
Approach LOS		A			A			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.52
Intersection Signal Delay: 11.4 — Intersection LOS: B
Intersection Capacity Utilization 88.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Dorchester Road & Hamilton Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	200	89	271	99	281	74	234
v/c Ratio	0.08	0.24	0.17	0.33	0.29	0.52	0.28	0.43
Control Delay	7.1	5.4	7.9	5.4	16.2	16.3	16.9	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	5.4	7.9	5.4	16.2	16.3	16.9	15.9
Queue Length 50th (m)	2.0	5.7	4.1	7.1	7.0	17.8	5.2	15.8
Queue Length 95th (m)	6.1	14.5	10.3	17.8	17.0	36.5	14.1	31.8
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	546	830	536	828	344	538	263	540
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	0.08	0.24	0.17	0.33	0.29	0.52	0.28	0.43

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	115	69	82	136	113	91	181	77	68	181	34
Future Volume (vph)	42	115	69	82	136	113	91	181	77	68	181	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.93		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1585		1612	1537		1805	1692		1579	1758	
Flt Permitted	0.59	1.00		0.63	1.00		0.60	1.00		0.53	1.00	
Satd. Flow (perm)	1092	1585		1072	1537		1147	1692		880	1758	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	125	75	89	148	123	99	197	84	74	197	37
RTOR Reduction (vph)	0	38	0	0	60	0	0	31	0	0	13	0
Lane Group Flow (vph)	46	163	0	89	211	0	99	250	0	74	221	0
Confl. Peds. (#/hr)	2					2			3	3		
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	546	792		536	768		344	507		264	527	
v/s Ratio Prot		0.10			c0.14			c0.15			0.13	
v/s Ratio Perm	0.04			0.08			0.09			0.08		
v/c Ratio	0.08	0.21		0.17	0.27		0.29	0.49		0.28	0.42	
Uniform Delay, d1	6.5	7.0		6.8	7.2		13.4	14.4		13.4	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.6		0.7	0.9		2.1	3.4		2.6	2.4	
Delay (s)	6.8	7.6		7.5	8.1		15.5	17.8		16.0	16.4	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		7.4			8.0			17.2			16.3	
Approach LOS		A			A			B			B	

Intersection Summary				
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	88.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

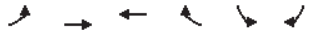
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	3	12	51	4	84	5	141	27	26	139	11
Future Volume (vph)	12	3	12	51	4	84	5	141	27	26	139	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.939				0.850		0.976			0.989	
Flt Protected		0.978			0.955		0.950			0.950		
Satd. Flow (prot)	0	1502	0	0	1784	1553	1805	1672	0	1736	1734	0
Flt Permitted		0.978			0.955		0.950			0.950		
Satd. Flow (perm)	0	1502	0	0	1784	1553	1805	1672	0	1736	1734	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			644.0			916.9	
Travel Time (s)		26.0			31.8			46.4			66.0	
Confl. Peds. (#/hr)			1	1					7	7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	0%	18%	0%	25%	4%	0%	13%	0%	4%	9%	0%
Adj. Flow (vph)	13	3	13	55	4	91	5	153	29	28	151	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	29	0	0	59	91	5	182	0	28	163	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.8%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	3	12	51	4	84	5	141	27	26	139	11
Future Volume (Veh/h)	12	3	12	51	4	84	5	141	27	26	139	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	3	13	55	4	91	5	153	29	28	151	12
Pedestrians					7			1				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	469	412	158	407	404	174	163			189		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	469	412	158	407	404	174	163			189		
tC, single (s)	7.3	6.5	6.4	7.1	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.5	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	97	99	98	90	99	89	100			98		
cM capacity (veh/h)	416	517	846	531	487	859	1428			1365		

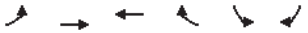
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	29	59	91	5	182	28	163
Volume Left	13	55	0	5	0	28	0
Volume Right	13	0	91	0	29	0	12
cSH	553	528	859	1428	1700	1365	1700
Volume to Capacity	0.05	0.11	0.11	0.00	0.11	0.02	0.10
Queue Length 95th (m)	1.3	3.0	2.8	0.1	0.0	0.5	0.0
Control Delay (s)	11.9	12.7	9.7	7.5	0.0	7.7	0.0
Lane LOS	B	B	A	A		A	
Approach Delay (s)	11.9	10.9		0.2		1.1	
Approach LOS	B	B					

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	31.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	50	138	17	10	4
Future Volume (vph)	1	50	138	17	10	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.986		0.964	
Flt Protected	0.950				0.965	
Satd. Flow (prot)	1805	1827	1825	0	1767	0
Flt Permitted	0.950				0.965	
Satd. Flow (perm)	1805	1827	1825	0	1767	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		442.1	195.5		166.1	
Travel Time (s)		31.8	14.1		12.0	
Confl. Peds. (#/hr)					2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	3%	0%	0%	0%
Adj. Flow (vph)	1	54	150	18	11	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	54	168	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

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



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	50	138	17	10	4
Future Volume (Veh/h)	1	50	138	17	10	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	54	150	18	11	4
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)						
pX, platoon unblocked						
vC, conflicting volume	168				217	159
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168				217	159
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1422				774	892

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	1	54	168	15
Volume Left	1	0	0	11
Volume Right	0	0	18	4
cSH	1422	1700	1700	802
Volume to Capacity	0.00	0.03	0.10	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.5
Control Delay (s)	7.5	0.0	0.0	9.6
Lane LOS	A			A
Approach Delay (s)	0.1		0.0	9.6
Approach LOS				A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	30	16	1	63	6	68	42	5	3	12	23
Future Volume (vph)	12	30	16	1	63	6	68	42	5	3	12	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.964			0.988			0.995			0.918	
Flt Protected		0.990			0.999			0.971			0.996	
Satd. Flow (prot)	0	1688	0	0	1826	0	0	1773	0	0	1737	0
Flt Permitted		0.990			0.999			0.971			0.996	
Satd. Flow (perm)	0	1688	0	0	1826	0	0	1773	0	0	1737	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	2		4	4		2	10		2	2		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	9%	7%	7%	0%	3%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	33	17	1	68	7	74	46	5	3	13	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	63	0	0	76	0	0	125	0	0	41	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	30	16	1	63	6	68	42	5	3	12	23
Future Volume (vph)	12	30	16	1	63	6	68	42	5	3	12	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	33	17	1	68	7	74	46	5	3	13	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	63	76	125	41
Volume Left (vph)	13	1	74	3
Volume Right (vph)	17	7	5	25
Hadj (s)	0.01	-0.01	0.15	-0.35
Departure Headway (s)	4.4	4.3	4.4	4.0
Degree Utilization, x	0.08	0.09	0.15	0.05
Capacity (veh/h)	787	794	785	858
Control Delay (s)	7.7	7.8	8.2	7.2
Approach Delay (s)	7.7	7.8	8.2	7.2
Approach LOS	A	A	A	A

Intersection Summary					
Delay		7.9			
Level of Service		A			
Intersection Capacity Utilization		30.1%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	151	22	4	291	47	2
Future Volume (vph)	151	22	4	291	47	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.983				0.995	
Flt Protected				0.999	0.954	
Satd. Flow (prot)	1570	0	0	1712	1769	0
Flt Permitted				0.999	0.954	
Satd. Flow (perm)	1570	0	0	1712	1769	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		8	8		1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	21%	5%	0%	11%	2%	0%
Adj. Flow (vph)	164	24	4	316	51	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	188	0	0	320	53	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	151	22	4	291	47	2
Future Volume (Veh/h)	151	22	4	291	47	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	164	24	4	316	51	2
Pedestrians	1				8	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			196		509	184
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			196		509	184
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		90	100
cM capacity (veh/h)			1380		519	858

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	188	320	53
Volume Left	0	4	51
Volume Right	24	0	2
cSH	1700	1380	526
Volume to Capacity	0.11	0.00	0.10
Queue Length 95th (m)	0.0	0.1	2.7
Control Delay (s)	0.0	0.1	12.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.6
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

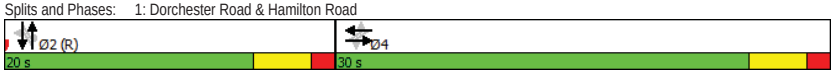
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	184	92	86	163	103	82	167	83	174	235	37
Future Volume (vph)	44	184	92	86	163	103	82	167	83	174	235	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00			1.00	0.99		1.00	1.00	
Frt		0.950			0.942			0.950			0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1746	0	1805	1744	0	1787	1724	0	1805	1816	0
Flt Permitted	0.583			0.577			0.508			0.543		
Satd. Flow (perm)	1086	1746	0	1096	1744	0	951	1724	0	1031	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		72			91			51			16	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)			1	1			5		1	1		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Adj. Flow (vph)	48	200	100	93	177	112	89	182	90	189	255	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	300	0	93	289	0	89	272	0	189	295	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.09	0.33		0.17	0.32		0.31	0.49		0.61	0.53	
Control Delay	7.1	6.8		7.9	6.1		17.2	15.2		26.0	17.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.1	6.8		7.9	6.1		17.2	15.2		26.0	17.9	
LOS	A	A		A	A		B	B		C	B	
Approach Delay		6.8			6.5			15.7			21.1	
Approach LOS		A			A			B			C	

Intersection Summary

Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 13.2		Intersection LOS: B	
Intersection Capacity Utilization 88.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Dorchester Road & Hamilton Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	48	300	93	289	89	272	189	295
v/c Ratio	0.09	0.33	0.17	0.32	0.31	0.49	0.61	0.53
Control Delay	7.1	6.8	7.9	6.1	17.2	15.2	26.0	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	6.8	7.9	6.1	17.2	15.2	26.0	17.9
Queue Length 50th (m)	2.1	11.1	4.3	9.4	6.3	16.4	14.9	21.3
Queue Length 95th (m)	6.3	23.1	10.7	20.7	16.2	34.2	#38.6	40.7
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	543	909	548	917	285	552	309	556
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	0.09	0.33	0.17	0.32	0.31	0.49	0.61	0.53

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)	44	184	92	86	163	103	82	167	83	174	235	37
Future Volume (vph)	44	184	92	86	163	103	82	167	83	174	235	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.94		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1746		1804	1744		1779	1724		1803	1816	
Flt Permitted	0.58	1.00		0.58	1.00		0.51	1.00		0.54	1.00	
Satd. Flow (perm)	1086	1746		1096	1744		951	1724		1032	1816	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	200	100	93	177	112	89	182	90	189	255	40
RTOR Reduction (vph)	0	36	0	0	46	0	0	36	0	0	11	0
Lane Group Flow (vph)	48	264	0	93	244	0	89	236	0	189	284	0
Confl. Peds. (#/hr)			1	1			5		1	1		5
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	543	873		548	872		285	517		309	544	
v/s Ratio Prot		c0.15			0.14			0.14			0.16	
v/s Ratio Perm	0.04			0.08			0.09			c0.18		
v/c Ratio	0.09	0.30		0.17	0.28		0.31	0.46		0.61	0.52	
Uniform Delay, d1	6.5	7.4		6.8	7.3		13.5	14.2		15.0	14.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.9		0.7	0.8		2.8	2.9		8.7	3.6	
Delay (s)	6.9	8.3		7.5	8.1		16.4	17.1		23.7	18.1	
Level of Service	A	A		A	A		B	B		C	B	
Approach Delay (s)		8.1			7.9			16.9			20.3	
Approach LOS		A			A			B			C	

Intersection Summary

HCM 2000 Control Delay	13.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.42				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	88.9%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	12	16	66	9	54	19	199	108	95	185	10
Future Volume (vph)	4	12	16	66	9	54	19	199	108	95	185	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.932				0.850		0.947			0.992	
Flt Protected		0.994			0.958		0.950			0.950		
Satd. Flow (prot)	0	1710	0	0	1820	1553	1703	1754	0	1787	1850	0
Flt Permitted		0.994			0.958		0.950			0.950		
Satd. Flow (perm)	0	1710	0	0	1820	1553	1703	1754	0	1787	1850	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			644.0			916.9	
Travel Time (s)		26.0			31.8			46.4			66.0	
Confl. Peds. (#/hr)			2	2					5	5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	0%	0%	0%	0%	4%	6%	4%	0%	1%	2%	0%
Adj. Flow (vph)	4	13	17	72	10	59	21	216	117	103	201	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	82	59	21	333	0	103	212	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.3%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	12	16	66	9	54	19	199	108	95	185	10
Future Volume (Veh/h)	4	12	16	66	9	54	19	199	108	95	185	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	13	17	72	10	59	21	216	117	103	201	11
Pedestrians					5			2				
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)												
pX, platoon unblocked												
vC, conflicting volume	734	792	208	754	740	280	212			338		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	734	792	208	754	740	280	212			338		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	98	96	98	75	97	92	98			92		
cM capacity (veh/h)	255	290	836	285	312	751	1335			1222		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	34	82	59	21	333	103	212
Volume Left	4	72	0	21	0	103	0
Volume Right	17	0	59	0	117	0	11
cSH	421	288	751	1335	1700	1222	1700
Volume to Capacity	0.08	0.29	0.08	0.02	0.20	0.08	0.12
Queue Length 95th (m)	2.1	9.2	2.0	0.4	0.0	2.2	0.0
Control Delay (s)	14.3	22.4	10.2	7.7	0.0	8.2	0.0
Lane LOS	B	C	B	A		A	
Approach Delay (s)	14.3	17.3		0.5		2.7	
Approach LOS	B	C					

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	43.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	9	196	115	14	20	2
Future Volume (vph)	9	196	115	14	20	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.986		0.989	
Flt Protected	0.950				0.956	
Satd. Flow (prot)	1805	1900	1841	0	1725	0
Flt Permitted	0.950				0.956	
Satd. Flow (perm)	1805	1900	1841	0	1725	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		442.1	195.5		166.1	
Travel Time (s)		31.8	14.1		12.0	
Confl. Peds. (#/hr)					3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	0%	0%	50%
Adj. Flow (vph)	10	213	125	15	22	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	213	140	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

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

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	196	115	14	20	2
Future Volume (Veh/h)	9	196	115	14	20	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	213	125	15	22	2
Pedestrians			3			
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)						
pX, platoon unblocked						
vC, conflicting volume	140				368	132
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	140				368	132
tC, single (s)	4.1				6.4	6.7
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.8
p0 queue free %	99				97	100
cM capacity (veh/h)	1456				630	803

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	10	213	140	24
Volume Left	10	0	0	22
Volume Right	0	0	15	2
cSH	1456	1700	1700	641
Volume to Capacity	0.01	0.13	0.08	0.04
Queue Length 95th (m)	0.2	0.0	0.0	0.9
Control Delay (s)	7.5	0.0	0.0	10.8
Lane LOS	A			B
Approach Delay (s)	0.3		0.0	10.8
Approach LOS				B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	20.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	105	74	2	67	2	40	13	2	9	32	20
Future Volume (vph)	27	105	74	2	67	2	40	13	2	9	32	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.952			0.996			0.995			0.956	
Flt Protected		0.994			0.999			0.965			0.993	
Satd. Flow (prot)	0	1792	0	0	1891	0	0	1760	0	0	1804	0
Flt Permitted		0.994			0.999			0.965			0.993	
Satd. Flow (perm)	0	1792	0	0	1891	0	0	1760	0	0	1804	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	5		3	3		5	8		2	2		8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	5%	0%	0%	0%	0%	0%
Adj. Flow (vph)	29	114	80	2	73	2	43	14	2	10	35	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	223	0	0	77	0	0	59	0	0	67	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.9%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	105	74	2	67	2	40	13	2	9	32	20
Future Volume (vph)	27	105	74	2	67	2	40	13	2	9	32	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	114	80	2	73	2	43	14	2	10	35	22

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	223	77	59	67
Volume Left (vph)	29	2	43	10
Volume Right (vph)	80	2	2	22
Hadj (s)	-0.18	-0.01	0.19	-0.17
Departure Headway (s)	4.1	4.4	4.8	4.5
Degree Utilization, x	0.25	0.09	0.08	0.08
Capacity (veh/h)	848	770	694	743
Control Delay (s)	8.5	7.9	8.2	7.9
Approach Delay (s)	8.5	7.9	8.2	7.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.3		
Level of Service	A		
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	314	112	18	227	67	24
Future Volume (vph)	314	112	18	227	67	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.964				0.965	
Flt Protected				0.996	0.964	
Satd. Flow (prot)	1792	0	0	1858	1767	0
Flt Permitted				0.996	0.964	
Satd. Flow (perm)	1792	0	0	1858	1767	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	2%	0%	0%
Adj. Flow (vph)	341	122	20	247	73	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	463	0	0	267	99	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.6%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	314	112	18	227	67	24
Future Volume (Veh/h)	314	112	18	227	67	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	341	122	20	247	73	26
Pedestrians					4	
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)						
pX, platoon unblocked						
vC, conflicting volume			467		693	406
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			467		693	406
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		82	96
cM capacity (veh/h)			1101		404	647

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	463	267	99
Volume Left	0	20	73
Volume Right	122	0	26
cSH	1700	1101	448
Volume to Capacity	0.27	0.02	0.22
Queue Length 95th (m)	0.0	0.4	6.7
Control Delay (s)	0.0	0.8	15.3
Lane LOS		A	C
Approach Delay (s)	0.0	0.8	15.3
Approach LOS			C

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G

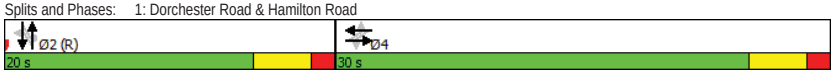
Opening-Year Total Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	110	79	78	129	108	116	211	73	65	191	33
Future Volume (vph)	40	110	79	78	129	108	116	211	73	65	191	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99			0.99		1.00		
Frt		0.937			0.932			0.962			0.978	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1581	0	1612	1537	0	1805	1716	0	1583	1764	0
Flt Permitted	0.600			0.629			0.588			0.488		
Satd. Flow (perm)	1106	1581	0	1067	1537	0	1117	1716	0	811	1764	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		86			117			35			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)	2					2			3	3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Adj. Flow (vph)	43	120	86	85	140	117	126	229	79	71	208	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	206	0	85	257	0	126	308	0	71	244	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.08	0.25		0.16	0.31		0.38	0.57		0.29	0.45	
Control Delay	7.0	5.2		7.8	5.2		17.9	18.0		17.4	16.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.0	5.2		7.8	5.2		17.9	18.0		17.4	16.3	
LOS	A	A		A	A		B	B		B	B	
Approach Delay		5.5			5.9			18.0			16.6	
Approach LOS		A			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 89.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Dorchester Road & Hamilton Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	206	85	257	126	308	71	244
v/c Ratio	0.08	0.25	0.16	0.31	0.38	0.57	0.29	0.45
Control Delay	7.0	5.2	7.8	5.2	17.9	18.0	17.4	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	5.2	7.8	5.2	17.9	18.0	17.4	16.3
Queue Length 50th (m)	1.9	5.5	3.9	6.5	9.1	20.9	5.0	16.8
Queue Length 95th (m)	5.8	14.4	10.0	16.8	21.3	41.5	13.9	33.3
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	553	833	533	827	335	539	243	541
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	0.08	0.25	0.16	0.31	0.38	0.57	0.29	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	110	79	78	129	108	116	211	73	65	191	33
Future Volume (vph)	40	110	79	78	129	108	116	211	73	65	191	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.93		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1582		1612	1536		1805	1715		1579	1763	
Flt Permitted	0.60	1.00		0.63	1.00		0.59	1.00		0.49	1.00	
Satd. Flow (perm)	1106	1582		1067	1536		1116	1715		811	1763	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	120	86	85	140	117	126	229	79	71	208	36
RTOR Reduction (vph)	0	43	0	0	59	0	0	25	0	0	13	0
Lane Group Flow (vph)	43	163	0	85	199	0	126	284	0	71	231	0
Confl. Peds. (#/hr)	2					2			3	3		
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	553	791		533	768		334	514		243	528	
v/s Ratio Prot		0.10			c0.13			c0.17			0.13	
v/s Ratio Perm	0.04			0.08			0.11			0.09		
v/c Ratio	0.08	0.21		0.16	0.26		0.38	0.55		0.29	0.44	
Uniform Delay, d1	6.5	7.0		6.8	7.2		13.8	14.7		13.4	14.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.6		0.6	0.8		3.2	4.2		3.0	2.6	
Delay (s)	6.8	7.6		7.4	8.0		17.0	18.9		16.5	16.7	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		7.4			7.9			18.4			16.7	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	13.2	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.37				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	89.8%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	3	11	69	4	115	5	168	47	37	152	10
Future Volume (vph)	11	3	11	69	4	115	5	168	47	37	152	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.940				0.850		0.967			0.991	
Flt Protected		0.978			0.955		0.950			0.950		
Satd. Flow (prot)	0	1506	0	0	1792	1553	1805	1668	0	1736	1736	0
Flt Permitted		0.978			0.955		0.950			0.950		
Satd. Flow (perm)	0	1506	0	0	1792	1553	1805	1668	0	1736	1736	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			333.3			916.9	
Travel Time (s)		26.0			31.8			24.0			66.0	
Confl. Peds. (#/hr)			1	1					7	7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	0%	18%	0%	25%	4%	0%	13%	0%	4%	9%	0%
Adj. Flow (vph)	12	3	12	75	4	125	5	183	51	40	165	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	0	0	79	125	5	234	0	40	176	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	33.8%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	3	11	69	4	115	5	168	47	37	152	10
Future Volume (Veh/h)	11	3	11	69	4	115	5	168	47	37	152	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	3	12	75	4	125	5	183	51	40	165	11
Pedestrians					7			1				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	570	502	172	485	482	216	176			241		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	570	502	172	485	482	216	176			241		
tC, single (s)	7.3	6.5	6.4	7.1	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.5	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	96	99	99	84	99	85	100			97		
cM capacity (veh/h)	333	456	832	468	434	815	1412			1306		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	27	79	125	5	234	40	176
Volume Left	12	75	0	5	0	40	0
Volume Right	12	0	125	0	51	0	11
cSH	473	466	815	1412	1700	1306	1700
Volume to Capacity	0.06	0.17	0.15	0.00	0.14	0.03	0.10
Queue Length 95th (m)	1.4	4.8	4.3	0.1	0.0	0.8	0.0
Control Delay (s)	13.1	14.3	10.2	7.6	0.0	7.8	0.0
Lane LOS	B	B	B	A		A	
Approach Delay (s)	13.1	11.8		0.2		1.5	
Approach LOS	B	B					

Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	33.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	64	16	5	141	16	46	0	17	9	0	4
Future Volume (vph)	1	64	16	5	141	16	46	0	17	9	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.971			0.985			0.964			0.961	
Flt Protected	0.950			0.950				0.965			0.966	
Satd. Flow (prot)	1805	1781	0	1770	1822	0	0	1733	0	0	1764	0
Flt Permitted	0.950			0.950				0.965			0.966	
Satd. Flow (perm)	1805	1781	0	1770	1822	0	0	1733	0	0	1764	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		442.1			195.5			129.5			166.1	
Travel Time (s)		31.8			14.1			9.3			12.0	
Confl. Peds. (#/hr)										2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	2%	2%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	1	70	17	5	153	17	50	0	18	10	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	87	0	5	170	0	0	68	0	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	64	16	5	141	16	46	0	17	9	0	4
Future Volume (Veh/h)	1	64	16	5	141	16	46	0	17	9	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	70	17	5	153	17	50	0	18	10	0	4
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)												
pX, platoon unblocked												
vC, conflicting volume	170			87			248	260	80	264	260	162
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	170			87			248	260	80	264	260	162
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	98	99	100	100
cM capacity (veh/h)	1420			1509			701	642	978	677	642	889

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	87	5	170	68	14
Volume Left	1	0	5	0	50	10
Volume Right	0	17	0	17	18	4
cSH	1420	1700	1509	1700	758	727
Volume to Capacity	0.00	0.05	0.00	0.10	0.09	0.02
Queue Length 95th (m)	0.0	0.0	0.1	0.0	2.4	0.5
Control Delay (s)	7.5	0.0	7.4	0.0	10.2	10.1
Lane LOS	A		A		B	B
Approach Delay (s)	0.1		0.2		10.2	10.1
Approach LOS					B	B

Intersection Summary					
Average Delay	2.6				
Intersection Capacity Utilization	19.3%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	63	15	1	74	6	65	40	5	3	11	22
Future Volume (vph)	11	63	15	1	74	6	65	40	5	3	11	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.977			0.989			0.994			0.917	
Flt Protected		0.994			0.999			0.971			0.996	
Satd. Flow (prot)	0	1720	0	0	1827	0	0	1770	0	0	1735	0
Flt Permitted		0.994			0.999			0.971			0.996	
Satd. Flow (perm)	0	1720	0	0	1827	0	0	1770	0	0	1735	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	2		4	4		2	10		2	2		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	9%	7%	7%	0%	3%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	12	68	16	1	80	7	71	43	5	3	12	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	96	0	0	88	0	0	119	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.1%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	63	15	1	74	6	65	40	5	3	11	22
Future Volume (vph)	11	63	15	1	74	6	65	40	5	3	11	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	68	16	1	80	7	71	43	5	3	12	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	96	88	119	39
Volume Left (vph)	12	1	71	3
Volume Right (vph)	16	7	5	24
Hadj (s)	0.05	0.00	0.15	-0.35
Departure Headway (s)	4.4	4.4	4.5	4.1
Degree Utilization, x	0.12	0.11	0.15	0.04
Capacity (veh/h)	781	778	760	818
Control Delay (s)	8.0	7.9	8.3	7.3
Approach Delay (s)	8.0	7.9	8.3	7.3
Approach LOS	A	A	A	A

Intersection Summary					
Delay		8.0			
Level of Service		A			
Intersection Capacity Utilization		31.1%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	21	4	277	45	2
Future Volume (vph)	144	21	4	277	45	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.983				0.995	
Flt Protected				0.999	0.954	
Satd. Flow (prot)	1570	0	0	1712	1770	0
Flt Permitted				0.999	0.954	
Satd. Flow (perm)	1570	0	0	1712	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		8	8		1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	21%	5%	0%	11%	2%	0%
Adj. Flow (vph)	157	23	4	301	49	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	180	0	0	305	51	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	144	21	4	277	45	2
Future Volume (Veh/h)	144	21	4	277	45	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	157	23	4	301	49	2
Pedestrians	1				8	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			188		486	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			188		486	176
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		91	100
cM capacity (veh/h)			1389		534	866

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	180	305	51
Volume Left	0	4	49
Volume Right	23	0	2
cSH	1700	1389	543
Volume to Capacity	0.11	0.00	0.09
Queue Length 95th (m)	0.0	0.1	2.5
Control Delay (s)	0.0	0.1	12.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.3
Approach LOS			B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	51	169	6	30	203
Future Volume (vph)	11	51	169	6	30	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.889		0.995			
Flt Protected	0.991					0.994
Satd. Flow (prot)	1641	0	1853	0	0	1852
Flt Permitted	0.991					0.994
Satd. Flow (perm)	1641	0	1853	0	0	1852
Link Speed (k/h)	50		50			50
Link Distance (m)	156.5		329.2			333.3
Travel Time (s)	11.3		23.7			24.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	55	184	7	33	221
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	0	191	0	0	254
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	51	169	6	30	203
Future Volume (Veh/h)	11	51	169	6	30	203
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	55	184	7	33	221
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	474	188			191	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	474	188			191	
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	94			98	
cM capacity (veh/h)	536	855			1383	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	67	191	254
Volume Left	12	0	33
Volume Right	55	7	0
cSH	772	1700	1383
Volume to Capacity	0.09	0.11	0.02
Queue Length 95th (m)	2.3	0.0	0.6
Control Delay (s)	10.1	0.0	1.2
Lane LOS	B		A
Approach Delay (s)	10.1	0.0	1.2
Approach LOS	B		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

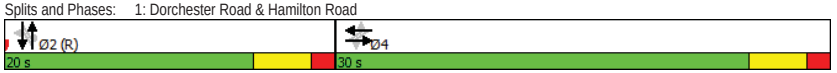
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	175	127	82	155	98	107	196	79	165	276	35
Future Volume (vph)	42	175	127	82	155	98	107	196	79	165	276	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00			1.00	0.99		1.00	1.00	
Frt		0.937			0.942			0.957			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1725	0	1805	1744	0	1787	1742	0	1805	1823	0
Flt Permitted	0.590			0.550			0.442			0.502		
Satd. Flow (perm)	1099	1725	0	1044	1744	0	828	1742	0	953	1823	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		105			92			42			13	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)			1	1			5		1	1		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Adj. Flow (vph)	46	190	138	89	168	107	116	213	86	179	300	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	328	0	89	275	0	116	299	0	179	338	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.08	0.36		0.17	0.30		0.47	0.54		0.63	0.61	
Control Delay	7.1	6.4		7.9	5.8		21.8	16.8		28.0	19.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.1	6.4		7.9	5.8		21.8	16.8		28.0	19.9	
LOS	A	A		A	A		C	B		C	B	
Approach Delay		6.4			6.3			18.2			22.7	
Approach LOS		A			A			B			C	

Intersection Summary

Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 90.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Dorchester Road & Hamilton Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	328	89	275	116	299	179	338
v/c Ratio	0.08	0.36	0.17	0.30	0.47	0.54	0.63	0.61
Control Delay	7.1	6.4	7.9	5.8	21.8	16.8	28.0	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	6.4	7.9	5.8	21.8	16.8	28.0	19.9
Queue Length 50th (m)	2.0	10.8	4.1	8.7	8.7	19.5	14.2	25.6
Queue Length 95th (m)	6.1	23.3	10.4	19.4	21.7	38.9	#38.1	47.5
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	549	915	522	918	248	552	285	556
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	0.08	0.36	0.17	0.30	0.47	0.54	0.63	0.61

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)	42	175	127	82	155	98	107	196	79	165	276	35
Future Volume (vph)	42	175	127	82	155	98	107	196	79	165	276	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.94		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1725		1804	1744		1780	1742		1803	1824	
Flt Permitted	0.59	1.00		0.55	1.00		0.44	1.00		0.50	1.00	
Satd. Flow (perm)	1100	1725		1044	1744		829	1742		952	1824	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	190	138	89	168	107	116	213	86	179	300	38
RTOR Reduction (vph)	0	53	0	0	46	0	0	29	0	0	9	0
Lane Group Flow (vph)	46	276	0	89	229	0	116	270	0	179	329	0
Confl. Peds. (#/hr)			1	1			5		1	1		5
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	550	862		522	872		248	522		285	547	
v/s Ratio Prot		c0.16			0.13			0.15			0.18	
v/s Ratio Perm	0.04			0.09			0.14			c0.19		
v/c Ratio	0.08	0.32		0.17	0.26		0.47	0.52		0.63	0.60	
Uniform Delay, d1	6.5	7.4		6.8	7.2		14.2	14.5		15.1	14.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.0		0.7	0.7		6.2	3.6		10.1	4.8	
Delay (s)	6.8	8.4		7.5	7.9		20.5	18.1		25.2	19.8	
Level of Service	A	A		A	A		C	B		C	B	
Approach Delay (s)		8.2			7.8			18.8			21.6	
Approach LOS		A			A			B			C	

Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.43				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	90.9%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	11	15	97	8	74	18	233	138	129	229	9
Future Volume (vph)	4	11	15	97	8	74	18	233	138	129	229	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.932				0.850		0.944			0.994	
Flt Protected		0.994			0.956		0.950			0.950		
Satd. Flow (prot)	0	1707	0	0	1816	1553	1703	1750	0	1787	1853	0
Flt Permitted		0.994			0.956		0.950			0.950		
Satd. Flow (perm)	0	1707	0	0	1816	1553	1703	1750	0	1787	1853	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			336.4			916.9	
Travel Time (s)		26.0			31.8			24.2			66.0	
Confl. Peds. (#/hr)			2	2					5	5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	0%	0%	0%	0%	4%	6%	4%	0%	1%	2%	0%
Adj. Flow (vph)	4	12	16	105	9	80	20	253	150	140	249	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	114	80	20	403	0	140	259	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	11	15	97	8	74	18	233	138	129	229	9
Future Volume (Veh/h)	4	11	15	97	8	74	18	233	138	129	229	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	12	16	105	9	80	20	253	150	140	249	10
Pedestrians					5			2				
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)												
pX, platoon unblocked												
vC, conflicting volume	912	982	256	926	912	333	259			408		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	912	982	256	926	912	333	259			408		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	98	94	98	50	96	89	98			88		
cM capacity (veh/h)	179	216	786	210	238	701	1283			1151		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	32	114	80	20	403	140	259
Volume Left	4	105	0	20	0	140	0
Volume Right	16	0	80	0	150	0	10
cSH	326	212	701	1283	1700	1151	1700
Volume to Capacity	0.10	0.54	0.11	0.02	0.24	0.12	0.15
Queue Length 95th (m)	2.6	22.8	3.1	0.4	0.0	3.3	0.0
Control Delay (s)	17.3	40.3	10.8	7.9	0.0	8.6	0.0
Lane LOS	C	E	B	A		A	
Approach Delay (s)	17.3	28.1		0.4		3.0	
Approach LOS	C	D					

Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	50.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	209	52	19	136	13	31	0	11	19	0	2
Future Volume (vph)	8	209	52	19	136	13	31	0	11	19	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.970			0.987			0.965			0.988	
Flt Protected	0.950			0.950				0.964			0.956	
Satd. Flow (prot)	1805	1836	0	1770	1842	0	0	1733	0	0	1720	0
Flt Permitted	0.950			0.950				0.964			0.956	
Satd. Flow (perm)	1805	1836	0	1770	1842	0	0	1733	0	0	1720	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		442.1			195.5			139.5			166.1	
Travel Time (s)		31.8			14.1			10.0			12.0	
Confl. Peds. (#/hr)										3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	2%	2%	0%	2%	2%	2%	0%	2%	50%
Adj. Flow (vph)	9	227	57	21	148	14	34	0	12	21	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	284	0	21	162	0	0	46	0	0	23	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	25.8%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	209	52	19	136	13	31	0	11	19	0	2
Future Volume (Veh/h)	8	209	52	19	136	13	31	0	11	19	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	227	57	21	148	14	34	0	12	21	0	2
Pedestrians					3							
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)												
pX, platoon unblocked												
vC, conflicting volume	162			284			466	478	258	457	499	155
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	162			284			466	478	258	457	499	155
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.7
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.8
p0 queue free %	99			98			93	100	98	96	100	100
cM capacity (veh/h)	1429			1278			497	476	778	499	463	779

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	9	284	21	162	46	23
Volume Left	9	0	21	0	34	21
Volume Right	0	57	0	14	12	2
cSH	1429	1700	1278	1700	549	515
Volume to Capacity	0.01	0.17	0.02	0.10	0.08	0.04
Queue Length 95th (m)	0.2	0.0	0.4	0.0	2.2	1.1
Control Delay (s)	7.5	0.0	7.9	0.0	12.2	12.3
Lane LOS	A		A		B	B
Approach Delay (s)	0.2		0.9		12.2	12.3
Approach LOS					B	B

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	25.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	132	71	2	109	2	38	12	2	8	31	19
Future Volume (vph)	26	132	71	2	109	2	38	12	2	8	31	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.958			0.998			0.995			0.956	
Flt Protected		0.994			0.999			0.965			0.993	
Satd. Flow (prot)	0	1804	0	0	1894	0	0	1760	0	0	1804	0
Flt Permitted		0.994			0.999			0.965			0.993	
Satd. Flow (perm)	0	1804	0	0	1894	0	0	1760	0	0	1804	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	5		3	3		5	8		2	2		8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	5%	0%	0%	0%	0%	0%
Adj. Flow (vph)	28	143	77	2	118	2	41	13	2	9	34	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	0	0	122	0	0	56	0	0	64	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	132	71	2	109	2	38	12	2	8	31	19
Future Volume (vph)	26	132	71	2	109	2	38	12	2	8	31	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	143	77	2	118	2	41	13	2	9	34	21

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	248	122	56	64
Volume Left (vph)	28	2	41	9
Volume Right (vph)	77	2	2	21
Hadj (s)	-0.16	-0.01	0.19	-0.17
Departure Headway (s)	4.2	4.5	5.0	4.6
Degree Utilization, x	0.29	0.15	0.08	0.08
Capacity (veh/h)	834	768	664	709
Control Delay (s)	8.9	8.2	8.4	8.0
Approach Delay (s)	8.9	8.2	8.4	8.0
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.6		
Level of Service	A		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	298	107	17	216	64	23
Future Volume (vph)	298	107	17	216	64	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.964				0.964	
Flt Protected				0.996	0.964	
Satd. Flow (prot)	1792	0	0	1858	1766	0
Flt Permitted				0.996	0.964	
Satd. Flow (perm)	1792	0	0	1858	1766	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	2%	0%	0%
Adj. Flow (vph)	324	116	18	235	70	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	440	0	0	253	95	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	298	107	17	216	64	23
Future Volume (Veh/h)	298	107	17	216	64	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	324	116	18	235	70	25
Pedestrians					4	
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)						
pX, platoon unblocked						
vC, conflicting volume			444		657	386
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			444		657	386
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		84	96
cM capacity (veh/h)			1123		424	664

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	440	253	95
Volume Left	0	18	70
Volume Right	116	0	25
cSH	1700	1123	469
Volume to Capacity	0.26	0.02	0.20
Queue Length 95th (m)	0.0	0.4	6.0
Control Delay (s)	0.0	0.7	14.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	14.6
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	77	312	30	90	251
Future Volume (vph)	26	77	312	30	90	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.899		0.988			
Flt Protected	0.988					0.987
Satd. Flow (prot)	1655	0	1840	0	0	1839
Flt Permitted	0.988					0.987
Satd. Flow (perm)	1655	0	1840	0	0	1839
Link Speed (k/h)	50		50			50
Link Distance (m)	213.1		358.6			336.4
Travel Time (s)	15.3		25.8			24.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	84	339	33	98	273
Shared Lane Traffic (%)						
Lane Group Flow (vph)	112	0	372	0	0	371
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	26	77	312	30	90	251
Future Volume (Veh/h)	26	77	312	30	90	251
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	84	339	33	98	273
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	824	356			372	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	824	356			372	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	88			92	
cM capacity (veh/h)	314	688			1186	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	112	372	371
Volume Left	28	0	98
Volume Right	84	33	0
cSH	531	1700	1186
Volume to Capacity	0.21	0.22	0.08
Queue Length 95th (m)	6.3	0.0	2.2
Control Delay (s)	13.6	0.0	2.8
Lane LOS	B		A
Approach Delay (s)	13.6	0.0	2.8
Approach LOS	B		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix H

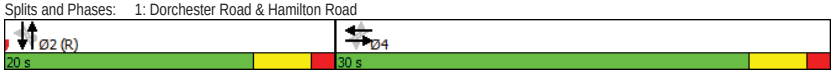
Five-Year Total Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	112	80	80	132	110	118	216	75	66	196	34
Future Volume (vph)	41	112	80	80	132	110	118	216	75	66	196	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99			0.99		1.00		
Frt		0.938			0.932			0.961			0.978	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1583	0	1612	1537	0	1805	1714	0	1583	1764	0
Flt Permitted	0.597			0.627			0.578			0.474		
Satd. Flow (perm)	1100	1583	0	1064	1537	0	1098	1714	0	788	1764	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		87			120			36			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)	2					2			3	3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Adj. Flow (vph)	45	122	87	87	143	120	128	235	82	72	213	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	209	0	87	263	0	128	317	0	72	250	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.08	0.25		0.16	0.32		0.39	0.59		0.31	0.46	
Control Delay	7.1	5.2		7.8	5.3		18.2	18.4		17.8	16.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.1	5.2		7.8	5.3		18.2	18.4		17.8	16.5	
LOS	A	A		A	A		B	B		B	B	
Approach Delay		5.5			5.9			18.3			16.8	
Approach LOS		A			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 90.2%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Dorchester Road & Hamilton Road



Queues
1: Dorchester Road & Hamilton Road

Five-Year Total: AM Peak Hour
180123: 187 Dorchester Road TRIS

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	209	87	263	128	317	72	250
v/c Ratio	0.08	0.25	0.16	0.32	0.39	0.59	0.31	0.46
Control Delay	7.1	5.2	7.8	5.3	18.2	18.4	17.8	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	5.2	7.8	5.3	18.2	18.4	17.8	16.5
Queue Length 50th (m)	2.0	5.6	4.0	6.7	9.4	21.7	5.1	17.2
Queue Length 95th (m)	6.0	14.6	10.1	17.0	21.6	42.7	14.1	34.2
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	550	835	532	828	329	539	236	541
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	0.08	0.25	0.16	0.32	0.39	0.59	0.31	0.46

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Dorchester Road & Hamilton Road

Five-Year Total: AM Peak Hour
180123: 187 Dorchester Road TRIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	112	80	80	132	110	118	216	75	66	196	34
Future Volume (vph)	41	112	80	80	132	110	118	216	75	66	196	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.93		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1582		1612	1536		1805	1714		1579	1763	
Flt Permitted	0.60	1.00		0.63	1.00		0.58	1.00		0.47	1.00	
Satd. Flow (perm)	1100	1582		1064	1536		1098	1714		788	1763	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	122	87	87	143	120	128	235	82	72	213	37
RTOR Reduction (vph)	0	44	0	0	60	0	0	25	0	0	13	0
Lane Group Flow (vph)	45	166	0	87	203	0	128	292	0	72	237	0
Confl. Peds. (#/hr)	2					2			3	3		
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	550	791		532	768		329	514		236	528	
v/s Ratio Prot		0.10			c0.13			c0.17			0.13	
v/s Ratio Perm	0.04			0.08			0.12			0.09		
v/c Ratio	0.08	0.21		0.16	0.26		0.39	0.57		0.31	0.45	
Uniform Delay, d1	6.5	7.0		6.8	7.2		13.9	14.8		13.5	14.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.6		0.7	0.8		3.4	4.5		3.3	2.8	
Delay (s)	6.8	7.6		7.5	8.0		17.3	19.3		16.8	16.9	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		7.4			7.9			18.7			16.9	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	13.4	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.38				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	90.2%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	3	12	70	4	117	5	172	47	37	156	11
Future Volume (vph)	12	3	12	70	4	117	5	172	47	37	156	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.939				0.850		0.968			0.990	
Flt Protected		0.978			0.955		0.950			0.950		
Satd. Flow (prot)	0	1502	0	0	1792	1553	1805	1669	0	1736	1735	0
Flt Permitted		0.978			0.955		0.950			0.950		
Satd. Flow (perm)	0	1502	0	0	1792	1553	1805	1669	0	1736	1735	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			333.3			916.9	
Travel Time (s)		26.0			31.8			24.0			66.0	
Confl. Peds. (#/hr)			1	1					7	7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	0%	18%	0%	25%	4%	0%	13%	0%	4%	9%	0%
Adj. Flow (vph)	13	3	13	76	4	127	5	187	51	40	170	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	29	0	0	80	127	5	238	0	40	182	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.1%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	3	12	70	4	117	5	172	47	37	156	11
Future Volume (Veh/h)	12	3	12	70	4	117	5	172	47	37	156	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	3	13	76	4	127	5	187	51	40	170	12
Pedestrians					7			1				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	582	511	177	495	492	220	182			245		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	582	511	177	495	492	220	182			245		
tC, single (s)	7.3	6.5	6.4	7.1	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.5	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	96	99	98	83	99	84	100			97		
cM capacity (veh/h)	326	450	826	460	428	810	1405			1302		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	29	80	127	5	238	40	182
Volume Left	13	76	0	5	0	40	0
Volume Right	13	0	127	0	51	0	12
cSH	466	459	810	1405	1700	1302	1700
Volume to Capacity	0.06	0.17	0.16	0.00	0.14	0.03	0.11
Queue Length 95th (m)	1.6	5.0	4.4	0.1	0.0	0.8	0.0
Control Delay (s)	13.2	14.5	10.3	7.6	0.0	7.9	0.0
Lane LOS	B	B	B	A		A	
Approach Delay (s)	13.2	11.9		0.2		1.4	
Approach LOS	B	B					

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	34.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	65	16	5	145	17	46	0	17	9	0	4
Future Volume (vph)	1	65	16	5	145	17	46	0	17	9	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.971			0.985			0.964			0.961	
Flt Protected	0.950			0.950				0.965			0.966	
Satd. Flow (prot)	1805	1781	0	1770	1822	0	0	1733	0	0	1764	0
Flt Permitted	0.950			0.950				0.965			0.966	
Satd. Flow (perm)	1805	1781	0	1770	1822	0	0	1733	0	0	1764	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		442.1			195.5			129.5			166.1	
Travel Time (s)		31.8			14.1			9.3			12.0	
Confl. Peds. (#/hr)										2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	2%	2%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	1	71	17	5	158	18	50	0	18	10	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	88	0	5	176	0	0	68	0	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	65	16	5	145	17	46	0	17	9	0	4
Future Volume (Veh/h)	1	65	16	5	145	17	46	0	17	9	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	71	17	5	158	18	50	0	18	10	0	4
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)												
pX, platoon unblocked												
vC, conflicting volume	176			88			254	268	82	270	267	167
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	176			88			254	268	82	270	267	167
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	98	99	100	100
cM capacity (veh/h)	1412			1508			694	636	977	671	636	882

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	88	5	176	68	14
Volume Left	1	0	5	0	50	10
Volume Right	0	17	0	18	18	4
cSH	1412	1700	1508	1700	752	720
Volume to Capacity	0.00	0.05	0.00	0.10	0.09	0.02
Queue Length 95th (m)	0.0	0.0	0.1	0.0	2.4	0.5
Control Delay (s)	7.6	0.0	7.4	0.0	10.3	10.1
Lane LOS	A		A		B	B
Approach Delay (s)	0.1		0.2		10.3	10.1
Approach LOS					B	B

Intersection Summary					
Average Delay	2.5				
Intersection Capacity Utilization	19.5%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	63	16	1	76	6	66	41	5	3	12	22
Future Volume (vph)	12	63	16	1	76	6	66	41	5	3	12	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.977			0.990			0.994			0.919	
Flt Protected		0.993			0.999			0.971			0.996	
Satd. Flow (prot)	0	1718	0	0	1829	0	0	1771	0	0	1739	0
Flt Permitted		0.993			0.999			0.971			0.996	
Satd. Flow (perm)	0	1718	0	0	1829	0	0	1771	0	0	1739	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	2		4	4		2	10		2	2		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	9%	7%	7%	0%	3%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	68	17	1	83	7	72	45	5	3	13	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	98	0	0	91	0	0	122	0	0	40	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	63	16	1	76	6	66	41	5	3	12	22
Future Volume (vph)	12	63	16	1	76	6	66	41	5	3	12	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	68	17	1	83	7	72	45	5	3	13	24

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	98	91	122	40
Volume Left (vph)	13	1	72	3
Volume Right (vph)	17	7	5	24
Hadj (s)	0.05	0.00	0.15	-0.34
Departure Headway (s)	4.4	4.4	4.5	4.1
Degree Utilization, x	0.12	0.11	0.15	0.05
Capacity (veh/h)	779	775	757	812
Control Delay (s)	8.0	7.9	8.4	7.3
Approach Delay (s)	8.0	7.9	8.4	7.3
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.0		
Level of Service	A		
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	147	21	4	284	46	2
Future Volume (vph)	147	21	4	284	46	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.983				0.995	
Flt Protected				0.999	0.954	
Satd. Flow (prot)	1570	0	0	1712	1770	0
Flt Permitted				0.999	0.954	
Satd. Flow (perm)	1570	0	0	1712	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		8	8		1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	21%	5%	0%	11%	2%	0%
Adj. Flow (vph)	160	23	4	309	50	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	183	0	0	313	52	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	147	21	4	284	46	2
Future Volume (Veh/h)	147	21	4	284	46	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	160	23	4	309	50	2
Pedestrians	1				8	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			191		498	180
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			191		498	180
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		91	100
cM capacity (veh/h)			1385		527	863

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	183	313	52
Volume Left	0	4	50
Volume Right	23	0	2
cSH	1700	1385	535
Volume to Capacity	0.11	0.00	0.10
Queue Length 95th (m)	0.0	0.1	2.6
Control Delay (s)	0.0	0.1	12.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.5
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	51	173	6	30	208
Future Volume (vph)	11	51	173	6	30	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.889		0.995			
Flt Protected	0.991					0.994
Satd. Flow (prot)	1641	0	1853	0	0	1852
Flt Permitted	0.991					0.994
Satd. Flow (perm)	1641	0	1853	0	0	1852
Link Speed (k/h)	50		50			50
Link Distance (m)	156.5		329.2			333.3
Travel Time (s)	11.3		23.7			24.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	55	188	7	33	226
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	0	195	0	0	259
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	51	173	6	30	208
Future Volume (Veh/h)	11	51	173	6	30	208
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	55	188	7	33	226
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	484	192			195	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	484	192			195	
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	94			98	
cM capacity (veh/h)	529	850			1378	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	67	195	259
Volume Left	12	0	33
Volume Right	55	7	0
cSH	767	1700	1378
Volume to Capacity	0.09	0.11	0.02
Queue Length 95th (m)	2.3	0.0	0.6
Control Delay (s)	10.1	0.0	1.2
Lane LOS	B		A
Approach Delay (s)	10.1	0.0	1.2
Approach LOS	B		

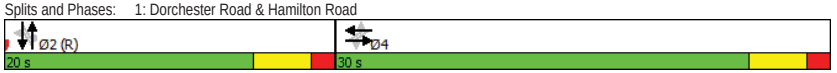
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	180	129	84	159	101	109	200	81	169	281	36
Future Volume (vph)	43	180	129	84	159	101	109	200	81	169	281	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00			1.00	0.99		1.00	1.00	
Frt		0.937			0.942			0.957			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1725	0	1805	1744	0	1787	1742	0	1805	1823	0
Flt Permitted	0.586			0.542			0.433			0.492		
Satd. Flow (perm)	1092	1725	0	1029	1744	0	811	1742	0	934	1823	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		103			92			42			13	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)			1	1			5		1	1		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Adj. Flow (vph)	47	196	140	91	173	110	118	217	88	184	305	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	336	0	91	283	0	118	305	0	184	344	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.09	0.37		0.18	0.31		0.49	0.55		0.66	0.62	
Control Delay	7.1	6.5		8.0	5.9		22.5	17.1		30.0	20.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.1	6.5		8.0	5.9		22.5	17.1		30.0	20.2	
LOS	A	A		A	A		C	B		C	C	
Approach Delay		6.6			6.4			18.6			23.6	
Approach LOS		A			A			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 91.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Dorchester Road & Hamilton Road



Queues
1: Dorchester Road & Hamilton Road

Five Year Total: PM Peak Hour
180123: 187 Dorchester Road TRIS

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	47	336	91	283	118	305	184	344
v/c Ratio	0.09	0.37	0.18	0.31	0.49	0.55	0.66	0.62
Control Delay	7.1	6.5	8.0	5.9	22.5	17.1	30.0	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	6.5	8.0	5.9	22.5	17.1	30.0	20.2
Queue Length 50th (m)	2.1	11.4	4.2	9.1	8.9	20.0	14.8	26.1
Queue Length 95th (m)	6.2	24.3	10.6	20.2	22.4	39.9	#40.1	48.4
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	546	914	514	918	243	552	280	556
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	0.09	0.37	0.18	0.31	0.49	0.55	0.66	0.62

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Dorchester Road & Hamilton Road

Five Year Total: PM Peak Hour
180123: 187 Dorchester Road TRIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	180	129	84	159	101	109	200	81	169	281	36
Future Volume (vph)	43	180	129	84	159	101	109	200	81	169	281	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.94		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1726		1804	1744		1780	1742		1803	1823	
Flt Permitted	0.59	1.00		0.54	1.00		0.43	1.00		0.49	1.00	
Satd. Flow (perm)	1092	1726		1029	1744		812	1742		935	1823	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	196	140	91	173	110	118	217	88	184	305	39
RTOR Reduction (vph)	0	52	0	0	46	0	0	29	0	0	9	0
Lane Group Flow (vph)	47	285	0	91	237	0	118	276	0	184	335	0
Confl. Peds. (#/hr)			1	1			5		1	1		5
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	546	863		514	872		243	522		280	546	
v/s Ratio Prot		c0.16			0.14			0.16			0.18	
v/s Ratio Perm	0.04			0.09			0.15			c0.20		
v/c Ratio	0.09	0.33		0.18	0.27		0.49	0.53		0.66	0.61	
Uniform Delay, d1	6.5	7.5		6.9	7.2		14.3	14.6		15.3	15.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.0		0.8	0.8		6.8	3.8		11.5	5.1	
Delay (s)	6.8	8.5		7.6	8.0		21.1	18.3		26.7	20.1	
Level of Service	A	A		A	A		C	B		C	C	
Approach Delay (s)		8.3			7.9			19.1			22.4	
Approach LOS		A			A			B			C	

Intersection Summary

HCM 2000 Control Delay	15.3	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.45				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	91.2%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	12	16	98	8	76	19	237	140	132	234	9
Future Volume (vph)	4	12	16	98	8	76	19	237	140	132	234	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.932				0.850		0.944			0.994	
Flt Protected		0.994			0.956		0.950			0.950		
Satd. Flow (prot)	0	1710	0	0	1816	1553	1703	1750	0	1787	1853	0
Flt Permitted		0.994			0.956		0.950			0.950		
Satd. Flow (perm)	0	1710	0	0	1816	1553	1703	1750	0	1787	1853	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			336.4			916.9	
Travel Time (s)		26.0			31.8			24.2			66.0	
Confl. Peds. (#/hr)			2	2					5	5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	0%	0%	0%	0%	4%	6%	4%	0%	1%	2%	0%
Adj. Flow (vph)	4	13	17	107	9	83	21	258	152	143	254	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	116	83	21	410	0	143	264	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	51.0%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	12	16	98	8	76	19	237	140	132	234	9
Future Volume (Veh/h)	4	12	16	98	8	76	19	237	140	132	234	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	13	17	107	9	83	21	258	152	143	254	10
Pedestrians					5			2				
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)												
pX, platoon unblocked												
vC, conflicting volume	932	1002	261	946	931	339	264			415		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	932	1002	261	946	931	339	264			415		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	98	94	98	47	96	88	98			88		
cM capacity (veh/h)	171	209	781	201	230	696	1277			1145		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	34	116	83	21	410	143	264
Volume Left	4	107	0	21	0	143	0
Volume Right	17	0	83	0	152	0	10
cSH	317	203	696	1277	1700	1145	1700
Volume to Capacity	0.11	0.57	0.12	0.02	0.24	0.12	0.16
Queue Length 95th (m)	2.9	24.9	3.2	0.4	0.0	3.4	0.0
Control Delay (s)	17.7	44.0	10.9	7.9	0.0	8.6	0.0
Lane LOS	C	E	B	A		A	
Approach Delay (s)	17.7	30.2		0.4		3.0	
Approach LOS	C	D					

Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	51.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	213	52	19	138	14	31	0	11	20	0	2
Future Volume (vph)	8	213	52	19	138	14	31	0	11	20	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.970			0.986			0.965			0.989	
Flt Protected	0.950			0.950				0.964			0.956	
Satd. Flow (prot)	1805	1836	0	1770	1840	0	0	1733	0	0	1725	0
Flt Permitted	0.950			0.950				0.964			0.956	
Satd. Flow (perm)	1805	1836	0	1770	1840	0	0	1733	0	0	1725	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		442.1			195.5			139.5			166.1	
Travel Time (s)		31.8			14.1			10.0			12.0	
Confl. Peds. (#/hr)										3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	2%	2%	0%	2%	2%	2%	0%	2%	50%
Adj. Flow (vph)	9	232	57	21	150	15	34	0	12	22	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	289	0	21	165	0	0	46	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	25.8%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	213	52	19	138	14	31	0	11	20	0	2
Future Volume (Veh/h)	8	213	52	19	138	14	31	0	11	20	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	232	57	21	150	15	34	0	12	22	0	2
Pedestrians					3							
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)												
pX, platoon unblocked												
vC, conflicting volume	165			289			472	486	264	464	506	158
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	165			289			472	486	264	464	506	158
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.7
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.8
p0 queue free %	99			98			93	100	98	96	100	100
cM capacity (veh/h)	1426			1273			492	471	773	493	458	776

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	9	289	21	165	46	24
Volume Left	9	0	21	0	34	22
Volume Right	0	57	0	15	12	2
cSH	1426	1700	1273	1700	543	509
Volume to Capacity	0.01	0.17	0.02	0.10	0.08	0.05
Queue Length 95th (m)	0.2	0.0	0.4	0.0	2.2	1.2
Control Delay (s)	7.5	0.0	7.9	0.0	12.2	12.4
Lane LOS	A		A		B	B
Approach Delay (s)	0.2		0.9		12.2	12.4
Approach LOS					B	B

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	25.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	135	73	2	110	2	39	13	2	8	32	20
Future Volume (vph)	26	135	73	2	110	2	39	13	2	8	32	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.958			0.998			0.995			0.955	
Flt Protected		0.995			0.999			0.965			0.993	
Satd. Flow (prot)	0	1805	0	0	1894	0	0	1761	0	0	1802	0
Flt Permitted		0.995			0.999			0.965			0.993	
Satd. Flow (perm)	0	1805	0	0	1894	0	0	1761	0	0	1802	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	5		3	3		5	8		2	2		8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	5%	0%	0%	0%	0%	0%
Adj. Flow (vph)	28	147	79	2	120	2	42	14	2	9	35	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	254	0	0	124	0	0	58	0	0	66	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	36.3%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	135	73	2	110	2	39	13	2	8	32	20
Future Volume (vph)	26	135	73	2	110	2	39	13	2	8	32	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	147	79	2	120	2	42	14	2	9	35	22

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	254	124	58	66
Volume Left (vph)	28	2	42	9
Volume Right (vph)	79	2	2	22
Hadj (s)	-0.16	-0.01	0.19	-0.17
Departure Headway (s)	4.2	4.5	5.0	4.6
Degree Utilization, x	0.30	0.15	0.08	0.09
Capacity (veh/h)	831	764	661	705
Control Delay (s)	8.9	8.3	8.5	8.1
Approach Delay (s)	8.9	8.3	8.5	8.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.6		
Level of Service	A		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	306	109	18	222	65	23
Future Volume (vph)	306	109	18	222	65	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965				0.965	
Flt Protected				0.996	0.964	
Satd. Flow (prot)	1794	0	0	1858	1767	0
Flt Permitted				0.996	0.964	
Satd. Flow (perm)	1794	0	0	1858	1767	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	2%	0%	0%
Adj. Flow (vph)	333	118	20	241	71	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	451	0	0	261	96	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.2%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	306	109	18	222	65	23
Future Volume (Veh/h)	306	109	18	222	65	23
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	333	118	20	241	71	25
Pedestrians					4	
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)						
pX, platoon unblocked						
vC, conflicting volume			455		677	396
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			455		677	396
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		83	96
cM capacity (veh/h)			1113		412	656

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	451	261	96
Volume Left	0	20	71
Volume Right	118	0	25
cSH	1700	1113	456
Volume to Capacity	0.27	0.02	0.21
Queue Length 95th (m)	0.0	0.4	6.3
Control Delay (s)	0.0	0.8	15.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.8	15.0
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	77	319	30	90	258
Future Volume (vph)	26	77	319	30	90	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.899		0.988			
Flt Protected	0.988					0.987
Satd. Flow (prot)	1655	0	1840	0	0	1839
Flt Permitted	0.988					0.987
Satd. Flow (perm)	1655	0	1840	0	0	1839
Link Speed (k/h)	50		50			50
Link Distance (m)	213.1		358.6			336.4
Travel Time (s)	15.3		25.8			24.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	84	347	33	98	280
Shared Lane Traffic (%)						
Lane Group Flow (vph)	112	0	380	0	0	378
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	26	77	319	30	90	258
Future Volume (Veh/h)	26	77	319	30	90	258
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	84	347	33	98	280
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	840	364			380	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	840	364			380	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	88			92	
cM capacity (veh/h)	308	681			1178	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	112	380	378
Volume Left	28	0	98
Volume Right	84	33	0
cSH	523	1700	1178
Volume to Capacity	0.21	0.22	0.08
Queue Length 95th (m)	6.4	0.0	2.2
Control Delay (s)	13.8	0.0	2.8
Lane LOS	B		A
Approach Delay (s)	13.8	0.0	2.8
Approach LOS	B		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix I

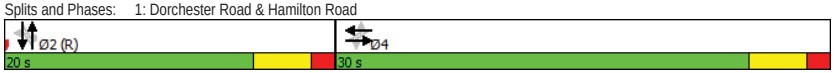
Ten-Year Total Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	115	82	82	136	113	121	220	77	68	200	34
Future Volume (vph)	42	115	82	82	136	113	121	220	77	68	200	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99			0.99		1.00		
Frt		0.938			0.932			0.961			0.978	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1583	0	1612	1537	0	1805	1713	0	1583	1764	0
Flt Permitted	0.593			0.624			0.572			0.465		
Satd. Flow (perm)	1093	1583	0	1059	1537	0	1087	1713	0	773	1764	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		89			120			36			18	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)	2					2			3	3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Adj. Flow (vph)	46	125	89	89	148	123	132	239	84	74	217	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	214	0	89	271	0	132	323	0	74	254	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.08	0.26		0.17	0.33		0.40	0.60		0.32	0.47	
Control Delay	7.1	5.2		7.9	5.4		18.6	18.7		18.2	16.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.1	5.2		7.9	5.4		18.6	18.7		18.2	16.7	
LOS	A	A		A	A		B	B		B	B	
Approach Delay		5.5			6.0			18.7			17.0	
Approach LOS		A			A			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 90.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Dorchester Road & Hamilton Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	214	89	271	132	323	74	254
v/c Ratio	0.08	0.26	0.17	0.33	0.40	0.60	0.32	0.47
Control Delay	7.1	5.2	7.9	5.4	18.6	18.7	18.2	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	5.2	7.9	5.4	18.6	18.7	18.2	16.7
Queue Length 50th (m)	2.0	5.7	4.1	7.1	9.7	22.2	5.3	17.6
Queue Length 95th (m)	6.1	14.8	10.3	17.8	22.4	43.7	14.6	34.6
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	546	836	529	828	326	539	231	541
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	0.08	0.26	0.17	0.33	0.40	0.60	0.32	0.47

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	115	82	82	136	113	121	220	77	68	200	34
Future Volume (vph)	42	115	82	82	136	113	121	220	77	68	200	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.93		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1582		1612	1537		1805	1713		1579	1764	
Flt Permitted	0.59	1.00		0.62	1.00		0.57	1.00		0.47	1.00	
Satd. Flow (perm)	1092	1582		1059	1537		1086	1713		773	1764	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	125	89	89	148	123	132	239	84	74	217	37
RTOR Reduction (vph)	0	45	0	0	60	0	0	25	0	0	13	0
Lane Group Flow (vph)	46	170	0	89	211	0	132	298	0	74	241	0
Confl. Peds. (#/hr)	2					2			3	3		
Heavy Vehicles (%)	3%	18%	5%	12%	10%	19%	0%	2%	17%	14%	3%	19%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	546	791		529	768		325	513		231	529	
v/s Ratio Prot		0.11			c0.14			c0.17			0.14	
v/s Ratio Perm	0.04			0.08			0.12			0.10		
v/c Ratio	0.08	0.21		0.17	0.27		0.41	0.58		0.32	0.46	
Uniform Delay, d1	6.5	7.0		6.8	7.2		13.9	14.8		13.6	14.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.6		0.7	0.9		3.7	4.7		3.6	2.8	
Delay (s)	6.8	7.6		7.5	8.1		17.7	19.6		17.2	17.0	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		7.5			8.0			19.0			17.1	
Approach LOS		A			A			B			B	

Intersection Summary				
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	90.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	3	12	72	4	119	5	175	48	38	159	11
Future Volume (vph)	12	3	12	72	4	119	5	175	48	38	159	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.939				0.850		0.968			0.990	
Flt Protected		0.978			0.955		0.950			0.950		
Satd. Flow (prot)	0	1502	0	0	1793	1553	1805	1669	0	1736	1735	0
Flt Permitted		0.978			0.955		0.950			0.950		
Satd. Flow (perm)	0	1502	0	0	1793	1553	1805	1669	0	1736	1735	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			333.3			916.9	
Travel Time (s)		26.0			31.8			24.0			66.0	
Confl. Peds. (#/hr)			1	1					7	7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	0%	18%	0%	25%	4%	0%	13%	0%	4%	9%	0%
Adj. Flow (vph)	13	3	13	78	4	129	5	190	52	41	173	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	29	0	0	82	129	5	242	0	41	185	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.3%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	3	12	72	4	119	5	175	48	38	159	11
Future Volume (Veh/h)	12	3	12	72	4	119	5	175	48	38	159	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	3	13	78	4	129	5	190	52	41	173	12
Pedestrians					7			1				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					1			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	592	520	180	504	500	223	185			249		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	592	520	180	504	500	223	185			249		
tC, single (s)	7.3	6.5	6.4	7.1	6.8	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.5	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	96	99	98	83	99	84	100			97		
cM capacity (veh/h)	319	445	822	454	423	807	1402			1297		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	29	82	129	5	242	41	185
Volume Left	13	78	0	5	0	41	0
Volume Right	13	0	129	0	52	0	12
cSH	458	453	807	1402	1700	1297	1700
Volume to Capacity	0.06	0.18	0.16	0.00	0.14	0.03	0.11
Queue Length 95th (m)	1.6	5.2	4.5	0.1	0.0	0.8	0.0
Control Delay (s)	13.4	14.7	10.3	7.6	0.0	7.9	0.0
Lane LOS	B	B	B	A		A	
Approach Delay (s)	13.4	12.0		0.2		1.4	
Approach LOS	B	B					

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	34.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	67	16	5	148	17	46	0	17	10	0	4
Future Volume (vph)	1	67	16	5	148	17	46	0	17	10	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.972			0.985			0.964			0.964	
Flt Protected	0.950			0.950				0.965			0.965	
Satd. Flow (prot)	1805	1782	0	1770	1822	0	0	1733	0	0	1767	0
Flt Permitted	0.950			0.950				0.965			0.965	
Satd. Flow (perm)	1805	1782	0	1770	1822	0	0	1733	0	0	1767	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		442.1			195.5			129.5			166.1	
Travel Time (s)		31.8			14.1			9.3			12.0	
Confl. Peds. (#/hr)										2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	2%	2%	3%	0%	2%	2%	2%	0%	2%	0%
Adj. Flow (vph)	1	73	17	5	161	18	50	0	18	11	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	90	0	5	179	0	0	68	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	67	16	5	148	17	46	0	17	10	0	4
Future Volume (Veh/h)	1	67	16	5	148	17	46	0	17	10	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	73	17	5	161	18	50	0	18	11	0	4
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)												
pX, platoon unblocked												
vC, conflicting volume	179			90			258	272	84	275	272	170
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	179			90			258	272	84	275	272	170
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	98	98	100	100
cM capacity (veh/h)	1409			1505			689	632	974	666	632	879

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	90	5	179	68	15
Volume Left	1	0	5	0	50	11
Volume Right	0	17	0	18	18	4
cSH	1409	1700	1505	1700	747	712
Volume to Capacity	0.00	0.05	0.00	0.11	0.09	0.02
Queue Length 95th (m)	0.0	0.0	0.1	0.0	2.4	0.5
Control Delay (s)	7.6	0.0	7.4	0.0	10.3	10.2
Lane LOS	A		A		B	B
Approach Delay (s)	0.1		0.2		10.3	10.2
Approach LOS					B	B

Intersection Summary					
Average Delay	2.5				
Intersection Capacity Utilization	19.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	64	16	1	78	6	68	42	5	3	12	23
Future Volume (vph)	12	64	16	1	78	6	68	42	5	3	12	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.977			0.990			0.995			0.918	
Flt Protected		0.994			0.999			0.971			0.996	
Satd. Flow (prot)	0	1720	0	0	1829	0	0	1773	0	0	1737	0
Flt Permitted		0.994			0.999			0.971			0.996	
Satd. Flow (perm)	0	1720	0	0	1829	0	0	1773	0	0	1737	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	2		4	4		2	10		2	2		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	9%	7%	7%	0%	3%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	70	17	1	85	7	74	46	5	3	13	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	0	0	93	0	0	125	0	0	41	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.6%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	64	16	1	78	6	68	42	5	3	12	23
Future Volume (vph)	12	64	16	1	78	6	68	42	5	3	12	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	70	17	1	85	7	74	46	5	3	13	25

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	100	93	125	41
Volume Left (vph)	13	1	74	3
Volume Right (vph)	17	7	5	25
Hadj (s)	0.05	0.00	0.15	-0.35
Departure Headway (s)	4.4	4.4	4.5	4.1
Degree Utilization, x	0.12	0.11	0.16	0.05
Capacity (veh/h)	776	772	755	810
Control Delay (s)	8.1	8.0	8.4	7.4
Approach Delay (s)	8.1	8.0	8.4	7.4
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	151	22	4	291	47	2
Future Volume (vph)	151	22	4	291	47	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.983				0.995	
Flt Protected				0.999	0.954	
Satd. Flow (prot)	1570	0	0	1712	1769	0
Flt Permitted				0.999	0.954	
Satd. Flow (perm)	1570	0	0	1712	1769	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		8	8		1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	21%	5%	0%	11%	2%	0%
Adj. Flow (vph)	164	24	4	316	51	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	188	0	0	320	53	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	151	22	4	291	47	2
Future Volume (Veh/h)	151	22	4	291	47	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	164	24	4	316	51	2
Pedestrians	1				8	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	0				1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			196		509	184
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			196		509	184
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		90	100
cM capacity (veh/h)			1380		519	858

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	188	320	53
Volume Left	0	4	51
Volume Right	24	0	2
cSH	1700	1380	526
Volume to Capacity	0.11	0.00	0.10
Queue Length 95th (m)	0.0	0.1	2.7
Control Delay (s)	0.0	0.1	12.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.6
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	51	178	6	30	213
Future Volume (vph)	11	51	178	6	30	213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.889		0.995			
Flt Protected	0.991					0.994
Satd. Flow (prot)	1641	0	1853	0	0	1852
Flt Permitted	0.991					0.994
Satd. Flow (perm)	1641	0	1853	0	0	1852
Link Speed (k/h)	50		50			50
Link Distance (m)	156.5		329.2			333.3
Travel Time (s)	11.3		23.7			24.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	55	193	7	33	232
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	0	200	0	0	265
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	51	178	6	30	213
Future Volume (Veh/h)	11	51	178	6	30	213
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	55	193	7	33	232
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	494	196			200	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	494	196			200	
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	93			98	
cM capacity (veh/h)	521	845			1372	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	67	200	265
Volume Left	12	0	33
Volume Right	55	7	0
cSH	760	1700	1372
Volume to Capacity	0.09	0.12	0.02
Queue Length 95th (m)	2.3	0.0	0.6
Control Delay (s)	10.2	0.0	1.1
Lane LOS	B		A
Approach Delay (s)	10.2	0.0	1.1
Approach LOS	B		

Intersection Summary				
Average Delay		1.9		
Intersection Capacity Utilization		36.4%	ICU Level of Service	A
Analysis Period (min)		15		

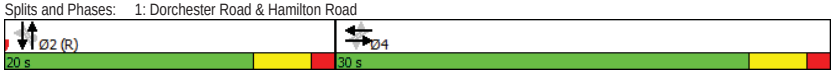
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	184	132	86	163	103	111	204	83	174	287	37
Future Volume (vph)	44	184	132	86	163	103	111	204	83	174	287	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0		0.0	20.0		0.0	30.0		0.0	50.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00			1.00	0.99		1.00	1.00	
Frt		0.937			0.942			0.957			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1725	0	1805	1744	0	1787	1742	0	1805	1823	0
Flt Permitted	0.583			0.535			0.422			0.482		
Satd. Flow (perm)	1086	1725	0	1016	1744	0	791	1742	0	915	1823	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		103			91			42			13	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		354.2			940.6			916.9			395.3	
Travel Time (s)		25.5			67.7			66.0			28.5	
Confl. Peds. (#/hr)			1	1			5		1	1		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Adj. Flow (vph)	48	200	143	93	177	112	121	222	90	189	312	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	343	0	93	289	0	121	312	0	189	352	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Minimum Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	24.0	24.0		24.0	24.0		11.0	11.0		11.0	11.0	
Flash Dont Walk (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
v/c Ratio	0.09	0.38		0.18	0.32		0.51	0.57		0.69	0.63	
Control Delay	7.1	6.7		8.1	6.1		23.8	17.4		32.5	20.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.1	6.7		8.1	6.1		23.8	17.4		32.5	20.6	
LOS	A	A		A	A		C	B		C	C	
Approach Delay		6.7			6.6			19.2			24.8	
Approach LOS		A			A			B			C	

Intersection Summary

Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 91.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Dorchester Road & Hamilton Road



Queues
1: Dorchester Road & Hamilton Road

Ten Year Total: PM Peak Hour
180123: 187 Dorchester Road TRIS

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	48	343	93	289	121	312	189	352
v/c Ratio	0.09	0.38	0.18	0.32	0.51	0.57	0.69	0.63
Control Delay	7.1	6.7	8.1	6.1	23.8	17.4	32.5	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	6.7	8.1	6.1	23.8	17.4	32.5	20.6
Queue Length 50th (m)	2.1	11.8	4.3	9.4	9.2	20.6	15.4	26.9
Queue Length 95th (m)	6.3	25.1	10.9	20.7	#24.8	41.1	#42.1	49.7
Internal Link Dist (m)		330.2		916.6		892.9		371.3
Turn Bay Length (m)	15.0		20.0		30.0		50.0	
Base Capacity (vph)	543	914	508	917	237	552	274	556
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	0.09	0.38	0.18	0.32	0.51	0.57	0.69	0.63

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Dorchester Road & Hamilton Road

Ten Year Total: PM Peak Hour
180123: 187 Dorchester Road TRIS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	184	132	86	163	103	111	204	83	174	287	37
Future Volume (vph)	44	184	132	86	163	103	111	204	83	174	287	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.94		1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1725		1804	1744		1780	1742		1803	1823	
Flt Permitted	0.58	1.00		0.54	1.00		0.42	1.00		0.48	1.00	
Satd. Flow (perm)	1086	1725		1016	1744		790	1742		915	1823	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	200	143	93	177	112	121	222	90	189	312	40
RTOR Reduction (vph)	0	52	0	0	46	0	0	29	0	0	9	0
Lane Group Flow (vph)	48	292	0	93	244	0	121	283	0	189	343	0
Confl. Peds. (#/hr)			1	1			5		1	1		5
Heavy Vehicles (%)	2%	4%	0%	0%	3%	2%	1%	2%	8%	0%	2%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	543	862		508	872		237	522		274	546	
v/s Ratio Prot		c0.17			0.14			0.16			0.19	
v/s Ratio Perm	0.04			0.09			0.15			c0.21		
v/c Ratio	0.09	0.34		0.18	0.28		0.51	0.54		0.69	0.63	
Uniform Delay, d1	6.5	7.5		6.9	7.3		14.5	14.6		15.4	15.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.1		0.8	0.8		7.7	4.0		13.3	5.4	
Delay (s)	6.9	8.6		7.7	8.1		22.1	18.6		28.8	20.5	
Level of Service	A	A		A	A		C	B		C	C	
Approach Delay (s)		8.4			8.0			19.6			23.4	
Approach LOS		A			A			B			C	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	50.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	91.6%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	12	16	100	9	77	19	242	143	134	238	10
Future Volume (vph)	4	12	16	100	9	77	19	242	143	134	238	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	80.0		0.0	40.0		0.0	35.0		0.0
Storage Lanes	0		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.932				0.850		0.944			0.994	
Flt Protected		0.994			0.956		0.950			0.950		
Satd. Flow (prot)	0	1710	0	0	1816	1553	1703	1750	0	1787	1853	0
Flt Permitted		0.994			0.956		0.950			0.950		
Satd. Flow (perm)	0	1710	0	0	1816	1553	1703	1750	0	1787	1853	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		360.5			442.1			336.4			916.9	
Travel Time (s)		26.0			31.8			24.2			66.0	
Confl. Peds. (#/hr)			2	2					5	5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	0%	0%	0%	0%	4%	6%	4%	0%	1%	2%	0%
Adj. Flow (vph)	4	13	17	109	10	84	21	263	155	146	259	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	119	84	21	418	0	146	270	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	12	16	100	9	77	19	242	143	134	238	10
Future Volume (Veh/h)	4	12	16	100	9	77	19	242	143	134	238	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	13	17	109	10	84	21	263	155	146	259	11
Pedestrians					5			2				
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)												
pX, platoon unblocked												
vC, conflicting volume	950	1022	266	964	950	346	270			423		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	950	1022	266	964	950	346	270			423		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	98	94	98	44	96	88	98			87		
cM capacity (veh/h)	164	203	776	195	224	690	1271			1137		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	34	119	84	21	418	146	270
Volume Left	4	109	0	21	0	146	0
Volume Right	17	0	84	0	155	0	11
cSH	308	197	690	1271	1700	1137	1700
Volume to Capacity	0.11	0.60	0.12	0.02	0.25	0.13	0.16
Queue Length 95th (m)	2.9	27.2	3.3	0.4	0.0	3.5	0.0
Control Delay (s)	18.1	47.9	10.9	7.9	0.0	8.6	0.0
Lane LOS	C	E	B	A		A	
Approach Delay (s)	18.1	32.6		0.4		3.0	
Approach LOS	C	D					

Intersection Summary					
Average Delay	7.9				
Intersection Capacity Utilization	51.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	218	52	19	141	14	31	0	11	20	0	2
Future Volume (vph)	9	218	52	19	141	14	31	0	11	20	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	90.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.971			0.987			0.965			0.989	
Flt Protected	0.950			0.950				0.964			0.956	
Satd. Flow (prot)	1805	1838	0	1770	1842	0	0	1733	0	0	1725	0
Flt Permitted	0.950			0.950				0.964			0.956	
Satd. Flow (perm)	1805	1838	0	1770	1842	0	0	1733	0	0	1725	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		442.1			195.5			139.5			166.1	
Travel Time (s)		31.8			14.1			10.0			12.0	
Confl. Peds. (#/hr)										3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	2%	2%	2%	0%	2%	2%	2%	0%	2%	50%
Adj. Flow (vph)	10	237	57	21	153	15	34	0	12	22	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	294	0	21	168	0	0	46	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	25.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	218	52	19	141	14	31	0	11	20	0	2
Future Volume (Veh/h)	9	218	52	19	141	14	31	0	11	20	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	237	57	21	153	15	34	0	12	22	0	2
Pedestrians					3							
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)												
pX, platoon unblocked												
vC, conflicting volume	168			294			482	496	268	474	516	160
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	168			294			482	496	268	474	516	160
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.7
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.8
p0 queue free %	99			98			93	100	98	95	100	100
cM capacity (veh/h)	1422			1268			484	464	768	486	452	773

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	10	294	21	168	46	24
Volume Left	10	0	21	0	34	22
Volume Right	0	57	0	15	12	2
cSH	1422	1700	1268	1700	536	501
Volume to Capacity	0.01	0.17	0.02	0.10	0.09	0.05
Queue Length 95th (m)	0.2	0.0	0.4	0.0	2.2	1.2
Control Delay (s)	7.5	0.0	7.9	0.0	12.3	12.5
Lane LOS	A		A		B	B
Approach Delay (s)	0.2		0.9		12.3	12.5
Approach LOS					B	B

Intersection Summary					
Average Delay	2.0				
Intersection Capacity Utilization	25.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	138	74	2	112	2	40	13	2	9	32	20
Future Volume (vph)	27	138	74	2	112	2	40	13	2	9	32	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.958			0.998			0.995			0.956	
Flt Protected		0.994			0.999			0.965			0.993	
Satd. Flow (prot)	0	1804	0	0	1894	0	0	1760	0	0	1804	0
Flt Permitted		0.994			0.999			0.965			0.993	
Satd. Flow (perm)	0	1804	0	0	1894	0	0	1760	0	0	1804	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		195.5			326.7			306.4			423.3	
Travel Time (s)		14.1			23.5			22.1			30.5	
Confl. Peds. (#/hr)	5		3	3		5	8		2	2		8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	5%	0%	0%	0%	0%	0%
Adj. Flow (vph)	29	150	80	2	122	2	43	14	2	10	35	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	259	0	0	126	0	0	59	0	0	67	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	36.6%	ICU Level of Service A	
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	138	74	2	112	2	40	13	2	9	32	20
Future Volume (vph)	27	138	74	2	112	2	40	13	2	9	32	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	150	80	2	122	2	43	14	2	10	35	22

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	259	126	59	67
Volume Left (vph)	29	2	43	10
Volume Right (vph)	80	2	2	22
Hadj (s)	-0.16	-0.01	0.19	-0.17
Departure Headway (s)	4.2	4.5	5.0	4.7
Degree Utilization, x	0.30	0.16	0.08	0.09
Capacity (veh/h)	829	761	657	701
Control Delay (s)	9.0	8.3	8.5	8.1
Approach Delay (s)	9.0	8.3	8.5	8.1
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.7		
Level of Service	A		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	314	112	18	227	67	24
Future Volume (vph)	314	112	18	227	67	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.964				0.965	
Flt Protected				0.996	0.964	
Satd. Flow (prot)	1792	0	0	1858	1767	0
Flt Permitted				0.996	0.964	
Satd. Flow (perm)	1792	0	0	1858	1767	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	940.6			446.7	423.3	
Travel Time (s)	67.7			32.2	30.5	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	2%	0%	0%
Adj. Flow (vph)	341	122	20	247	73	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	463	0	0	267	99	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	314	112	18	227	67	24
Future Volume (Veh/h)	314	112	18	227	67	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	341	122	20	247	73	26
Pedestrians					4	
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)						
pX, platoon unblocked						
vC, conflicting volume			467		693	406
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			467		693	406
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		82	96
cM capacity (veh/h)			1101		404	647

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	463	267	99
Volume Left	0	20	73
Volume Right	122	0	26
cSH	1700	1101	448
Volume to Capacity	0.27	0.02	0.22
Queue Length 95th (m)	0.0	0.4	6.7
Control Delay (s)	0.0	0.8	15.3
Lane LOS		A	C
Approach Delay (s)	0.0	0.8	15.3
Approach LOS			C

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	38.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	77	328	30	90	264
Future Volume (vph)	26	77	328	30	90	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.899		0.989			
Flt Protected	0.988					0.987
Satd. Flow (prot)	1655	0	1842	0	0	1839
Flt Permitted	0.988					0.987
Satd. Flow (perm)	1655	0	1842	0	0	1839
Link Speed (k/h)	50		50			50
Link Distance (m)	213.1		358.6			336.4
Travel Time (s)	15.3		25.8			24.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	84	357	33	98	287
Shared Lane Traffic (%)						
Lane Group Flow (vph)	112	0	390	0	0	385
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

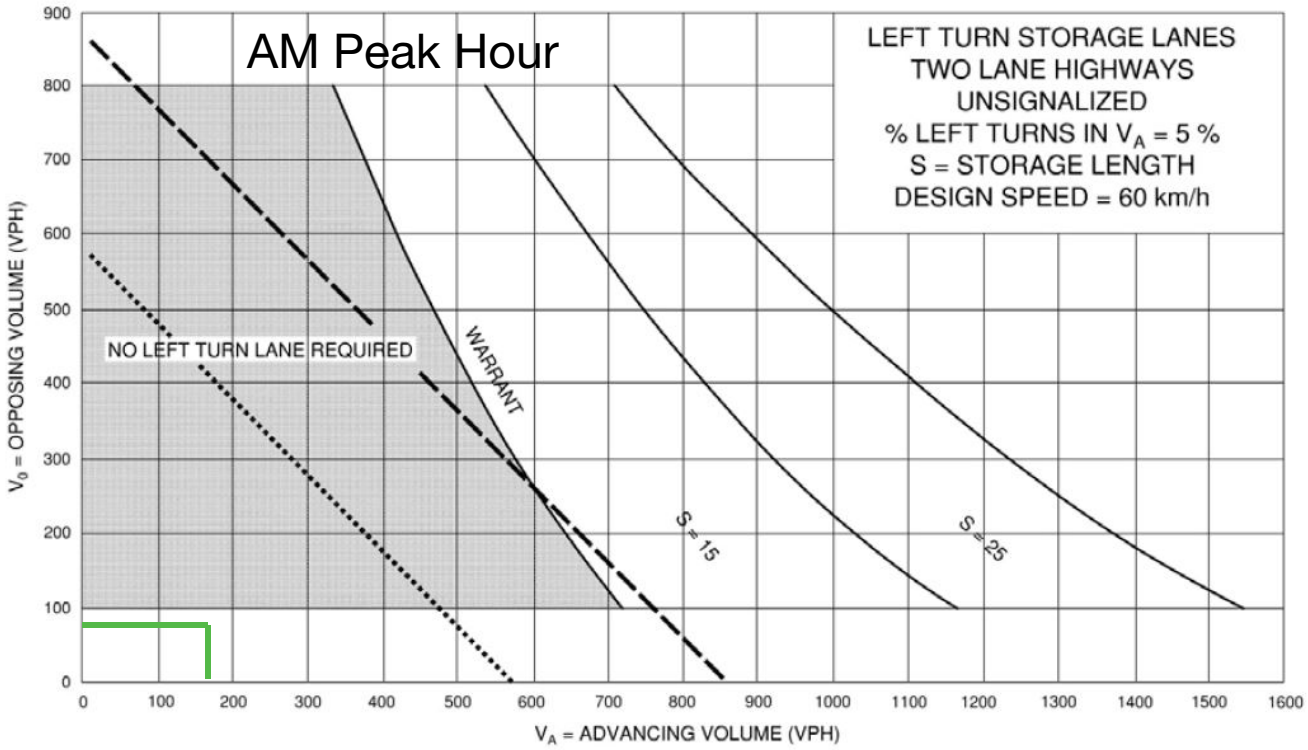
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	26	77	328	30	90	264
Future Volume (Veh/h)	26	77	328	30	90	264
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	84	357	33	98	287
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	856	374			390	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	856	374			390	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	88			92	
cM capacity (veh/h)	300	673			1169	

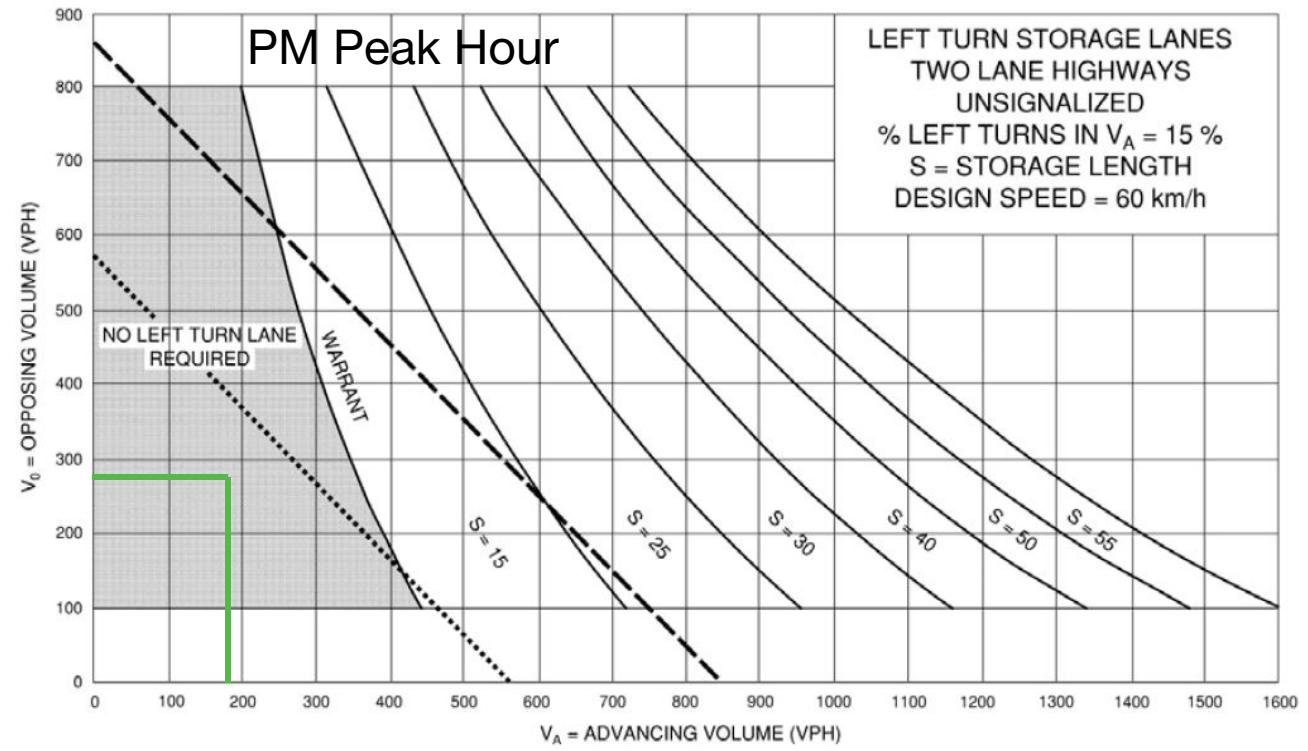
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	112	390	385
Volume Left	28	0	98
Volume Right	84	33	0
cSH	514	1700	1169
Volume to Capacity	0.22	0.23	0.08
Queue Length 95th (m)	6.6	0.0	2.2
Control Delay (s)	14.0	0.0	2.8
Lane LOS	B		A
Approach Delay (s)	14.0	0.0	2.8
Approach LOS	B		

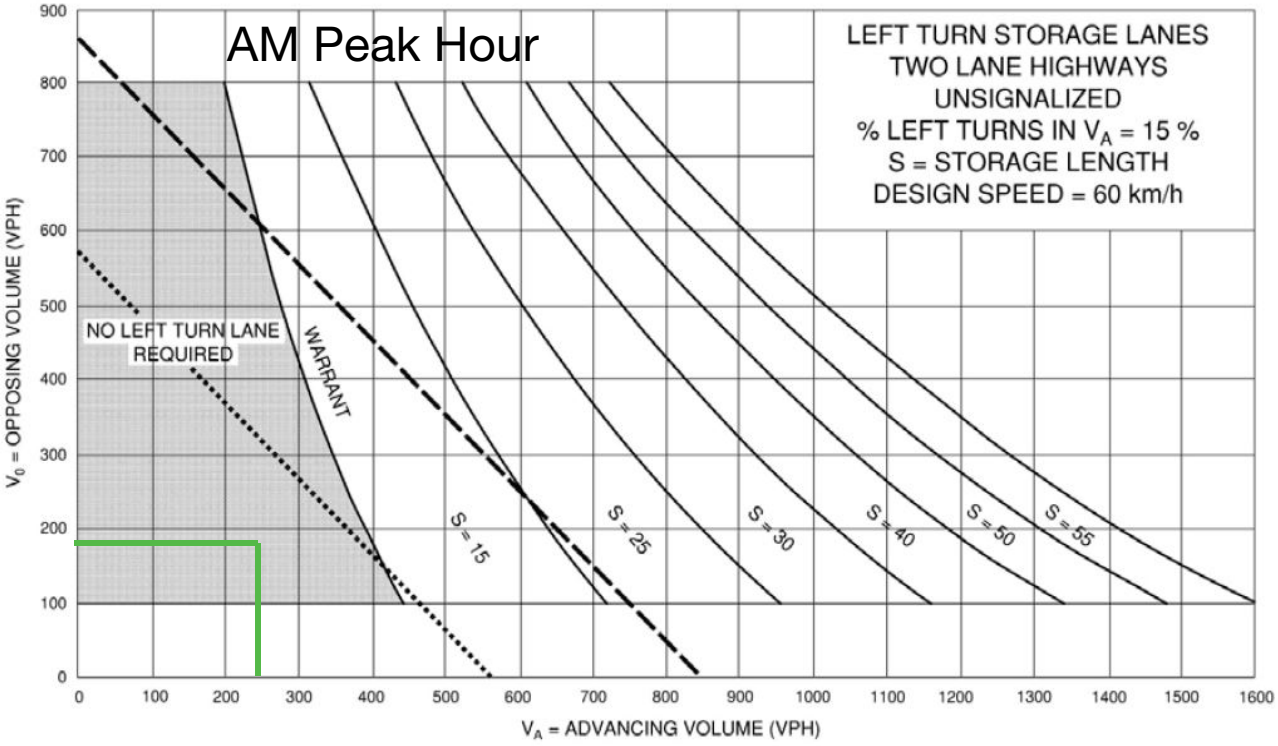
Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

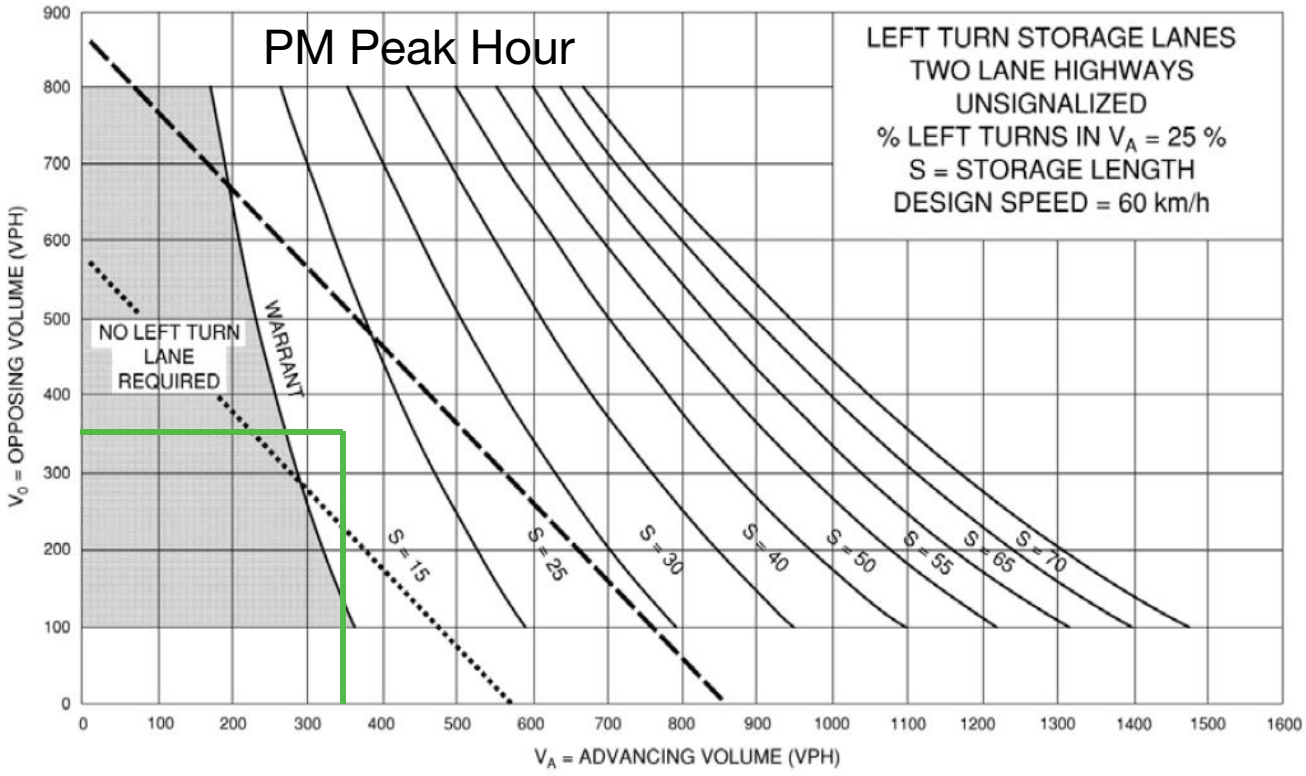
Appendix J

Left-Turn Lane Warrants


AM Peak Hour
LEFT TURN STORAGE LANES
TWO LANE HIGHWAYS
UNSIGNALIZED
% LEFT TURNS IN V_A = 5 %
S = STORAGE LENGTH
DESIGN SPEED = 60 km/h
NO LEFT TURN LANE REQUIRED
WARRANT
S = 15
S = 25
V_0 = OPPOSING VOLUME (VPH)
V_A = ADVANCING VOLUME (VPH)


PM Peak Hour
LEFT TURN STORAGE LANES
TWO LANE HIGHWAYS
UNSIGNALIZED
% LEFT TURNS IN V_A = 15 %
S = STORAGE LENGTH
DESIGN SPEED = 60 km/h
NO LEFT TURN LANE REQUIRED
WARRANT
S = 15
S = 25
S = 30
S = 40
S = 50
S = 55
V_0 = OPPOSING VOLUME (VPH)
V_A = ADVANCING VOLUME (VPH)


AM Peak Hour
LEFT TURN STORAGE LANES
TWO LANE HIGHWAYS
UNSIGNALIZED
% LEFT TURNS IN V_A = 15 %
S = STORAGE LENGTH
DESIGN SPEED = 60 km/h
NO LEFT TURN LANE REQUIRED
WARRANT
S = 15
S = 25
S = 30
S = 40
S = 50
S = 55
V_0 = OPPOSING VOLUME (VPH)
V_A = ADVANCING VOLUME (VPH)


PM Peak Hour
LEFT TURN STORAGE LANES
TWO LANE HIGHWAYS
UNSIGNALIZED
% LEFT TURNS IN V_A = 25 %
S = STORAGE LENGTH
DESIGN SPEED = 60 km/h
NO LEFT TURN LANE REQUIRED
WARRANT
S = 15
S = 25
S = 30
S = 40
S = 50
S = 55
S = 65
S = 70
V_0 = OPPOSING VOLUME (VPH)
V_A = ADVANCING VOLUME (VPH)

Appendix K

OTM Traffic Control Signal Warrants

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

Horizon Year: Total Traffic - Opening Year
Region/City/Township: County of Middlesex

Major Street: Dorchester Road
Minor Street: Byron Avenue
North/South: Y

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

PM Forecast Only? N

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

Time Period	Major Street: Dorchester Road						Minor Street: Byron Avenue						Peds Crossing Main Road
	Northbound			Southbound			Eastbound			Westbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour	5	168	47	37	152	10	11	3	11	69	4	115	2
PM Peak Hour	18	233	138	129	229	9	4	11	15	97	8	74	2
Average Hourly Volume	**6**	**100**	**46**	**42**	**95**	**5**	**4**	**4**	**7**	**42**	**3**	**47**	**1**

Warrant 1 - Minimum Vehicular Volume

Warrant	AHV
1A - All	399
1B - Minor	106
2A - Major	294
2B - Cross	50

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	399
					% Fulfilled	55.5%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	120	170	120	170	106
					% Fulfilled	62.1%

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	294
					% Fulfilled	40.8%

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	50
					% Fulfilled	66.3%

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

Horizon Year: Total Traffic - Five-Year
Region/City/Township: County of Middlesex

Major Street: Dorchester Road
Minor Street: Byron Avenue
North/South: Y

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

PM Forecast Only? N

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

Time Period	Major Street: Dorchester Road						Minor Street: Byron Avenue						Peds Crossing Main Road
	Northbound			Southbound			Eastbound			Westbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour	5	172	47	37	156	11	12	3	12	70	4	117	2
PM Peak Hour	19	237	140	132	234	9	4	12	16	98	8	76	2
Average Hourly Volume	**6**	**102**	**47**	**42**	**98**	**5**	**4**	**4**	**7**	**42**	**3**	**48**	**1**

Warrant 1 - Minimum Vehicular Volume

Warrant	AHV
1A - All	408
1B - Minor	108
2A - Major	300
2B - Cross	51

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	408
					% Fulfilled	56.6%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	120	170	120	170	108
					% Fulfilled	63.5%

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	300
					% Fulfilled	41.6%

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	51
					% Fulfilled	67.7%

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

Horizon Year: Total Traffic - Ten-Year
Region/City/Township: County of Middlesex

Major Street: Dorchester Road
Minor Street: Byron Avenue
North/South: Y

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

PM Forecast Only? N

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

Time Period	Major Street: Dorchester Road						Minor Street: Byron Avenue						Peds Crossing Main Road
	Northbound			Southbound			Eastbound			Westbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak Hour	5	175	48	38	159	11	12	3	12	72	4	119	2
PM Peak Hour	19	242	143	134	238	10	4	12	16	100	9	77	2
Average Hourly Volume	**6**	**104**	**48**	**43**	**99**	**5**	**4**	**4**	**7**	**43**	**3**	**49**	**1**

Warrant 1 - Minimum Vehicular Volume

Warrant	AHV
1A - All	416
1B - Minor	110
2A - Major	306
2B - Cross	52

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	416
					% Fulfilled	57.7%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	120	170	120	170	110
					% Fulfilled	64.7%

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	306
					% Fulfilled	42.4%

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	52
					% Fulfilled	69.0%