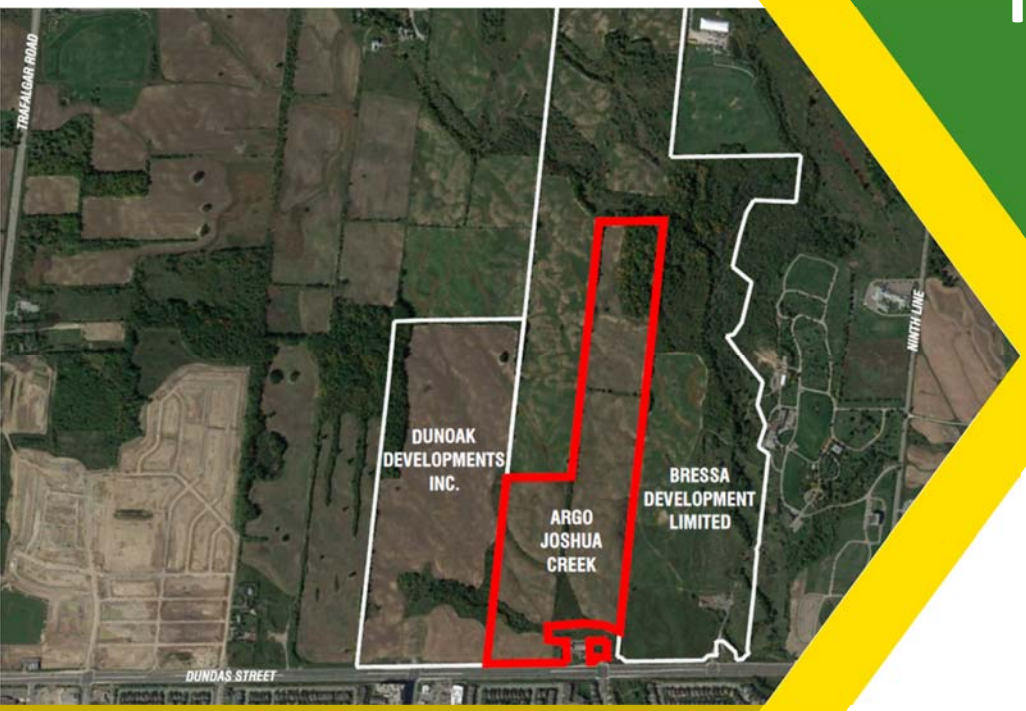
ARGO Land Development

Joshua Creek Subdivision

Transportation Impact Study



CGH TRANSPORTATION

Joshua Creek Transportation Impact Study

Prepared for:

Argo Land Development
4900 Palladium Way
Burlington, ON
L7M 0W7

Prepared by:

CGH Transportation Inc.
628 Haines Road
Newmarket, ON
L3Y 6V5

December 2019

PN: 2018-56

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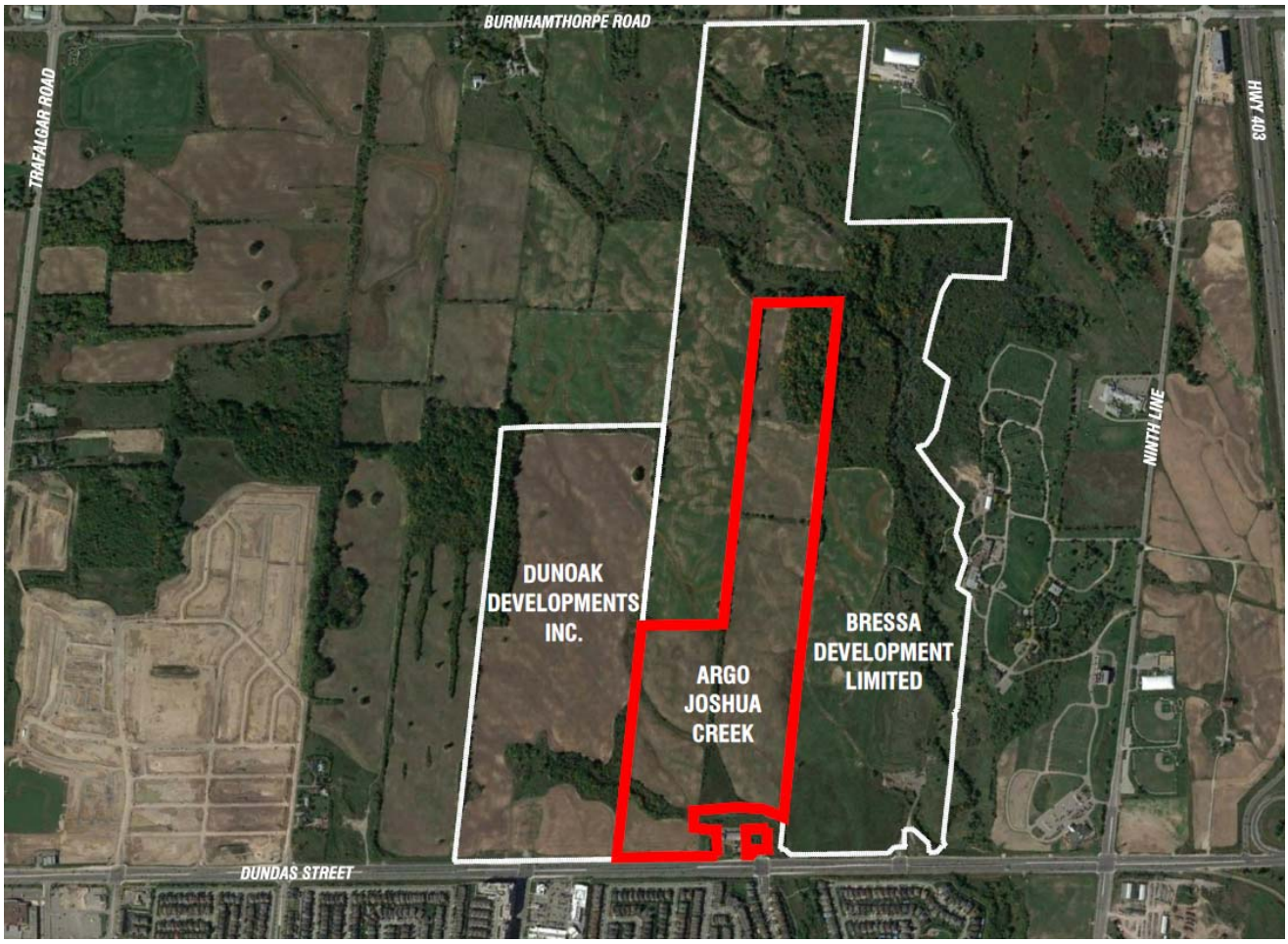
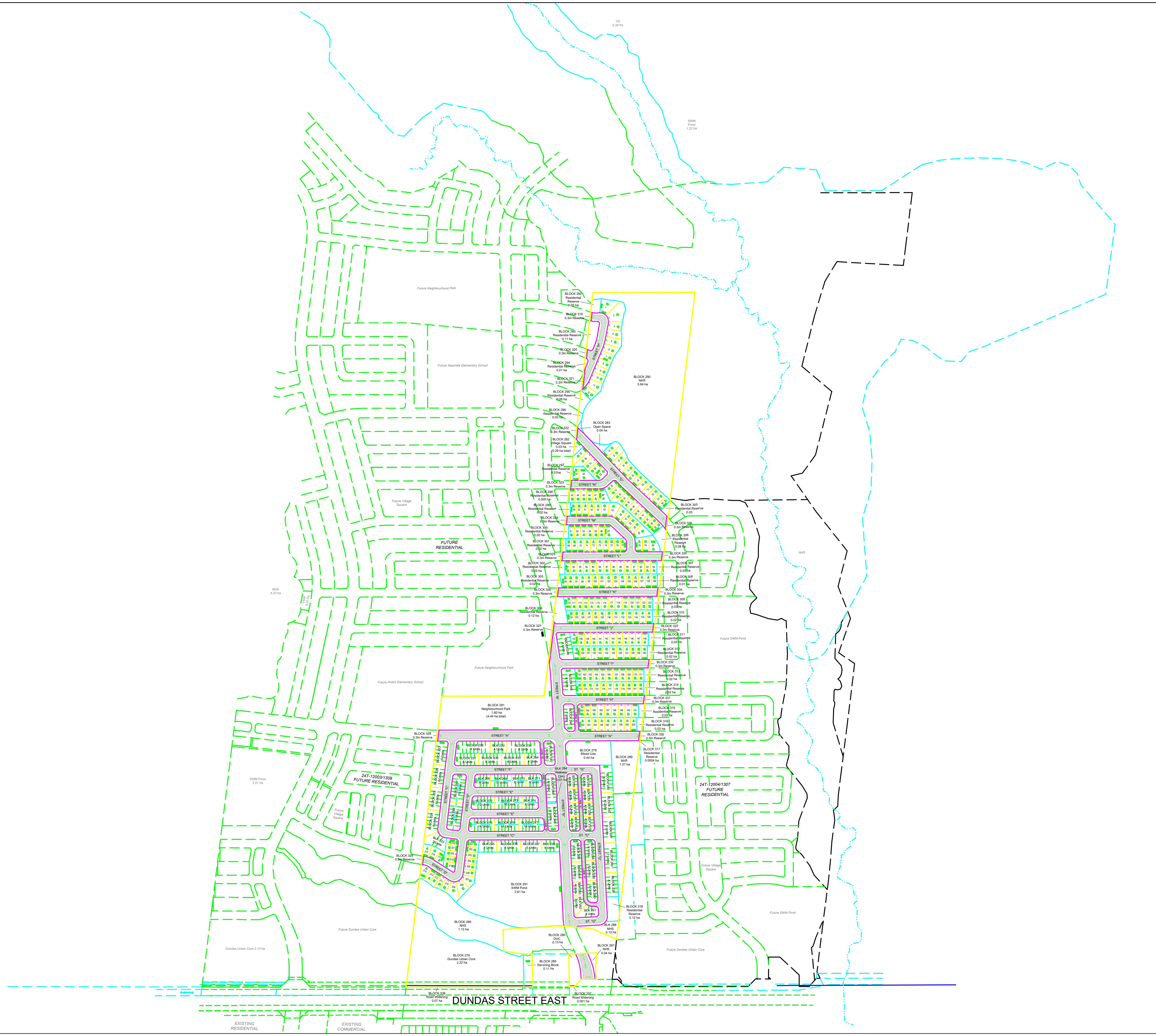
1 Introduction

This Transportation Impact Study has been prepared to support the proposed development of the Joshua Creek Subdivision in North Oakville. The proposed residential development includes a mix of townhouses, single detached units, and a Dundas Urban Core parcel that will include medium rise apartments. The breakdown is as follows: 378 townhouse units, 222 single detached units, and approximately 400 apartment units. The development is anticipated to be built out within the next five years. Therefore, the analysis will include 2019 existing conditions and 2024 full build out and future background conditions. The timing of each phase is not known at this time. Figure 1 illustrates the site context. Figure 2 illustrates the proposed development concept plan.

Figure 1: Site Context



The proposed development will have a primary access that forms the fourth leg of the intersection of Meadowridge Drive at Dundas Street. Additionally, a right in / right out access is proposed into the Dundas Urban Core portion of the development. This development will also have connections to both of the adjacent proposed developments (Dunoak to the west and Bressa to the east). The scope of this TIS has been confirmed with transportation staff from the Town of Oakville and Halton Region. E-mail correspondence discussing the scope is included in Appendix A.



Notes:

A	description	by	xx/xx/xx
REV:	DESCRIPTION:	BY:	DATE:

STATUS: status

CGH Transportation
628 Haines Road
Newmarket, ON
L3Y 6V5
(905) 251-4070

CLIENT: Neighbourhood 9/10
Landowners' Group

ARCHITECT:

SITE: Neighbourhood 9/10

TITLE: Development Concept Plan

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2019-03-01		
PROJECT NO:	DRAWING NO:		REVISION:
2018-23	002		

2 Existing Conditions

2.1 Area Road Network

Eighth Line

Eighth Line is a Town of Oakville minor arterial road with a four-lane, divided, urban cross-section. The Town of Oakville Official Plan protects a 26-metre right-of-way for minor arterial roads. Left turn lanes are included at major intersections. A 50 km/h posted speed limit applies.

Prince Michael Drive

Prince Michael Drive is a Town of Oakville major collector with a two-lane urban cross-section. The Town of Oakville Official Plan protects a 26-metre right-of-way for major collector roads. Left turn lanes are included at major intersections. A 50 km/h posted speed limit applies.

Meadowridge Drive

Meadowridge Drive is a Town of Oakville minor collector with a two-lane cross section. The Town of Oakville Official Plan protects a 20-metre right-of-way for minor collector roads. Left turn lanes are included at signalized intersections. As there is no posted speed limit, the default 50km/h posted speed limit applies.

Ninth Line

Ninth Line is a regional road with a four-lane urban cross-section. The Halton Region Official Plan protects a 35-metre right-of-way for Ninth Line. A 60km/h posted speed limit applies. As this is a regional arterial road, left and right turn auxiliary lanes are generally provided at major intersections. Additionally, cycling lanes are provided northbound and southbound on the south leg of the intersection.

Dundas Street

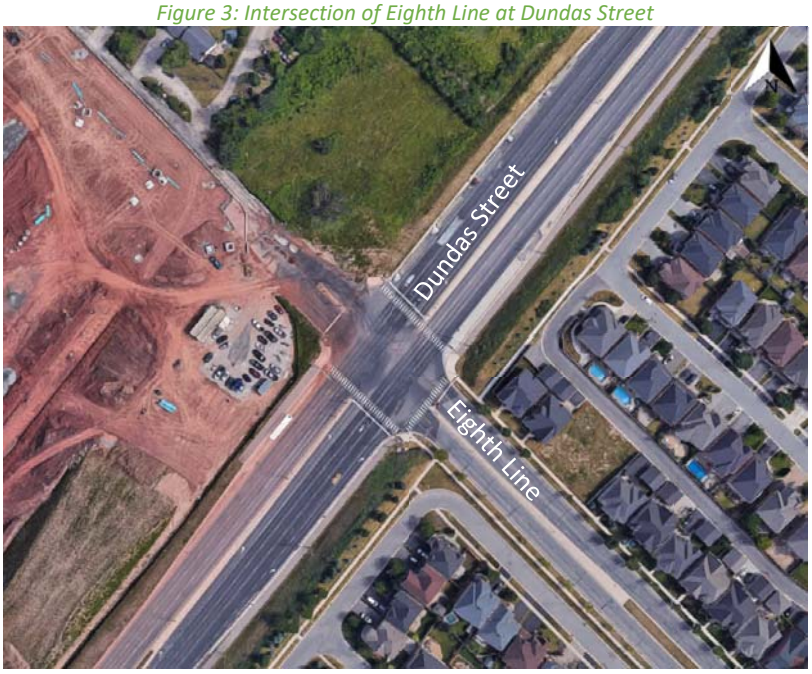
Dundas Street is a regional road with a six-lane divided urban cross-section. The Halton Region Official Plan protects for a 50-metre right-of-way. Auxiliary lanes are provided at major intersections. A 60 km/h posted speed limit applies.

2.2 Existing Intersections

Eighth Line at Dundas Street

The intersection of Eighth Line at Dundas Street is a signalized intersection with auxiliary left turn lanes on all approaches. Right turn lanes are provided on the eastbound, westbound, and southbound legs. Crosswalks are present on all legs with pedestrian signal heads and call buttons. The sidewalks are not continuous north of the intersection. Along the south side of Dundas Street, a three-metre asphalt multi-use pathway is provided in place of a sidewalk. Figure 3 illustrates the intersection of Eighth Line at Dundas Street. Note that the aerial photograph used in Figure 3 is slightly outdated and the north leg has subsequently been constructed.

Figure 3: Intersection of Eighth Line at Dundas Street



Prince Michael Drive at Dundas Street

The intersection of Prince Michael Drive at Dundas Street is a signalized intersection with auxiliary left turn lanes on all three approaches. The north leg has not yet been constructed. An eastbound right turn lane is provided. On the westbound approach a right turn lane has been constructed, but is not currently in use, as the northbound leg has not been constructed. Similarly, an eastbound left turn lane has been constructed, but not opened. Crosswalks are present on all legs with pedestrian signal heads and call buttons. There is a multi-use pathway along the southside of Dundas Street, along with sidewalks on both sides of Prince Michael Drive. Figure 4 illustrates the intersection of Prince Michael Drive at Dundas Street.

Figure 4: Intersection of Prince Michael Drive at Dundas Street

Meadowridge Drive at Dundas Street

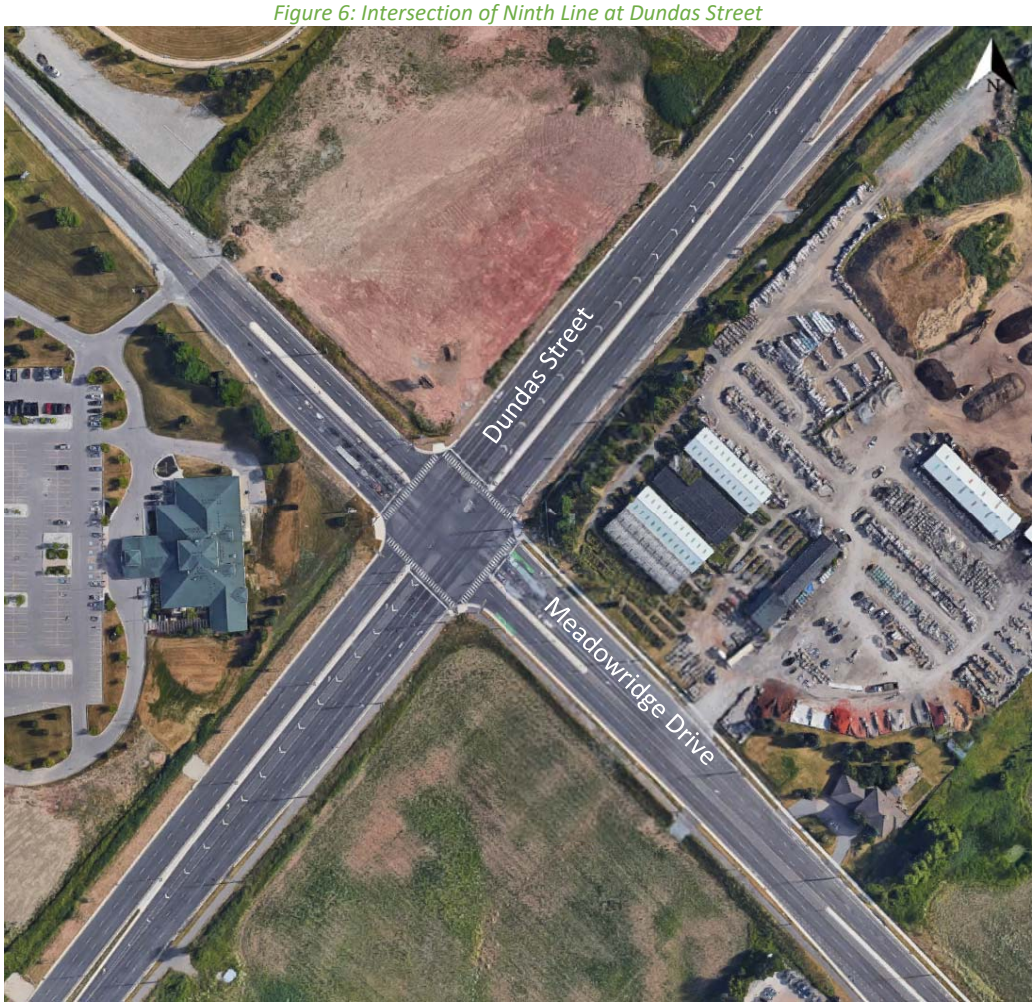
The intersection of Meadowridge Drive at Dundas Drive is a signalized intersection with auxiliary left turn lanes on all three existing approaches. Similar to Prince Michael Drive at Dundas Street, the north leg of the intersection has not been constructed, however, an eastbound left turn lane and a westbound right turn lane have been constructed but are currently unused. There is a multi-use pathway along the south side of Dundas Street along with sidewalks along both sides of Meadowridge Drive. Figure 5 illustrates the intersection of Meadowridge Drive at Dundas Street.

Figure 5: Intersection of Meadowridge Drive at Dundas Street

Ninth Line at Dundas Street

The intersection of Ninth Line at Dundas Street is a signalized intersection with auxiliary left and right turn lanes on all approaches. Additionally, on the eastbound and westbound approaches a second left turn lane has been constructed but is not currently in use. Crosswalks are provided on all legs with pedestrian signal heads and call buttons. There is a multi-use pathway along the south of Dundas Street, west of the intersection, continuing south along Ninth Line. Additionally, there is a sidewalk along the east side of Ninth Line. Dedicated cycling lanes are provided both directions on the south leg of the intersection. Figure 6 illustrates the intersection of Ninth Line at Dundas Street.

Figure 6: Intersection of Ninth Line at Dundas Street



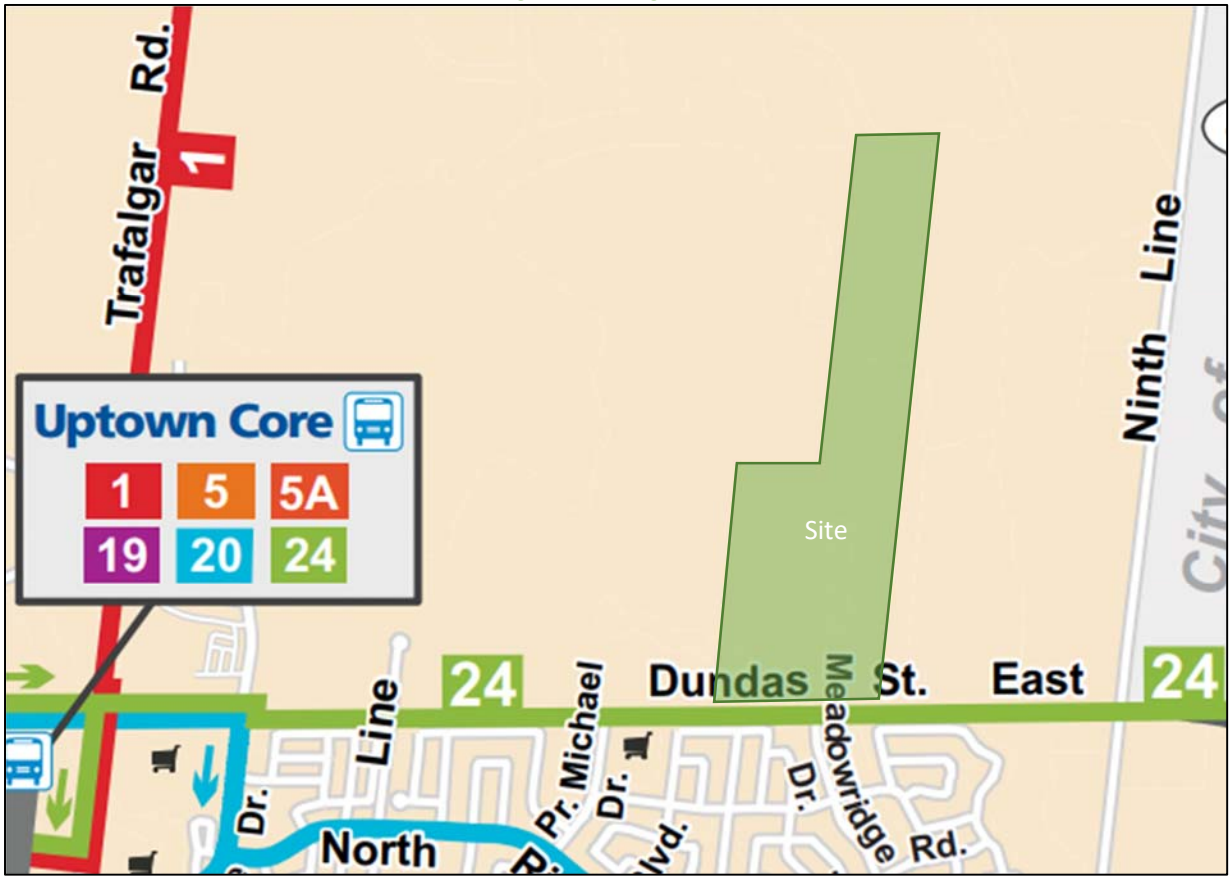
2.3 Cycling and Pedestrian Facilities

Cycling facilities in the Study Area are currently provided via a multi-use pathway along the south side of Dundas Street. Crosswalks are present at all the Study Area intersections with sidewalks along both sides of the collector roads. The Town of Oakville Active Transportation Master Plan (ATMP) outlines the proposed cycling and pedestrian network. Map 8 and Map 9 from the ATMP have been included in Appendix B for reference. Generally, sidewalks will be provided along the local and collector roads throughout the proposed development as is appropriate based on the proposed cross-sections, additionally, paths will be included in the green spaces that will be reserved as part of the proposed development. Cycling facilities will be provided along the collector roads as outlined in Map 9 of the ATMP.

2.4 Existing Transit

Transit service in the Study Area is provided along Dundas Street West and Trafalgar Road via Route 24 along Dundas Street. Far side transit stops are provided at each of the existing Study Area intersections, serving the existing developments south of Dundas Street.

Figure 7: Existing Transit



2.5 Existing Peak Hour Travel Demand

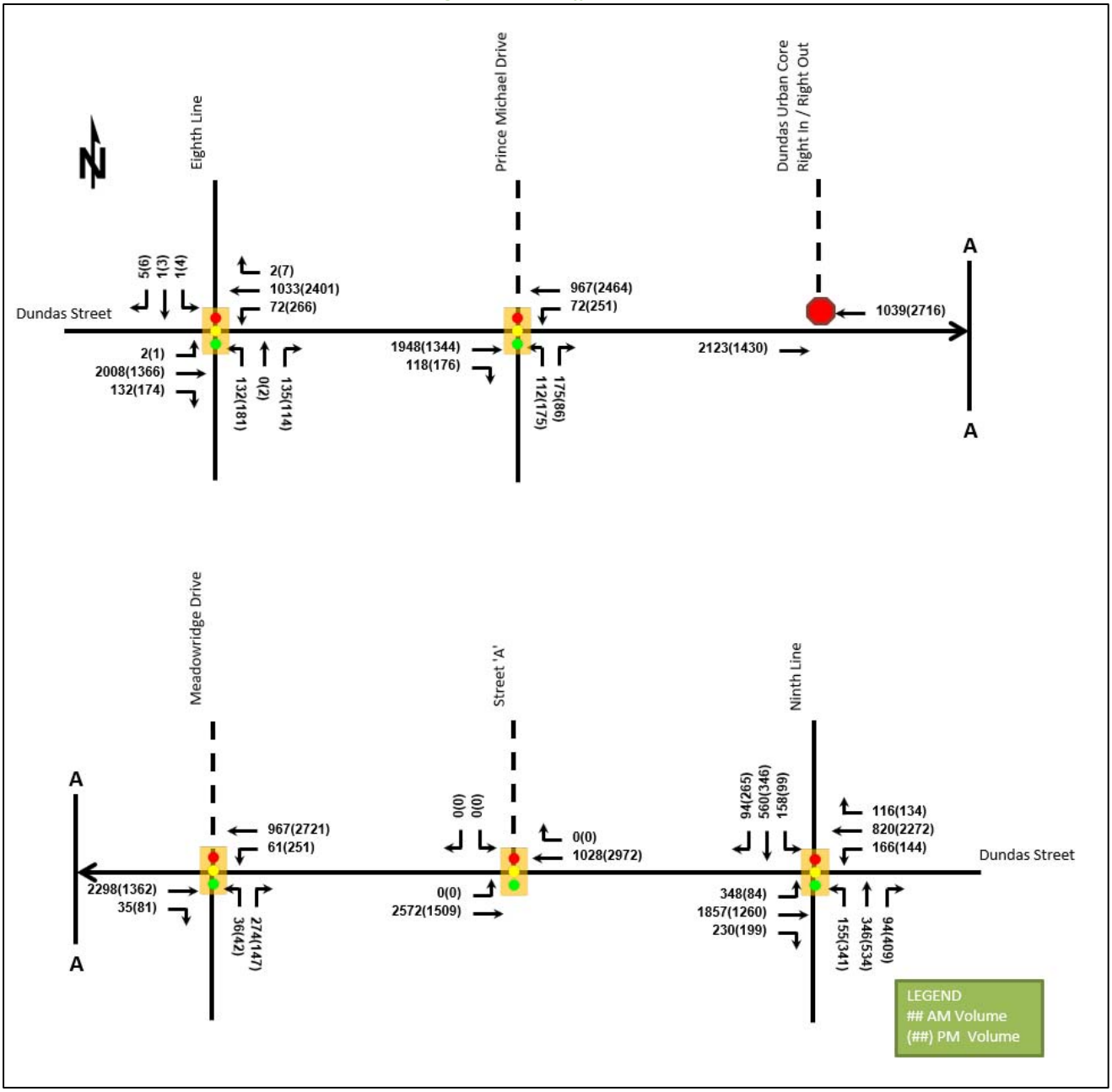
To understand the existing AM and PM peak hour traffic volumes turning movement counts for the Study Area intersections have been purchased from the Town of Oakville and the Region of Halton. Additionally, historical ATR counts along Dundas Street between Prince Michael Drive and Meadowridge Drive were requested from Halton Region Staff. Table 1 summarizes the date of the most recent turning movement count at each Study Area intersection as well as the ATR count records.

Table 1: Turning Movement Count Data Dates

Location	Count Date
Eighth Line at Dundas Street (TMC)	May 24, 2017
Prince Michael Drive at Dundas Street (TMC)	May 24, 2017
Meadowridge Drive at Dundas Street (TMC)	May 24, 2017
Ninth Line at Dundas Street (TMC)	May 24, 2017
ATR Count Dundas Street between Prince Michael Drive and Meadowridge Drive	June 14, 2018
	April 4, 2017
	April 15, 2015

The turning movement counts were undertaken in 2017, just less than two years prior to the study horizon of 2019. To reflect a 2019 horizon a compound annual growth rate has been applied to reflect growth outside of the Study Area. Using the ATR records a compound growth rate was calculated for growth between 2015 and 2018. A 1.20% compound annual growth rate (CAGR) was calculated. To ensure that a conservative estimate of the background growth is considered in this study, a 1.5% CAGR will be applied to the Study Area traffic volumes. Turning movement count and ATR data is included in Appendix C.

Figure 8: 2019 Traffic Volumes



3 Future Background Conditions

3.1 Planned Conditions

3.1.1 Dundas Street HOV / Transit Lanes

Dundas Street is currently a three-lane road in each direction, with all lanes operating as general-purpose traffic lanes with no vehicle restrictions. It has been indicated by Halton Region Staff that it is anticipated that by 2024 the outer traffic lane would be converted to a high occupancy vehicle (HOV) / transit lane, restricting single occupant vehicles from using this lane. The analysis will include a reduced lane utilization factor to account for this restriction.

3.1.2 Other Study Area Developments

Adjacent to Argo's Joshua Creek development are the Dunoak and Bressa developments. These developments will have direct connections between the properties via collector roads, as well as several local roads. As a result, the proposed development is closely tied to the adjacent developments. Therefore, the traffic generated by the adjacent developments will be included as background traffic growth.

In addition to the developments immediately adjacent to the subject development, the following nearby developments will be considered as part of the background traffic growth:

- Shieldbay Developments (Northeast quadrant of Dundas Street East at Postridge Road)
- Dundas Trafalgar Inc. (Northeast corner of Dundas Street and Trafalgar Road)

Each background development, and the traffic associated with it, has been summarized in the subsections below.

3.1.2.1 Dunoak and Bressa Developments

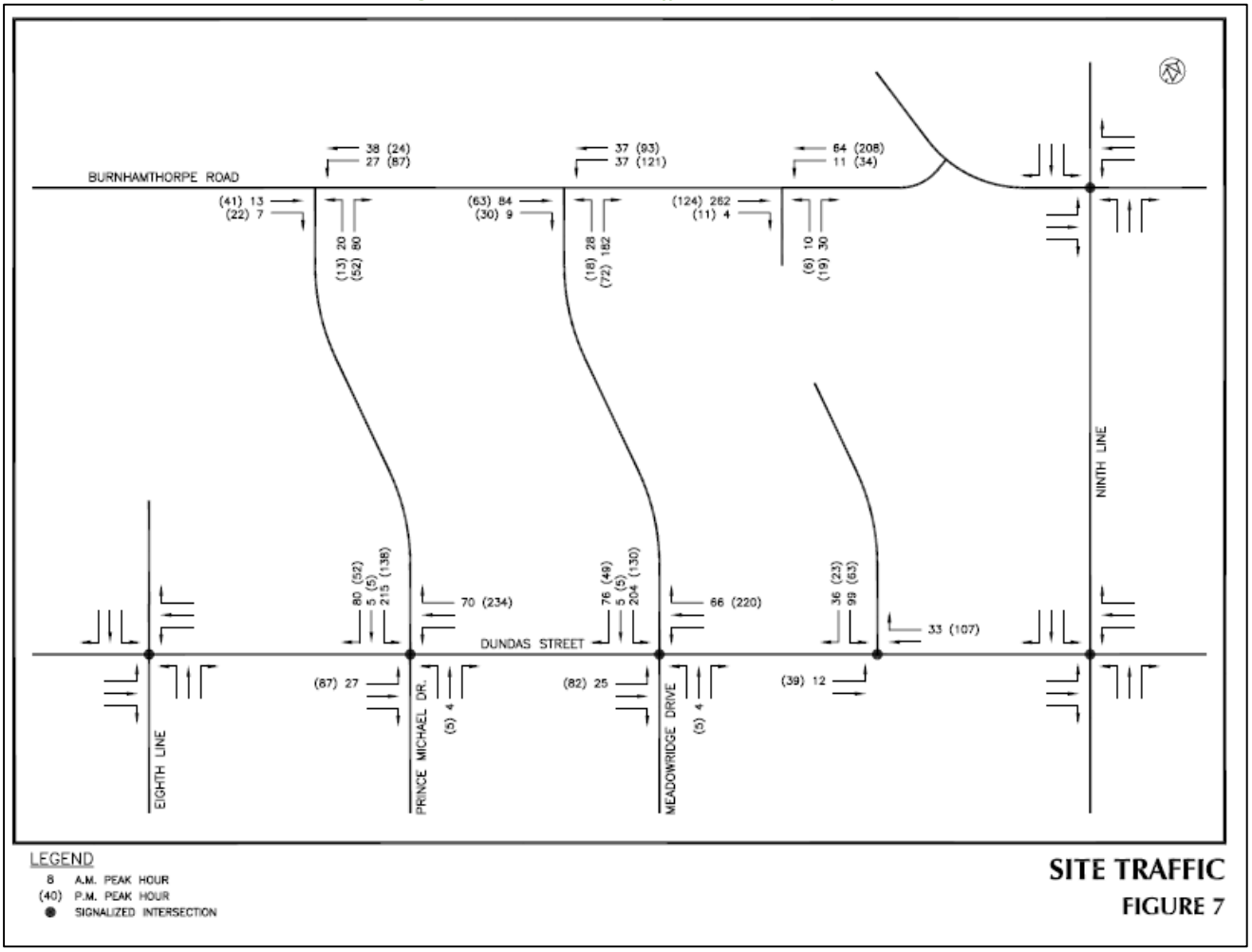
The Dunoak and Bressa developments abut the proposed development to the west and east, respectively. A traffic report was written to support those developments in August 2012. That report included the subject development as part of the overall development. However, as that study is six years old, a new traffic study is required. This study will use the previous study as a reference document to determine the traffic generated by the Dunoak and Bressa, as well as how that traffic is assigned to the Study Area Road Network. Figure 9 illustrates the combined area of the previous Joshua's Creek TIS. The previous study referred to the lands considered in this study as "Holdout".

Figure 9: Combined Draft Plan

Reference: Traffic Impact Study Joshua's Creek Lands North Oakville; Reed, Voorhees & Associates; August 2012

The previous study was examined to determine the background traffic generated by the developments immediately adjacent to the subject property. Figure 10 illustrates the site generated traffic from the previous study.

Figure 10: Site Generated Traffic - Previous Study



Reference: Traffic Impact Study Joshua's Creek Lands North Oakville; Reed, Voorhees & Associates; August 2012

The traffic projections illustrated above include traffic that was projected to be generated by the subject development. It is necessary to isolate the background development traffic. It is assumed that the subject lands will primarily use the Meadowridge Drive access. Using the land use assumptions of the previous study it was determined what percent of the total trip generation would be associated with the subject development. This calculation is summarized in Table 2.

Table 2: Holdout Traffic Percent

Category	Traffic Volumes
Background Units Total	2514
Holdout	500
Total	3014
Holdout (%)	17%

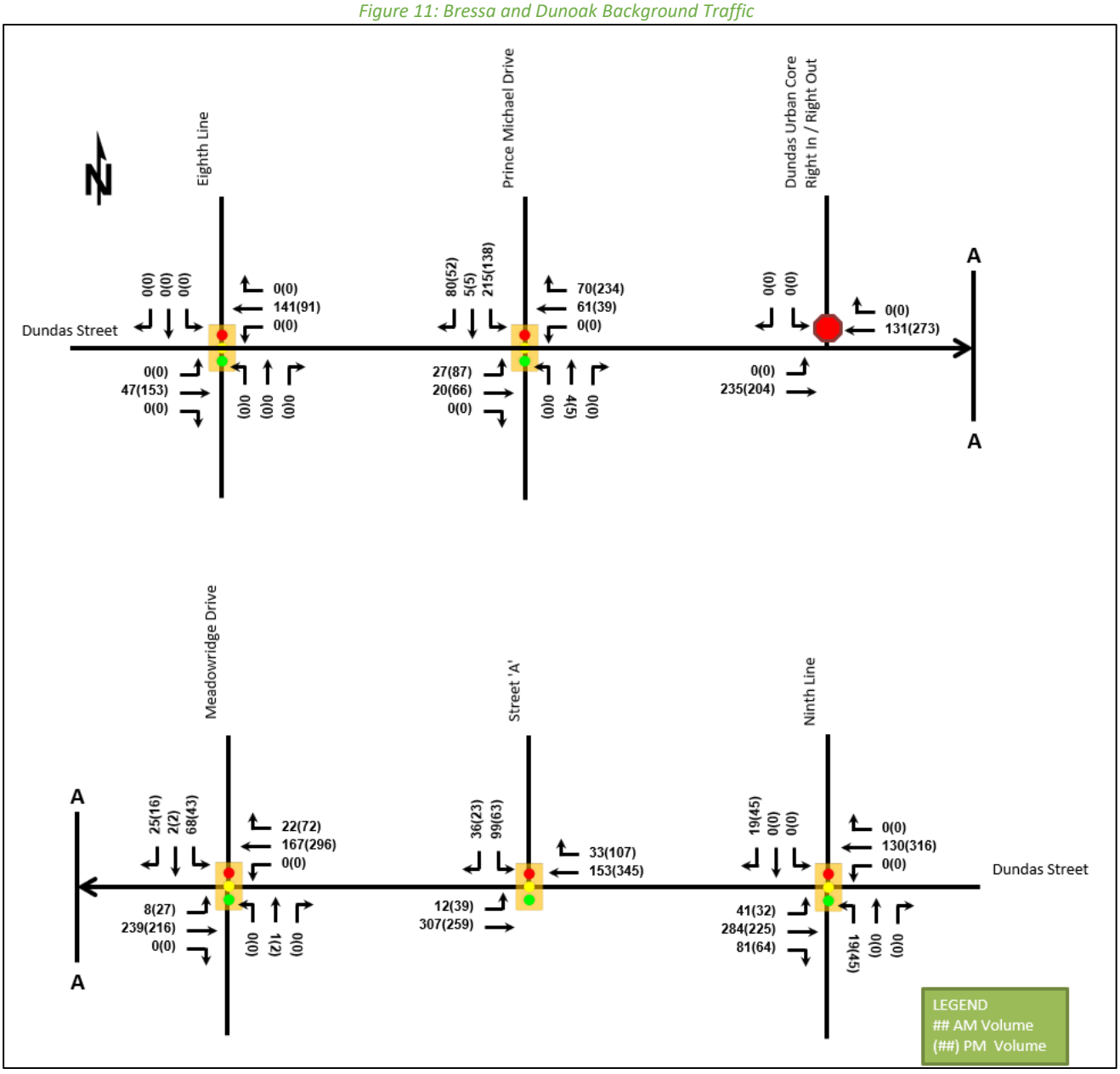
It was found that the Holdout comprised 17% of the total units, separating the Holdout from the rest of the development. Table 3 summarizes the calculation of trips generated by the Holdout and the number of total trips on the Meadowridge Drive access intersection.

Table 3: Trip Generation Reduction

	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
External Trips	375	1119	1219	725
Holdout (%)	17%	17%	17%	17%
Holdout (Trips)	64	190	207	123
Figure Trips	95	285	307	184
Remaining trips	31	95	100	61

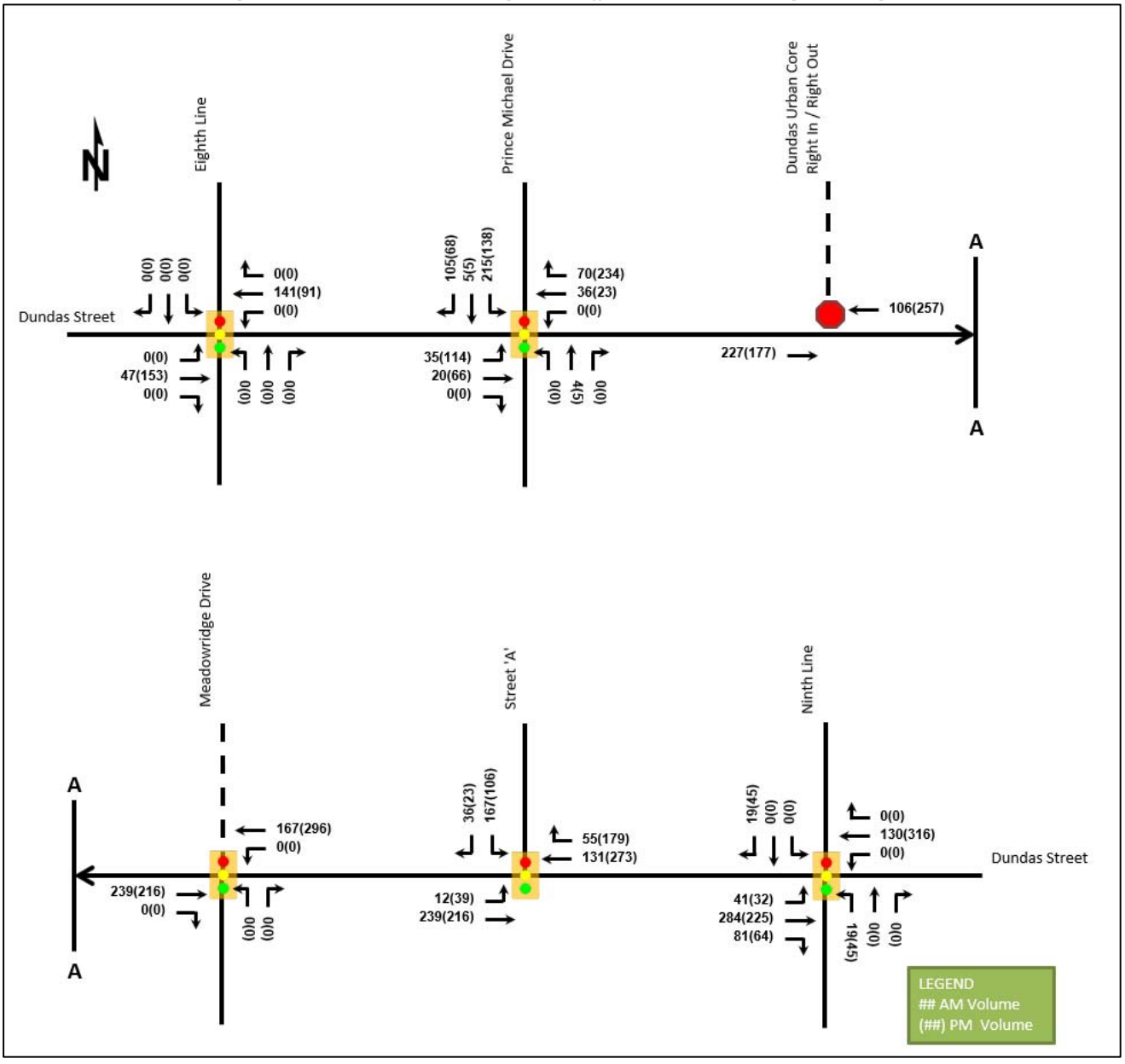
The remaining trips were then distributed to the turning movements proportionate to the amount of traffic on each movement in the previous study. Figure 11 illustrates the Bressa and Dunoak background traffic that will be included in the total future traffic horizon.

Figure 11: Bressa and Dunoak Background Traffic



Prior to the construction of the proposed development the north leg of Meadowridge Drive will not exist and therefore the traffic from Bressa and Dunoak will be distributed slightly differently. It has been assumed, for the purposes of this study, that the traffic from Meadowridge Drive will be split between Prince Michael Drive and Street "A".

Figure 12: Bressa and Dunoak Background Traffic (without Meadowridge north leg)



3.1.2.2 Shieldbay Development

West of the proposed development, at the northeast corner of Dundas Street East at Postridge Drive, is the Shieldbay Development. This development includes 520 residential units, 182 Dundas Urban Core units, and a school property. A TIS was prepared to support the Shieldbay Development. That TIS was reviewed to determine the trip generation. Figure 13 and Figure 14 illustrate the AM and PM peak hour traffic from the Shieldbay Development, at the intersection of Eighth Line at Dundas Street East.

Figure 13: Shieldbay TIS AM Peak Hour Traffic

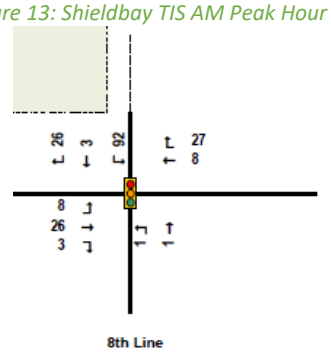
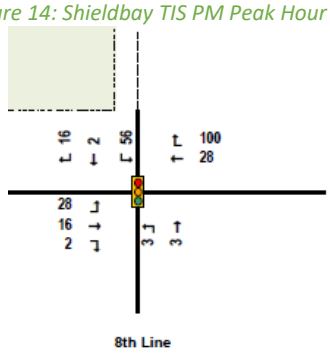


Figure 14: Shieldbay TIS PM Peak Hour Traffic

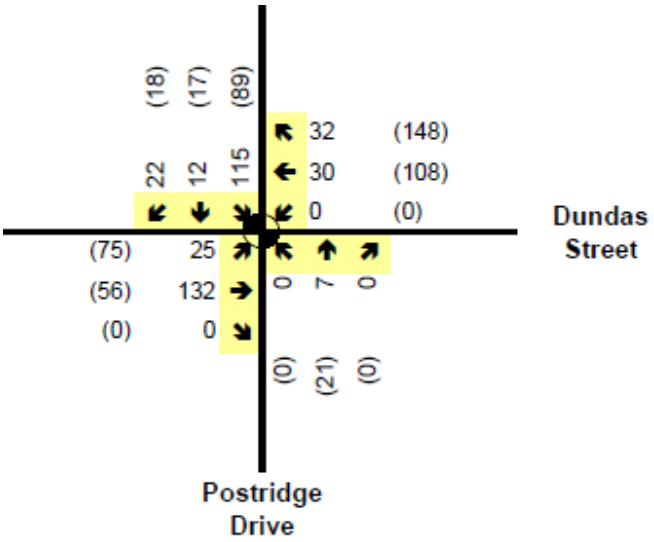


Reference: Transportation Impact Study Shieldbay Developments Inc. Town of Oakville; URS Canada Inc.; November 2013

3.1.2.3 Dundas Trafalgar Development

West of the proposed development, at the northeast corner of Dundas Street East at Trafalgar Road, is the Dundas Trafalgar Development. This development includes approximately 2,000 residential units and a 0.859-hectare commercial block. A TIS was prepared to support this development. That TIS was reviewed to determine the trip generation. Figure 15 illustrates the AM and PM peak hour traffic from the Dundas Trafalgar Development.

Figure 15:Dundas Trafalgar TIA AM and PM Peak Hour Traffic



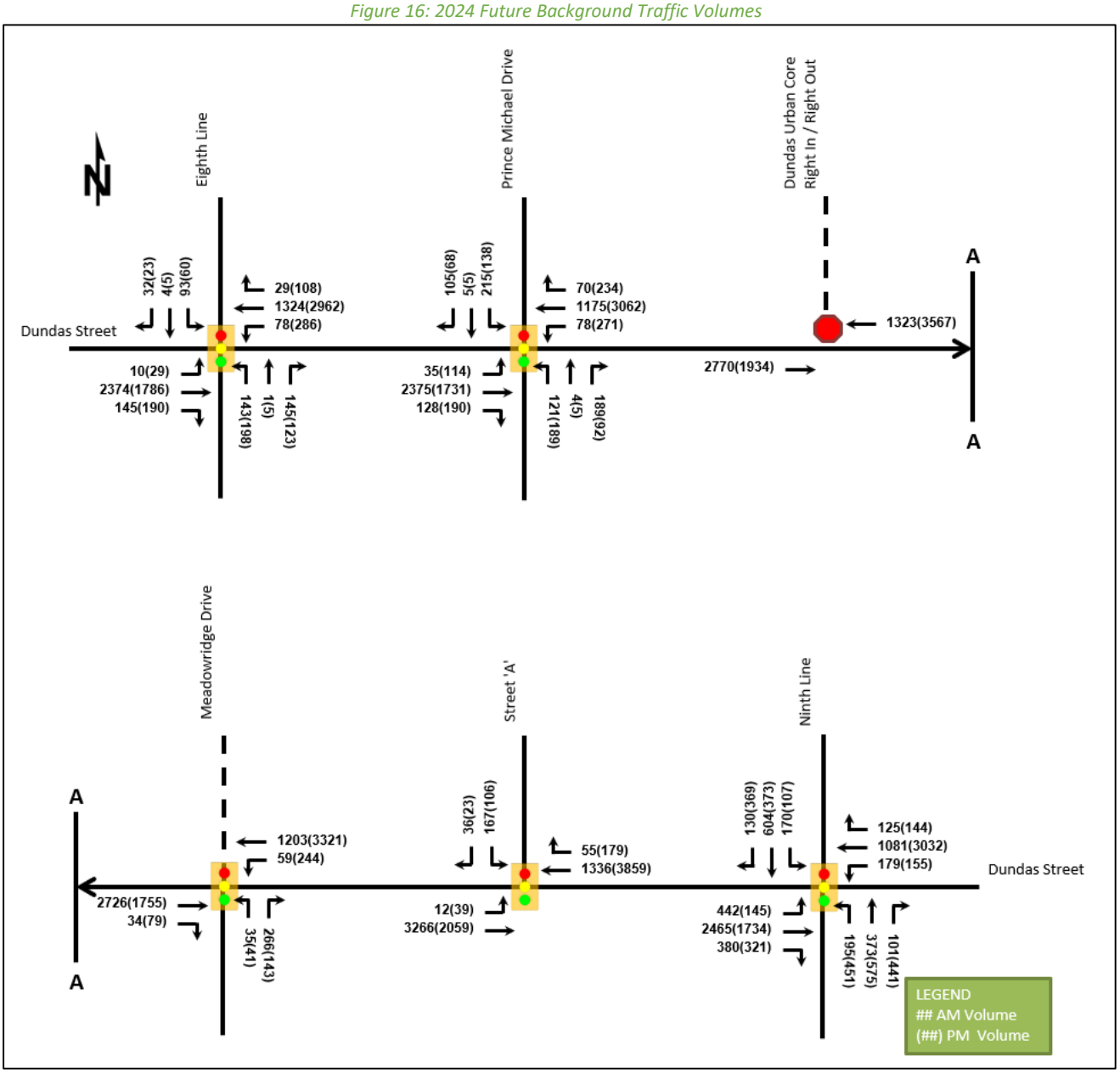
3.1.3 Background Growth

As discussed in Section 2.5 historical traffic counts have been reviewed to determine the historical growth rate. A 1.5% compound annual growth rate was selected.

3.1.4 Future Background Traffic Volumes

Combining the background development traffic, the background growth rate, and the existing traffic volumes, the future background traffic volumes were projected. Figure 16 illustrates the 2024 future background traffic volumes.

Figure 16: 2024 Future Background Traffic Volumes



4 Forecasting

4.1 Development-Generated Travel Demand

4.1.1 Trip Generation and Mode Shares

The ITE Trip Generation Manual 10th Edition has been reviewed to determine the appropriate trip generation rate equations for the proposed land uses. The rate equations were used to determine appropriate vehicle trip generation rates. The Multifamily Housing (Low-Rise) is used to estimate trips for townhouses and semi-detached housing and the Multifamily Housing (Mid-Rise) is used to estimate trips for the Dundas Urban Core. To estimate person trip generation the calculated vehicle trip generation rates were multiplied by a factor of 1.28. Table 4 summarizes the person trip rates for the proposed land uses.

Table 4: TRANS Trip Generation Person Trip Rates

Dwelling Type	Unit Count	ITE LUC	Peak Hour	Vehicle Trip Rate	Person Trip Rates
Single Family Detached	222	210	AM	0.73	0.93
			PM	0.98	1.25
Multifamily Housing (Low-Rise)	378	220	AM	0.45	0.58
			PM	0.51	0.65
Multifamily Housing (Mid-Rise)	400	221	AM	0.33	0.42
			PM	0.51	0.65

LUC – Land Use Code

Using the above Person Trip rates, the total person trip generation for the Joshua Creek Development has been estimated and is summarized in Table 5. No synergy or pass-by trip reduction factors have been applied to the trip generation.

Table 5: Total Person Trip Generation

Land Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Low-rise Development	101	324	425	330	194	524
Dundas Urban Core	39	129	168	164	96	260
Total Person Trips	**140**	**453**	**593**	**494**	**290**	**784**

Mode share information has been provided by Halton Region Staff for 2026, these have been assumed to apply to the 2024 horizon. The mode shares are summarized in Table 6.

Table 6: Mode Share Assumptions

Travel Mode	2024 Mode Share
Auto Driver	65%
Auto Passenger	15%
Transit	15%
Non-Auto	5%
Total	100%

Using the above mode shares and person trip rates, the person trips by mode have been projected. Table 7 summarizes the 2024 trip generation by mode.

Table 7: 2024 Trip Generation by Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Auto Driver	65%	86	279	366	305	180	485
Auto Passenger	15%	22	67	89	74	43	118
Transit	15%	22	67	89	74	43	118
Non-Auto Modes	5%	12	38	49	41	24	65
Total	**100%**	140	453	593	494	290	784

As shown above, 593 AM and 784 PM peak hour two-way person trips are projected as a result of the proposed development.

4.1.2 Trip Distribution

To understand the travel patterns of the subject development the Travel Tomorrow Survey (TTS) has been reviewed to determine the existing travel patterns for Oakville. Table 8 below summarizes the distribution.

Table 8: OD Survey Existing Mode Share – Oakville

To/From	Percent of Trips
North	15%
South	35%
East	20%
West	30%
Total	100%

4.1.3 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the Study Area road network. The 2024 site generated traffic volumes for the developments is summarized in Figure 17.

4.1.4 Future Total Travel Demands

The site generated traffic has been combined with the 2024 future background traffic volumes to estimate the future total traffic volumes. Figure 18 illustrates the 2024 total future traffic volumes.

Figure 17: 2024 Traffic Assignment

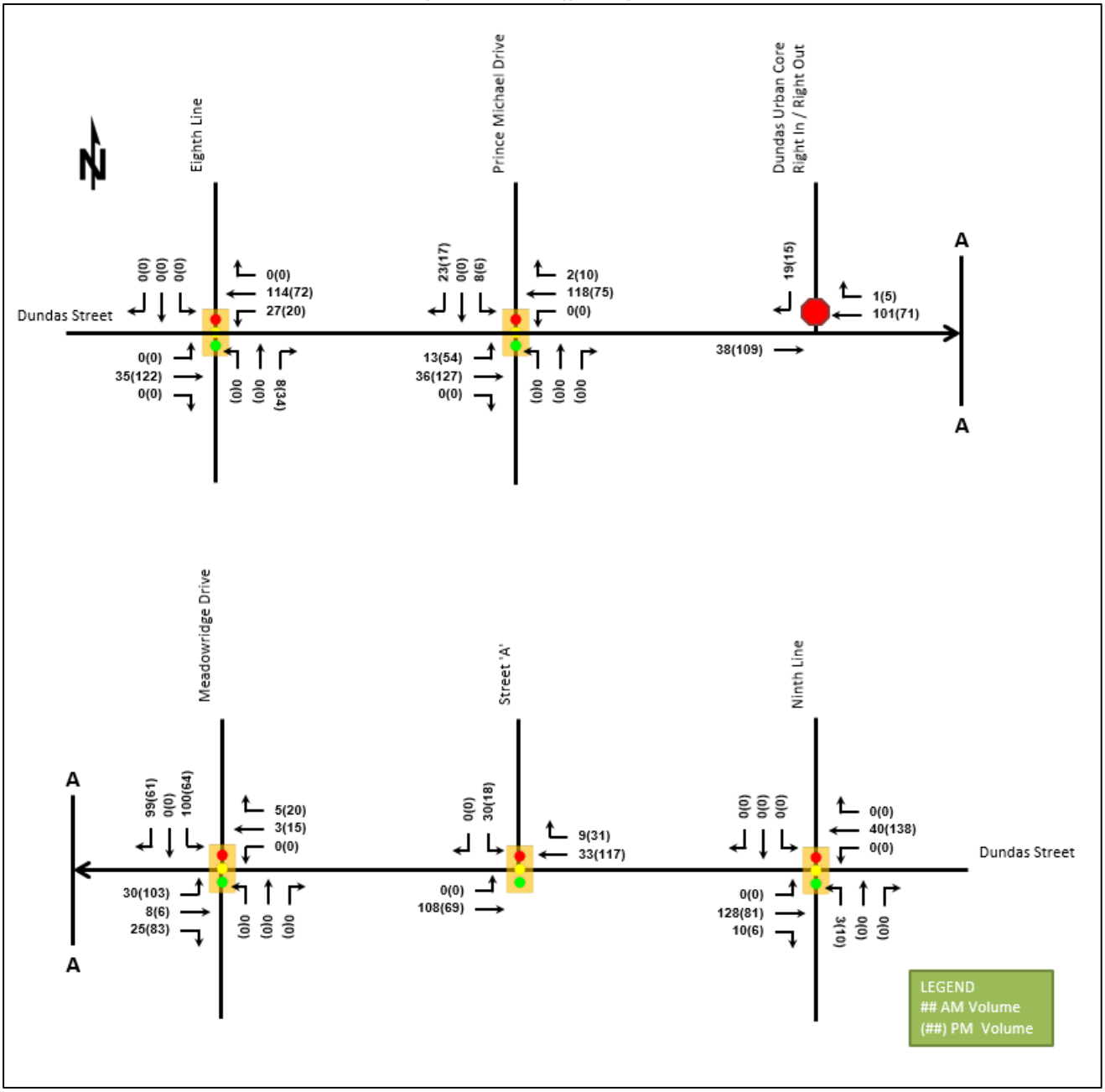
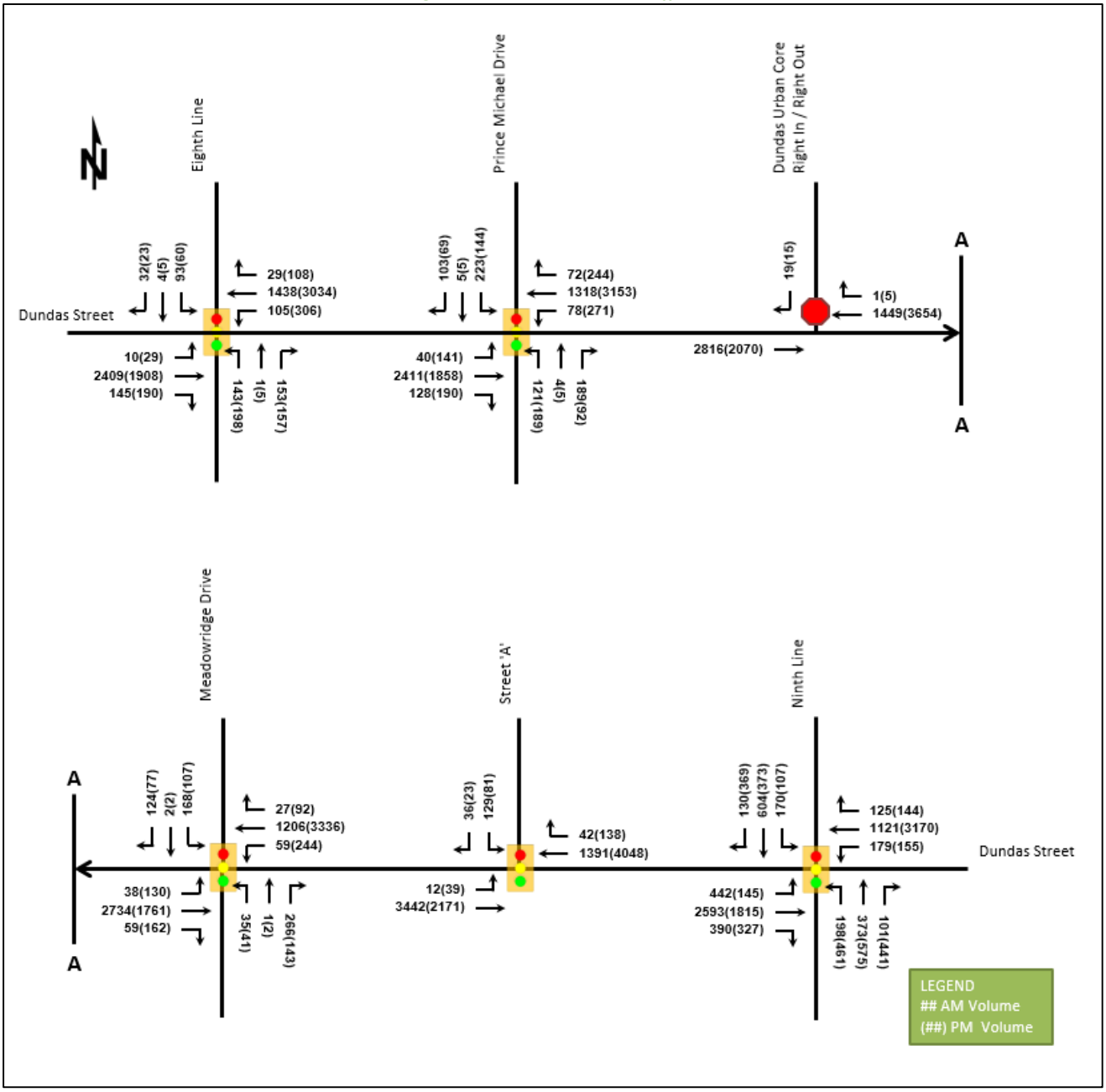


Figure 18: 2024 Future Total Traffic



5 Operational Analysis

To understand the operational characteristics of the Study Area intersections, a Synchro model has been created using Trafficware's Synchro (Version 10). The Synchro model has been coded using the existing traffic signal timing, provided by Halton Region. Peak Hour factors have been calculated based on the existing turning movement counts. All other parameters have been coded using accepted best practices and default parameters where applicable.

LOS has been defined using HCM 2010 definition for LOS at signalized intersections (Table 9) and unsignalized intersections (Table 10).

Table 9: Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (Seconds/Vehicle)
A	≤10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	>80

Table 10: Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (Second/Vehicle)
A	0 – 10
B	>10 – 25
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	>50

5.1 2019 Existing Conditions

Table 11 summarizes the operational analysis of the 2019 existing conditions. The tables summarize the critical movements, which for the purposes of this TIS are defined as movements with a volume to capacity (v/c) ratio greater than 0.90 or a level of service (LOS) F. Where no critical movements are projected the worst movement will be included for all intersections. At signalized intersections the overall LOS and delay will be included. All other movements have been excluded from the summaries. Synchro worksheets are included as Appendix D.

Table 11: 2019 Existing Conditions Operational Analysis

Intersection	Mvmnt	AM Peak Hour			PM Peak Hour		
		LOS	V/C	Del (s)	LOS	V/C	Del. (s)
Eighth Line & Dundas Street (Signalized)	Overall	B	-	11	B	-	10
Prince Michael Drive & Dundas Street (Signalized)	WBL	C	0.44	31	E	0.97	58
	Overall	B	-	11	C	-	20
Meadowridge Drive & Dundas Street	Overall	B	-	13	A	-	7
Ninth Line & Dundas Street (Signalized)	WBL	F	1.04	109	B	0.58	19
	WBT	B	0.32	16	C	0.89	31
	NBL	F	1.63	356	F	1.35	214
	SBL	F	0.86	81	E	1.68	65
	Overall	C	-	32	D	-	45
	Mitigation Measures: AM Peak Hour – Northbound Permissive/Protected Left Phase added. Signal timing splits optimized. PM Peak Hour – Signal timing splits optimized.						
	NBL	D	0.76	52	F	1.13	124
	Overall	C	-	33	D	-	45

The above table summarizes the intersection operational analysis of the 2019 projected volumes. Generally, the study area intersections are operating with good overall LOS and low delays. The exception to this is the signalized intersection of Ninth Line and Dundas Street. This is an intersection of two busy Arterial Regional Roads and as a result this intersection has several movements that are operating with long delays and V/C ratios greater than 1.0. To mitigate the projected deficiencies mitigation measures have been tested. During the AM peak hour, a permissive / protected left turn phase was added and the signal timing splits were optimized in both peak hours. This improved the operation of all movements of the intersection, with only the northbound left turn still operating with a projected v/c ratio greater than 1.0, and high delays. Given the high volume of traffic volume travelling on both Dundas Street and Ninth Line some delays on turning movements are not unexpected.

5.2 2024 Future Background Conditions

The 2024 future background conditions have been examined to determine the future traffic conditions without the addition of the proposed development. This will isolate the impact of the subject development on the traffic network. Table 12 summarizes the operational analysis of 2024 future background conditions. All mitigation measures previously discussed have been carried forward for the analysis of future background conditions. By 2024 it is anticipated that the outer lane of Dundas Street will be converted to an HOV / Transit lane. To reflect this, as instructed by Region Staff, a lane utilization factor of 0.80 has been used to estimate the impact of this reduction in east-west vehicle capacity along Dundas Street. Synchro worksheets have been included in Appendix E.

Table 12: 2024 Future Background Conditions Operational Analysis

Intersection	Mvmnt	AM Peak Hour			PM Peak Hour		
		LOS	V/C	Del (s)	LOS	V/C	Del. (s)
Eighth Line & Dundas Street (Signalized)	WBT	B	0.42	18	D	1.02	37
	Overall	B	-	15	D	-	35
Prince Michael Drive & Dundas Street (Signalized)	EBL	B	0.24	11	E	0.90	73
	EBT	E	1.11	76	E	0.83	59
	WBL	C	0.48	30	D	0.90	55
	WBT	B	0.48	13	F	1.21	125
	Overall	A	-	9	E	-	71
Meadowridge Drive & Dundas Street (Signalized)	EBT	B	0.98	16	C	0.57	29
	Overall	C	-	34	A	-	2
Dundas Street & Street 'A' (Signalized)	EBT	D	1.03	46	A	0.57	5
	WBT	A	0.42	5	D	1.07	53
	Overall	D	-	50	C	-	34
Ninth Line & Dundas Street (Signalized)	EBL	E	1.00	76	E	0.87	64
	EBT	F	1.23	136	C	0.80	32
	WBL	F	1.07	117	D	0.79	50
	WBT	D	0.82	44	F	1.36	192
	NBL	F	1.09	125	F	1.45	248
	Overall	F	-	87	F	-	124

With the addition of 1.5% of background traffic growth as well as the nearby background development traffic, the Study Area intersections are experiencing operational constraints, particularly along the Dundas Street corridor.

Along Dundas Street a 1.5% compound annual growth rate has been applied. As there are already quite large traffic volumes traveling along this road, a compound growth rate will accelerate the growth quite rapidly, leading to capacity constraints. This level of growth is unlikely to be realized along this corridor as the parallel corridor of William Halton Parkway will be complete by 2024 and it is anticipated that east-west traffic will divert to that facility, reducing the traffic load on Dundas Street. This will also improve the operations of the intersection of Ninth Line and Dundas Street, which is projected to operate with worse operational parameters than existing conditions. Further exacerbating the east-west capacity issues is the conversion of one lane each way on Dundas Street from a general travel lane to an HOV / Transit lane. Generally, the turning movements into the adjacent developments operate within permissible operational thresholds and with low delays.

5.3 2024 Future Total Conditions

The analysis parameters used to analyze the 2024 future background conditions have been carried forward as part of the analysis of 2024 total future conditions. Table 13 summarizes the results of the Synchro Analysis. Synchro worksheets have been included in Appendix F.

Table 13: 2024 Total Future Conditions Operational Analysis

Intersection	Mvmnt	AM Peak Hour			PM Peak Hour		
		LOS	V/C	Del (s)	LOS	V/C	Del. (s)
Eighth Line & Dundas Street (Signalized)	WBT	B	0.45	19	D	1.07	49
	Overall	B	-	15	D	-	40
Prince Michael Drive & Dundas Street (Signalized)	EBL	B	0.35	14	F	1.11	122
	EBT	F	1.12	82	E	0.89	60
	WBL	C	0.48	27	E	0.90	58
	WBT	B	0.53	12	F	1.25	141
	Overall	A	-	6	F	-	109
Dundas Urban Core Access (Right In/Right Out Only)	SBR	C	0.07	19	F	0.37	126
Meadowridge Drive & Dundas Street (Signalized)	EBT	C	1.01	23	C	0.64	26
	WBT	A	0.40	8	F	1.08	63
	Overall	C	-	24	C	-	22
Dundas Street & Street 'A' (Signalized)	EBT	E	1.13	75	A	0.63	2
	WBT	A	0.46	7	F	1.17	98
	Overall	D	-	47	E	-	61
Ninth Line & Dundas Street (Signalized)	EBL	E	1.00	76	E	0.87	64
	EBT	F	1.29	163	C	0.84	34
	WBL	F	1.07	117	D	0.79	50
	WBT	D	0.85	45	F	1.42	219
	NBL	F	1.11	130	F	1.48	261
	Overall	F	-	99	F	-	137

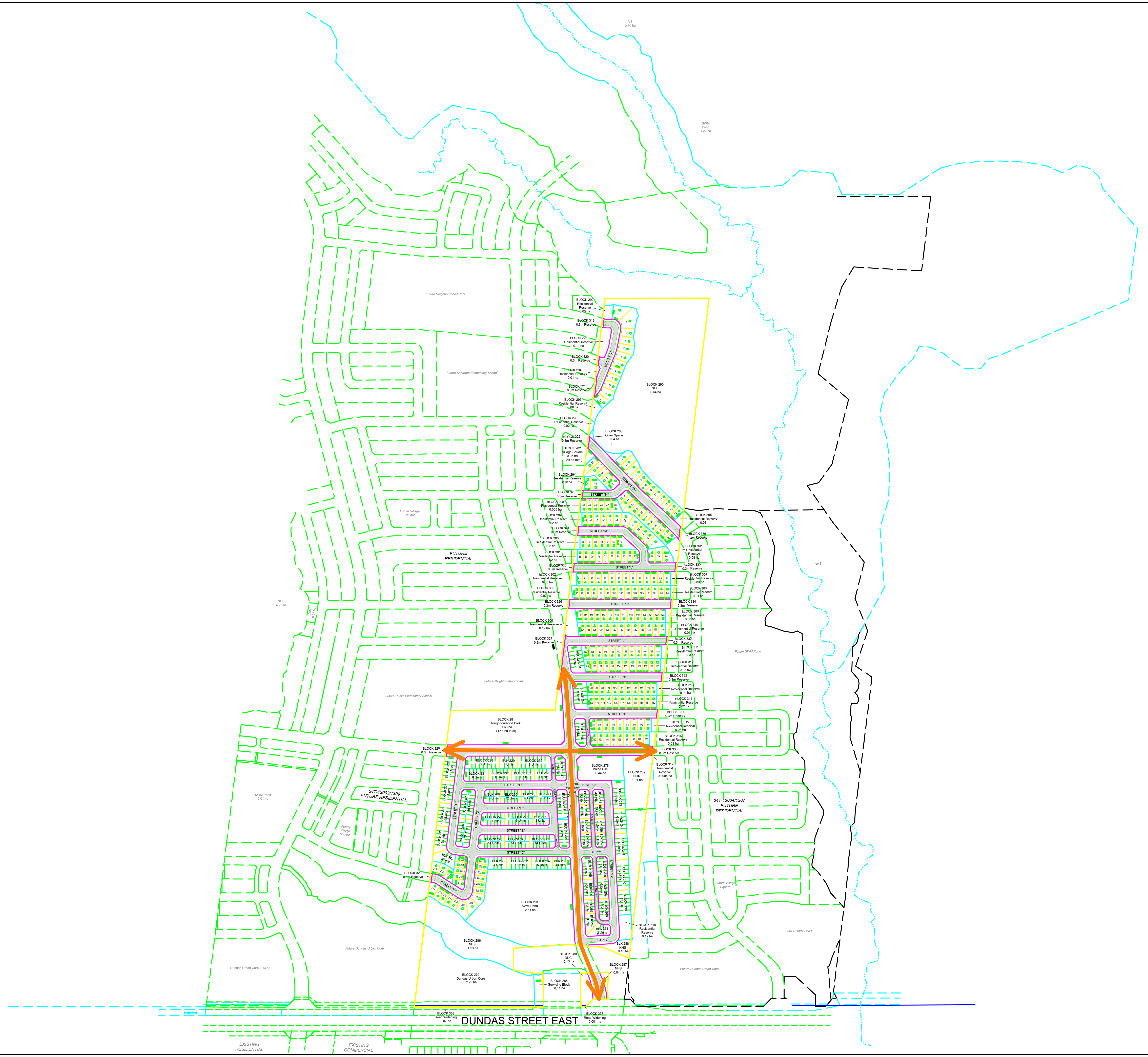
The projected 2024 total future conditions are similar to those projected for 2024 future background conditions, the east-west through volumes on Dundas Street are projected to operate over capacity.

At the main access to the proposed development, the future north leg of Meadowridge Drive & Dundas Street, the addition of the north leg changes the signal phasing, allowing less time for the east-west through movements decreasing the LOS. As discussed previously the future William Halton Parkway corridor will reduce the traffic load on Dundas Street alleviating the projected capacity constraints.

At the proposed right in / right out only access to the Dundas Urban Core property the southbound, outbound right is projected to operate with LOS F, and very high delays. This movement, in the PM peak hour, is projected to carry 19 vehicles. The high delay is caused by the large number of westbound vehicles on Dundas Street in the PM peak hour. As the DUC block will also have access to the nearby signalized intersections of Prince Michael Drive and Meadowridge Drive there are alternate routes for residents of the Dundas Urban Core block to access Dundas Street. Therefore, the projected delays are likely overestimated as commuters will naturally gravitate towards faster paths.

6 Transportation Demand Management Recommendations

The proposed developments are residential units with a mix of unit types including primarily detached single family homes and townhouse or semi-detached units. In these types of development one of the most effective Transportation Demand Management (TDM) measures are access and usability of transit, cycling, and pedestrian facilities. To this end the following plans have been created to illustrate the appropriate cycling (Figure 19), transit (Figure 20), and pedestrian (Figure 21) facilities. A transit stop has been assumed in the adjacent property to ensure adequate transit coverage. This should be confirmed by the TIS for the adjacent properties. Appendix G includes an on-street parking analysis and pedestrian circulation / transit facilities plan by Korsiak Planning.



Notes:

LEGEND:

Signed Route

A	description	by	xx/xx/xx
REV:	**DESCRIPTION:**	**BY:**	**DATE:**

STATUS: status

CGH Transportation
628 Haines Road
Newmarket, ON
L3Y 6V5
(905) 251-4070

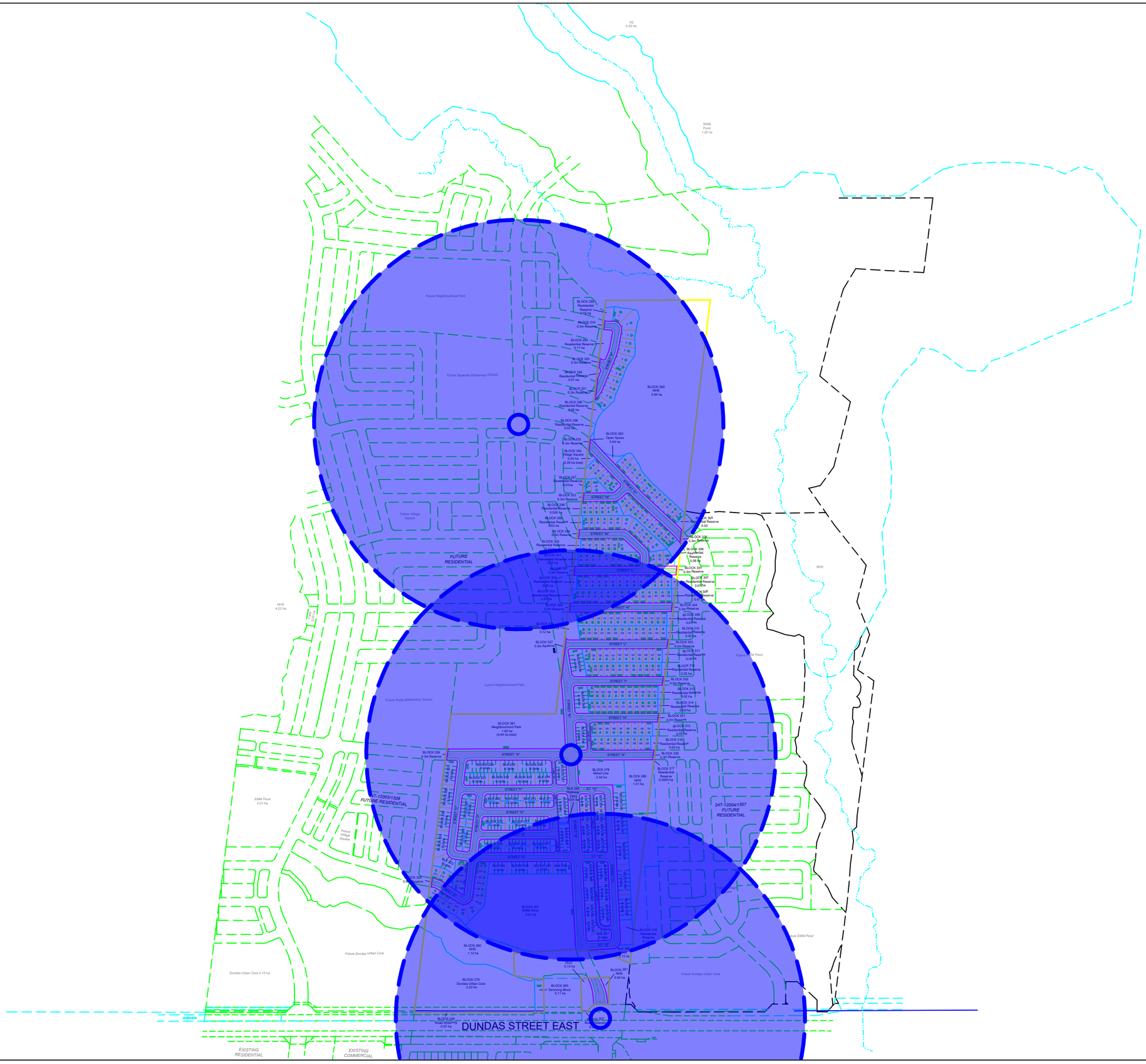
CLIENT: Argo Land

ARCHITECT:

SITE: Joshua Creek

TITLE: Cycling Facilities Concept Plan

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2019-03-22	MC	
PROJECT NO:	**DRAWING NO:**		**REVISION:**
2018-56	019		



Notes:

LEGEND:

400m Transit Walking Distance

REV:	DESCRIPTION:	BY:	DATE:
A	description	by	xx/xx/xx

STATUS: status

CGH Transportation
628 Haines Road
Newmarket, ON
L3Y 6V5
(905) 251-4070

CLIENT: Argo Land

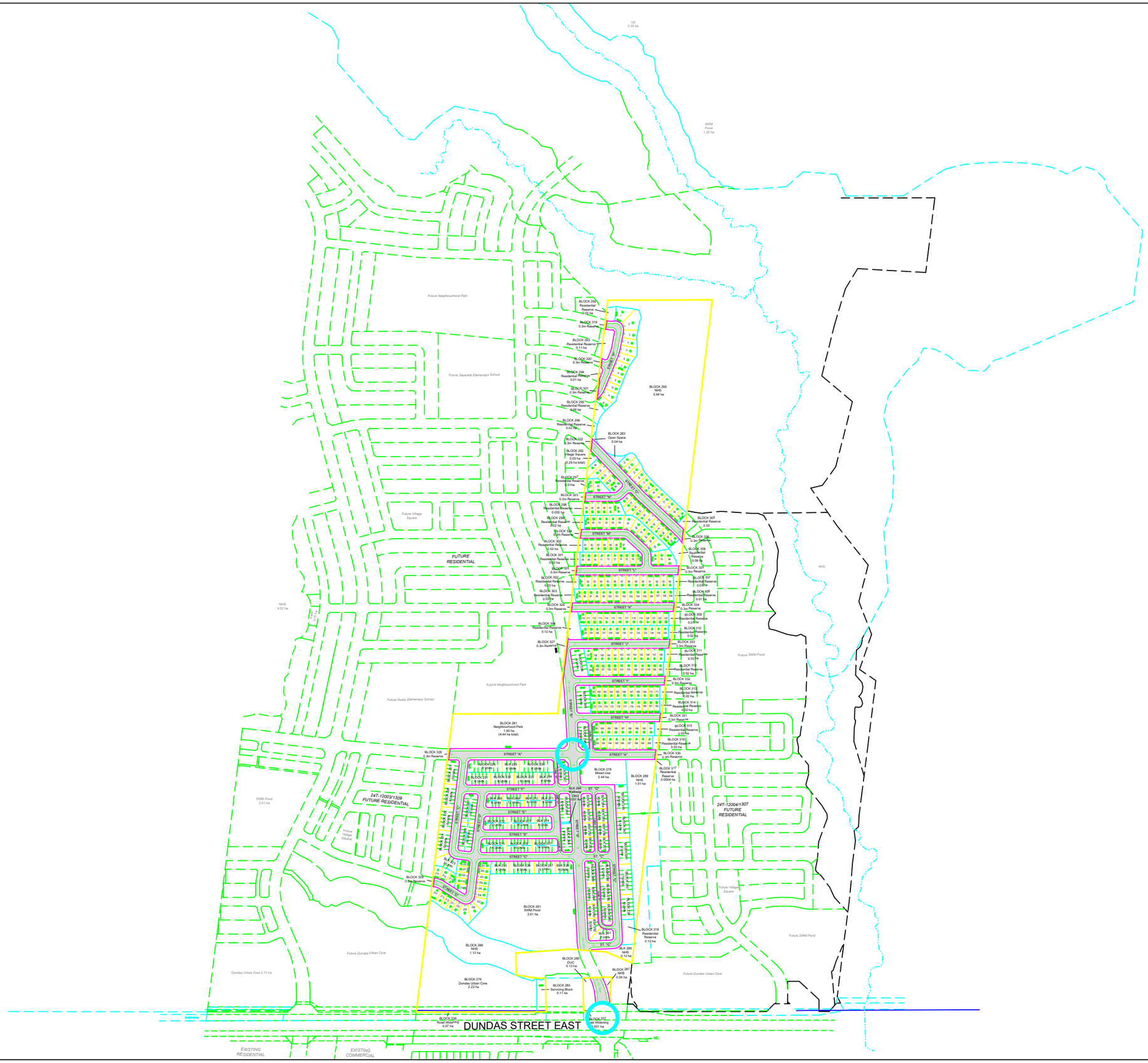
ARCHITECT:

SITE: Joshua Creek

TITLE: Transit Facilities Concept Plan

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2019-03-22	MC	

PROJECT NO:	DRAWING NO:	REVISION:
2018-56	020	



Notes:

LEGEND:

Key Pedestrian Crossing Locations

REV:	DESCRIPTION:	BY:	DATE:
A	description	by	xx/xx/xx

STATUS: status

CGH Transportation
628 Haines Road
Newmarket, ON
L3Y 6V5
(905) 251-4070

CLIENT: Argo Land

ARCHITECT:

SITE: Joshua Creek

TITLE: Transit Facilities Concept Plan

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2019-03-22	MC	

PROJECT NO:	DRAWING NO:	REVISION:
2018-56	021	

7 Recommendations

The proposed development will fit into the existing road network, with the signalized intersections that provide access already being constructed with turning lanes into the proposed developments. No further geometric modifications are required to the signalized access intersection of Meadowridge Drive at Dundas Street. The north leg should be constructed to match the opposing south leg and should include 65 metres of storage on the auxiliary left turn lane to accommodate the projected queueing on this leg.

The right in / right out only access should be located such that it does not interfere with the westbound bus bay and taper at the intersection of Meadowridge Drive and Dundas Street. The right turn in will provide access for approximately 1 AM peak hour and 5 PM peak hour trips. Therefore, it is anticipated that no auxiliary right turn lane will be required to support the minimal inbound traffic volumes.

8 Conclusions

This Transportation Impact Study has examined the trip generation, access requirements, and Study Area road network impact of the proposed Joshua Creek residential development. The TIS has shown the following:

a) The development, referred to as Joshua Creek, will include 222 single detached homes, 378 townhouses, and 400 mid-rise units.
b) The proposed development will have two accesses directly onto Dundas Street, one signalized intersection at Meadowridge Drive and Dundas Street, and a right in / right out only access to the Dundas Urban Core portion of the property. Additionally, the adjacent developments will be connected by internal local and collector streets.
c) Using the Town of Oakville's Development Application search tool, it was found that the adjacent developments of Dunoak and Bressa, with direct connections between the developments, should be considered a background development. In addition to those developments the Region requested that the Shieldbay and Dundas Trafalgar developments be included in the traffic projections.
d) Historical turning movement counts and ATRs have been reviewed to determine what the approximate background growth rate is, from growth beyond the Study Area. Reviewing the ATR counts for Dundas Street within the Study Area, it was found that a CAGR of 1.2% has been observed historically. As a conservative estimate of traffic growth, a 1.5% growth rate was applied to the Study Area traffic volumes.
e) To estimate the impact of the subject development on the Study Area a person trip generation exercise has been undertaken. The subject development is anticipated to generate 593 AM and 784 PM peak hour person trips.
f) Using the existing traffic volumes, projected to 2019, an operation analysis of existing conditions was undertaken. Through this analysis it was determined that the study area intersections generally operate within acceptable operational thresholds. The intersection of Ninth Line and Dundas Street was analysed with signal timing and phasing adjustments which were found to improve the LOS of the critical movements.
g) The 2024 future background traffic volumes, including background growth and the nearby background developments were analysed. It was found that the turning movements generally operated with reasonable LOS and delay, but due to the large increase in traffic eastbound and westbound along Dundas Street, the eastbound and westbound through volumes would exceed the theoretical capacity of the intersections. This was further exacerbated by the future conversion of the outside lane on Dundas Street from a standard travel lane to an HOV / transit lane. The analysis herein has not accounted for a diversion of traffic that is likely to occur as a result of the opening of the William Halton Parkway, an arterial road north of and parallel to Dundas Street. This future road will provide an alternate route for traffic travelling east-west through North Oakville, relieving congestion along Dundas Street.

h) With the addition of site traffic volumes to the Study Area intersections the intersections operate with slightly worse LOS and higher delays. Generally, these are minor and do not cause additional critical movements. At the intersection of Meadowridge Drive at Dundas Street, the high volume of east-west traffic causes this intersection to be sensitive to changes. The addition of the site traffic causes this intersection to operate with high delays on the eastbound and westbound through movements. It is anticipated that the William Halton Parkway corridor will draw some traffic demand from Dundas Street, reducing congestion on the through movements at all of the Study Area intersections. Additionally, with the provision of an HOV / Transit lane there should be an increase in the number of commuters using transit and carpooling, further reducing vehicle traffic demand, which would decrease the delay at the Study Area intersections.

i) TDM measures are implemented to encourage commuters to shift away from single occupant vehicle trips. For a development of the type proposed for Joshua Creek, primarily low-density residential units, the most effective measures are access and usability of transit, cycling and transit facilities. To ensure that the proposed developments are appropriately served by transit, cycling, and pedestrian facilities, concept plans have been prepared.

The Joshua Creek development will have a minor impact on the Study Area road network. The proposed accesses will operate with reasonable LOS and delays on the turning movements into and out of the site. The concept plan prepared will provide a good pedestrian and cycling network along with good access to transit throughout the development. It is recommended that, from a transportation perspective, the proposed development application proceed.

Prepared By:

Mark Crockford, P. Eng.
905-251-4070
Mark.Crockford@CGHTransportation.com

Reviewed By:

Christopher Gordon, P. Eng.
343-999-9117
Christopher.Gordon@CGHTransportation.com

Appendix A

Scope Confirmation

Mark Crockford

From: Asadullah Yousfani <asad.yousfani@oakville.ca>
Sent: February 13, 2019 2:22 PM
To: Mark Crockford
Subject: RE: Joshua Creek TIS Scope - Region and Town Comments Consolidated

Hi Mark,

I'm ok with the following consolidated scope.

Thanks-ASAD

Asadullah Yousfani, M.Eng., P. Eng. PMP
Transportation Engineer
Engineering & Construction
Town of Oakville | 905-845-6601, ext.3236 | www.oakville.ca

Complete our Community Development customer service survey

Canada's Best Place to Live (MoneySense 2018)

From: Mark Crockford [mailto:mark.crockford@cghtransportation.com]
Sent: Wednesday, February 13, 2019 11:10 AM
To: Asadullah Yousfani <asad.yousfani@oakville.ca>
Subject: FW: Joshua Creek TIS Scope - Region and Town Comments Consolidated

Hi Asad,

Just wanted to confirm that you are OK with the consolidated scope that I prepared combining your comments and the Region's comments.

Thanks!
Mark

Mark Crockford, P.Eng.
CGH Transportation Inc.
P:905-251-4070
E:Mark.Crockford@CGHTransportation.com

From: Scattolon, Walter <Walter.Scattolon@halton.ca>
Sent: February 8, 2019 5:10 PM
To: Mark Crockford <mark.crockford@cghtransportation.com>
Cc: Natywary, Laurielle <Laurielle.Natywary@halton.ca>; Krusto, Matt <Matt.Krusto@halton.ca>; Larkin, Ann <Ann.Larkin@halton.ca>; Asadullah Yousfani <asad.yousfani@oakville.ca>; Christopher Gordon <christopher.gordon@cghtransportation.com>
Subject: RE: Joshua Creek TIS Scope - Region and Town Comments Consolidated

Hello Mark,

Thank you for contacting Transportation Planning to finalize the proposed Terms of Reference for the above noted TIS.

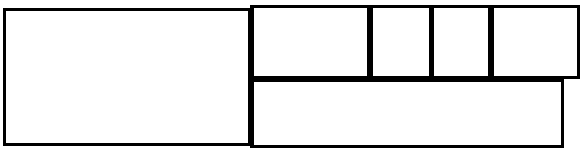
The updated scope you have provided below is acceptable and addresses prior comments on the draft scope.

We look forward to receiving the TIS report for review.

Have a great weekend,

Walter Scattolon

Walter Scattolon, BASc (Eng.), PMP
Transportation Planning Coordinator
Infrastructure Planning & Policy
Public Works
Halton Region
905-825-6000, ext. 2687 | 1-866-442-5866



From: Mark Crockford [mailto:mark.crockford@cghtransportation.com]
Sent: Wednesday, February 06, 2019 8:51 PM
To: Natywary, Laurielle; Krusto, Matt; Scattolon, Walter; Larkin, Ann; Asadullah Yousfani
Cc: Christopher Gordon
Subject: Joshua Creek TIS Scope - Region and Town Comments Consolidated

Hi All,

Walter and Ann, I have CCed you as I received an out of office bounce back from Matt. I have previously sent this to Matt (through Laurielle) and received feedback on our proposed scope.

I have sent our proposed scope to both the Town and the Region. Based on comments received I have prepared a consolidated set of comments.

Transportation Impact Study Requirements (TIS):

-The following intersections have been proposed for the Transportation Impact Study Area:

- Dundas Street East at Ninth Line
- Dundas Street East at Meadowridge Drive
- One Site Access directly on Dundas Street East
- Dundas Street East at Eighth Line
- Dundas Street East at Prince Michael Drive
- Dundas Street at Street A (east of Meadowridge)

Site Access:

The proposed Dundas Street access (analysed as a right-in/right-out access), will be located a minimum 150m west of the Meadowridge Drive intersection end of radius, to ensure adequate spacing from the end of the Dundas Street westbound bus bay/taper. The requirement for a westbound right-turn lane for this access (as is the requirement for most right-in/right-out accesses along Dundas Street) will be examined. If it is found to be required then the access will be located appropriately.

Analysis Assumptions:

-Horizon years: 2019 and 2024.

-Dundas Street East will be analyzed as six (6) general purpose lanes for year 2019 (based on existing conditions), and four (4) lanes plus HOV lane (with assumption that 20% of the lane capacity assigned to HOV usage by using a 0.8 lane utilization factor) for year 2024.

The TIS report will include:

- Site Plan and Map,
- Size & Number of Development Phases,
- Existing Conditions (Study Area Intersections, Road Network, Pedestrian Routes, Cycling Routes, Transit Services),
- Existing Traffic Conditions (Site Operating Characteristics, Data Collection/Traffic Counts, Analysis Periods (5 years Ahead),
- Future Background Conditions (Horizon Years, Horizon Year Volumes)
- Background Traffic Demand (with TMC's < 2 years old),
- Background Traffic Demand Forecast (with acceptable growth rates)
- Site Generated Traffic (Transit Modal Split, Trip Generation/Distribution/Assignment)
- Future Total Traffic Demand,
- Capacity Analysis (by Intersection, with LOS, Avg. Delay, V/C ratios),
- Traffic Impacts (Tables – Total Traffic with/without Mitigation)
- Access Considerations – Existing, Proposed, Geometrics (turn lanes, sight lines),
- Recommendations,
- TDM recommendations (Transit, Pedestrian & Cycling Facilities Analysis)
- Conclusions

Background Traffic:

-ATR counts for Dundas Street between Prince Michael Drive and Meadowridge Drive have been examined for 2015, 2017, and 2018 (2016 ATR data was not available). The AM and PM peak hours were summed and the compound annual growth rate (CAGR) was examined. Between 2015 and 2017 a CAGR of -1% was calculated. Between 2015 and 2018 a CAGR of 1.25% was calculated. As a conservative estimate of the traffic growth a 1.5% growth rate will be applied to the Study Area turning movement counts.
-background development assumptions for the proposed developments Bressa, DunOak (immediately adjacent to the development lands).
-background development assumptions for proposed development to the west (Shieldbay, Minto, others).
-Halton's Transportation Master Plan 2011 utilizes a transit mode split of 10% for 2021, 15% for 2026 and 20% for 2031. Assumption of travel via other modes (active transportation i.e.: walk, cycle) should utilize a 5% mode split for 2031. Transportation Demand Management (TDM) assumptions of 3% for 2031 would also be acceptable.

Site Access:

-Study will be in accordance with Halton Region's Transportation Impact Guidelines and Town of Oakville's Terms of Reference for Transportation Impact Studies and Transportation Functional Design Studies
-Identify required/recommended road improvements either as a result of the development impacts, or general non-development improvements.

Thanks for your input.

Thanks,
Mark

Mark Crockford, P.Eng.
CGH Transportation Inc.
P:905-251-4070
E:Mark.Crockford@CGHTransportation.com

Appendix B

Town of Oakville Active Transportation Master Plan Map 8 and Map 9

Map 8 - Proposed Pedestrian Network Phasing

OAKVILLE
WSP | MMM GROUP

Map 8

TOWN OF MILTON
CITY OF BURLINGTON
CITY OF MISSISSAUGA
BRONTE CREEK PROVINCIAL PARK
LAKE ONTARIO

Town of Oakville
Active Transportation
Master Plan (ATMP)

Final November 2017

Legend

Existing Pedestrian Routes[i]
- Route in Road Right-of-Way
- Route outside of Road Right-of-Way

Proposed Phasing and Routes[ii]
- 2018
- 2019
- 2020
- 2021
- 2022
- 2023
- 2024
- 2025
- 2026
- 2027
- Long Term Phase (11-20+ Years)
- Current Project Underway[iii]
- Proposed Off-Road Trail in North Oakville Trails Plan area[iv]
- Regional Route[v] (Town of Oakville ATMP Update does not include phasing of regional routes. Refer to Technical Appendix K.)

Sidewalk Network
- Proposed Short Term Sidewalk Connection (1-10 Years) (along a local town roadway)
- Proposed Sidewalk Connection in North Oakville Trais Plan and Midtown Oakville study area

Grade Separated Pedestrian Crossings
- Proposed Grade Separated Pedestrian Crossing
- Existing Grade Separated Pedestrian Crossing

Existing and Proposed Surrounding Connections

Existing	Proposed
	Route in Road Right-of-Way
	Route outside of Road Right-of-Way

Existing Regional Trails
- Waterfront Trail / Trans Canada Trail

Community Destinations
- GO Transit Station
- Elementary School
- Secondary School
- College
- Other School
- Community Centre
- Library
- Municipal / Regional Office
- Sport Facility
- Transit Station
- Other Key Destination

Transportation Features
- Provincial Highway
- Regional Road
- Local Road
- Private Road
- Proposed Road
- Active Railway

Land Use Features
- Park / Natural Heritage System[vi]
- Provincial Park
- Waterbody

Downtown Area

0 1 2 4 Kilometres

Notes:
i. Based on existing routes from the Town of Oakville Active Transportation MasterPlan (2009), the North Oakville Trails Plan (2013), Downtown Transportation and Streetscape Study (2015), Midtown Oakville Transportation and Stormwater Municipal Class EA Final Report (2014) and the Halton Region Active Transportation Master Plan (2015).
ii. Propoed phasing includes routes under the jurisdiction of Conservation Halton, Ontario Parks and Metrolinx.
iii. Includes current / on-going environmental issessment studies, detailed design sudies, etc. undertaken by the Town of Oakvile.
iv. Off-Road Trails within the North Oakville Tails Plan study area have not been identified within a specific implementation year. The timing of these projects will be consistent with the constuction timeline for the development areas.
v. Phasing for regional routes is not identifiedas part of this study. Refer to the Haton Region Active Transportation Master Pan for phasing (by year) of routes under the jurisdiction of Halton Region - see Technical Appendix K.
vi. Parks and Natural Heritage System includes the Parkway Belt.

Map 9 - Proposed Cycling Network Phasing & Priority Projects

OAKVILLE

Map 9

Priority Projects

Ultimate Solutions

U1: Bronte Road - Signed Route with Sharrows (Rebecca St. to Lakeshore Rd. W.)

U2: Bronte Rd. /Ontario St./ East St. - Signed Route with Sharrows (Lakeshore Rd. to Lakeshore Rd.)

U3: Kerr St. - Signed Route with Sharrows (Speers Rd. to Lakeshore Rd. W.)

U4: Trafalgar Rd. - Signed Route with Sharrows(Cornwal Rd. to Randall St.)

U5: Lakeshore Rd. W. - Signed Route with Sharrows (Kerr St. to Forsythe St.)

U6: Lakeshore Rd. W. - Signed Route with Sharrows (Navy St. to Allan St.)

Interim Solution

I1: Lakeshore Rd. W. - Signed Route with Sharrows (Third Line to Dorval Dr.)

I2: Lakeshore Rd. E. - Signed Route with Sharrows (Allan St. to Winston Churchill Blvd.)

TOWN OF MILTON

CITY OF BURLINGTON

CITY OF MISSISSAUGA

BRONTE CREEK PROVINCIAL PARK

LAKE ONTARIO

Interim Solution - Signed Route with Sharrows

Interim Solution - Signed Route with Sharrows

Lakeshore Road West (Mississauga Street to Dorval Drive) currently under study - Class EA. As per the Lakeshore Road West Improvement: Class EA, the preferred roadway improvement is expected to include some form of cycling infrastructure.

0 1 2 4 Kilometres

Notes:

i. Based on existing routes from the Town of Oakville Active Transportation Master Plan (2009), the North Oakville Trails Plan (2013), Downtown Transportation and Streetscape Study (2015), Midtown Oakville Transportation and Stormwater Municipal Class EA Final Report(2014) and the Halton Region Active Transportation Master Plan (2015).

ii. Proposed phasing includes routes under the jurisdiction of the Town of Oakville, Conservation Halton, Ontario Parks and Metrolinx.

iii. Includes current / on-going environmental assessment studies, detailed designstudies, etc. undertaken by the Town of Oakville.

iv. Off-road Trails within the North OakvilleTrails Plan study area have not been dentified within a specific implementation year. The timing of these pojects will be consistent with the construction timeline for the development areas.

v. Phasing for Regional routes is not identified as part of this study. Refer to the Halton Region Active Transportation MasterPlan for phasing (by year) of routes under the jurisdiction of Halton Region - see Technical Appendix K.

vi. Refer to table in top-left corner of Map 9for list of priority projects.

vii. Parks and Natural Heritage System includes the Parkway Belt.

Downtown Area

Town of Oakville
Active Transportation
Master Plan (ATMP)

Final November 2017

Legend

Existing Cycling Routes[i]
- Route in Road Right-of-Way
- Route outside of Road Right-of-Way

Proposed Phasing and Routes[ii]
- 2018
- 2019
- 2020
- 2021
- 2022
- 2023
- 2024
- 2025
- 2026
- 2027
- Long Term Phase (11-20+ Years)
- Current Projects Underway[iii]
- Proposed Off-Road Trail in North Oakville Trails Plan area[iv]
- Regional Route[v] (Town of Oakville ATMP Update does not include phasing of regional routes. Refer to Technical Appendix K.)

Grade Separated Pedestrian Crossings
- Proposed Grade Separated Pedestrian Crossing
- Existing Grade Separated Pedestrian Crossing

Priority Projects[vi]
- Interim Solution
- Ultimate Solution

Existing and Proposed Surrounding Connections

Existing / Proposed
- Route in Road Right-of-Way
- Route outside of Road Right-of-Way

Existing Regional Trails
- Waterfront Trail / Trans Canada Trail

Community Destinations
- GO Transit Station
- Elementary School
- Secondary School
- College
- Other School
- Community Centre
- Library
- Municipal / Regional Office
- Sport Facility
- Transit Station
- Other Key Destination

Transportation Features
- Provincial Highway
- Regional Road
- Local Road
- Private Road
- Proposed Road
- Active Railway

Land Use Features
- Park / Natural Heritage System[vii]
- Provincial Park
- Waterbody

Appendix C

Turning Movement Count Data

Dundas St E @ Eighth Line

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

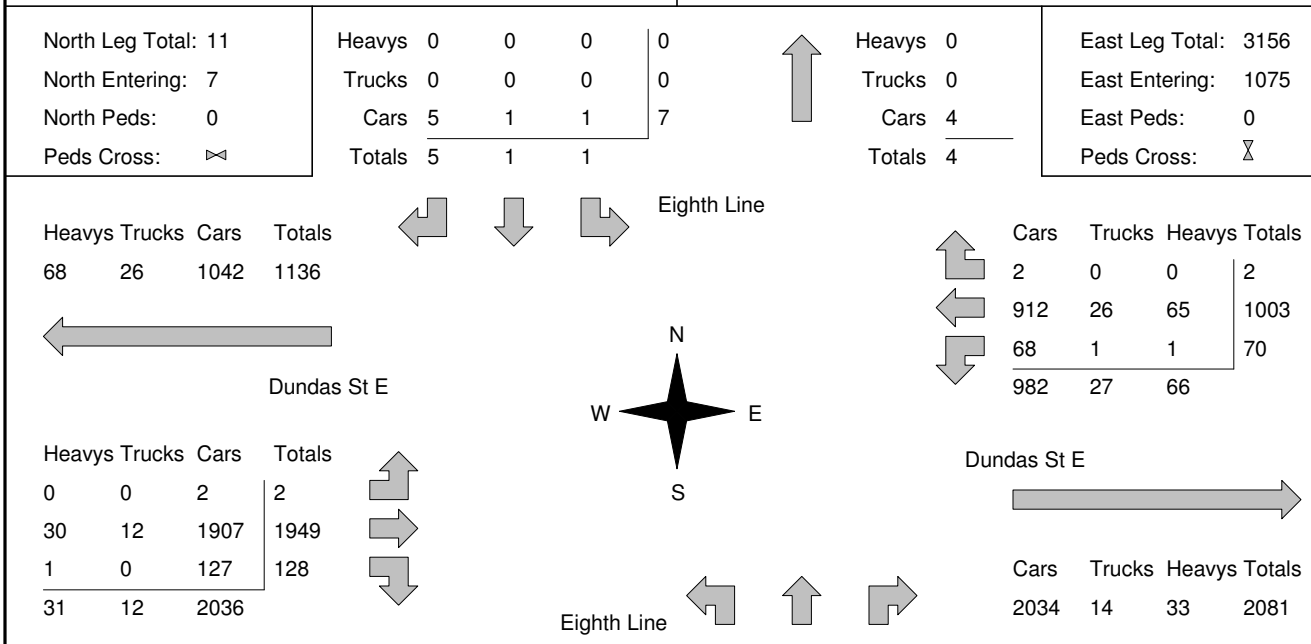
Municipality: Halton Region
Site #: 0000002973
Intersection: Dundas St E & Eighth Line
TFR File #: 7
Count date: 24-May-2017

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E



Comments

Dundas St E @ Eighth Line

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:15:00
To: 13:15:00

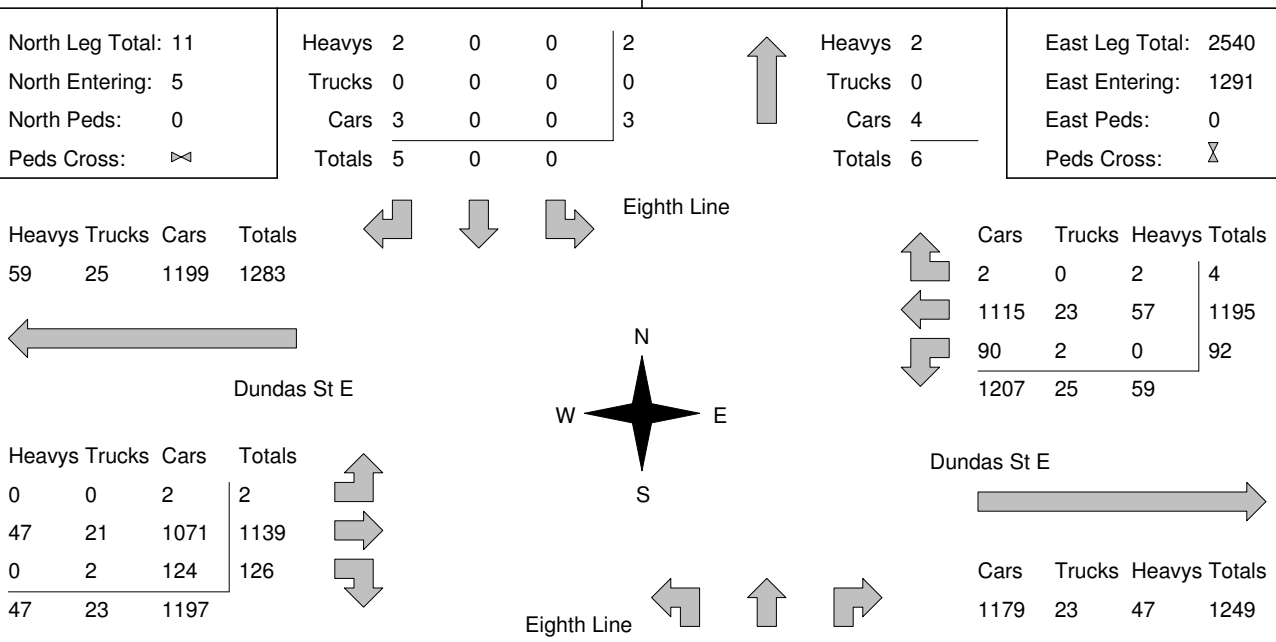
Municipality: Halton Region
Site #: 0000002973
Intersection: Dundas St E & Eighth Line
TFR File #: 7
Count date: 24-May-2017

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E



Comments

Dundas St E @ Eighth Line

Afternoon Peak Diagram

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

One Hour Peak
From: 17:00:00
To: 18:00:00

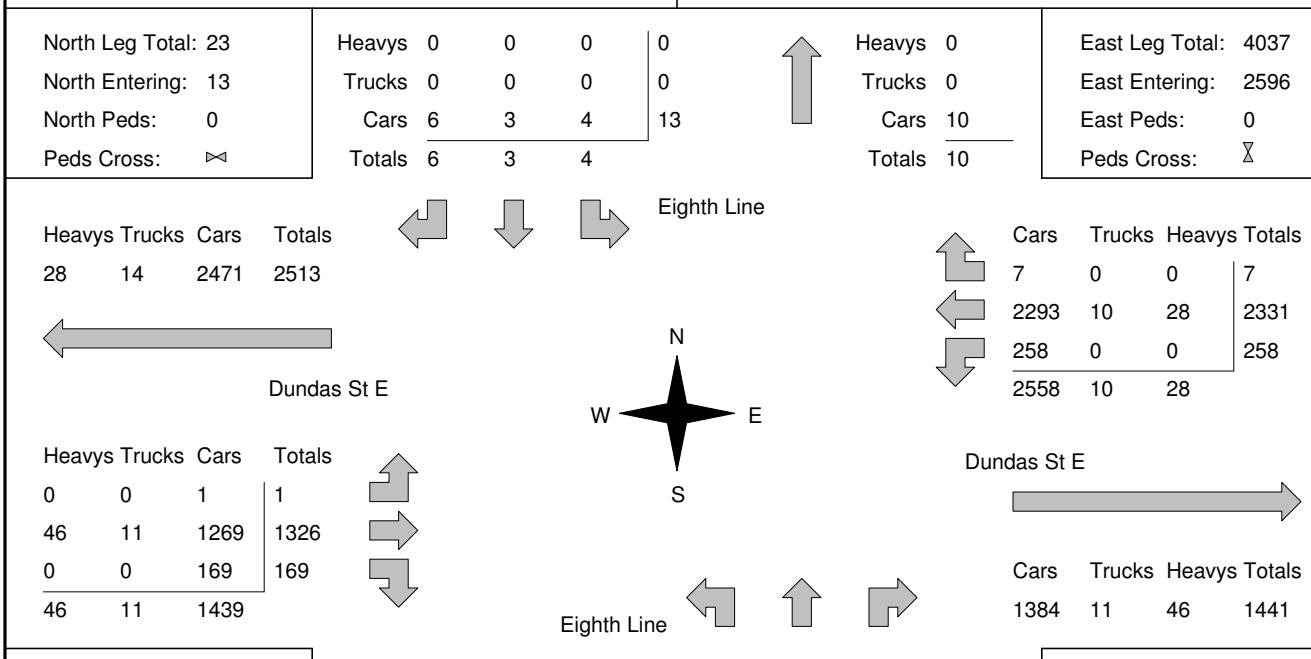
Municipality: Halton Region
Site #: 0000002973
Intersection: Dundas St E & Eighth Line
TFR File #: 7
Count date: 24-May-2017

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E



Comments

Dundas St E @ Eighth Line

Total Count Diagram

Municipality: Halton Region
Site #: 0000002973
Intersection: Dundas St E & Eighth Line
TFR File #: 7
Count date: 24-May-2017

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E

North Leg Total:	93			
North Entering:	49			
North Peds:	2			
Peds Cross:	⋈			
Heavys	4	0	0	4
Trucks	0	0	0	0
Cars	29	5	11	45
Totals	33	5	11	
Heavys	4			
Trucks	0			
Cars	40			
Totals	44			
East Leg Total:	24312			
East Entering:	12816			
East Peds:	1			
Peds Cross:	⧖			

Eighth Line

Heavys	Trucks	Cars	Totals
432	173	12326	12931

Dundas St E

Cars	Trucks	Heavys	Totals
20	0	2	22
11284	149	424	11857
927	7	3	937
12231	156	429	

N
W E
S

Heavys	Trucks	Cars	Totals
2	0	14	16
392	109	10171	10672
12	5	1017	1034
406	114	11202	

Dundas St E

Cars	Trucks	Heavys	Totals
10979	121	396	11496

Eighth Line

Peds Cross:	⧖			
West Peds:	6			
West Entering:	11722			
West Leg Total:	24653			
Cars	1949			
Trucks	12			
Heavys	15			
Totals	1976			
Cars	1013	6	797	1816
Trucks	24	0	12	36
Heavys	4	0	4	8
Totals	1041	6	813	
Peds Cross:	⋈			
South Peds:	43			
South Entering:	1860			
South Leg Total:	3836			

Comments

Dundas St E @ Prince Michael Dr

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

Municipality: Halton Region
Site #: 0000002974
Intersection: Dundas St E & Prince Michael Dr
TFR File #: 8
Count date: 24-May-2017

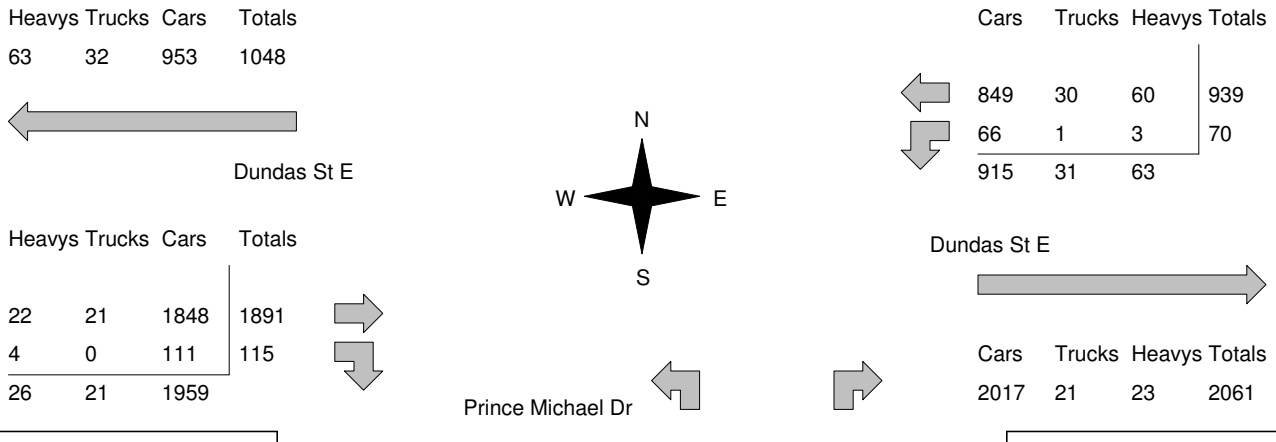
Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E

East Leg Total: 3070
East Entering: 1009
East Peds: 2
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 2006
West Leg Total: 3054

Cars 177
Trucks 1
Heavys 7
Totals 185

Cars 104 169 273
Trucks 2 0 2
Heavys 3 1 4
Totals 109 170

Peds Cross: ⋈
South Peds: 4
South Entering: 279
South Leg Total: 464

Comments

Dundas St E @ Prince Michael Dr

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:15:00
To: 13:15:00

Municipality: Halton Region
Site #: 0000002974
Intersection: Dundas St E & Prince Michael Dr
TFR File #: 8
Count date: 24-May-2017

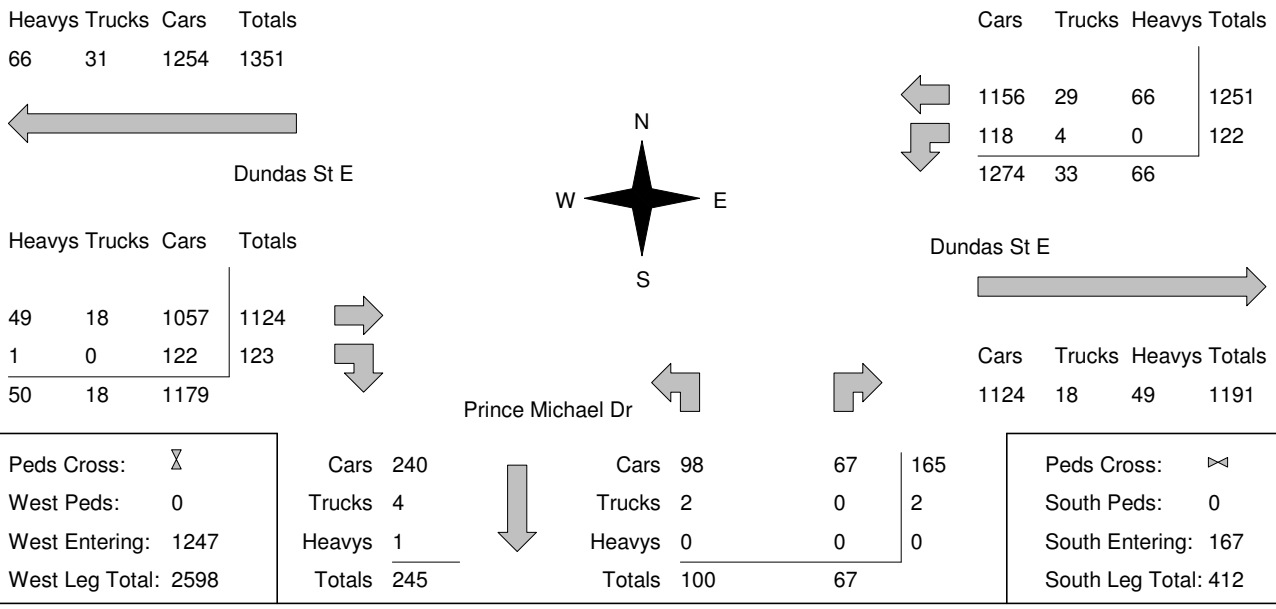
Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E

East Leg Total: 2564
East Entering: 1373
East Peds: 0
Peds Cross:



Peds Cross:
West Peds: 0
West Entering: 1247
West Leg Total: 2598

Cars 240
Trucks 4
Heavys 1
Totals 245

Cars 98 67 165
Trucks 2 0 2
Heavys 0 0 0
Totals 100 67

Peds Cross:
South Peds: 0
South Entering: 167
South Leg Total: 412

Comments

Dundas St E @ Prince Michael Dr

Afternoon Peak Diagram

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

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Halton Region
Site #: 0000002974
Intersection: Dundas St E & Prince Michael Dr
TFR File #: 8
Count date: 24-May-2017

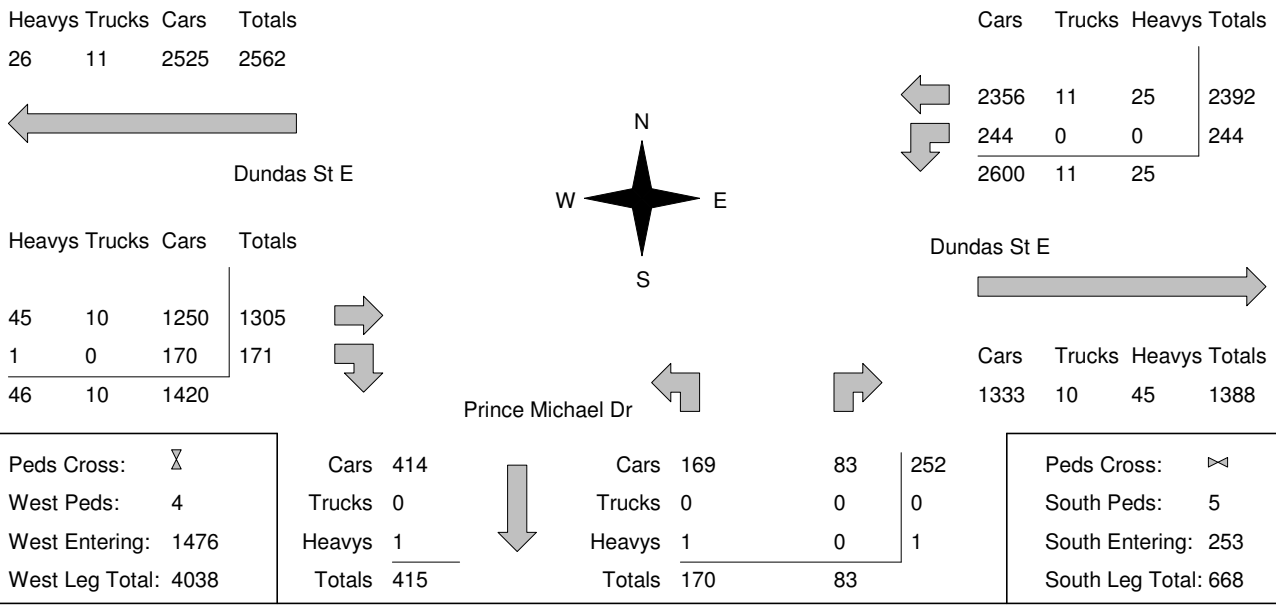
Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E

East Leg Total: 4024
East Entering: 2636
East Peds: 2
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 4
West Entering: 1476
West Leg Total: 4038

Cars 414
Trucks 0
Heavys 1
Totals 415

Cars 169 83 252
Trucks 0 0 0
Heavys 1 0 1
Totals 170 83

Peds Cross: ⋈
South Peds: 5
South Entering: 253
South Leg Total: 668

Comments

Dundas St E @ Prince Michael Dr

Total Count Diagram

Municipality: Halton Region
Site #: 0000002974
Intersection: Dundas St E & Prince Michael Dr
TFR File #: 8
Count date: 24-May-2017

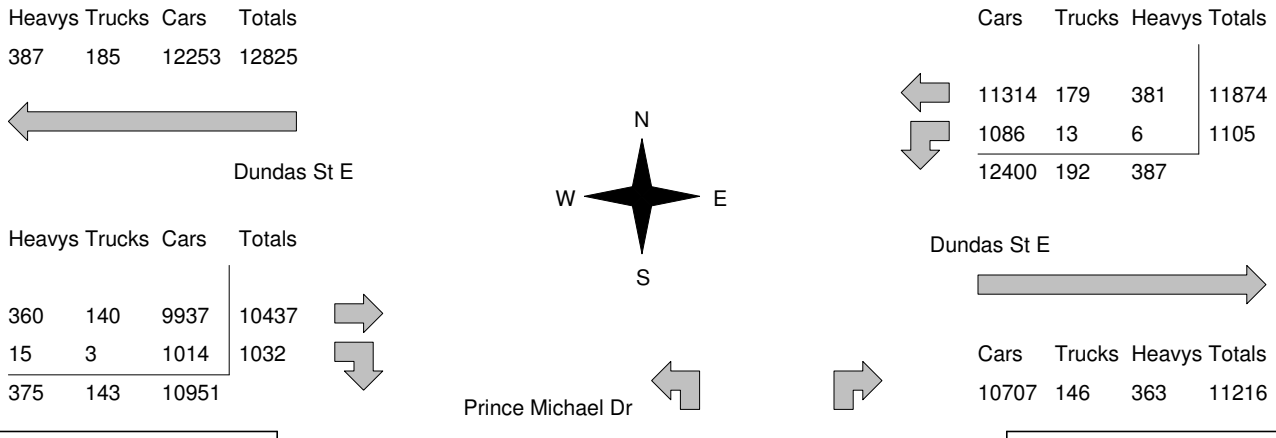
Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E

East Leg Total: 24195
East Entering: 12979
East Peds: 10
Peds Cross:



Peds Cross:
West Peds: 12
West Entering: 11469
West Leg Total: 24294

Cars 2100
Trucks 16
Heavys 21
Totals 2137

Cars 939 770 1709
Trucks 6 6 12
Heavys 6 3 9
Totals 951 779

Peds Cross:
South Peds: 32
South Entering: 1730
South Leg Total: 3867

Comments

Dundas St E @ Meadowridge Dr

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

Municipality: Halton Region
Site #: 0000002975
Intersection: Dundas St E & Meadowridge Dr
TFR File #: 9
Count date: 24-May-2017

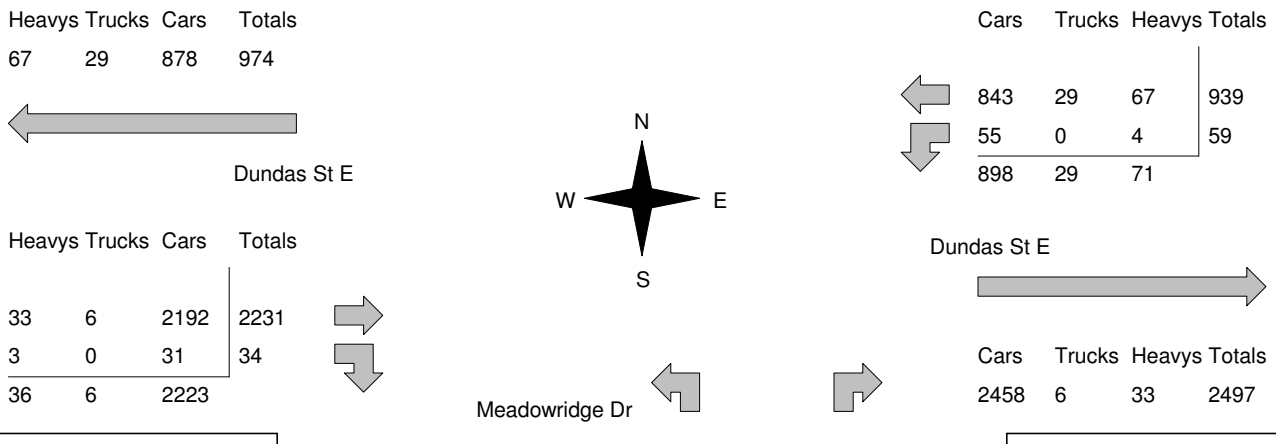
Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E

East Leg Total: 3495
East Entering: 998
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 3
West Entering: 2265
West Leg Total: 3239

Cars 86
Trucks 0
Heavys 7
Totals 93

Cars 35 266 301
Trucks 0 0 0
Heavys 0 0 0
Totals 35 266

Peds Cross: ⋈
South Peds: 1
South Entering: 301
South Leg Total: 394

Comments

Dundas St E @ Meadowridge Dr

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:15:00
To: 13:15:00

Municipality: Halton Region
Site #: 0000002975
Intersection: Dundas St E & Meadowridge Dr
TFR File #: 9
Count date: 24-May-2017

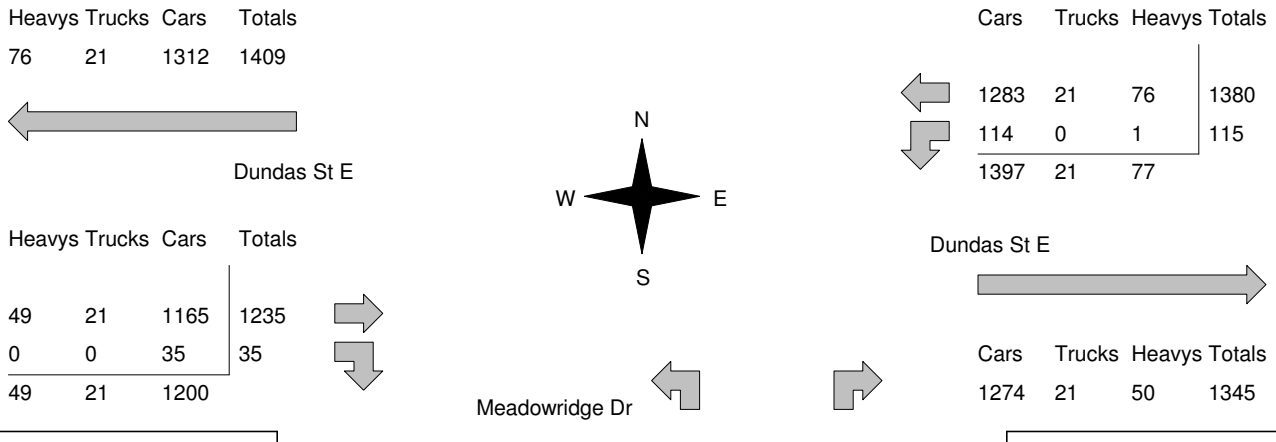
Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E

East Leg Total: 2840
East Entering: 1495
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 1
West Entering: 1270
West Leg Total: 2679

Cars 149
Trucks 0
Heavys 1
Totals 150

Cars 29 109 138
Trucks 0 0 0
Heavys 0 1 1
Totals 29 110

Peds Cross: ⋈
South Peds: 0
South Entering: 139
South Leg Total: 289

Comments

Dundas St E @ Meadowridge Dr

Afternoon Peak Diagram

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

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Halton Region
Site #: 0000002975
Intersection: Dundas St E & Meadowridge Dr
TFR File #: 9
Count date: 24-May-2017

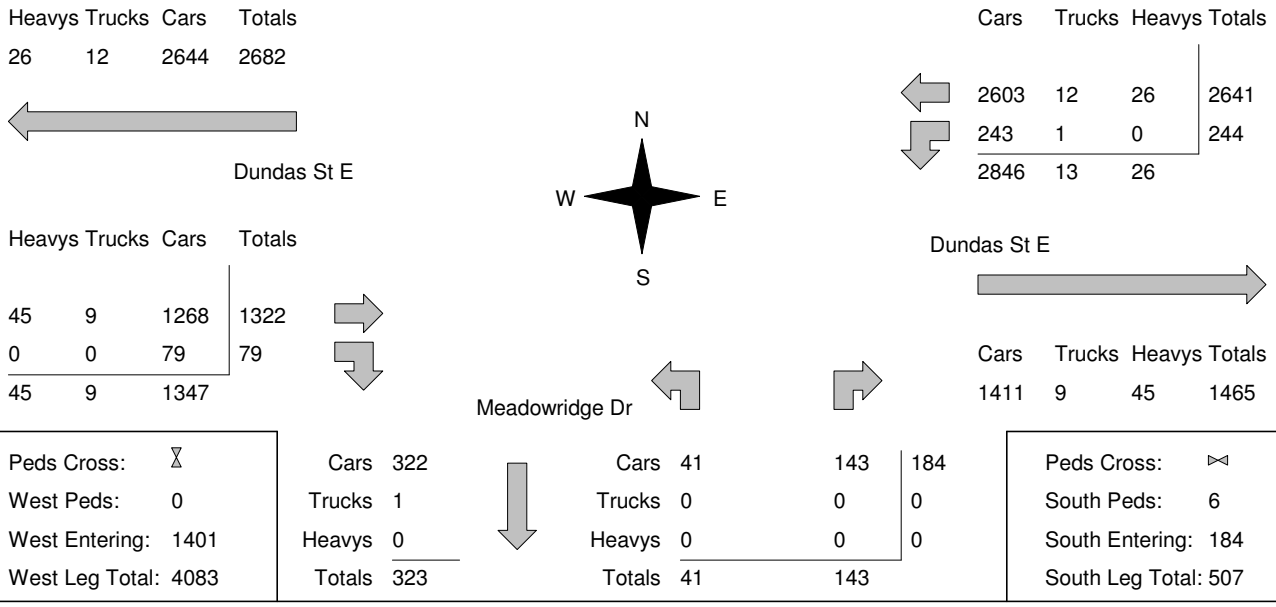
Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E

East Leg Total: 4350
East Entering: 2885
East Peds: 1
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 1401
West Leg Total: 4083

Cars 322
Trucks 1
Heavys 0
Totals 323

Cars 41 143 184
Trucks 0 0 0
Heavys 0 0 0
Totals 41 143

Peds Cross: ⋈
South Peds: 6
South Entering: 184
South Leg Total: 507

Comments

Dundas St E @ Meadowridge Dr

Total Count Diagram

Municipality: Halton Region
Site #: 0000002975
Intersection: Dundas St E & Meadowridge Dr
TFR File #: 9
Count date: 24-May-2017

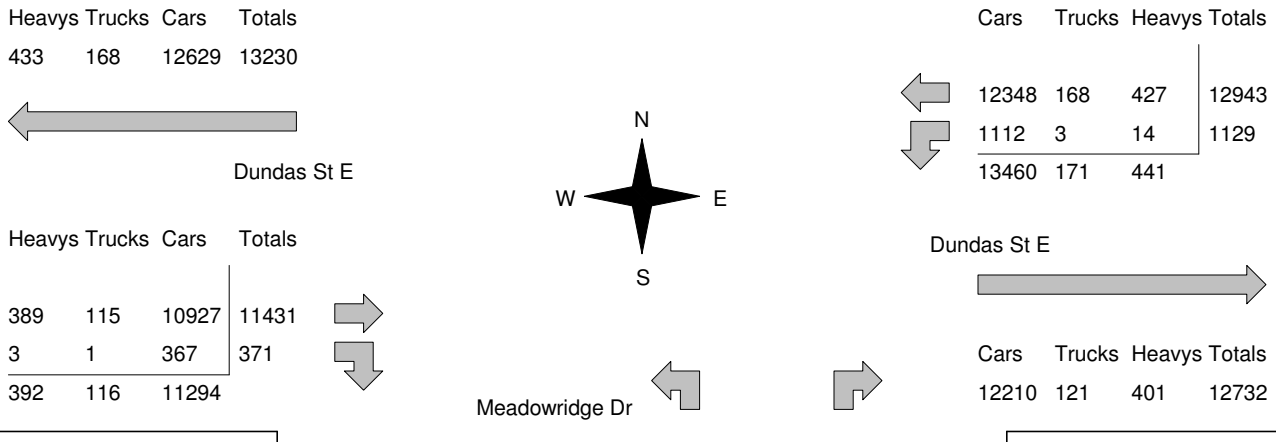
Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E

East Leg Total: 26804
East Entering: 14072
East Peds: 2
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 7
West Entering: 11802
West Leg Total: 25032

Cars 1479
Trucks 4
Heavys 17
Totals 1500

Cars 281 1283 1564
Trucks 0 6 6
Heavys 6 12 18
Totals 287 1301

Peds Cross: ⋈
South Peds: 16
South Entering: 1588
South Leg Total: 3088

Comments

Dundas St E @ Ninth Line

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

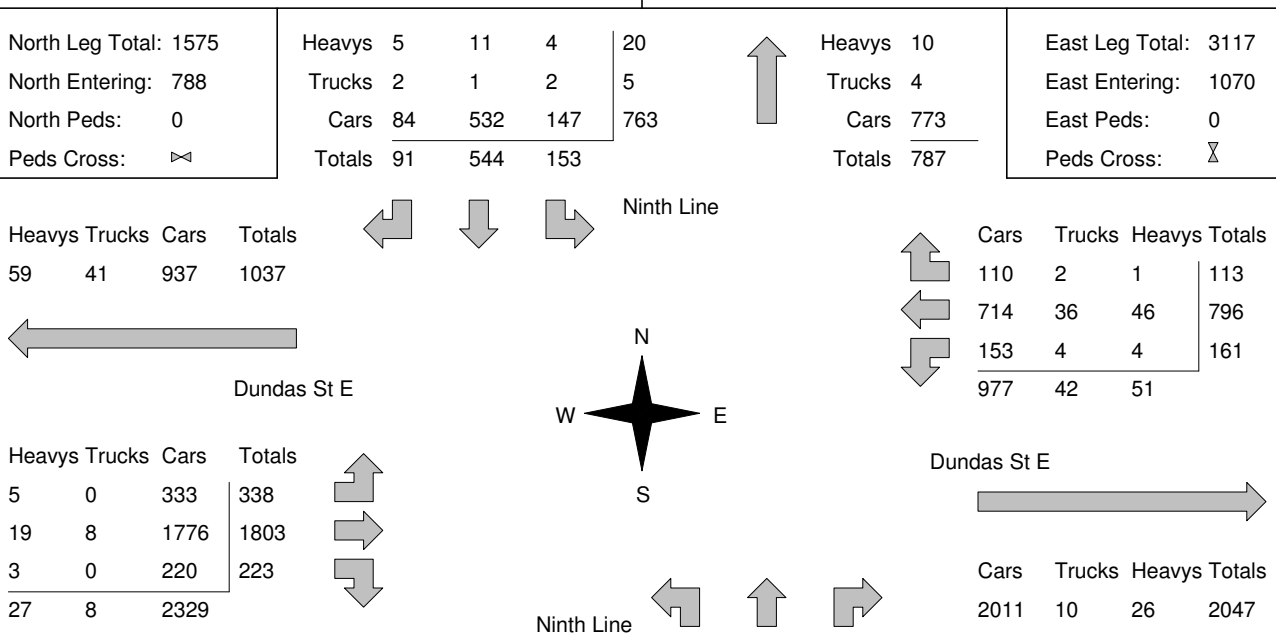
Municipality: Halton Region
Site #: 0000002976
Intersection: Dundas St E & Ninth Line
TFR File #: 10
Count date: 24-May-2017

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E



Comments

Dundas St E @ Ninth Line

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:30:00
To: 13:30:00

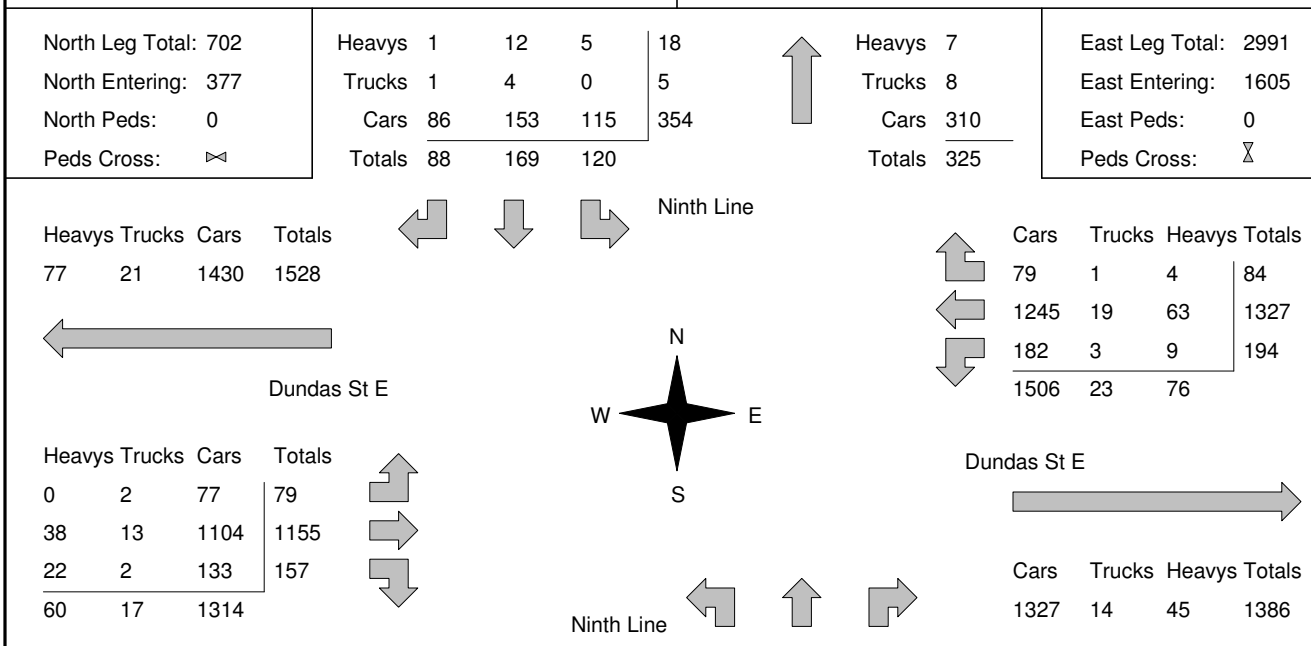
Municipality: Halton Region
Site #: 0000002976
Intersection: Dundas St E & Ninth Line
TFR File #: 10
Count date: 24-May-2017

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E



Comments

Dundas St E @ Ninth Line

Afternoon Peak Diagram

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

One Hour Peak
From: 16:45:00
To: 17:45:00

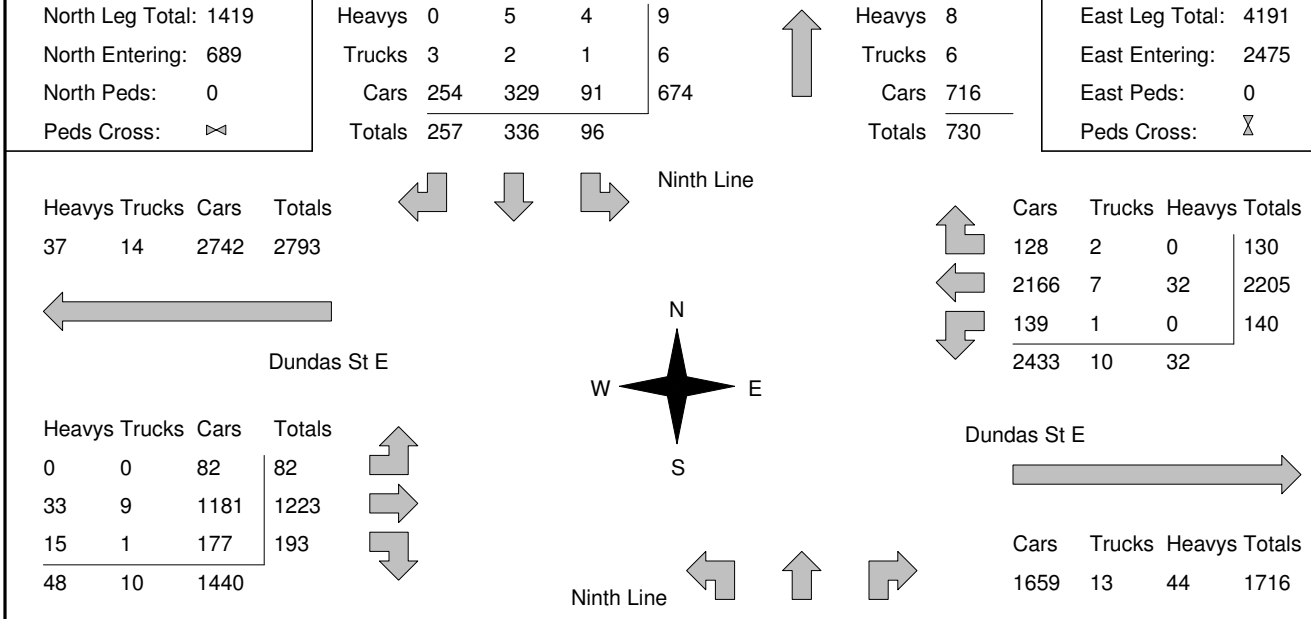
Municipality: Halton Region
Site #: 0000002976
Intersection: Dundas St E & Ninth Line
TFR File #: 10
Count date: 24-May-2017

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Dundas St E runs W/E



Comments

Dundas St E @ Ninth Line

Total Count Diagram

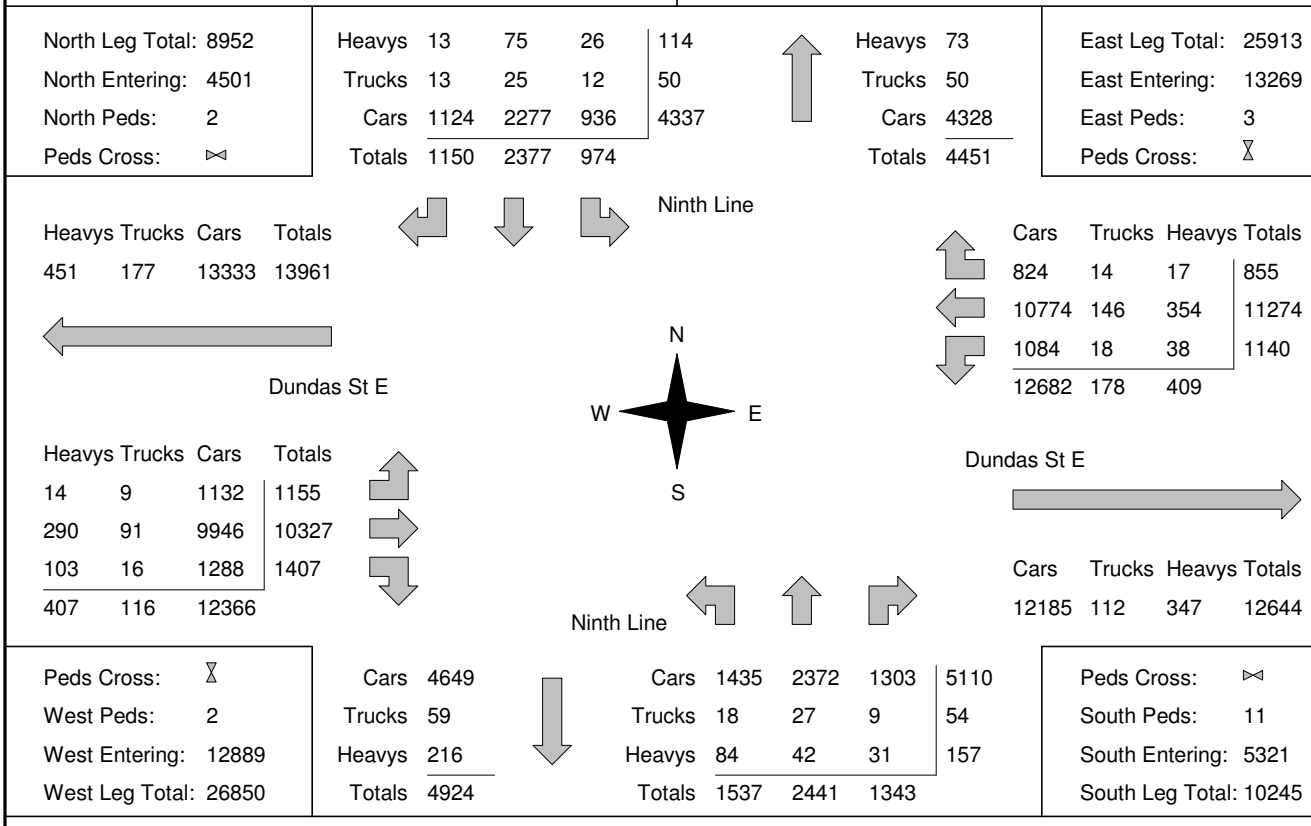
Municipality: Halton Region
Site #: 0000002976
Intersection: Dundas St E & Ninth Line
TFR File #: 10
Count date: 24-May-2017

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

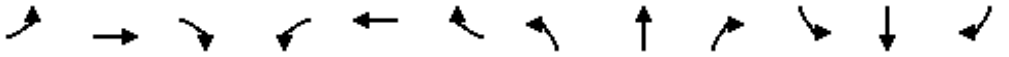
Major Road: Dundas St E runs W/E



Comments

Appendix D

2019 Existing Conditions Synchro Worksheets



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	2008	132	72	1033	2	132	0	135	1	1	5
Future Volume (vph)	2	2008	132	72	1033	2	132	0	135	1	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	115.0		50.0	150.0		75.0	50.0		0.0	40.0		40.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	75.0			75.0			50.0			15.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850		0.850				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	3008	0	1770	1863	1583
Flt Permitted	0.259			0.061			0.757			0.664		
Satd. Flow (perm)	482	5085	1583	114	5085	1583	1410	3008	0	1237	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			73		140				65
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		200.0			600.0			200.0			200.0	
Travel Time (s)		10.3			30.9			14.4			14.4	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	2	2049	135	73	1054	2	135	0	138	1	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	2049	135	73	1054	2	135	138	0	1	1	5
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
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	1	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	37.2	37.2	46.0	46.0		46.0	46.0	46.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	12.0	61.2	61.2	12.0	61.2	61.2	46.8	46.8		46.8	46.8	46.8
Total Split (%)	10.0%	51.0%	51.0%	10.0%	51.0%	51.0%	39.0%	39.0%		39.0%	39.0%	39.0%
Maximum Green (s)	8.0	55.0	55.0	8.0	55.0	55.0	39.8	39.8		39.8	39.8	39.8
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.5	3.7	3.7		3.7	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.2	6.2	4.0	6.2	6.2	7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)		24.0	24.0		24.0	24.0	32.0	32.0		32.0	32.0	32.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	0
Act Effct Green (s)	88.2	80.4	80.4	91.8	87.6	87.6	17.0	17.0		17.0	17.0	17.0
Actuated g/C Ratio	0.74	0.67	0.67	0.76	0.73	0.73	0.14	0.14		0.14	0.14	0.14
v/c Ratio	0.00	0.60	0.12	0.38	0.28	0.00	0.68	0.25		0.01	0.00	0.02
Control Delay	5.0	13.3	5.0	24.1	15.0	0.0	65.0	7.7		40.0	40.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	5.0	13.3	5.0	24.1	15.0	0.0	65.0	7.7		40.0	40.0	0.2
LOS	A	B	A	C	B	A	E	A		D	D	A
Approach Delay		12.8			15.5			36.0			11.6	
Approach LOS		B			B			D			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 49.2 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 72.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Eighth Line & Dundas Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	2008	132	72	1033	2	132	0	135	1	1	5
Future Volume (veh/h)	2	2008	132	72	1033	2	132	0	135	1	1	5
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	2	2049	135	73	1054	2	135	0	138	1	1	5
Adj No. of Lanes	1	3	1	1	3	1	1	2	0	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	428	3456	1076	237	3708	1154	233	219	196	110	231	196
Arrive On Green	0.00	0.68	0.68	0.11	1.00	1.00	0.12	0.00	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1404	1770	1583	1246	1863	1583
Grp Volume(v), veh/h	2	2049	135	73	1054	2	135	0	138	1	1	5
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1404	1770	1583	1246	1863	1583
Q Serve(g_s), s	0.0	25.9	3.6	1.3	0.0	0.0	11.2	0.0	10.0	0.1	0.1	0.3
Cycle Q Clear(g_c), s	0.0	25.9	3.6	1.3	0.0	0.0	11.2	0.0	10.0	10.1	0.1	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	428	3456	1076	237	3708	1154	233	219	196	110	231	196
V/C Ratio(X)	0.00	0.59	0.13	0.31	0.28	0.00	0.58	0.00	0.70	0.01	0.00	0.03
Avail Cap(c_a), veh/h	540	3456	1076	261	3708	1154	525	587	525	369	618	525
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.0	10.3	6.7	8.7	0.0	0.0	51.0	0.0	50.5	55.3	46.1	46.2
Incr Delay (d2), s/veh	0.0	0.8	0.2	0.7	0.2	0.0	2.3	0.0	4.6	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.2	1.6	0.9	0.1	0.0	4.5	0.0	4.7	0.0	0.0	0.1
LnGrp Delay(d),s/veh	6.0	11.1	7.0	9.4	0.2	0.0	53.3	0.0	55.0	55.4	46.1	46.3
LnGrp LOS	A	B	A	A	A	A	D		E	E	D	D
Approach Vol, veh/h		2186			1129			273			7	
Approach Delay, s/veh		10.8			0.8			54.2			47.5	
Approach LOS		B			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.4	87.8		21.9	4.5	93.7		21.9
Change Period (Y+Rc), s	4.0	* 6.2		7.0	4.0	* 6.2		7.0
Max Green Setting (Gmax), s	8.0	* 55		39.8	8.0	* 55		39.8
Max Q Clear Time (g_c+I1), s	3.3	27.9		12.1	2.0	2.0		13.2
Green Ext Time (p_c), s	0.1	21.0		0.0	0.0	11.6		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

Notes

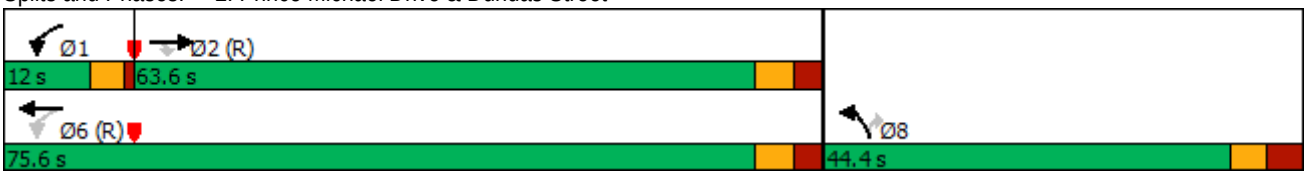
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1948	118	72	967	112	175
Future Volume (vph)	1948	118	72	967	112	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		50.0	125.0		60.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			55.0		25.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5085	1583	1770	5085	1770	1583
Flt Permitted			0.063		0.950	
Satd. Flow (perm)	5085	1583	117	5085	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		69				136
Link Speed (k/h)	70			70	50	
Link Distance (m)	600.0			450.0	200.0	
Travel Time (s)	30.9			23.1	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2051	124	76	1018	118	184
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2051	124	76	1018	118	184
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
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	20.0	20.0	7.0	20.0	10.0	10.0
Minimum Split (s)	38.3	38.3	11.5	38.3	43.9	43.9

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (s)	63.6	63.6	12.0	75.6	44.4	44.4
Total Split (%)	53.0%	53.0%	10.0%	63.0%	37.0%	37.0%
Maximum Green (s)	57.3	57.3	8.0	69.3	37.5	37.5
Yellow Time (s)	3.7	3.7	3.0	3.7	3.3	3.3
All-Red Time (s)	2.6	2.6	1.0	2.6	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	4.0	6.3	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	25.0	25.0		25.0	30.0	30.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	60.0	60.0	71.6	69.3	37.5	37.5
Actuated g/C Ratio	0.50	0.50	0.60	0.58	0.31	0.31
v/c Ratio	0.81	0.15	0.44	0.35	0.21	0.31
Control Delay	21.4	4.8	31.3	13.8	31.7	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	4.8	31.3	13.8	31.7	10.9
LOS	C	A	C	B	C	B
Approach Delay	20.4			15.0	19.0	
Approach LOS	C			B	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 82.8 (69%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 18.6		Intersection LOS: B	
Intersection Capacity Utilization 66.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Prince Michael Drive & Dundas Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1948	118	72	967	112	175
Future Volume (veh/h)	1948	118	72	967	112	175
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	2051	124	76	1018	118	184
Adj No. of Lanes	3	1	1	3	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2494	777	237	2937	554	495
Arrive On Green	0.98	0.98	0.04	0.39	0.31	0.31
Sat Flow, veh/h	5253	1583	1774	5253	1774	1583
Grp Volume(v), veh/h	2051	124	76	1018	118	184
Grp Sat Flow(s),veh/h/ln	1695	1583	1774	1695	1774	1583
Q Serve(g_s), s	4.8	0.2	2.4	17.0	5.9	10.8
Cycle Q Clear(g_c), s	4.8	0.2	2.4	17.0	5.9	10.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2494	777	237	2937	554	495
V/C Ratio(X)	0.82	0.16	0.32	0.35	0.21	0.37
Avail Cap(c_a), veh/h	2494	777	260	2937	554	495
HCM Platoon Ratio	2.00	2.00	0.67	0.67	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.6	0.6	12.7	20.8	30.4	32.1
Incr Delay (d2), s/veh	3.2	0.4	0.8	0.3	0.9	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.2	1.2	8.1	3.0	5.0
LnGrp Delay(d),s/veh	3.8	1.0	13.4	21.1	31.3	34.2
LnGrp LOS	A	A	B	C	C	C
Approach Vol, veh/h	2175			1094	302	
Approach Delay, s/veh	3.7			20.5	33.1	
Approach LOS	A			C	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.4	65.2				75.6		44.4
Change Period (Y+Rc), s	4.0	* 6.3				* 6.3		6.9
Max Green Setting (Gmax), s	8.0	* 57				* 69		37.5
Max Q Clear Time (g_c+I1), s	4.4	6.8				19.0		12.8
Green Ext Time (p_c), s	0.1	32.9				10.9		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	11.3
HCM 2010 LOS	B

Notes

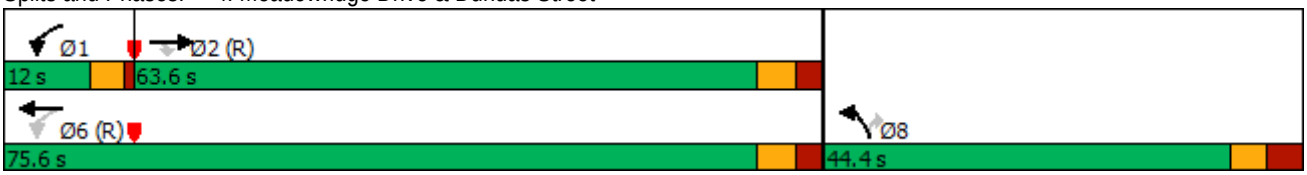
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2298	35	61	967	36	274
Future Volume (vph)	2298	35	61	967	36	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		60.0	135.0		25.0	0.0
Storage Lanes		1	1		2	1
Taper Length (m)			60.0		45.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5085	1583	1770	5085	3433	1583
Flt Permitted			0.048		0.950	
Satd. Flow (perm)	5085	1583	89	5085	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		20				134
Link Speed (k/h)	70			70	50	
Link Distance (m)	150.0			350.0	200.0	
Travel Time (s)	7.7			18.0	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2419	37	64	1018	38	288
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2419	37	64	1018	38	288
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
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
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	20.0	20.0	7.0	20.0	10.0	10.0
Minimum Split (s)	36.2	36.2	11.0	36.2	43.9	43.9

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (s)	63.6	63.6	12.0	75.6	44.4	44.4
Total Split (%)	53.0%	53.0%	10.0%	63.0%	37.0%	37.0%
Maximum Green (s)	57.4	57.4	8.0	69.4	37.5	37.5
Yellow Time (s)	3.7	3.7	3.0	3.7	3.3	3.3
All-Red Time (s)	2.5	2.5	1.0	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.0	6.2	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	30.0	30.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	79.2	79.2	90.6	88.4	18.5	18.5
Actuated g/C Ratio	0.66	0.66	0.76	0.74	0.15	0.15
v/c Ratio	0.72	0.04	0.38	0.27	0.07	0.81
Control Delay	4.5	0.2	15.9	6.0	40.2	42.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	0.2	15.9	6.0	40.2	42.3
LOS	A	A	B	A	D	D
Approach Delay	4.5			6.6	42.1	
Approach LOS	A			A	D	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 118.8 (99%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 72.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Meadowridge Drive & Dundas Street



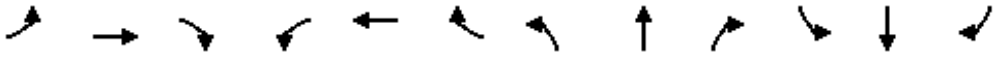
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2298	35	61	967	36	274
Future Volume (veh/h)	2298	35	61	967	36	274
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	2419	37	64	1018	38	288
Adj No. of Lanes	3	1	1	3	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	3058	952	198	3489	705	324
Arrive On Green	0.80	0.80	0.05	0.69	0.20	0.20
Sat Flow, veh/h	5253	1583	1774	5253	3442	1583
Grp Volume(v), veh/h	2419	37	64	1018	38	288
Grp Sat Flow(s),veh/h/ln	1695	1583	1774	1695	1721	1583
Q Serve(g_s), s	31.1	0.6	1.5	9.4	1.1	21.2
Cycle Q Clear(g_c), s	31.1	0.6	1.5	9.4	1.1	21.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	3058	952	198	3489	705	324
V/C Ratio(X)	0.79	0.04	0.32	0.29	0.05	0.89
Avail Cap(c_a), veh/h	3058	952	225	3489	1076	495
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.9	4.9	15.4	7.4	38.4	46.4
Incr Delay (d2), s/veh	2.2	0.1	0.9	0.2	0.0	12.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.7	0.3	1.1	4.4	0.5	10.4
LnGrp Delay(d),s/veh	10.1	4.9	16.3	7.6	38.4	58.6
LnGrp LOS	B	A	B	A	D	E
Approach Vol, veh/h	2456			1082	326	
Approach Delay, s/veh	10.0			8.1	56.2	
Approach LOS	B			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.2	78.4				88.5		31.5
Change Period (Y+Rc), s	4.0	* 6.2				* 6.2		6.9
Max Green Setting (Gmax), s	8.0	* 57				* 69		37.5
Max Q Clear Time (g_c+I1), s	3.5	33.1				11.4		23.2
Green Ext Time (p_c), s	0.1	21.2				11.1		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

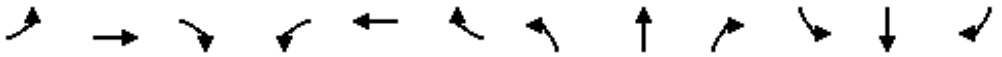


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	348	1857	230	166	820	116	155	346	94	158	560	94
Future Volume (vph)	348	1857	230	166	820	116	155	346	94	158	560	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		50.0	200.0		65.0	150.0		90.0	115.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.262			0.070			0.279			0.468		
Satd. Flow (perm)	488	5085	1583	130	5085	1583	520	3539	1583	872	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			72			122			109			109
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		450.0			200.0			200.0			200.0	
Travel Time (s)		23.1			10.3			12.0			12.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	366	1955	242	175	863	122	163	364	99	166	589	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	366	1955	242	175	863	122	163	364	99	166	589	99
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	15.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	32.0	24.0	24.0	24.0	36.0	36.0	36.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	16.0	69.0	69.0	11.0	64.0	64.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	13.3%	57.5%	57.5%	9.2%	53.3%	53.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	12.0	62.0	62.0	7.0	57.0	57.0	34.0	34.0	34.0	34.0	34.0	34.0
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		12.0	12.0				23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)	76.0	62.0	62.0	67.0	57.0	57.0	34.0	34.0	34.0	34.0	34.0	34.0
Actuated g/C Ratio	0.63	0.52	0.52	0.56	0.48	0.48	0.28	0.28	0.28	0.28	0.28	0.28
v/c Ratio	0.84	0.74	0.28	1.04	0.36	0.15	1.11	0.36	0.19	0.67	0.59	0.19
Control Delay	29.7	25.0	12.2	109.2	20.4	3.5	147.5	35.6	5.9	53.2	39.8	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	25.0	12.2	109.2	20.4	3.5	147.5	35.6	5.9	53.2	39.8	5.9
LOS	C	C	B	F	C	A	F	D	A	D	D	A
Approach Delay		24.5			32.1			60.1			38.5	
Approach LOS		C			C			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 32.7		Intersection LOS: C	
Intersection Capacity Utilization 92.2%		ICU Level of Service F	
Analysis Period (min) 15			

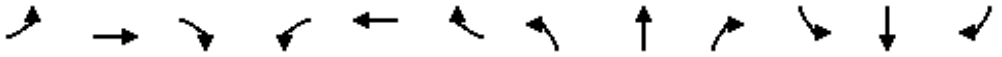
Splits and Phases: 6: Ninth Line & Dundas Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	348	1857	230	166	820	116	155	346	94	158	560	94
Future Volume (veh/h)	348	1857	230	166	820	116	155	346	94	158	560	94
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	366	1955	242	175	863	122	163	364	99	166	589	99
Adj No. of Lanes	1	3	1	1	3	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	447	2627	818	201	2416	752	165	1003	449	246	1003	449
Arrive On Green	0.10	0.52	0.52	0.06	0.47	0.47	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	751	3539	1583	925	3539	1583
Grp Volume(v), veh/h	366	1955	242	175	863	122	163	364	99	166	589	99
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	751	1770	1583	925	1770	1583
Q Serve(g_s), s	12.0	36.2	10.5	6.1	12.9	5.3	16.8	9.9	5.7	21.0	17.2	5.7
Cycle Q Clear(g_c), s	12.0	36.2	10.5	6.1	12.9	5.3	34.0	9.9	5.7	30.8	17.2	5.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	447	2627	818	201	2416	752	165	1003	449	246	1003	449
V/C Ratio(X)	0.82	0.74	0.30	0.87	0.36	0.16	0.99	0.36	0.22	0.67	0.59	0.22
Avail Cap(c_a), veh/h	447	2627	818	201	2416	752	165	1003	449	246	1003	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	22.8	16.5	25.2	19.9	17.9	54.6	34.3	32.9	46.7	37.0	32.9
Incr Delay (d2), s/veh	11.5	2.0	0.9	30.9	0.4	0.5	65.5	0.2	0.2	7.1	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	17.3	4.8	4.7	6.1	2.4	8.4	4.8	2.5	5.8	8.5	2.5
LnGrp Delay(d),s/veh	27.7	24.7	17.5	56.1	20.3	18.4	120.1	34.6	33.1	53.7	37.9	33.1
LnGrp LOS	C	C	B	E	C	B	F	C	C	D	D	C
Approach Vol, veh/h		2563			1160			626			854	
Approach Delay, s/veh		24.5			25.5			56.6			40.4	
Approach LOS		C			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	69.0		40.0	16.0	64.0		40.0
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		6.0
Max Green Setting (Gmax), s	7.0	62.0		34.0	12.0	57.0		34.0
Max Q Clear Time (g_c+I1), s	8.1	38.2		32.8	14.0	14.9		36.0
Green Ext Time (p_c), s	0.0	18.6		0.7	0.0	9.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.2
HCM 2010 LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	348	1857	230	166	820	116	155	346	94	158	560	94
Future Volume (vph)	348	1857	230	166	820	116	155	346	94	158	560	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		50.0	200.0		65.0	150.0		90.0	115.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.229			0.096			0.182			0.535		
Satd. Flow (perm)	427	5085	1583	179	5085	1583	339	3539	1583	997	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			128			136			109			145
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		450.0			200.0			200.0			200.0	
Travel Time (s)		23.1			10.3			12.0			12.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	366	1955	242	175	863	122	163	364	99	166	589	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	366	1955	242	175	863	122	163	364	99	166	589	99
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	32.0	11.0	24.0	24.0	36.0	36.0	36.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	32.0	58.0	58.0	14.0	40.0	40.0	12.0	48.0	48.0	36.0	36.0	36.0
Total Split (%)	26.7%	48.3%	48.3%	11.7%	33.3%	33.3%	10.0%	40.0%	40.0%	30.0%	30.0%	30.0%
Maximum Green (s)	28.0	51.0	51.0	10.0	33.0	33.0	8.0	42.0	42.0	30.0	30.0	30.0
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		12.0	12.0				23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)	67.6	51.1	51.1	54.3	41.5	41.5	38.9	36.9	36.9	24.9	24.9	24.9
Actuated g/C Ratio	0.59	0.45	0.45	0.47	0.36	0.36	0.34	0.32	0.32	0.22	0.22	0.22
v/c Ratio	0.77	0.86	0.31	0.80	0.47	0.19	0.76	0.32	0.17	0.77	0.77	0.22
Control Delay	25.5	34.4	11.2	53.4	31.1	5.0	51.9	30.1	4.9	65.7	49.4	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	34.4	11.2	53.4	31.1	5.0	51.9	30.1	4.9	65.7	49.4	2.8
LOS	C	C	B	D	C	A	D	C	A	E	D	A
Approach Delay		30.9			31.7			31.8			47.1	
Approach LOS		C			C			C			D	

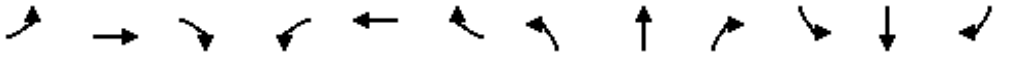
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 114.8			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 33.9		Intersection LOS: C	
Intersection Capacity Utilization 89.2%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 6: Ninth Line & Dundas Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	348	1857	230	166	820	116	155	346	94	158	560	94
Future Volume (veh/h)	348	1857	230	166	820	116	155	346	94	158	560	94
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	366	1955	242	175	863	122	163	364	99	166	589	99
Adj No. of Lanes	1	3	1	1	3	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	468	2273	708	219	1915	596	237	1155	517	268	783	350
Arrive On Green	0.15	0.45	0.45	0.08	0.38	0.38	0.07	0.33	0.33	0.22	0.22	0.22
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	3539	1583	925	3539	1583
Grp Volume(v), veh/h	366	1955	242	175	863	122	163	364	99	166	589	99
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	1770	1583	925	1770	1583
Q Serve(g_s), s	13.6	39.4	11.4	6.8	14.5	5.9	8.0	8.8	5.1	19.4	17.7	5.9
Cycle Q Clear(g_c), s	13.6	39.4	11.4	6.8	14.5	5.9	8.0	8.8	5.1	19.4	17.7	5.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	468	2273	708	219	1915	596	237	1155	517	268	783	350
V/C Ratio(X)	0.78	0.86	0.34	0.80	0.45	0.20	0.69	0.32	0.19	0.62	0.75	0.28
Avail Cap(c_a), veh/h	640	2273	708	237	1915	596	237	1303	583	306	931	416
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.4	28.3	20.6	26.4	26.7	24.0	32.2	28.9	27.6	42.2	41.5	36.9
Incr Delay (d2), s/veh	4.4	4.5	1.3	16.5	0.8	0.8	8.1	0.2	0.2	3.0	2.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	19.2	5.2	4.3	6.9	2.7	4.4	4.3	2.3	5.2	9.0	2.6
LnGrp Delay(d),s/veh	22.8	32.9	21.9	42.8	27.5	24.8	40.3	29.0	27.8	45.2	44.4	37.3
LnGrp LOS	C	C	C	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		2563			1160			626			854	
Approach Delay, s/veh		30.4			29.5			31.8			43.7	
Approach LOS		C			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	12.9	58.0	12.0	31.2	20.9	50.0		43.2
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	4.0	7.0		6.0
Max Green Setting (Gmax), s	10.0	51.0	8.0	30.0	28.0	33.0		42.0
Max Q Clear Time (g_c+I1), s	8.8	41.4	10.0	21.4	15.6	16.5		10.8
Green Ext Time (p_c), s	0.1	8.5	0.0	3.8	1.3	6.7		3.4

Intersection Summary	
HCM 2010 Ctrl Delay	32.6
HCM 2010 LOS	C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1366	174	266	2401	7	181	2	114	4	3	6
Future Volume (vph)	1	1366	174	266	2401	7	181	2	114	4	3	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	115.0		50.0	150.0		75.0	50.0		0.0	40.0		40.0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (m)	75.0			75.0			50.0			15.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850		0.853				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	3019	0	1770	1863	1583
Flt Permitted	0.069			0.117			0.756			0.677		
Satd. Flow (perm)	129	5085	1583	218	5085	1583	1408	3019	0	1261	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			140			73		154				65
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		200.0			600.0			200.0			200.0	
Travel Time (s)		10.3			30.9			14.4			14.4	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1	1394	178	271	2450	7	185	2	116	4	3	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1394	178	271	2450	7	185	118	0	4	3	6
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
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Detector Phase	5	2	2	1	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	37.2	37.2	46.0	46.0		46.0	46.0	46.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	12.0	61.2	61.2	12.0	61.2	61.2	46.8	46.8		46.8	46.8	46.8
Total Split (%)	10.0%	51.0%	51.0%	10.0%	51.0%	51.0%	39.0%	39.0%		39.0%	39.0%	39.0%
Maximum Green (s)	8.0	55.0	55.0	8.0	55.0	55.0	39.8	39.8		39.8	39.8	39.8
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.3	3.3		3.3	3.3	3.3
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.5	3.7	3.7		3.7	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.2	6.2	4.0	6.2	6.2	7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)		24.0	24.0		24.0	24.0	32.0	32.0		32.0	32.0	32.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	0
Act Effct Green (s)	67.5	58.3	58.3	87.8	83.4	83.4	21.2	21.2		21.2	21.2	21.2
Actuated g/C Ratio	0.56	0.49	0.49	0.73	0.70	0.70	0.18	0.18		0.18	0.18	0.18
v/c Ratio	0.01	0.56	0.21	0.59	0.69	0.01	0.74	0.18		0.02	0.01	0.02
Control Delay	7.0	23.2	5.6	33.4	4.9	0.0	63.9	2.9		36.8	36.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	7.0	23.2	5.6	33.4	4.9	0.0	63.9	2.9		36.8	36.3	0.2
LOS	A	C	A	C	A	A	E	A		D	D	A
Approach Delay		21.2			7.7			40.2			19.8	
Approach LOS		C			A			D			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 24 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 83.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Eighth Line & Dundas Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1366	174	266	2401	7	181	2	114	4	3	6
Future Volume (veh/h)	1	1366	174	266	2401	7	181	2	114	4	3	6
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	1	1394	178	271	2450	7	185	2	116	4	3	6
Adj No. of Lanes	1	3	1	1	3	1	1	2	0	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	3206	998	338	3535	1101	282	282	253	178	297	253
Arrive On Green	0.00	0.63	0.63	0.09	0.92	0.92	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1400	1770	1583	1269	1863	1583
Grp Volume(v), veh/h	1	1394	178	271	2450	7	185	2	116	4	3	6
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1400	1770	1583	1269	1863	1583
Q Serve(g_s), s	0.0	16.8	5.6	6.4	12.1	0.0	15.4	0.1	8.0	0.3	0.2	0.4
Cycle Q Clear(g_c), s	0.0	16.8	5.6	6.4	12.1	0.0	15.5	0.1	8.0	8.3	0.2	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	144	3206	998	338	3535	1101	282	282	253	178	297	253
V/C Ratio(X)	0.01	0.43	0.18	0.80	0.69	0.01	0.66	0.01	0.46	0.02	0.01	0.02
Avail Cap(c_a), veh/h	259	3206	998	338	3535	1101	523	587	525	397	618	525
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.2	11.3	9.2	12.9	1.8	1.4	49.0	42.4	45.7	49.5	42.4	42.5
Incr Delay (d2), s/veh	0.0	0.4	0.4	13.0	1.1	0.0	2.6	0.0	1.3	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.9	2.5	6.9	5.3	0.0	6.2	0.1	3.6	0.1	0.1	0.2
LnGrp Delay(d),s/veh	8.2	11.7	9.6	25.9	3.0	1.4	51.6	42.4	47.0	49.5	42.5	42.6
LnGrp LOS	A	B	A	C	A	A	D	D	D	D	D	D
Approach Vol, veh/h		1573			2728			303			13	
Approach Delay, s/veh		11.5			5.3			49.8			44.7	
Approach LOS		B			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	81.8		26.2	4.2	89.6		26.2
Change Period (Y+Rc), s	4.0	* 6.2		7.0	4.0	* 6.2		7.0
Max Green Setting (Gmax), s	8.0	* 55		39.8	8.0	* 55		39.8
Max Q Clear Time (g_c+I1), s	8.4	18.8		10.3	2.0	14.1		17.5
Green Ext Time (p_c), s	0.0	17.0		0.0	0.0	33.2		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B

Notes

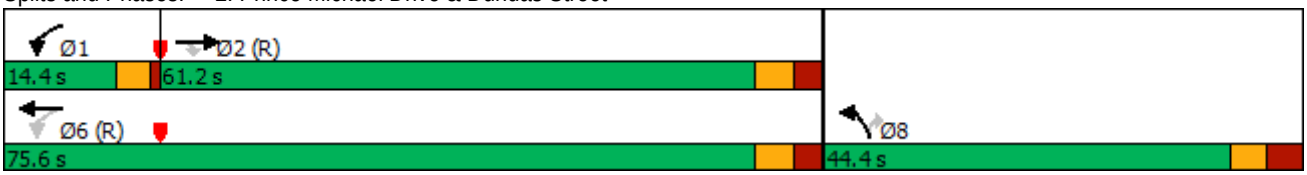
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1344	176	251	2464	175	86
Future Volume (vph)	1344	176	251	2464	175	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		50.0	125.0		60.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			55.0		25.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5085	1583	1770	5085	1770	1583
Flt Permitted			0.116		0.950	
Satd. Flow (perm)	5085	1583	216	5085	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		144				87
Link Speed (k/h)	70			70	50	
Link Distance (m)	600.0			450.0	200.0	
Travel Time (s)	30.9			23.1	14.4	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	1358	178	254	2489	177	87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1358	178	254	2489	177	87
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
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	20.0	20.0	7.0	20.0	10.0	10.0
Minimum Split (s)	38.3	38.3	11.5	38.3	43.9	43.9

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (s)	61.2	61.2	14.4	75.6	44.4	44.4
Total Split (%)	51.0%	51.0%	12.0%	63.0%	37.0%	37.0%
Maximum Green (s)	54.9	54.9	10.4	69.3	37.5	37.5
Yellow Time (s)	3.7	3.7	3.0	3.7	3.3	3.3
All-Red Time (s)	2.6	2.6	1.0	2.6	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.3	6.3	4.0	6.3	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	25.0	25.0		25.0	30.0	30.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	54.9	54.9	71.6	69.3	37.5	37.5
Actuated g/C Ratio	0.46	0.46	0.60	0.58	0.31	0.31
v/c Ratio	0.58	0.22	0.97	0.85	0.32	0.16
Control Delay	50.3	26.1	58.4	24.7	33.5	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	26.1	58.4	24.7	33.5	6.8
LOS	D	C	E	C	C	A
Approach Delay	47.5			27.9	24.7	
Approach LOS	D			C	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 34.3		Intersection LOS: C	
Intersection Capacity Utilization 68.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Prince Michael Drive & Dundas Street



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1344	176	251	2464	175	86
Future Volume (veh/h)	1344	176	251	2464	175	86
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1358	178	254	2489	177	87
Adj No. of Lanes	3	1	1	3	1	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2327	724	284	2937	554	495
Arrive On Green	0.15	0.15	0.17	1.00	0.31	0.31
Sat Flow, veh/h	5253	1583	1774	5253	1774	1583
Grp Volume(v), veh/h	1358	178	254	2489	177	87
Grp Sat Flow(s),veh/h/ln	1695	1583	1774	1695	1774	1583
Q Serve(g_s), s	29.8	11.9	9.6	0.0	9.1	4.8
Cycle Q Clear(g_c), s	29.8	11.9	9.6	0.0	9.1	4.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2327	724	284	2937	554	495
V/C Ratio(X)	0.58	0.25	0.89	0.85	0.32	0.18
Avail Cap(c_a), veh/h	2327	724	284	2937	554	495
HCM Platoon Ratio	0.33	0.33	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.3	32.7	21.1	0.0	31.5	30.0
Incr Delay (d2), s/veh	1.1	0.8	28.1	3.3	1.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	5.4	6.7	0.9	4.7	2.2
LnGrp Delay(d),s/veh	41.4	33.5	49.2	3.3	33.0	30.8
LnGrp LOS	D	C	D	A	C	C
Approach Vol, veh/h	1536			2743	264	
Approach Delay, s/veh	40.5			7.5	32.3	
Approach LOS	D			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	14.4	61.2				75.6		44.4
Change Period (Y+Rc), s	4.0	* 6.3				* 6.3		6.9
Max Green Setting (Gmax), s	10.4	* 55				* 69		37.5
Max Q Clear Time (g_c+I1), s	11.6	31.8				2.0		11.1
Green Ext Time (p_c), s	0.0	13.0				49.8		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	20.1
HCM 2010 LOS	C

Notes

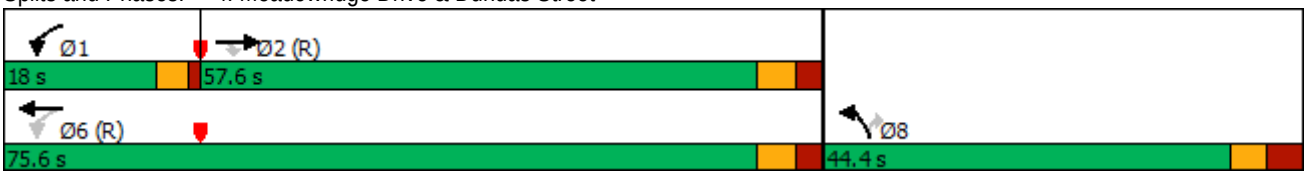
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

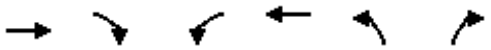
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1362	81	251	2721	42	147
Future Volume (vph)	1362	81	251	2721	42	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		60.0	135.0		25.0	0.0
Storage Lanes		1	1		2	1
Taper Length (m)			60.0		45.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5085	1583	1770	5085	3433	1583
Flt Permitted			0.148		0.950	
Satd. Flow (perm)	5085	1583	276	5085	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		73				150
Link Speed (k/h)	70			70	50	
Link Distance (m)	150.0			350.0	200.0	
Travel Time (s)	7.7			18.0	14.4	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1390	83	256	2777	43	150
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1390	83	256	2777	43	150
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
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
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	20.0	20.0	7.0	20.0	10.0	10.0
Minimum Split (s)	36.2	36.2	11.0	36.2	43.9	43.9

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (s)	57.6	57.6	18.0	75.6	44.4	44.4
Total Split (%)	48.0%	48.0%	15.0%	63.0%	37.0%	37.0%
Maximum Green (s)	51.4	51.4	14.0	69.4	37.5	37.5
Yellow Time (s)	3.7	3.7	3.0	3.7	3.3	3.3
All-Red Time (s)	2.5	2.5	1.0	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.0	6.2	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	30.0	30.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	76.4	76.4	98.6	96.4	10.5	10.5
Actuated g/C Ratio	0.64	0.64	0.82	0.80	0.09	0.09
v/c Ratio	0.43	0.08	0.60	0.68	0.14	0.55
Control Delay	28.8	13.4	12.5	6.2	51.4	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	13.4	12.5	6.2	51.4	15.8
LOS	C	B	B	A	D	B
Approach Delay	28.0			6.8	23.8	
Approach LOS	C			A	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 74.4 (62%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 71.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Meadowridge Drive & Dundas Street





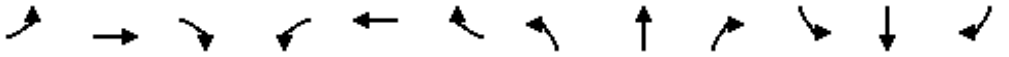
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1362	81	251	2721	42	147
Future Volume (veh/h)	1362	81	251	2721	42	147
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1390	83	256	2777	43	150
Adj No. of Lanes	3	1	1	3	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	3452	1075	414	3939	400	184
Arrive On Green	1.00	1.00	0.06	0.77	0.12	0.12
Sat Flow, veh/h	5253	1583	1774	5253	3442	1583
Grp Volume(v), veh/h	1390	83	256	2777	43	150
Grp Sat Flow(s),veh/h/ln	1695	1583	1774	1695	1721	1583
Q Serve(g_s), s	0.0	0.0	4.9	32.5	1.3	11.1
Cycle Q Clear(g_c), s	0.0	0.0	4.9	32.5	1.3	11.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	3452	1075	414	3939	400	184
V/C Ratio(X)	0.40	0.08	0.62	0.71	0.11	0.81
Avail Cap(c_a), veh/h	3452	1075	510	3939	1076	495
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	4.2	6.7	47.4	51.8
Incr Delay (d2), s/veh	0.4	0.1	1.5	1.1	0.1	8.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	2.5	15.3	0.6	5.3
LnGrp Delay(d),s/veh	0.4	0.1	5.7	7.8	47.6	60.2
LnGrp LOS	A	A	A	A	D	E
Approach Vol, veh/h	1473			3033	193	
Approach Delay, s/veh	0.3			7.6	57.4	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.5	87.7				99.1		20.9
Change Period (Y+Rc), s	4.0	* 6.2				* 6.2		6.9
Max Green Setting (Gmax), s	14.0	* 51				* 69		37.5
Max Q Clear Time (g_c+I1), s	6.9	2.0				34.5		13.1
Green Ext Time (p_c), s	0.6	18.1				31.6		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	7.4
HCM 2010 LOS	A

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

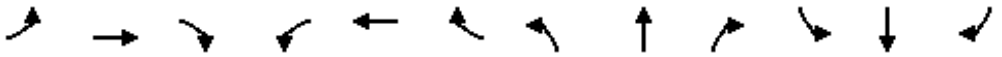


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	1260	199	144	2272	134	341	534	409	99	346	265
Future Volume (vph)	84	1260	199	144	2272	134	341	534	409	99	346	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		50.0	200.0		65.0	150.0		90.0	115.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.070			0.148			0.343			0.444		
Satd. Flow (perm)	130	5085	1583	276	5085	1583	639	3539	1583	827	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			176			100			142			116
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		450.0			200.0			200.0			200.0	
Travel Time (s)		23.1			10.3			14.4			14.4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	88	1313	207	150	2367	140	355	556	426	103	360	276
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	1313	207	150	2367	140	355	556	426	103	360	276
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	5.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	32.0	10.0	24.0	24.0	35.0	35.0	35.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	11.0	63.0	63.0	11.0	63.0	63.0	11.0	46.0	46.0	35.0	35.0	35.0
Total Split (%)	9.2%	52.5%	52.5%	9.2%	52.5%	52.5%	9.2%	38.3%	38.3%	29.2%	29.2%	29.2%
Maximum Green (s)	7.0	56.0	56.0	7.0	56.0	56.0	7.0	40.0	40.0	29.0	29.0	29.0
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		12.0	12.0				22.0	22.0	22.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)	66.2	56.1	56.1	67.0	58.4	58.4	33.4	31.4	31.4	20.4	20.4	20.4
Actuated g/C Ratio	0.59	0.50	0.50	0.60	0.52	0.52	0.30	0.28	0.28	0.18	0.18	0.18
v/c Ratio	0.49	0.51	0.23	0.58	0.89	0.16	1.35	0.56	0.78	0.68	0.56	0.72
Control Delay	22.4	20.1	4.6	19.3	30.5	6.3	213.6	36.3	34.7	65.3	44.6	35.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	20.1	4.6	19.3	30.5	6.3	213.6	36.3	34.7	65.3	44.6	35.3
LOS	C	C	A	B	C	A	F	D	C	E	D	D
Approach Delay		18.2			28.6			82.8			44.0	
Approach LOS		B			C			F			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 111.6			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.35			
Intersection Signal Delay: 39.2		Intersection LOS: D	
Intersection Capacity Utilization 98.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 6: Ninth Line & Dundas Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1260	199	144	2272	134	341	534	409	99	346	265
Future Volume (veh/h)	84	1260	199	144	2272	134	341	534	409	99	346	265
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	88	1312	207	150	2367	140	355	556	426	103	360	276
Adj No. of Lanes	1	3	1	1	3	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	161	2395	746	263	2411	751	282	1158	518	176	830	372
Arrive On Green	0.06	0.47	0.47	0.06	0.47	0.47	0.06	0.33	0.33	0.23	0.23	0.23
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	3539	1583	571	3539	1583
Grp Volume(v), veh/h	88	1312	207	150	2367	140	355	556	426	103	360	276
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	1770	1583	571	1770	1583
Q Serve(g_s), s	2.9	21.9	9.5	5.2	54.4	6.1	7.0	14.9	29.4	20.9	10.3	19.2
Cycle Q Clear(g_c), s	2.9	21.9	9.5	5.2	54.4	6.1	7.0	14.9	29.4	24.8	10.3	19.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	161	2395	746	263	2411	751	282	1158	518	176	830	372
V/C Ratio(X)	0.55	0.55	0.28	0.57	0.98	0.19	1.26	0.48	0.82	0.59	0.43	0.74
Avail Cap(c_a), veh/h	167	2395	746	263	2411	751	282	1191	533	181	863	386
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	22.4	19.1	17.9	30.7	18.0	43.4	31.9	36.8	46.2	38.8	42.2
Incr Delay (d2), s/veh	3.4	0.9	0.9	2.9	14.5	0.5	142.5	0.3	9.8	4.6	0.4	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	10.4	4.3	2.7	28.7	2.8	18.0	7.3	14.3	3.5	5.1	9.2
LnGrp Delay(d),s/veh	30.6	23.3	20.1	20.8	45.2	18.6	185.9	32.2	46.6	50.8	39.1	49.5
LnGrp LOS	C	C	C	C	D	B	F	C	D	D	D	D
Approach Vol, veh/h		1607			2657			1337			739	
Approach Delay, s/veh		23.3			42.4			77.6			44.6	
Approach LOS		C			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	63.0	11.0	33.9	10.6	63.4		44.9
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	4.0	7.0		6.0
Max Green Setting (Gmax), s	7.0	56.0	7.0	29.0	7.0	56.0		40.0
Max Q Clear Time (g_c+I1), s	7.2	23.9	9.0	26.8	4.9	56.4		31.4
Green Ext Time (p_c), s	0.0	15.2	0.0	1.1	0.0	0.0		4.0

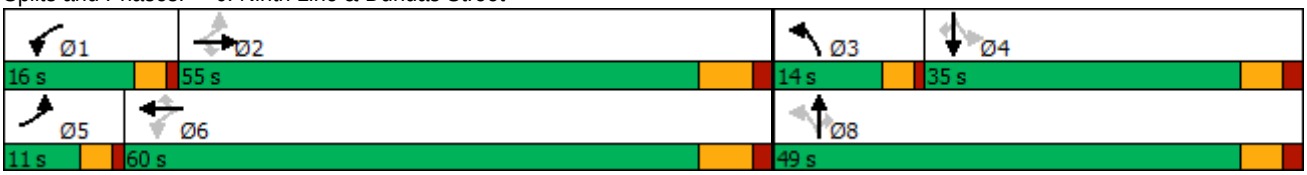
Intersection Summary	
HCM 2010 Ctrl Delay	45.3
HCM 2010 LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	1260	199	144	2272	134	341	534	409	99	346	265
Future Volume (vph)	84	1260	199	144	2272	134	341	534	409	99	346	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		50.0	200.0		65.0	150.0		90.0	115.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.079			0.128			0.345			0.444		
Satd. Flow (perm)	147	5085	1583	238	5085	1583	643	3539	1583	827	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			156			100			166			145
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		450.0			200.0			200.0			200.0	
Travel Time (s)		23.1			10.3			12.0			12.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	88	1313	207	150	2367	140	355	556	426	103	360	276
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	1313	207	150	2367	140	355	556	426	103	360	276
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	5.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	32.0	10.0	24.0	24.0	35.0	35.0	35.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	11.0	55.0	55.0	16.0	60.0	60.0	14.0	49.0	49.0	35.0	35.0	35.0
Total Split (%)	9.2%	45.8%	45.8%	13.3%	50.0%	50.0%	11.7%	40.8%	40.8%	29.2%	29.2%	29.2%
Maximum Green (s)	7.0	48.0	48.0	12.0	53.0	53.0	10.0	43.0	43.0	29.0	29.0	29.0
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		12.0	12.0				22.0	22.0	22.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)	59.7	49.6	49.6	65.3	54.5	54.5	36.4	34.4	34.4	20.4	20.4	20.4
Actuated g/C Ratio	0.54	0.45	0.45	0.59	0.49	0.49	0.33	0.31	0.31	0.18	0.18	0.18
v/c Ratio	0.48	0.58	0.26	0.55	0.94	0.17	1.13	0.50	0.70	0.68	0.55	0.67
Control Delay	23.7	24.8	7.2	18.7	37.3	7.0	123.9	32.8	26.7	64.7	44.2	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	24.8	7.2	18.7	37.3	7.0	123.9	32.8	26.7	64.7	44.2	28.0
LOS	C	C	A	B	D	A	F	C	C	E	D	C
Approach Delay		22.5			34.6			55.1			41.0	
Approach LOS		C			C			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 110.6			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.13			
Intersection Signal Delay: 36.6		Intersection LOS: D	
Intersection Capacity Utilization 98.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 6: Ninth Line & Dundas Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1260	199	144	2272	134	341	534	409	99	346	265
Future Volume (veh/h)	84	1260	199	144	2272	134	341	534	409	99	346	265
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	88	1312	207	150	2367	140	355	556	426	103	360	276
Adj No. of Lanes	1	3	1	1	3	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	163	2297	715	264	2330	725	317	1196	535	185	767	343
Arrive On Green	0.06	0.45	0.45	0.06	0.46	0.46	0.09	0.34	0.34	0.22	0.22	0.22
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	3539	1583	571	3539	1583
Grp Volume(v), veh/h	88	1312	207	150	2367	140	355	556	426	103	360	276
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	1770	1583	571	1770	1583
Q Serve(g_s), s	3.0	22.0	9.5	5.2	53.0	6.1	10.0	14.3	28.2	20.0	10.3	19.1
Cycle Q Clear(g_c), s	3.0	22.0	9.5	5.2	53.0	6.1	10.0	14.3	28.2	20.3	10.3	19.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	163	2297	715	264	2330	725	317	1196	535	185	767	343
V/C Ratio(X)	0.54	0.57	0.29	0.57	1.02	0.19	1.12	0.46	0.80	0.56	0.47	0.80
Avail Cap(c_a), veh/h	170	2297	715	336	2330	725	317	1316	589	204	887	397
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	23.4	20.0	18.6	31.3	18.6	39.9	30.1	34.7	43.5	39.5	43.0
Incr Delay (d2), s/veh	3.1	1.0	1.0	1.9	22.7	0.6	87.3	0.3	6.9	2.7	0.4	10.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	10.5	4.3	2.6	29.5	2.8	15.3	7.0	13.3	3.3	5.0	9.3
LnGrp Delay(d),s/veh	29.6	24.5	21.0	20.5	54.0	19.2	127.2	30.4	41.6	46.3	39.9	53.0
LnGrp LOS	C	C	C	C	F	B	F	C	D	D	D	D
Approach Vol, veh/h		1607			2657			1337			739	
Approach Delay, s/veh		24.3			50.3			59.7			45.7	
Approach LOS		C			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	11.3	59.3	14.0	31.1	10.6	60.0		45.1
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	4.0	7.0		6.0
Max Green Setting (Gmax), s	12.0	48.0	10.0	29.0	7.0	53.0		43.0
Max Q Clear Time (g_c+I1), s	7.2	24.0	12.0	22.3	5.0	55.0		30.2
Green Ext Time (p_c), s	0.2	13.0	0.0	2.8	0.0	0.0		5.2

Intersection Summary	
HCM 2010 Ctrl Delay	45.1
HCM 2010 LOS	D

Appendix E

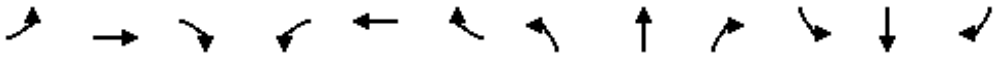
2024 Future Background Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2374	145	78	1324	29	143	1	145	93	4	32
Future Volume (vph)	10	2374	145	78	1324	29	143	1	145	93	4	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	115.0		50.0	150.0		75.0	50.0		0.0	40.0		40.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	75.0			75.0			50.0			15.0		
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4471	1583	1770	4471	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.145			0.049			0.755			0.757		
Satd. Flow (perm)	270	4471	1583	91	4471	1583	1406	1863	1583	1410	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			73			139			65
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		200.0			600.0			200.0			200.0	
Travel Time (s)		10.3			30.9			14.4			14.4	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	2422	148	80	1351	30	146	1	148	95	4	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	2422	148	80	1351	30	146	1	148	95	4	33
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	37.2	37.2	46.0	46.0	46.0	46.0	46.0	46.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	12.0	61.2	61.2	12.0	61.2	61.2	46.8	46.8	46.8	46.8	46.8	46.8
Total Split (%)	10.0%	51.0%	51.0%	10.0%	51.0%	51.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Maximum Green (s)	8.0	55.0	55.0	8.0	55.0	55.0	39.8	39.8	39.8	39.8	39.8	39.8
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.5	3.7	3.7	3.7	3.7	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.2	6.2	4.0	6.2	6.2	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		24.0	24.0		24.0	24.0	32.0	32.0	32.0	32.0	32.0	32.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	0
Act Effct Green (s)	87.0	79.2	79.2	91.0	86.7	86.7	17.9	17.9	17.9	17.9	17.9	17.9
Actuated g/C Ratio	0.72	0.66	0.66	0.76	0.72	0.72	0.15	0.15	0.15	0.15	0.15	0.15
v/c Ratio	0.04	0.82	0.14	0.44	0.42	0.03	0.70	0.00	0.42	0.45	0.01	0.11
Control Delay	5.2	20.4	5.7	26.7	18.1	5.5	65.0	39.0	11.7	52.0	39.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	20.4	5.7	26.7	18.1	5.5	65.0	39.0	11.7	52.0	39.5	2.5
LOS	A	C	A	C	B	A	E	D	B	D	D	A
Approach Delay		19.5			18.3			38.2			39.2	
Approach LOS		B			B			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 49.2 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 20.9		Intersection LOS: C	
Intersection Capacity Utilization 80.6%		ICU Level of Service D	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Eighth Line & Dundas Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	2374	145	78	1324	29	143	1	145	93	4	32
Future Volume (veh/h)	10	2374	145	78	1324	29	143	1	145	93	4	32
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	10	2422	148	80	1351	30	146	1	148	95	4	33
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	351	2989	1059	190	3158	1118	240	249	212	224	249	212
Arrive On Green	0.02	0.67	0.67	0.11	1.00	1.00	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	4471	1583	1774	4471	1583	1365	1863	1583	1234	1863	1583
Grp Volume(v), veh/h	10	2422	148	80	1351	30	146	1	148	95	4	33
Grp Sat Flow(s),veh/h/ln	1774	1490	1583	1774	1490	1583	1365	1863	1583	1234	1863	1583
Q Serve(g_s), s	0.2	47.0	4.1	1.5	0.0	0.0	12.5	0.1	10.7	8.7	0.2	2.2
Cycle Q Clear(g_c), s	0.2	47.0	4.1	1.5	0.0	0.0	12.7	0.1	10.7	8.7	0.2	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	351	2989	1059	190	3158	1118	240	249	212	224	249	212
V/C Ratio(X)	0.03	0.81	0.14	0.42	0.43	0.03	0.61	0.00	0.70	0.42	0.02	0.16
Avail Cap(c_a), veh/h	439	2989	1059	212	3158	1118	510	618	525	469	618	525
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.0	14.4	7.3	23.6	0.0	0.0	50.6	45.0	49.7	48.8	45.1	46.0
Incr Delay (d2), s/veh	0.0	2.5	0.3	1.5	0.4	0.0	2.5	0.0	4.1	1.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	19.8	1.8	1.8	0.1	0.0	4.9	0.0	4.9	3.0	0.1	1.0
LnGrp Delay(d),s/veh	6.0	16.9	7.5	25.0	0.4	0.0	53.1	45.1	53.8	50.1	45.1	46.3
LnGrp LOS	A	B	A	C	A	A	D	D	D	D	D	D
Approach Vol, veh/h		2580			1461			295			132	
Approach Delay, s/veh		16.3			1.8			53.4			49.0	
Approach LOS		B			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.5	86.4		23.1	6.0	91.0		23.1
Change Period (Y+Rc), s	4.0	* 6.2		7.0	4.0	* 6.2		7.0
Max Green Setting (Gmax), s	8.0	* 55		39.8	8.0	* 55		39.8
Max Q Clear Time (g_c+I1), s	3.5	49.0		10.7	2.2	2.0		14.7
Green Ext Time (p_c), s	0.1	5.7		0.6	0.0	17.1		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.0
HCM 2010 LOS	B

Notes

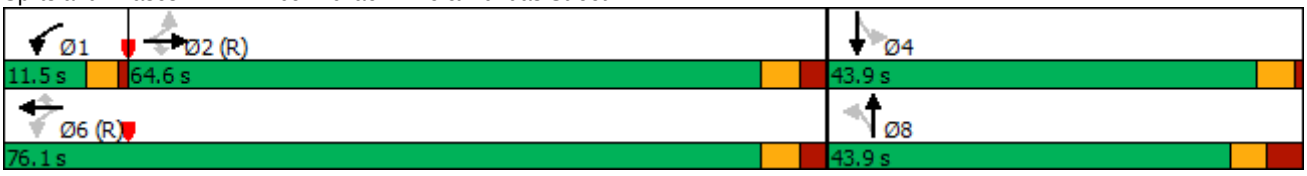
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

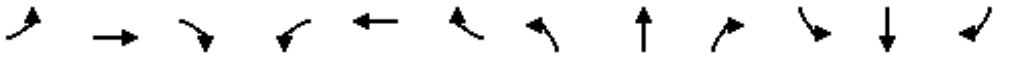
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	2375	128	78	1175	70	121	4	189	215	5	105
Future Volume (vph)	35	2375	128	78	1175	70	121	4	189	215	5	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		50.0	125.0		50.0	60.0		0.0	60.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	55.0			55.0			25.0			25.0		
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.853			0.856	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4471	1583	1770	4471	1583	1770	1589	0	1770	1595	0
Flt Permitted	0.167			0.063			0.658			0.572		
Satd. Flow (perm)	311	4471	1583	117	4471	1583	1226	1589	0	1065	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			72			76		125			64	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		600.0			450.0			200.0			200.0	
Travel Time (s)		30.9			23.1			14.4			14.4	
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Adj. Flow (vph)	38	2500	135	82	1237	76	127	4	199	234	5	114
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	2500	135	82	1237	76	127	203	0	234	119	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
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0		5.0	5.0	
Minimum Split (s)	38.3	38.3	38.3	11.5	38.3	38.3	43.9	43.9		22.5	22.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	64.6	64.6	64.6	11.5	76.1	76.1	43.9	43.9		43.9	43.9	
Total Split (%)	53.8%	53.8%	53.8%	9.6%	63.4%	63.4%	36.6%	36.6%		36.6%	36.6%	
Maximum Green (s)	58.3	58.3	58.3	7.5	69.8	69.8	37.0	37.0		39.4	39.4	
Yellow Time (s)	3.7	3.7	3.7	3.0	3.7	3.7	3.3	3.3		3.5	3.5	
All-Red Time (s)	2.6	2.6	2.6	1.0	2.6	2.6	3.6	3.6		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	4.0	6.3	6.3	6.9	6.9		4.5	4.5	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0	25.0		25.0	25.0	30.0	30.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0		0	0	
Act Effct Green (s)	60.7	60.7	60.7	72.1	69.8	69.8	37.0	37.0		39.4	39.4	
Actuated g/C Ratio	0.51	0.51	0.51	0.60	0.58	0.58	0.31	0.31		0.33	0.33	
v/c Ratio	0.24	1.11	0.16	0.48	0.48	0.08	0.34	0.35		0.67	0.21	
Control Delay	10.6	76.4	3.1	32.1	17.2	5.0	35.1	14.5		45.8	15.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	10.6	76.4	3.1	32.1	17.2	5.0	35.1	14.5		45.8	15.3	
LOS	B	E	A	C	B	A	D	B		D	B	
Approach Delay		71.8			17.5			22.4			35.5	
Approach LOS		E			B			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 82.8 (69%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 49.7		Intersection LOS: D	
Intersection Capacity Utilization 93.6%		ICU Level of Service F	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 2: Prince Michael Drive & Dundas Street





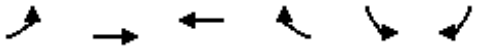
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	2375	128	78	1175	70	121	4	189	215	5	105
Future Volume (veh/h)	35	2375	128	78	1175	70	121	4	189	215	5	105
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	38	2500	135	82	1237	76	127	4	199	234	5	114
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	339	3316	1174	241	3708	1313	390	10	491	313	21	482
Arrive On Green	1.00	1.00	1.00	0.04	0.56	0.56	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	417	4471	1583	1774	4471	1583	1268	31	1557	1174	67	1526
Grp Volume(v), veh/h	38	2500	135	82	1237	76	127	0	203	234	0	119
Grp Sat Flow(s),veh/h/ln	417	1490	1583	1774	1490	1583	1268	0	1588	1174	0	1593
Q Serve(g_s), s	1.2	0.0	0.0	1.1	18.1	2.6	9.9	0.0	12.0	23.4	0.0	6.6
Cycle Q Clear(g_c), s	10.1	0.0	0.0	1.1	18.1	2.6	16.5	0.0	12.0	35.5	0.0	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.96
Lane Grp Cap(c), veh/h	339	3316	1174	241	3708	1313	390	0	501	313	0	503
V/C Ratio(X)	0.11	0.75	0.11	0.34	0.33	0.06	0.33	0.00	0.41	0.75	0.00	0.24
Avail Cap(c_a), veh/h	339	3316	1174	255	3708	1313	390	0	501	328	0	523
HCM Platoon Ratio	2.00	2.00	2.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.5	0.0	0.0	2.4	8.6	5.1	36.5	0.0	32.2	46.1	0.0	30.4
Incr Delay (d2), s/veh	0.7	1.6	0.2	0.8	0.2	0.1	2.2	0.0	2.4	8.7	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.1	0.6	7.5	1.2	3.7	0.0	5.6	8.4	0.0	2.9
LnGrp Delay(d),s/veh	1.2	1.6	0.2	3.2	8.8	5.2	38.7	0.0	34.6	54.9	0.0	30.6
LnGrp LOS	A	A	A	A	A	A	D		C	D		C
Approach Vol, veh/h		2673			1395			330			353	
Approach Delay, s/veh		1.6			8.3			36.2			46.7	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	10.5	96.2		44.8		106.7		44.8
Change Period (Y+Rc), s	4.0	* 6.3		* 6.9		* 6.3		* 6.9
Max Green Setting (Gmax), s	7.5	* 58		* 39		* 70		* 37
Max Q Clear Time (g_c+I1), s	3.1	12.1		37.5		20.1		18.5
Green Ext Time (p_c), s	0.1	38.9		0.4		15.2		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			
Traffic Volume (vph)	0	2770	1323	0	0	0
Future Volume (vph)	0	2770	1323	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			40.0	0.0	0.0
Storage Lanes	0			0	0	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	*0.80	*0.80	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	4471	4471	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	4471	4471	0	0	0
Link Speed (k/h)		70	70		50	
Link Distance (m)		450.0	150.0		200.0	
Travel Time (s)		23.1	7.7		14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	3011	1438	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	3011	1438	0	0	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		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	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 56.9%		ICU Level of Service B	
Analysis Period (min) 15			

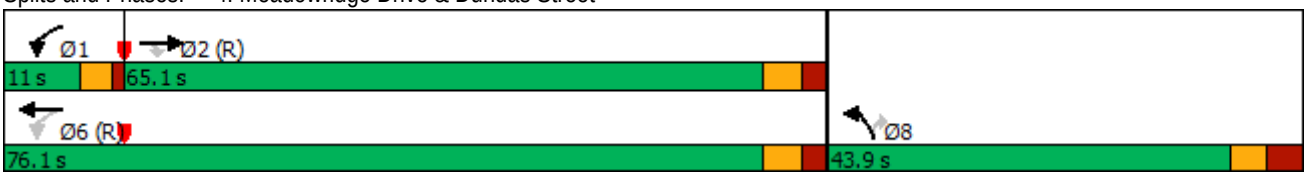
* User Entered Value

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2726	34	59	1203	35	266
Future Volume (vph)	2726	34	59	1203	35	266
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		60.0	135.0		25.0	0.0
Storage Lanes		1	1		2	1
Taper Length (m)			60.0		45.0	
Lane Util. Factor	*0.80	1.00	1.00	*0.80	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	4471	1583	1770	4471	3433	1583
Flt Permitted			0.049		0.950	
Satd. Flow (perm)	4471	1583	91	4471	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		15				116
Link Speed (k/h)	70			70	50	
Link Distance (m)	150.0			350.0	200.0	
Travel Time (s)	7.7			18.0	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2869	36	62	1266	37	280
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2869	36	62	1266	37	280
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
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
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	20.0	20.0	7.0	20.0	10.0	10.0
Minimum Split (s)	36.2	36.2	11.0	36.2	43.9	43.9

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (s)	65.1	65.1	11.0	76.1	43.9	43.9
Total Split (%)	54.3%	54.3%	9.2%	63.4%	36.6%	36.6%
Maximum Green (s)	58.9	58.9	7.0	69.9	37.0	37.0
Yellow Time (s)	3.7	3.7	3.0	3.7	3.3	3.3
All-Red Time (s)	2.5	2.5	1.0	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.0	6.2	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	30.0	30.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	78.8	78.8	90.1	87.9	19.0	19.0
Actuated g/C Ratio	0.66	0.66	0.75	0.73	0.16	0.16
v/c Ratio	0.98	0.03	0.36	0.39	0.07	0.80
Control Delay	15.6	1.7	15.1	7.1	39.7	45.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.6	1.7	15.1	7.1	39.7	45.0
LOS	B	A	B	A	D	D
Approach Delay	15.4			7.4	44.4	
Approach LOS	B			A	D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 118.8 (99%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 15.1		Intersection LOS: B	
Intersection Capacity Utilization 80.1%		ICU Level of Service D	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 4: Meadowridge Drive & Dundas Street



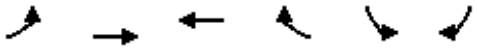
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2726	34	59	1203	35	266
Future Volume (veh/h)	2726	34	59	1203	35	266
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	2869	36	62	1266	37	280
Adj No. of Lanes	3	1	1	3	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	2713	961	150	3090	687	316
Arrive On Green	0.81	0.81	0.05	0.69	0.20	0.20
Sat Flow, veh/h	4843	1583	1774	4843	3442	1583
Grp Volume(v), veh/h	2869	36	62	1266	37	280
Grp Sat Flow(s),veh/h/ln	1490	1583	1774	1490	1721	1583
Q Serve(g_s), s	72.8	0.5	1.4	14.6	1.0	20.6
Cycle Q Clear(g_c), s	72.8	0.5	1.4	14.6	1.0	20.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2713	961	150	3090	687	316
V/C Ratio(X)	1.06	0.04	0.41	0.41	0.05	0.89
Avail Cap(c_a), veh/h	2713	961	163	3090	1061	488
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	4.6	29.9	8.0	38.9	46.7
Incr Delay (d2), s/veh	34.9	0.1	1.8	0.4	0.0	11.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	37.2	0.2	1.3	6.1	0.5	10.1
LnGrp Delay(d),s/veh	46.4	4.7	31.7	8.4	38.9	58.6
LnGrp LOS	F	A	C	A	D	E
Approach Vol, veh/h	2905			1328	317	
Approach Delay, s/veh	45.9			9.5	56.3	
Approach LOS	D			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.1	79.0				89.1		30.9
Change Period (Y+Rc), s	4.0	* 6.2				* 6.2		6.9
Max Green Setting (Gmax), s	7.0	* 59				* 70		37.0
Max Q Clear Time (g_c+I1), s	3.4	74.8				16.6		22.6
Green Ext Time (p_c), s	0.0	0.0				15.2		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	36.0
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

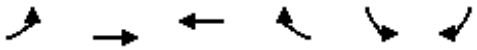


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	3266	1336	55	167	36
Future Volume (vph)	12	3266	1336	55	167	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0			70.0	60.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	65.0				25.0	
Lane Util. Factor	1.00	*0.80	*0.80	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	4471	4471	1583	1770	1583
Flt Permitted	0.114				0.950	
Satd. Flow (perm)	212	4471	4471	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				60		39
Link Speed (k/h)		70	70		50	
Link Distance (m)		350.0	450.0		200.0	
Travel Time (s)		18.0	23.1		14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	3550	1452	60	182	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	3550	1452	60	182	39
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
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	2.0	10.0	10.0	2.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6	2.0	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	7.0	7.0
Minimum Split (s)	36.2	36.2	36.2	36.2	36.9	36.9

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (s)	97.0	97.0	97.0	97.0	36.9	36.9
Total Split (%)	72.4%	72.4%	72.4%	72.4%	27.6%	27.6%
Maximum Green (s)	90.8	90.8	90.8	90.8	30.0	30.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.9	6.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	90.8	90.8	90.8	90.8	30.0	30.0
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.22	0.22
v/c Ratio	0.09	1.17	0.48	0.05	0.46	0.10
Control Delay	9.2	104.1	10.9	1.8	49.4	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	104.1	10.9	1.8	49.4	12.8
LOS	A	F	B	A	D	B
Approach Delay		103.8	10.6		42.9	
Approach LOS		F	B		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 133.9			
Actuated Cycle Length: 133.9			
Offset: 23 (17%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.17			
Intersection Signal Delay: 74.6		Intersection LOS: E	
Intersection Capacity Utilization 83.3%		ICU Level of Service E	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 5: Dundas Street & Street 'A'



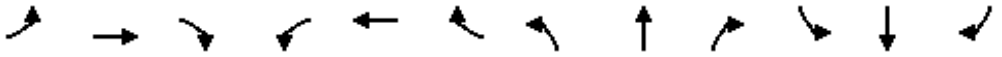
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	3266	1336	55	167	36
Future Volume (veh/h)	12	3266	1336	55	167	36
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	13	3550	1452	60	182	39
Adj No. of Lanes	1	3	3	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	234	3033	3033	1074	397	354
Arrive On Green	0.68	0.68	0.68	0.68	0.22	0.22
Sat Flow, veh/h	344	4843	4843	1583	1774	1583
Grp Volume(v), veh/h	13	3550	1452	60	182	39
Grp Sat Flow(s),veh/h/ln	344	1490	1490	1583	1774	1583
Q Serve(g_s), s	2.5	90.9	20.7	1.7	11.9	2.6
Cycle Q Clear(g_c), s	23.2	90.9	20.7	1.7	11.9	2.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	234	3033	3033	1074	397	354
V/C Ratio(X)	0.06	1.17	0.48	0.06	0.46	0.11
Avail Cap(c_a), veh/h	234	3033	3033	1074	397	354
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.8	21.6	10.3	7.2	45.0	41.4
Incr Delay (d2), s/veh	0.5	80.6	0.5	0.1	3.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	59.7	8.6	0.8	6.2	1.2
LnGrp Delay(d),s/veh	16.3	102.2	10.8	7.3	48.7	42.0
LnGrp LOS	B	F	B	A	D	D
Approach Vol, veh/h		3563	1512		221	
Approach Delay, s/veh		101.9	10.7		47.6	
Approach LOS		F	B		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		97.1		36.9		97.1		
Change Period (Y+Rc), s		* 6.2		* 6.9		* 6.2		
Max Green Setting (Gmax), s		* 91		* 30		* 91		
Max Q Clear Time (g_c+I1), s		92.9		13.9		22.7		
Green Ext Time (p_c), s		0.0		0.8		20.8		

Intersection Summary	
HCM 2010 Ctrl Delay	73.6
HCM 2010 LOS	E

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



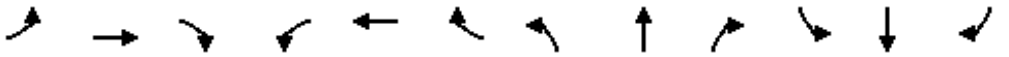
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	442	2465	380	179	1081	125	195	373	101	170	604	130
Future Volume (vph)	442	2465	380	179	1081	125	195	373	101	170	604	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		50.0	200.0		65.0	150.0		90.0	115.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4471	1583	1770	4471	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.100			0.111			0.158			0.520		
Satd. Flow (perm)	186	4471	1583	207	4471	1583	294	3539	1583	969	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			136			109			145
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		450.0			200.0			200.0			200.0	
Travel Time (s)		23.1			10.3			12.0			12.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	465	2595	400	188	1138	132	205	393	106	179	636	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	465	2595	400	188	1138	132	205	393	106	179	636	137
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	32.0	11.0	24.0	24.0	36.0	36.0	36.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	30.0	62.0	62.0	11.0	43.0	43.0	11.0	47.0	47.0	36.0	36.0	36.0
Total Split (%)	25.0%	51.7%	51.7%	9.2%	35.8%	35.8%	9.2%	39.2%	39.2%	30.0%	30.0%	30.0%
Maximum Green (s)	26.0	55.0	55.0	7.0	36.0	36.0	7.0	41.0	41.0	30.0	30.0	30.0
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		12.0	12.0				23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)	69.1	55.1	55.1	46.0	36.0	36.0	39.2	37.2	37.2	26.2	26.2	26.2
Actuated g/C Ratio	0.59	0.47	0.47	0.40	0.31	0.31	0.34	0.32	0.32	0.23	0.23	0.23
v/c Ratio	1.00	1.23	0.48	1.07	0.82	0.23	1.09	0.35	0.18	0.82	0.80	0.29
Control Delay	76.0	135.6	15.3	117.1	43.6	5.9	125.0	31.0	5.6	71.6	50.7	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.0	135.6	15.3	117.1	43.6	5.9	125.0	31.0	5.6	71.6	50.7	6.8
LOS	E	F	B	F	D	A	F	C	A	E	D	A
Approach Delay		113.7			49.6			54.6			48.3	
Approach LOS		F			D			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 116.3			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 83.7		Intersection LOS: F	
Intersection Capacity Utilization 102.5%		ICU Level of Service G	
Analysis Period (min) 15			

* User Entered Value

Splits and Phases: 6: Ninth Line & Dundas Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	442	2465	380	179	1081	125	195	373	101	170	604	130
Future Volume (veh/h)	442	2465	380	179	1081	125	195	373	101	170	604	130
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	465	2595	400	188	1138	132	205	393	106	179	636	137
Adj No. of Lanes	1	3	1	1	3	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	484	2093	741	167	1370	485	213	1159	519	271	828	370
Arrive On Green	0.22	0.47	0.47	0.06	0.31	0.31	0.06	0.33	0.33	0.23	0.23	0.23
Sat Flow, veh/h	1774	4471	1583	1774	4471	1583	1774	3539	1583	895	3539	1583
Grp Volume(v), veh/h	465	2595	400	188	1138	132	205	393	106	179	636	137
Grp Sat Flow(s),veh/h/ln	1774	1490	1583	1774	1490	1583	1774	1770	1583	895	1770	1583
Q Serve(g_s), s	24.3	55.0	21.1	7.0	27.8	7.4	7.0	9.9	5.7	22.5	19.7	8.5
Cycle Q Clear(g_c), s	24.3	55.0	21.1	7.0	27.8	7.4	7.0	9.9	5.7	22.5	19.7	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	484	2093	741	167	1370	485	213	1159	519	271	828	370
V/C Ratio(X)	0.96	1.24	0.54	1.13	0.83	0.27	0.96	0.34	0.20	0.66	0.77	0.37
Avail Cap(c_a), veh/h	484	2093	741	167	1370	485	213	1235	553	290	904	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	31.2	22.2	33.7	37.9	30.8	40.9	29.9	28.5	43.1	42.0	37.7
Incr Delay (d2), s/veh	31.0	112.2	2.8	107.5	6.0	1.4	51.0	0.2	0.2	5.0	3.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.0	44.2	9.7	5.0	12.1	3.4	6.2	4.8	2.5	5.9	10.1	3.8
LnGrp Delay(d),s/veh	62.8	143.5	25.0	141.2	43.9	32.2	91.8	30.1	28.7	48.1	45.7	38.4
LnGrp LOS	E	F	C	F	D	C	F	C	C	D	D	D
Approach Vol, veh/h		3460			1458			704			952	
Approach Delay, s/veh		119.0			55.4			47.8			45.1	
Approach LOS		F			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	62.0	11.0	33.5	30.0	43.0		44.5
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	4.0	7.0		6.0
Max Green Setting (Gmax), s	7.0	55.0	7.0	30.0	26.0	36.0		41.0
Max Q Clear Time (g_c+I1), s	9.0	57.0	9.0	24.5	26.3	29.8		11.9
Green Ext Time (p_c), s	0.0	0.0	0.0	3.0	0.0	4.2		3.7

Intersection Summary	
HCM 2010 Ctrl Delay	86.5
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	1786	190	286	2962	108	198	5	123	60	5	23
Future Volume (vph)	29	1786	190	286	2962	108	198	5	123	60	5	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	115.0		50.0	150.0		75.0	50.0		0.0	40.0		40.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	75.0			75.0			50.0			15.0		
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4471	1583	1770	4471	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.073			0.068			0.754			0.754		
Satd. Flow (perm)	136	4471	1583	127	4471	1583	1405	1863	1583	1405	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			103			73			126			65
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		200.0			600.0			200.0			200.0	
Travel Time (s)		10.3			30.9			14.4			14.4	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	30	1822	194	292	3022	110	202	5	126	61	5	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	1822	194	292	3022	110	202	5	126	61	5	23
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	37.2	37.2	46.0	46.0	46.0	46.0	46.0	46.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	12.0	61.2	61.2	12.0	61.2	61.2	46.8	46.8	46.8	46.8	46.8	46.8
Total Split (%)	10.0%	51.0%	51.0%	10.0%	51.0%	51.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Maximum Green (s)	8.0	55.0	55.0	8.0	55.0	55.0	39.8	39.8	39.8	39.8	39.8	39.8
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.5	3.7	3.7	3.7	3.7	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.2	6.2	4.0	6.2	6.2	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		24.0	24.0		24.0	24.0	32.0	32.0	32.0	32.0	32.0	32.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	0
Act Effct Green (s)	64.2	55.0	55.0	86.3	77.4	77.4	22.7	22.7	22.7	22.7	22.7	22.7
Actuated g/C Ratio	0.54	0.46	0.46	0.72	0.64	0.64	0.19	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.18	0.89	0.25	0.67	1.05	0.11	0.76	0.01	0.31	0.23	0.01	0.07
Control Delay	10.7	36.4	10.0	44.0	37.3	0.2	63.4	35.2	8.3	40.9	35.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	36.4	10.0	44.0	37.3	0.2	63.4	35.2	8.3	40.9	35.2	0.3
LOS	B	D	B	D	D	A	E	D	A	D	D	A
Approach Delay		33.5			36.7			42.1			30.1	
Approach LOS		C			D			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 24 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.05			
Intersection Signal Delay: 35.8		Intersection LOS: D	
Intersection Capacity Utilization 95.0%		ICU Level of Service F	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Eighth Line & Dundas Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	1786	190	286	2962	108	198	5	123	60	5	23
Future Volume (veh/h)	29	1786	190	286	2962	108	198	5	123	60	5	23
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	30	1822	194	292	3022	110	202	5	126	61	5	23
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	2756	976	253	2889	1023	296	323	275	275	323	275
Arrive On Green	0.04	0.62	0.62	0.09	0.86	0.86	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1774	4471	1583	1774	4471	1583	1377	1863	1583	1254	1863	1583
Grp Volume(v), veh/h	30	1822	194	292	3022	110	202	5	126	61	5	23
Grp Sat Flow(s),veh/h/ln	1774	1490	1583	1774	1490	1583	1377	1863	1583	1254	1863	1583
Q Serve(g_s), s	0.7	31.7	6.4	8.0	77.5	1.3	17.1	0.3	8.6	5.1	0.3	1.5
Cycle Q Clear(g_c), s	0.7	31.7	6.4	8.0	77.5	1.3	17.4	0.3	8.6	5.4	0.3	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	125	2756	976	253	2889	1023	296	323	275	275	323	275
V/C Ratio(X)	0.24	0.66	0.20	1.16	1.05	0.11	0.68	0.02	0.46	0.22	0.02	0.08
Avail Cap(c_a), veh/h	178	2756	976	253	2889	1023	513	618	525	473	618	525
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	14.9	10.1	26.9	8.4	3.1	48.3	41.1	44.5	43.3	41.1	41.6
Incr Delay (d2), s/veh	1.0	1.3	0.5	105.2	30.4	0.2	2.8	0.0	1.2	0.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	13.3	2.9	15.7	38.1	0.6	6.7	0.1	3.8	1.8	0.1	0.6
LnGrp Delay(d),s/veh	31.1	16.2	10.5	132.2	38.8	3.3	51.1	41.1	45.7	43.7	41.1	41.7
LnGrp LOS	C	B	B	F	F	A	D	D	D	D	D	D
Approach Vol, veh/h		2046			3424			333			89	
Approach Delay, s/veh		15.9			45.6			48.9			43.0	
Approach LOS		B			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	80.2		27.8	8.4	83.7		27.8
Change Period (Y+Rc), s	4.0	* 6.2		7.0	4.0	* 6.2		7.0
Max Green Setting (Gmax), s	8.0	* 55		39.8	8.0	* 55		39.8
Max Q Clear Time (g_c+I1), s	10.0	33.7		7.4	2.7	79.5		19.4
Green Ext Time (p_c), s	0.0	16.1		0.4	0.0	0.0		1.5

Intersection Summary	
HCM 2010 Ctrl Delay	35.4
HCM 2010 LOS	D

Notes

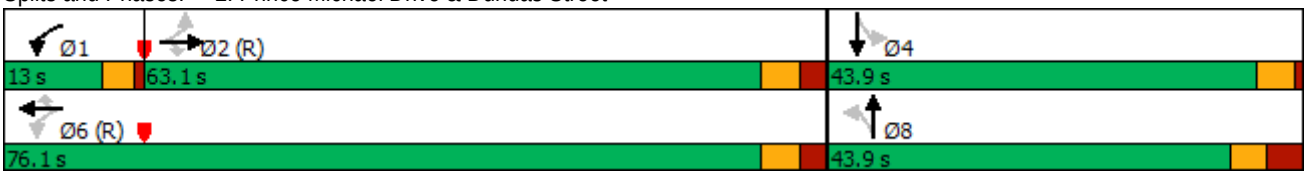
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

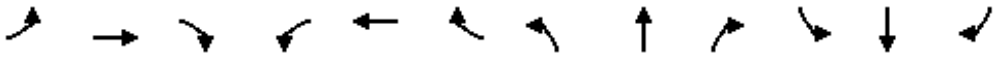
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	1731	190	271	3062	234	189	5	92	138	5	68
Future Volume (vph)	114	1731	190	271	3062	234	189	5	92	138	5	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		50.0	125.0		50.0	60.0		0.0	60.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	55.0			55.0			25.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.858			0.859	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1598	0	1770	1600	0
Flt Permitted	0.070			0.066			0.706			0.694		
Satd. Flow (perm)	130	5085	1583	123	5085	1583	1315	1598	0	1293	1600	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124			117		93			1	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		600.0			450.0			200.0			200.0	
Travel Time (s)		30.9			23.1			14.4			14.4	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Adj. Flow (vph)	124	1748	192	274	3093	254	191	5	93	150	5	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	124	1748	192	274	3093	254	191	98	0	150	79	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
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0		5.0	5.0	
Minimum Split (s)	38.3	38.3	38.3	11.5	38.3	38.3	43.9	43.9		22.5	22.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	63.1	63.1	63.1	13.0	76.1	76.1	43.9	43.9		43.9	43.9	
Total Split (%)	52.6%	52.6%	52.6%	10.8%	63.4%	63.4%	36.6%	36.6%		36.6%	36.6%	
Maximum Green (s)	56.8	56.8	56.8	9.0	69.8	69.8	37.0	37.0		39.4	39.4	
Yellow Time (s)	3.7	3.7	3.7	3.0	3.7	3.7	3.3	3.3		3.5	3.5	
All-Red Time (s)	2.6	2.6	2.6	1.0	2.6	2.6	3.6	3.6		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	4.0	6.3	6.3	6.9	6.9		4.5	4.5	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0	25.0		25.0	25.0	30.0	30.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0		0	0	
Act Effct Green (s)	56.8	56.8	56.8	72.1	69.8	69.8	37.0	37.0		39.4	39.4	
Actuated g/C Ratio	0.47	0.47	0.47	0.60	0.58	0.58	0.31	0.31		0.33	0.33	
v/c Ratio	2.03	0.73	0.24	1.39	1.05	0.26	0.47	0.18		0.35	0.15	
Control Delay	523.5	46.8	22.0	225.4	45.5	3.1	38.3	7.6		33.6	29.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	523.5	46.8	22.0	225.4	45.5	3.1	38.3	7.6		33.6	29.2	
LOS	F	D	C	F	D	A	D	A		C	C	
Approach Delay		73.1			56.1			27.9			32.1	
Approach LOS		E			E			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 108 (90%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 2.03			
Intersection Signal Delay: 59.6		Intersection LOS: E	
Intersection Capacity Utilization 109.2%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Prince Michael Drive & Dundas Street





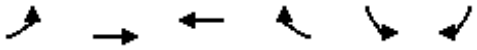
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	1731	190	271	3062	234	189	5	92	138	5	68
Future Volume (veh/h)	114	1731	190	271	3062	234	189	5	92	138	5	68
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	124	1748	192	274	3093	254	191	5	93	150	5	74
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	60	2407	749	226	2958	921	418	25	467	400	31	462
Arrive On Green	0.16	0.16	0.16	0.15	1.00	1.00	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	55	5085	1583	1774	5085	1583	1314	81	1514	1292	101	1497
Grp Volume(v), veh/h	124	1748	192	274	3093	254	191	0	98	150	0	79
Grp Sat Flow(s),veh/h/ln	55	1695	1583	1774	1695	1583	1314	0	1596	1292	0	1599
Q Serve(g_s), s	0.5	39.3	12.8	9.0	69.8	0.0	14.8	0.0	5.4	11.6	0.0	4.3
Cycle Q Clear(g_c), s	56.8	39.3	12.8	9.0	69.8	0.0	19.2	0.0	5.4	17.0	0.0	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.94
Lane Grp Cap(c), veh/h	60	2407	749	226	2958	921	418	0	492	400	0	493
V/C Ratio(X)	2.06	0.73	0.26	1.21	1.05	0.28	0.46	0.00	0.20	0.38	0.00	0.16
Avail Cap(c_a), veh/h	60	2407	749	226	2958	921	418	0	492	426	0	525
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	79.0	43.2	32.1	26.3	0.0	0.0	37.2	0.0	30.6	36.9	0.0	30.2
Incr Delay (d2), s/veh	529.1	2.0	0.8	128.6	30.1	0.7	3.6	0.0	0.9	0.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	18.9	5.8	15.5	8.2	0.2	5.8	0.0	2.5	4.2	0.0	1.9
LnGrp Delay(d),s/veh	608.2	45.2	32.9	154.9	30.1	0.7	40.7	0.0	31.5	37.4	0.0	30.3
LnGrp LOS	F	D	C	F	F	A	D		C	D		C
Approach Vol, veh/h		2064			3621			289			229	
Approach Delay, s/veh		77.9			37.5			37.6			35.0	
Approach LOS		E			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	13.0	63.1		43.9		76.1		43.9
Change Period (Y+Rc), s	4.0	* 6.3		* 6.9		* 6.3		* 6.9
Max Green Setting (Gmax), s	9.0	* 57		* 39		* 70		* 37
Max Q Clear Time (g_c+I1), s	11.0	58.8		19.0		71.8		21.2
Green Ext Time (p_c), s	0.0	0.0		1.2		0.0		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	50.8
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			
Traffic Volume (vph)	0	1934	3567	0	0	0
Future Volume (vph)	0	1934	3567	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			40.0	0.0	0.0
Storage Lanes	0			0	0	0
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	5085	5085	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	5085	5085	0	0	0
Link Speed (k/h)		70	70		50	
Link Distance (m)		450.0	150.0		200.0	
Travel Time (s)		23.1	7.7		14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2102	3877	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2102	3877	0	0	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		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

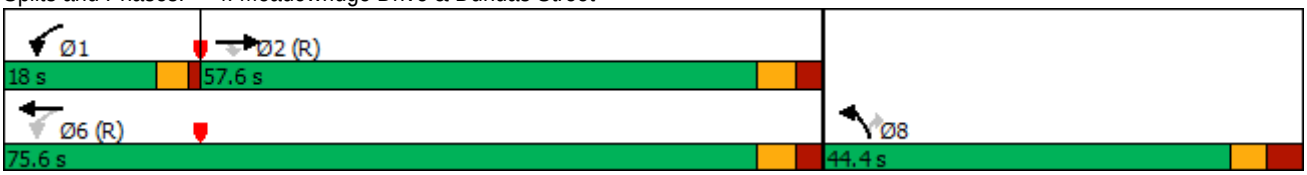
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.3%		ICU Level of Service C	
Analysis Period (min) 15			

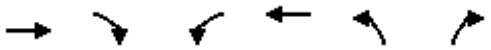
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1755	79	244	3321	41	143
Future Volume (vph)	1755	79	244	3321	41	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		60.0	135.0		25.0	0.0
Storage Lanes		1	1		2	1
Taper Length (m)			60.0		45.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5085	1583	1770	5085	3433	1583
Flt Permitted			0.082		0.950	
Satd. Flow (perm)	5085	1583	153	5085	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		55				146
Link Speed (k/h)	70			70	50	
Link Distance (m)	150.0			350.0	200.0	
Travel Time (s)	7.7			18.0	14.4	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1791	81	249	3389	42	146
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1791	81	249	3389	42	146
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
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
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	1	6	8	8
Switch Phase						
Minimum Initial (s)	20.0	20.0	7.0	20.0	10.0	10.0
Minimum Split (s)	36.2	36.2	11.0	36.2	43.9	43.9

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Split (s)	57.6	57.6	18.0	75.6	44.4	44.4
Total Split (%)	48.0%	48.0%	15.0%	63.0%	37.0%	37.0%
Maximum Green (s)	51.4	51.4	14.0	69.4	37.5	37.5
Yellow Time (s)	3.7	3.7	3.0	3.7	3.3	3.3
All-Red Time (s)	2.5	2.5	1.0	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	4.0	6.2	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0		23.0	30.0	30.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	74.1	74.1	98.6	96.4	10.5	10.5
Actuated g/C Ratio	0.62	0.62	0.82	0.80	0.09	0.09
v/c Ratio	0.57	0.08	0.67	0.83	0.14	0.54
Control Delay	28.8	10.8	39.5	5.8	51.4	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	10.8	39.5	5.8	51.4	15.9
LOS	C	B	D	A	D	B
Approach Delay	28.0			8.1	23.8	
Approach LOS	C			A	C	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 74.4 (62%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 83.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 4: Meadowridge Drive & Dundas Street





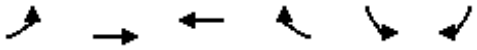
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1755	79	244	3321	41	143
Future Volume (veh/h)	1755	79	244	3321	41	143
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	1791	81	249	3389	42	146
Adj No. of Lanes	3	1	1	3	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	3453	1075	340	3952	391	180
Arrive On Green	1.00	1.00	0.13	1.00	0.11	0.11
Sat Flow, veh/h	5253	1583	1774	5253	3442	1583
Grp Volume(v), veh/h	1791	81	249	3389	42	146
Grp Sat Flow(s),veh/h/ln	1695	1583	1774	1695	1721	1583
Q Serve(g_s), s	0.0	0.0	5.2	0.0	1.3	10.8
Cycle Q Clear(g_c), s	0.0	0.0	5.2	0.0	1.3	10.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	3453	1075	340	3952	391	180
V/C Ratio(X)	0.52	0.08	0.73	0.86	0.11	0.81
Avail Cap(c_a), veh/h	3453	1075	432	3952	1076	495
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	4.1	0.0	47.7	51.9
Incr Delay (d2), s/veh	0.6	0.1	4.7	2.6	0.1	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	2.9	1.0	0.6	5.2
LnGrp Delay(d),s/veh	0.6	0.1	8.8	2.6	47.8	60.4
LnGrp LOS	A	A	A	A	D	E
Approach Vol, veh/h	1872			3638	188	
Approach Delay, s/veh	0.5			3.1	57.6	
Approach LOS	A			A	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.8	87.7				99.5		20.5
Change Period (Y+Rc), s	4.0	* 6.2				* 6.2		6.9
Max Green Setting (Gmax), s	14.0	* 51				* 69		37.5
Max Q Clear Time (g_c+I1), s	7.2	2.0				2.0		12.8
Green Ext Time (p_c), s	0.6	26.5				64.5		0.9

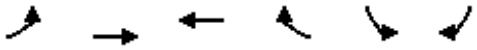
Intersection Summary	
HCM 2010 Ctrl Delay	4.0
HCM 2010 LOS	A

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



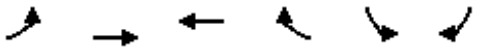
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	39	2059	3859	179	106	23
Future Volume (vph)	39	2059	3859	179	106	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0			70.0	60.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	65.0				25.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	5085	5085	1583	1770	1583
Flt Permitted	0.052				0.950	
Satd. Flow (perm)	97	5085	5085	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				103		
Link Speed (k/h)		70	70		50	
Link Distance (m)		350.0	450.0		200.0	
Travel Time (s)		18.0	23.1		14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	2238	4195	195	115	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	2238	4195	195	115	25
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
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	2.0	10.0	10.0	2.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6	2.0	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Detector Phase	4	4	8	8	6	6
Switch Phase						
Minimum Initial (s)	20.0	20.0	20.0	20.0	7.0	7.0
Minimum Split (s)	36.2	36.2	36.2	36.2	36.9	36.9



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (s)	83.0	83.0	83.0	83.0	37.0	37.0
Total Split (%)	69.2%	69.2%	69.2%	69.2%	30.8%	30.8%
Maximum Green (s)	76.8	76.8	76.8	76.8	30.1	30.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.9	6.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	23.0	23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	76.8	76.8	76.8	76.8	30.1	30.1
Actuated g/C Ratio	0.64	0.64	0.64	0.64	0.25	0.25
v/c Ratio	0.68	0.69	1.29	0.19	0.26	0.06
Control Delay	66.5	8.4	156.0	4.5	38.0	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	8.4	156.0	4.5	38.0	34.9
LOS	E	A	F	A	D	C
Approach Delay		9.4	149.2		37.4	
Approach LOS		A	F		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 100.1		Intersection LOS: F	
Intersection Capacity Utilization 91.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 5: Dundas Street & Street 'A'



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	2059	3859	179	106	23
Future Volume (veh/h)	39	2059	3859	179	106	23
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	42	2238	4195	195	115	25
Adj No. of Lanes	1	3	3	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	60	3255	3255	1013	445	397
Arrive On Green	1.00	1.00	0.64	0.64	0.25	0.25
Sat Flow, veh/h	19	5253	5253	1583	1774	1583
Grp Volume(v), veh/h	42	2238	4195	195	115	25
Grp Sat Flow(s),veh/h/ln	19	1695	1695	1583	1774	1583
Q Serve(g_s), s	0.0	0.0	76.8	6.1	6.2	1.4
Cycle Q Clear(g_c), s	76.8	0.0	76.8	6.1	6.2	1.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	60	3255	3255	1013	445	397
V/C Ratio(X)	0.70	0.69	1.29	0.19	0.26	0.06
Avail Cap(c_a), veh/h	60	3255	3255	1013	445	397
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	0.0	21.6	8.9	36.0	34.2
Incr Delay (d2), s/veh	30.3	0.6	132.4	0.1	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	75.5	2.7	3.2	0.7
LnGrp Delay(d),s/veh	68.7	0.6	154.0	9.0	37.4	34.5
LnGrp LOS	E	A	F	A	D	C
Approach Vol, veh/h		2280	4390		140	
Approach Delay, s/veh		1.9	147.6		36.9	
Approach LOS		A	F		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				83.0		37.0		83.0
Change Period (Y+Rc), s				* 6.2		6.9		* 6.2
Max Green Setting (Gmax), s				* 77		30.1		* 77
Max Q Clear Time (g_c+I1), s				78.8		8.2		78.8
Green Ext Time (p_c), s				0.0		0.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	96.5
HCM 2010 LOS	F

Notes

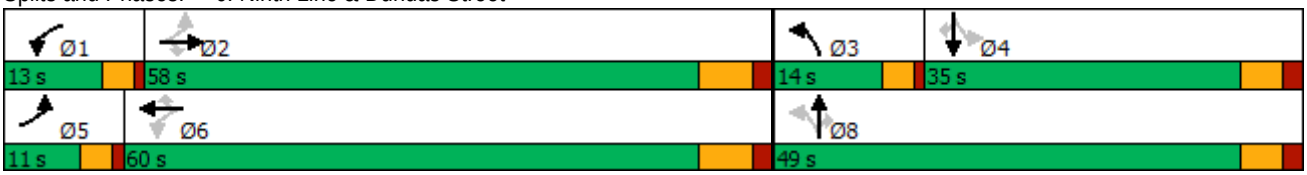
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

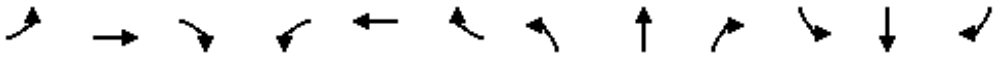
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	1734	321	155	3032	144	451	575	441	107	373	369
Future Volume (vph)	145	1734	321	155	3032	144	451	575	441	107	373	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		50.0	200.0		65.0	150.0		90.0	115.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.078			0.075			0.347			0.426		
Satd. Flow (perm)	145	5085	1583	140	5085	1583	646	3539	1583	794	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			191			100			134			118
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		450.0			200.0			200.0			200.0	
Travel Time (s)		23.1			10.3			12.0			12.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	151	1806	334	161	3158	150	470	599	459	111	389	384
Shared Lane Traffic (%)												
Lane Group Flow (vph)	151	1806	334	161	3158	150	470	599	459	111	389	384
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	5.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	32.0	10.0	24.0	24.0	35.0	35.0	35.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	11.0	58.0	58.0	13.0	60.0	60.0	14.0	49.0	49.0	35.0	35.0	35.0
Total Split (%)	9.2%	48.3%	48.3%	10.8%	50.0%	50.0%	11.7%	40.8%	40.8%	29.2%	29.2%	29.2%
Maximum Green (s)	7.0	51.0	51.0	9.0	53.0	53.0	10.0	43.0	43.0	29.0	29.0	29.0
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		12.0	12.0				22.0	22.0	22.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)	61.3	51.3	51.3	65.0	53.1	53.1	40.9	38.8	38.8	24.8	24.8	24.8
Actuated g/C Ratio	0.53	0.44	0.44	0.56	0.46	0.46	0.35	0.33	0.33	0.21	0.21	0.21
v/c Ratio	0.87	0.80	0.41	0.79	1.36	0.19	1.45	0.51	0.74	0.66	0.51	0.89
Control Delay	64.2	32.2	11.3	50.2	192.2	8.2	247.7	32.3	31.6	60.5	42.5	53.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	32.2	11.3	50.2	192.2	8.2	247.7	32.3	31.6	60.5	42.5	53.7
LOS	E	C	B	D	F	A	F	C	C	E	D	D
Approach Delay		31.2			177.6			98.4			49.6	
Approach LOS		C			F			F			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 116			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.45			
Intersection Signal Delay: 107.9		Intersection LOS: F	
Intersection Capacity Utilization 121.6%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 6: Ninth Line & Dundas Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	1734	321	155	3032	144	451	575	441	107	373	369
Future Volume (veh/h)	145	1734	321	155	3032	144	451	575	441	107	373	369
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	151	1806	334	161	3158	150	470	599	459	111	389	384
Adj No. of Lanes	1	3	1	1	3	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	163	2203	686	201	2246	699	311	1268	567	181	855	383
Arrive On Green	0.06	0.43	0.43	0.07	0.44	0.44	0.08	0.36	0.36	0.24	0.24	0.24
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	3539	1583	531	3539	1583
Grp Volume(v), veh/h	151	1806	334	161	3158	150	470	599	459	111	389	384
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	1770	1583	531	1770	1583
Q Serve(g_s), s	6.1	37.5	18.2	6.0	53.0	7.0	10.0	15.7	31.4	24.5	11.2	29.0
Cycle Q Clear(g_c), s	6.1	37.5	18.2	6.0	53.0	7.0	10.0	15.7	31.4	26.2	11.2	29.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	163	2203	686	201	2246	699	311	1268	567	181	855	383
V/C Ratio(X)	0.92	0.82	0.49	0.80	1.41	0.21	1.51	0.47	0.81	0.61	0.45	1.00
Avail Cap(c_a), veh/h	163	2203	686	216	2246	699	311	1268	567	181	855	383
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	29.9	24.4	26.7	33.5	20.7	39.9	29.7	34.8	45.3	38.8	45.5
Incr Delay (d2), s/veh	48.6	3.6	2.5	18.1	185.5	0.7	246.9	0.3	8.6	6.0	0.4	46.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	18.3	8.4	3.9	63.3	3.2	34.3	7.7	15.1	3.9	5.6	17.6
LnGrp Delay(d),s/veh	79.2	33.4	26.9	44.8	219.0	21.4	286.9	30.0	43.4	51.3	39.1	92.4
LnGrp LOS	E	C	C	D	F	C	F	C	D	D	D	F
Approach Vol, veh/h		2291			3469			1528			884	
Approach Delay, s/veh		35.5			202.3			113.0			63.8	
Approach LOS		D			F			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	59.0	14.0	35.0	11.0	60.0		49.0
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	4.0	7.0		6.0
Max Green Setting (Gmax), s	9.0	51.0	10.0	29.0	7.0	53.0		43.0
Max Q Clear Time (g_c+I1), s	8.0	39.5	12.0	31.0	8.1	55.0		33.4
Green Ext Time (p_c), s	0.1	9.8	0.0	0.0	0.0	0.0		4.7

Intersection Summary	
HCM 2010 Ctrl Delay	123.9
HCM 2010 LOS	F

Appendix F

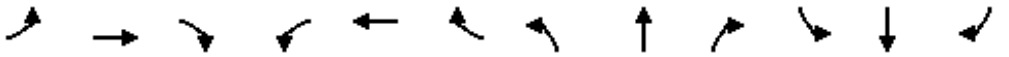
2024 Total Future Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2409	145	105	1438	29	143	1	153	93	4	32
Future Volume (vph)	10	2409	145	105	1438	29	143	1	153	93	4	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	115.0		50.0	150.0		75.0	50.0		0.0	40.0		40.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	75.0			75.0			50.0			15.0		
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4471	1583	1770	4471	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.127			0.050			0.755			0.757		
Satd. Flow (perm)	237	4471	1583	93	4471	1583	1406	1863	1583	1410	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			73			139			65
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		200.0			600.0			200.0			200.0	
Travel Time (s)		10.3			30.9			14.4			14.4	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	10	2458	148	107	1467	30	146	1	156	95	4	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	2458	148	107	1467	30	146	1	156	95	4	33
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	37.2	37.2	46.0	46.0	46.0	46.0	46.0	46.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	12.0	61.2	61.2	12.0	61.2	61.2	46.8	46.8	46.8	46.8	46.8	46.8
Total Split (%)	10.0%	51.0%	51.0%	10.0%	51.0%	51.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Maximum Green (s)	8.0	55.0	55.0	8.0	55.0	55.0	39.8	39.8	39.8	39.8	39.8	39.8
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.5	3.7	3.7	3.7	3.7	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.2	6.2	4.0	6.2	6.2	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		24.0	24.0		24.0	24.0	32.0	32.0	32.0	32.0	32.0	32.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	0
Act Effct Green (s)	85.1	75.9	75.9	91.1	86.7	86.7	17.9	17.9	17.9	17.9	17.9	17.9
Actuated g/C Ratio	0.71	0.63	0.63	0.76	0.72	0.72	0.15	0.15	0.15	0.15	0.15	0.15
v/c Ratio	0.04	0.87	0.14	0.55	0.45	0.03	0.70	0.00	0.44	0.45	0.01	0.11
Control Delay	5.4	23.8	6.1	33.5	19.4	4.2	65.0	39.0	13.2	52.0	39.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	23.8	6.1	33.5	19.4	4.2	65.0	39.0	13.2	52.0	39.5	2.5
LOS	A	C	A	C	B	A	E	D	B	D	D	A
Approach Delay		22.8			20.1			38.2			39.2	
Approach LOS		C			C			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 49.2 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 23.3		Intersection LOS: C	
Intersection Capacity Utilization 81.3%		ICU Level of Service D	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Eighth Line & Dundas Street



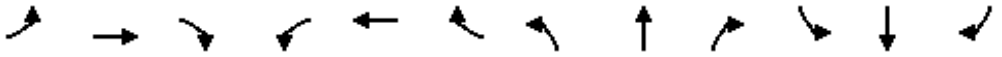
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	2409	145	105	1438	29	143	1	153	93	4	32
Future Volume (veh/h)	10	2409	145	105	1438	29	143	1	153	93	4	32
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	10	2458	148	107	1467	30	146	1	156	95	4	33
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	2977	1054	191	3156	1118	241	250	212	224	250	212
Arrive On Green	0.02	0.67	0.67	0.11	1.00	1.00	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1774	4471	1583	1774	4471	1583	1365	1863	1583	1225	1863	1583
Grp Volume(v), veh/h	10	2458	148	107	1467	30	146	1	156	95	4	33
Grp Sat Flow(s),veh/h/ln	1774	1490	1583	1774	1490	1583	1365	1863	1583	1225	1863	1583
Q Serve(g_s), s	0.2	49.0	4.1	2.0	0.0	0.0	12.5	0.1	11.4	8.7	0.2	2.2
Cycle Q Clear(g_c), s	0.2	49.0	4.1	2.0	0.0	0.0	12.7	0.1	11.4	8.8	0.2	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	322	2977	1054	191	3156	1118	241	250	212	224	250	212
V/C Ratio(X)	0.03	0.83	0.14	0.56	0.46	0.03	0.61	0.00	0.73	0.42	0.02	0.16
Avail Cap(c_a), veh/h	411	2977	1054	209	3156	1118	510	618	525	466	618	525
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.1	14.9	7.4	26.0	0.0	0.0	50.6	45.0	49.9	48.8	45.1	45.9
Incr Delay (d2), s/veh	0.0	2.8	0.3	2.8	0.5	0.0	2.5	0.0	4.9	1.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	20.6	1.9	2.4	0.1	0.0	4.9	0.0	5.3	3.0	0.1	1.0
LnGrp Delay(d),s/veh	6.1	17.6	7.7	28.8	0.5	0.0	53.1	45.0	54.8	50.1	45.1	46.3
LnGrp LOS	A	B	A	C	A	A	D	D	D	D	D	D
Approach Vol, veh/h		2616			1604			303			132	
Approach Delay, s/veh		17.0			2.4			53.9			49.0	
Approach LOS		B			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.8	86.1		23.1	6.0	90.9		23.1
Change Period (Y+Rc), s	4.0	* 6.2		7.0	4.0	* 6.2		7.0
Max Green Setting (Gmax), s	8.0	* 55		39.8	8.0	* 55		39.8
Max Q Clear Time (g_c+I1), s	4.0	51.0		10.8	2.2	2.0		14.7
Green Ext Time (p_c), s	0.1	3.9		0.6	0.0	19.5		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

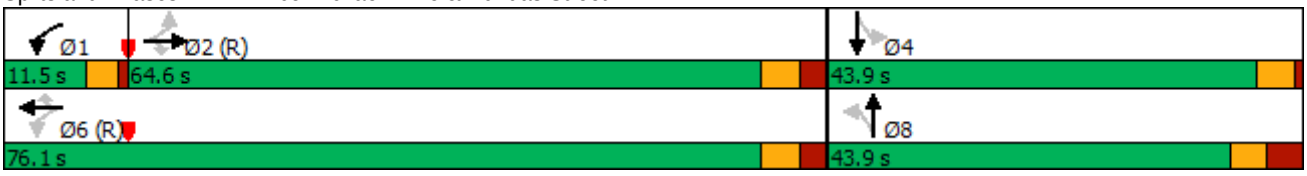


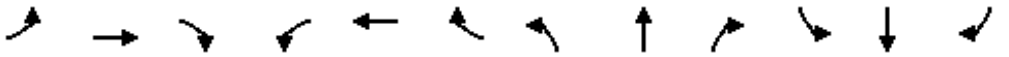
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	2411	128	78	1318	72	121	4	189	223	5	103
Future Volume (vph)	40	2411	128	78	1318	72	121	4	189	223	5	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		50.0	125.0		50.0	60.0		0.0	60.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	55.0			55.0			25.0			25.0		
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.853			0.856	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4471	1583	1770	4471	1583	1770	1589	0	1770	1595	0
Flt Permitted	0.130			0.063			0.661			0.572		
Satd. Flow (perm)	242	4471	1583	117	4471	1583	1231	1589	0	1065	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			72			70		125			44	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		600.0			450.0			200.0			200.0	
Travel Time (s)		30.9			23.1			14.4			14.4	
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Adj. Flow (vph)	43	2538	135	82	1387	78	127	4	199	242	5	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	2538	135	82	1387	78	127	203	0	242	117	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
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0		5.0	5.0	
Minimum Split (s)	38.3	38.3	38.3	11.5	38.3	38.3	43.9	43.9		22.5	22.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	64.6	64.6	64.6	11.5	76.1	76.1	43.9	43.9		43.9	43.9	
Total Split (%)	53.8%	53.8%	53.8%	9.6%	63.4%	63.4%	36.6%	36.6%		36.6%	36.6%	
Maximum Green (s)	58.3	58.3	58.3	7.5	69.8	69.8	37.0	37.0		39.4	39.4	
Yellow Time (s)	3.7	3.7	3.7	3.0	3.7	3.7	3.3	3.3		3.5	3.5	
All-Red Time (s)	2.6	2.6	2.6	1.0	2.6	2.6	3.6	3.6		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.3	6.3	6.3	4.0	6.3	6.3	6.9	6.9		4.5	4.5	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	25.0	25.0	25.0		25.0	25.0	30.0	30.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0		0	0	
Act Effct Green (s)	60.7	60.7	60.7	72.1	69.8	69.8	37.0	37.0		39.4	39.4	
Actuated g/C Ratio	0.51	0.51	0.51	0.60	0.58	0.58	0.31	0.31		0.33	0.33	
v/c Ratio	0.35	1.12	0.16	0.48	0.53	0.08	0.34	0.35		0.69	0.21	
Control Delay	13.6	81.8	2.6	26.7	12.1	3.5	35.1	14.5		47.1	19.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	13.6	81.8	2.6	26.7	12.1	3.5	35.1	14.5		47.1	19.2	
LOS	B	F	A	C	B	A	D	B		D	B	
Approach Delay		76.8			12.4			22.4			38.0	
Approach LOS		E			B			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 82.8 (69%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.12			
Intersection Signal Delay: 50.3		Intersection LOS: D	
Intersection Capacity Utilization 94.8%		ICU Level of Service F	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 2: Prince Michael Drive & Dundas Street





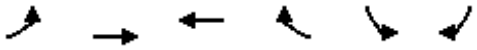
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	2411	128	78	1318	72	121	4	189	223	5	103
Future Volume (veh/h)	40	2411	128	78	1318	72	121	4	189	223	5	103
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	43	2538	135	82	1387	78	127	4	199	242	5	112
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	385	4086	1447	256	4479	1586	399	10	499	320	22	489
Arrive On Green	1.00	1.00	1.00	0.05	1.00	1.00	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	360	4471	1583	1774	4471	1583	1270	31	1557	1174	68	1525
Grp Volume(v), veh/h	43	2538	135	82	1387	78	127	0	203	242	0	117
Grp Sat Flow(s),veh/h/ln	360	1490	1583	1774	1490	1583	1270	0	1588	1174	0	1594
Q Serve(g_s), s	0.2	0.0	0.0	0.1	0.0	0.0	9.8	0.0	11.9	24.3	0.0	6.5
Cycle Q Clear(g_c), s	1.7	0.0	0.0	0.1	0.0	0.0	16.2	0.0	11.9	36.2	0.0	6.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.96
Lane Grp Cap(c), veh/h	385	4086	1447	256	4479	1586	399	0	509	320	0	511
V/C Ratio(X)	0.11	0.62	0.09	0.32	0.31	0.05	0.32	0.00	0.40	0.76	0.00	0.23
Avail Cap(c_a), veh/h	385	4086	1447	270	4479	1586	399	0	509	329	0	523
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.2	0.0	0.0	35.8	0.0	31.8	45.9	0.0	29.9
Incr Delay (d2), s/veh	0.6	0.7	0.1	0.7	0.2	0.1	2.1	0.0	2.3	9.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.1	0.3	0.1	0.0	3.7	0.0	5.6	8.7	0.0	2.9
LnGrp Delay(d),s/veh	0.6	0.7	0.1	0.9	0.2	0.1	37.9	0.0	34.1	55.3	0.0	30.1
LnGrp LOS	A	A	A	A	A	A	D		C	E		C
Approach Vol, veh/h		2716			1547			330			359	
Approach Delay, s/veh		0.7			0.2			35.6			47.1	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	10.5	117.5		45.4		128.0		45.4
Change Period (Y+Rc), s	4.0	* 6.3		* 6.9		* 6.3		* 6.9
Max Green Setting (Gmax), s	7.5	* 58		* 39		* 70		* 37
Max Q Clear Time (g_c+I1), s	2.1	3.7		38.2		2.0		18.2
Green Ext Time (p_c), s	0.1	45.5		0.3		19.4		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	6.2
HCM 2010 LOS	A

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑	↱		↱
Traffic Volume (vph)	0	2816	1449	1	0	19
Future Volume (vph)	0	2816	1449	1	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			40.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	*0.80	*0.80	1.00	1.00	1.00
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	4471	4471	1583	0	1611
Flt Permitted						
Satd. Flow (perm)	0	4471	4471	1583	0	1611
Link Speed (k/h)		70	70		50	
Link Distance (m)		450.0	150.0		200.0	
Travel Time (s)		23.1	7.7		14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	3061	1575	1	0	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	3061	1575	1	0	21
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	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 57.7%		ICU Level of Service B	
Analysis Period (min) 15			

* User Entered Value

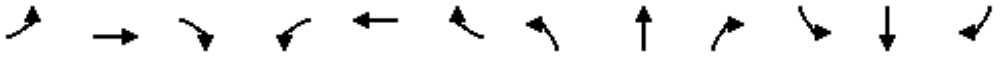
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑	↱		↱
Traffic Vol, veh/h	0	2816	1449	1	0	19
Future Vol, veh/h	0	2816	1449	1	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	400	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3061	1575	1	0	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	788
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	-	0	287
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	287
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	287
HCM Lane V/C Ratio	-	-	-	0.072
HCM Control Delay (s)	-	-	-	18.5
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0.2

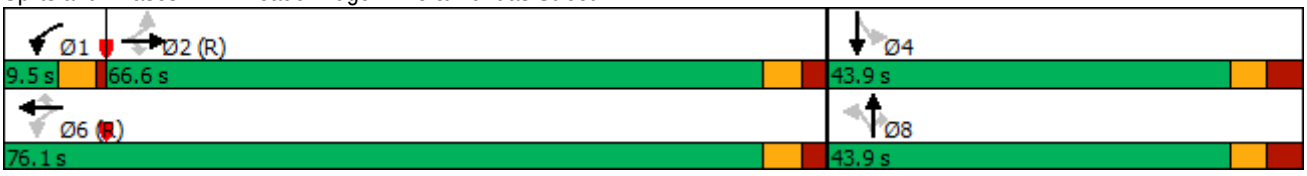


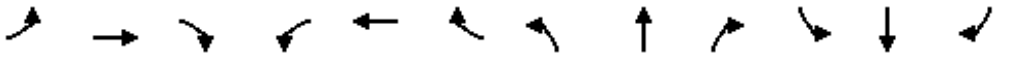
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	2734	59	59	1206	27	35	1	266	168	2	124
Future Volume (vph)	38	2734	59	59	1206	27	35	1	266	168	2	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		60.0	135.0		75.0	25.0		0.0	60.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	70.0			60.0			45.0			40.0		
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.852	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4471	1583	1770	4471	1583	1770	1863	1583	1770	1587	0
Flt Permitted	0.172			0.050			0.631			0.757		
Satd. Flow (perm)	320	4471	1583	93	4471	1583	1175	1863	1583	1410	1587	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			76			35			84		59	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		150.0			350.0			200.0			200.0	
Travel Time (s)		7.7			18.0			14.4			14.4	
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Adj. Flow (vph)	41	2878	62	62	1269	29	37	1	280	183	2	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	2878	62	62	1269	29	37	1	280	183	137	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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	2	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	5.0	20.0	20.0	10.0	10.0	10.0	5.0	5.0	
Minimum Split (s)	36.2	36.2	36.2	9.5	36.2	36.2	43.9	43.9	43.9	43.9	43.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	66.6	66.6	66.6	9.5	76.1	76.1	43.9	43.9	43.9	43.9	43.9	
Total Split (%)	55.5%	55.5%	55.5%	7.9%	63.4%	63.4%	36.6%	36.6%	36.6%	36.6%	36.6%	
Maximum Green (s)	60.4	60.4	60.4	5.0	69.9	69.9	37.0	37.0	37.0	37.0	37.0	
Yellow Time (s)	3.7	3.7	3.7	3.5	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	2.5	2.5	2.5	1.0	2.5	2.5	3.6	3.6	3.6	3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2	4.5	6.2	6.2	6.9	6.9	6.9	6.9	6.9	
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	23.0	23.0	23.0		23.0	23.0	30.0	30.0	30.0	30.0	30.0	
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0	0	0	
Act Effct Green (s)	76.2	76.2	76.2	87.2	85.5	85.5	21.4	21.4	21.4	21.4	21.4	
Actuated g/C Ratio	0.64	0.64	0.64	0.73	0.71	0.71	0.18	0.18	0.18	0.18	0.18	
v/c Ratio	0.20	1.01	0.06	0.38	0.40	0.03	0.18	0.00	0.80	0.73	0.41	
Control Delay	6.1	22.5	0.1	25.6	7.9	2.0	40.8	35.0	48.8	62.3	26.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	6.1	22.5	0.1	25.6	7.9	2.0	40.8	35.0	48.8	62.3	26.9	
LOS	A	C	A	C	A	A	D	C	D	E	C	
Approach Delay		21.8			8.6			47.8			47.2	
Approach LOS		C			A			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 109 (91%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 21.5		Intersection LOS: C	
Intersection Capacity Utilization 95.3%		ICU Level of Service F	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 4: Meadowridge Drive & Dundas Street





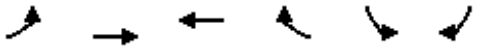
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	2734	59	59	1206	27	35	1	266	168	2	124
Future Volume (veh/h)	38	2734	59	59	1206	27	35	1	266	168	2	124
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	41	2878	62	62	1269	29	37	1	280	183	2	135
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	2760	977	159	3090	1094	215	372	316	278	5	312
Arrive On Green	1.00	1.00	1.00	0.07	1.00	1.00	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	423	4471	1583	1774	4471	1583	1247	1863	1583	1094	23	1564
Grp Volume(v), veh/h	41	2878	62	62	1269	29	37	1	280	183	0	137
Grp Sat Flow(s),veh/h/ln	423	1490	1583	1774	1490	1583	1247	1863	1583	1094	0	1587
Q Serve(g_s), s	0.0	74.1	0.0	1.4	0.0	0.0	3.2	0.1	20.6	19.3	0.0	9.1
Cycle Q Clear(g_c), s	0.0	74.1	0.0	1.4	0.0	0.0	12.3	0.1	20.6	19.4	0.0	9.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Lane Grp Cap(c), veh/h	321	2760	977	159	3090	1094	215	372	316	278	0	317
V/C Ratio(X)	0.13	1.04	0.06	0.39	0.41	0.03	0.17	0.00	0.89	0.66	0.00	0.43
Avail Cap(c_a), veh/h	321	2760	977	168	3090	1094	350	574	488	397	0	489
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	15.9	0.0	0.0	47.5	38.5	46.7	46.2	0.0	42.1
Incr Delay (d2), s/veh	0.8	29.6	0.1	1.6	0.4	0.0	0.4	0.0	11.9	2.7	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	7.6	0.0	1.3	0.1	0.0	1.1	0.0	10.1	6.1	0.0	4.1
LnGrp Delay(d),s/veh	0.8	29.6	0.1	17.5	0.4	0.0	47.8	38.5	58.6	48.9	0.0	43.0
LnGrp LOS	A	F	A	B	A	A	D	D	E	D		D
Approach Vol, veh/h		2981			1360			318			320	
Approach Delay, s/veh		28.6			1.2			57.3			46.4	
Approach LOS		C			A			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	8.9	80.3		30.9		89.1		30.9
Change Period (Y+Rc), s	4.5	* 6.2		* 6.9		* 6.2		* 6.9
Max Green Setting (Gmax), s	5.0	* 60		* 37		* 70		* 37
Max Q Clear Time (g_c+I1), s	3.4	76.1		21.4		2.0		22.6
Green Ext Time (p_c), s	0.0	0.0		1.8		16.2		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	24.1
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

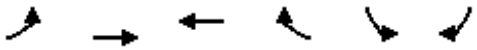


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	3442	1391	42	129	36
Future Volume (vph)	12	3442	1391	42	129	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0			70.0	60.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	65.0				25.0	
Lane Util. Factor	1.00	*0.80	*0.80	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	4471	4471	1583	1770	1583
Flt Permitted	0.113				0.950	
Satd. Flow (perm)	210	4471	4471	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				46		39
Link Speed (k/h)		70	70		50	
Link Distance (m)		350.0	450.0		200.0	
Travel Time (s)		18.0	23.1		14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	3741	1512	46	140	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	3741	1512	46	140	39
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
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	2.0	10.0	10.0	2.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6	2.0	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.2	24.2	24.2	24.2	24.9	24.9

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (s)	95.1	95.1	95.1	95.1	24.9	24.9
Total Split (%)	79.3%	79.3%	79.3%	79.3%	20.8%	20.8%
Maximum Green (s)	88.9	88.9	88.9	88.9	18.0	18.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.9	6.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	88.9	88.9	88.9	88.9	18.0	18.0
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.15	0.15
v/c Ratio	0.08	1.13	0.46	0.04	0.53	0.14
Control Delay	1.9	75.3	6.6	1.3	55.1	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	75.3	6.6	1.3	55.1	14.9
LOS	A	E	A	A	E	B
Approach Delay		75.0	6.5		46.4	
Approach LOS		E	A		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.13			
Intersection Signal Delay: 54.6		Intersection LOS: D	
Intersection Capacity Utilization 84.6%		ICU Level of Service E	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 5: Dundas Street & Street 'A'



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	3442	1391	42	129	36
Future Volume (veh/h)	12	3442	1391	42	129	36
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	13	3741	1512	46	140	39
Adj No. of Lanes	1	3	3	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	260	3312	3312	1173	266	237
Arrive On Green	0.99	0.99	0.74	0.74	0.15	0.15
Sat Flow, veh/h	330	4843	4843	1583	1774	1583
Grp Volume(v), veh/h	13	3741	1512	46	140	39
Grp Sat Flow(s),veh/h/ln	330	1490	1490	1583	1774	1583
Q Serve(g_s), s	1.0	88.9	15.9	0.9	8.7	2.6
Cycle Q Clear(g_c), s	16.8	88.9	15.9	0.9	8.7	2.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	260	3312	3312	1173	266	237
V/C Ratio(X)	0.05	1.13	0.46	0.04	0.53	0.16
Avail Cap(c_a), veh/h	260	3312	3312	1173	266	237
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	2.0	0.9	6.1	4.2	47.1	44.4
Incr Delay (d2), s/veh	0.4	62.7	0.5	0.1	7.3	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	28.3	6.6	0.4	4.8	1.2
LnGrp Delay(d),s/veh	2.3	63.6	6.5	4.2	54.3	45.9
LnGrp LOS	A	F	A	A	D	D
Approach Vol, veh/h		3754	1558		179	
Approach Delay, s/veh		63.4	6.5		52.5	
Approach LOS		E	A		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		95.1		24.9		95.1		
Change Period (Y+Rc), s		* 6.2		* 6.9		* 6.2		
Max Green Setting (Gmax), s		* 89		* 18		* 89		
Max Q Clear Time (g_c+I1), s		90.9		10.7		17.9		
Green Ext Time (p_c), s		0.0		0.4		22.3		

Intersection Summary	
HCM 2010 Ctrl Delay	46.9
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

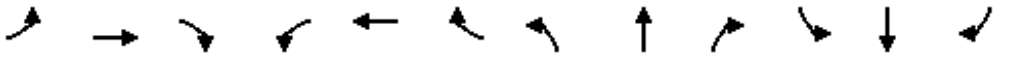
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	442	2593	390	179	1121	125	198	373	101	170	604	130
Future Volume (vph)	442	2593	390	179	1121	125	198	373	101	170	604	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		50.0	200.0		65.0	150.0		90.0	115.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4471	1583	1770	4471	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.100			0.111			0.158			0.520		
Satd. Flow (perm)	186	4471	1583	207	4471	1583	294	3539	1583	969	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145			136			109			145
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		450.0			200.0			200.0			200.0	
Travel Time (s)		23.1			10.3			12.0			12.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	465	2729	411	188	1180	132	208	393	106	179	636	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	465	2729	411	188	1180	132	208	393	106	179	636	137
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	32.0	11.0	24.0	24.0	36.0	36.0	36.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	30.0	62.0	62.0	11.0	43.0	43.0	11.0	47.0	47.0	36.0	36.0	36.0
Total Split (%)	25.0%	51.7%	51.7%	9.2%	35.8%	35.8%	9.2%	39.2%	39.2%	30.0%	30.0%	30.0%
Maximum Green (s)	26.0	55.0	55.0	7.0	36.0	36.0	7.0	41.0	41.0	30.0	30.0	30.0
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		12.0	12.0				23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)	69.1	55.1	55.1	46.0	36.0	36.0	39.2	37.2	37.2	26.2	26.2	26.2
Actuated g/C Ratio	0.59	0.47	0.47	0.40	0.31	0.31	0.34	0.32	0.32	0.23	0.23	0.23
v/c Ratio	1.00	1.29	0.50	1.07	0.85	0.23	1.11	0.35	0.18	0.82	0.80	0.29
Control Delay	76.0	162.8	16.0	117.1	45.2	5.9	130.0	31.0	5.6	71.6	50.7	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.0	162.8	16.0	117.1	45.2	5.9	130.0	31.0	5.6	71.6	50.7	6.8
LOS	E	F	B	F	D	A	F	C	A	E	D	A
Approach Delay		134.9			50.8			56.3			48.3	
Approach LOS		F			D			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 116.3			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 95.8		Intersection LOS: F	
Intersection Capacity Utilization 105.2%		ICU Level of Service G	
Analysis Period (min) 15			

* User Entered Value

Splits and Phases: 6: Ninth Line & Dundas Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	442	2593	390	179	1121	125	198	373	101	170	604	130
Future Volume (veh/h)	442	2593	390	179	1121	125	198	373	101	170	604	130
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	465	2729	411	188	1180	132	208	393	106	179	636	137
Adj No. of Lanes	1	3	1	1	3	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	478	2093	741	167	1370	485	213	1159	519	271	828	370
Arrive On Green	0.22	0.47	0.47	0.06	0.31	0.31	0.06	0.33	0.33	0.23	0.23	0.23
Sat Flow, veh/h	1774	4471	1583	1774	4471	1583	1774	3539	1583	895	3539	1583
Grp Volume(v), veh/h	465	2729	411	188	1180	132	208	393	106	179	636	137
Grp Sat Flow(s),veh/h/ln	1774	1490	1583	1774	1490	1583	1774	1770	1583	895	1770	1583
Q Serve(g_s), s	24.8	55.0	21.9	7.0	29.2	7.4	7.0	9.9	5.7	22.5	19.7	8.5
Cycle Q Clear(g_c), s	24.8	55.0	21.9	7.0	29.2	7.4	7.0	9.9	5.7	22.5	19.7	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	478	2093	741	167	1370	485	213	1159	519	271	828	370
V/C Ratio(X)	0.97	1.30	0.55	1.13	0.86	0.27	0.98	0.34	0.20	0.66	0.77	0.37
Avail Cap(c_a), veh/h	478	2093	741	167	1370	485	213	1235	553	290	904	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	31.2	22.4	33.7	38.4	30.8	41.1	29.9	28.5	43.1	42.0	37.7
Incr Delay (d2), s/veh	34.1	140.4	3.0	107.5	7.3	1.4	54.9	0.2	0.2	5.0	3.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.5	49.7	10.1	10.7	12.9	3.4	6.6	4.8	2.5	5.9	10.1	3.8
LnGrp Delay(d),s/veh	67.1	171.6	25.4	141.2	45.7	32.2	96.0	30.1	28.7	48.1	45.7	38.4
LnGrp LOS	E	F	C	F	D	C	F	C	C	D	D	D
Approach Vol, veh/h		3605			1500			707			952	
Approach Delay, s/veh		141.5			56.5			49.3			45.1	
Approach LOS		F			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	11.0	62.0	11.0	33.5	30.0	43.0		44.5
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	4.0	7.0		6.0
Max Green Setting (Gmax), s	7.0	55.0	7.0	30.0	26.0	36.0		41.0
Max Q Clear Time (g_c+I1), s	9.0	57.0	9.0	24.5	26.8	31.2		11.9
Green Ext Time (p_c), s	0.0	0.0	0.0	3.0	0.0	3.4		3.7

Intersection Summary	
HCM 2010 Ctrl Delay	99.4
HCM 2010 LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	1908	190	306	3034	108	198	5	157	60	5	23
Future Volume (vph)	29	1908	190	306	3034	108	198	5	157	60	5	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	115.0		50.0	150.0		75.0	50.0		0.0	40.0		40.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	75.0			75.0			50.0			15.0		
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	4471	1583	1770	4471	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.073			0.068			0.754			0.754		
Satd. Flow (perm)	136	4471	1583	127	4471	1583	1405	1863	1583	1405	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			96			73			141			65
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		200.0			600.0			200.0			200.0	
Travel Time (s)		10.3			30.9			14.4			14.4	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	30	1947	194	312	3096	110	202	5	160	61	5	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	1947	194	312	3096	110	202	5	160	61	5	23
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.5	37.2	37.2	11.5	37.2	37.2	46.0	46.0	46.0	46.0	46.0	46.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	12.0	61.2	61.2	12.0	61.2	61.2	46.8	46.8	46.8	46.8	46.8	46.8
Total Split (%)	10.0%	51.0%	51.0%	10.0%	51.0%	51.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Maximum Green (s)	8.0	55.0	55.0	8.0	55.0	55.0	39.8	39.8	39.8	39.8	39.8	39.8
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.5	3.7	3.7	3.7	3.7	3.7	3.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.2	6.2	4.0	6.2	6.2	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		24.0	24.0		24.0	24.0	32.0	32.0	32.0	32.0	32.0	32.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	0
Act Effct Green (s)	64.2	55.0	55.0	86.3	77.4	77.4	22.7	22.7	22.7	22.7	22.7	22.7
Actuated g/C Ratio	0.54	0.46	0.46	0.72	0.64	0.64	0.19	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.18	0.95	0.25	0.72	1.07	0.11	0.76	0.01	0.39	0.23	0.01	0.07
Control Delay	10.7	42.7	10.6	54.8	48.7	0.0	63.4	35.2	11.1	40.9	35.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	42.7	10.6	54.8	48.7	0.0	63.4	35.2	11.1	40.9	35.2	0.3
LOS	B	D	B	D	D	A	E	D	B	D	D	A
Approach Delay		39.4			47.7			40.2			30.1	
Approach LOS		D			D			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 24 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 44.1		Intersection LOS: D	
Intersection Capacity Utilization 96.4%		ICU Level of Service F	
Analysis Period (min) 15			
* User Entered Value			

Splits and Phases: 1: Eighth Line & Dundas Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	1908	190	306	3034	108	198	5	157	60	5	23
Future Volume (veh/h)	29	1908	190	306	3034	108	198	5	157	60	5	23
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	30	1947	194	312	3096	110	202	5	160	61	5	23
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	1	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	148	2750	974	238	2883	1021	298	326	277	270	326	277
Arrive On Green	0.04	0.62	0.62	0.13	1.00	1.00	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1774	4471	1583	1774	4471	1583	1377	1863	1583	1216	1863	1583
Grp Volume(v), veh/h	30	1947	194	312	3096	110	202	5	160	61	5	23
Grp Sat Flow(s),veh/h/ln	1774	1490	1583	1774	1490	1583	1377	1863	1583	1216	1863	1583
Q Serve(g_s), s	0.7	35.6	6.4	8.0	77.4	0.0	17.1	0.3	11.1	5.2	0.3	1.5
Cycle Q Clear(g_c), s	0.7	35.6	6.4	8.0	77.4	0.0	17.3	0.3	11.1	5.5	0.3	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	148	2750	974	238	2883	1021	298	326	277	270	326	277
V/C Ratio(X)	0.20	0.71	0.20	1.31	1.07	0.11	0.68	0.02	0.58	0.23	0.02	0.08
Avail Cap(c_a), veh/h	201	2750	974	238	2883	1021	513	618	525	461	618	525
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	15.7	10.1	26.8	0.0	0.0	48.1	41.0	45.4	43.2	41.0	41.5
Incr Delay (d2), s/veh	0.7	1.6	0.5	167.5	40.6	0.2	2.7	0.0	1.9	0.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	15.0	2.9	18.8	10.9	0.1	6.7	0.1	5.0	1.8	0.1	0.6
LnGrp Delay(d),s/veh	15.9	17.3	10.6	194.3	40.6	0.2	50.8	41.0	47.3	43.7	41.0	41.6
LnGrp LOS	B	B	B	F	F	A	D	D	D	D	D	D
Approach Vol, veh/h		2171			3518			367			89	
Approach Delay, s/veh		16.7			53.0			49.2			43.0	
Approach LOS		B			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	80.0		28.0	8.4	83.6		28.0
Change Period (Y+Rc), s	4.0	* 6.2		7.0	4.0	* 6.2		7.0
Max Green Setting (Gmax), s	8.0	* 55		39.8	8.0	* 55		39.8
Max Q Clear Time (g_c+I1), s	10.0	37.6		7.5	2.7	79.4		19.3
Green Ext Time (p_c), s	0.0	14.2		0.4	0.0	0.0		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	39.8
HCM 2010 LOS	D

Notes

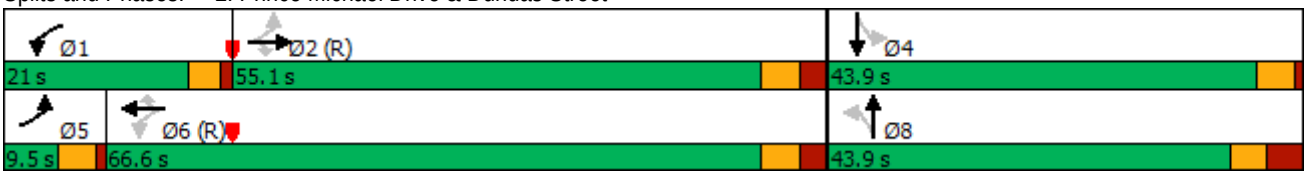
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

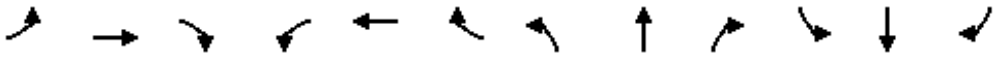
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	1858	190	271	3153	244	189	5	92	144	5	69
Future Volume (vph)	141	1858	190	271	3153	244	189	5	92	144	5	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	125.0		50.0	125.0		50.0	60.0		0.0	60.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	55.0			55.0			25.0			25.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.858			0.859	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1598	0	1770	1600	0
Flt Permitted	0.081			0.075			0.705			0.694		
Satd. Flow (perm)	151	5085	1583	140	5085	1583	1313	1598	0	1293	1600	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			113			99		93			75	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		600.0			450.0			200.0			200.0	
Travel Time (s)		30.9			23.1			14.4			14.4	
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Adj. Flow (vph)	153	1877	192	274	3185	265	191	5	93	157	5	75
Shared Lane Traffic (%)												
Lane Group Flow (vph)	153	1877	192	274	3185	265	191	98	0	157	80	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
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0		5.0	5.0	
Minimum Split (s)	9.5	38.3	38.3	11.5	38.3	38.3	43.9	43.9		22.5	22.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	9.5	55.1	55.1	21.0	66.6	66.6	43.9	43.9		43.9	43.9	
Total Split (%)	7.9%	45.9%	45.9%	17.5%	55.5%	55.5%	36.6%	36.6%		36.6%	36.6%	
Maximum Green (s)	5.0	48.8	48.8	17.0	60.3	60.3	37.0	37.0		39.4	39.4	
Yellow Time (s)	3.5	3.7	3.7	3.0	3.7	3.7	3.3	3.3		3.5	3.5	
All-Red Time (s)	1.0	2.6	2.6	1.0	2.6	2.6	3.6	3.6		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	6.3	6.3	4.0	6.3	6.3	6.9	6.9		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		25.0	25.0		25.0	25.0	30.0	30.0		11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0		0	0	
Act Effct Green (s)	56.4	49.6	49.6	72.1	60.3	60.3	37.0	37.0		39.4	39.4	
Actuated g/C Ratio	0.47	0.41	0.41	0.60	0.50	0.50	0.31	0.31		0.33	0.33	
v/c Ratio	1.11	0.89	0.27	0.90	1.25	0.31	0.47	0.18		0.37	0.14	
Control Delay	121.5	60.0	29.2	58.1	140.5	15.8	38.3	7.6		34.0	7.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	121.5	60.0	29.2	58.1	140.5	15.8	38.3	7.6		34.0	7.8	
LOS	F	E	C	E	F	B	D	A		C	A	
Approach Delay		61.5			125.6			27.9			25.1	
Approach LOS		E			F			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 95.6		Intersection LOS: F	
Intersection Capacity Utilization 100.6%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 2: Prince Michael Drive & Dundas Street





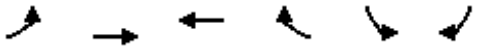
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	1858	190	271	3153	244	189	5	92	144	5	69
Future Volume (veh/h)	141	1858	190	271	3153	244	189	5	92	144	5	69
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	153	1877	192	274	3185	265	191	5	93	157	5	75
Adj No. of Lanes	1	3	1	1	3	1	1	1	0	1	1	0
Peak Hour Factor	0.92	0.99	0.99	0.99	0.99	0.92	0.99	0.92	0.99	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	134	2119	660	304	2555	796	417	25	467	400	31	462
Arrive On Green	0.01	0.14	0.14	0.04	0.17	0.17	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1313	81	1514	1292	100	1498
Grp Volume(v), veh/h	153	1877	192	274	3185	265	191	0	98	157	0	80
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1313	0	1596	1292	0	1598
Q Serve(g_s), s	5.0	43.5	13.1	13.6	60.3	17.7	14.9	0.0	5.4	12.2	0.0	4.4
Cycle Q Clear(g_c), s	5.0	43.5	13.1	13.6	60.3	17.7	19.2	0.0	5.4	17.7	0.0	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.94
Lane Grp Cap(c), veh/h	134	2119	660	304	2555	796	417	0	492	400	0	493
V/C Ratio(X)	1.14	0.89	0.29	0.90	1.25	0.33	0.46	0.00	0.20	0.39	0.00	0.16
Avail Cap(c_a), veh/h	134	2119	660	322	2555	796	417	0	492	426	0	525
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.2	48.9	35.8	41.0	50.1	32.3	37.2	0.0	30.6	37.1	0.0	30.2
Incr Delay (d2), s/veh	121.2	5.9	1.1	25.9	114.3	1.1	3.6	0.0	0.9	0.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	21.6	6.0	11.3	55.4	8.0	5.8	0.0	2.5	4.4	0.0	2.0
LnGrp Delay(d),s/veh	152.4	54.8	36.9	66.9	164.4	33.4	40.8	0.0	31.5	37.7	0.0	30.4
LnGrp LOS	F	D	D	E	F	C	D		C	D		C
Approach Vol, veh/h		2222			3724			289			237	
Approach Delay, s/veh		60.0			147.9			37.7			35.2	
Approach LOS		E			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	19.8	56.3		43.9	9.5	66.6		43.9
Change Period (Y+Rc), s	4.0	* 6.3		* 6.9	4.5	* 6.3		* 6.9
Max Green Setting (Gmax), s	17.0	* 49		* 39	5.0	* 60		* 37
Max Q Clear Time (g_c+I1), s	15.6	45.5		19.7	7.0	62.3		21.2
Green Ext Time (p_c), s	0.2	3.0		1.2	0.0	0.0		1.4

Intersection Summary		
HCM 2010 Ctrl Delay	108.7	
HCM 2010 LOS	F	

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑	↱		↱
Traffic Volume (vph)	0	2070	3654	5	0	15
Future Volume (vph)	0	2070	3654	5	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			40.0	0.0	0.0
Storage Lanes	0			1	0	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt				0.850		0.865
Flt Protected						
Satd. Flow (prot)	0	5085	5085	1583	0	1611
Flt Permitted						
Satd. Flow (perm)	0	5085	5085	1583	0	1611
Link Speed (k/h)		70	70		50	
Link Distance (m)		450.0	150.0		200.0	
Travel Time (s)		23.1	7.7		14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2250	3972	5	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2250	3972	5	0	16
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		0.0	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	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 80.6%		ICU Level of Service D	
Analysis Period (min) 15			

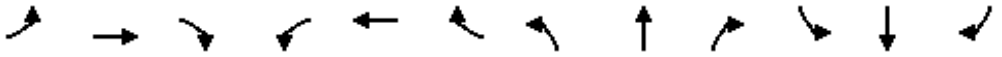
Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑	↱		↱
Traffic Vol, veh/h	0	2070	3654	5	0	15
Future Vol, veh/h	0	2070	3654	5	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	400	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2250	3972	5	0	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1986
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	-	0	44
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	-	-	-	-	-	44
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	128.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	44
HCM Lane V/C Ratio	-	-	-	0.371
HCM Control Delay (s)	-	-	-	128.8
HCM Lane LOS	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	1.3

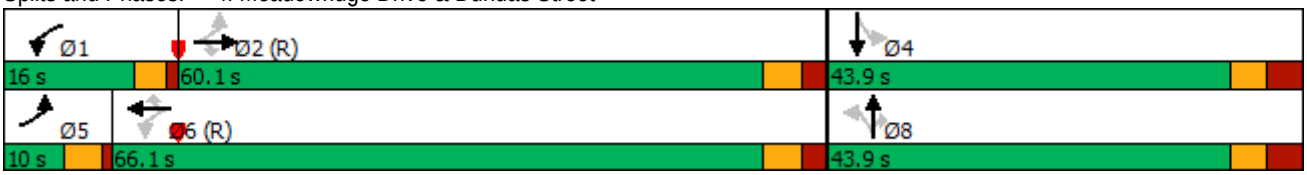


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	1761	162	244	3336	92	41	2	143	107	2	77
Future Volume (vph)	130	1761	162	244	3336	92	41	2	143	107	2	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		60.0	135.0		75.0	25.0		0.0	60.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	70.0			60.0			45.0			40.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.853	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1863	1583	1770	1589	0
Flt Permitted	0.061			0.069			0.701			0.757		
Satd. Flow (perm)	114	5085	1583	129	5085	1583	1306	1863	1583	1410	1589	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			116			76			137		84	
Link Speed (k/h)		70			70			50			50	
Link Distance (m)		150.0			350.0			200.0			200.0	
Travel Time (s)		7.7			18.0			14.4			14.4	
Peak Hour Factor	0.92	0.98	0.98	0.98	0.98	0.92	0.98	0.92	0.98	0.92	0.92	0.92
Adj. Flow (vph)	141	1797	165	249	3404	100	42	2	146	116	2	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	141	1797	165	249	3404	100	42	2	146	116	86	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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	20.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	5.0	5.0	
Minimum Split (s)	9.5	36.2	36.2	11.0	36.2	36.2	43.9	43.9	43.9	43.9	43.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	10.0	60.1	60.1	16.0	66.1	66.1	43.9	43.9	43.9	43.9	43.9	
Total Split (%)	8.3%	50.1%	50.1%	13.3%	55.1%	55.1%	36.6%	36.6%	36.6%	36.6%	36.6%	
Maximum Green (s)	5.5	53.9	53.9	12.0	59.9	59.9	37.0	37.0	37.0	37.0	37.0	
Yellow Time (s)	3.5	3.7	3.7	3.0	3.7	3.7	3.3	3.3	3.3	3.3	3.3	
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	2.5	3.6	3.6	3.6	3.6	3.6	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	4.0	6.2	6.2	6.9	6.9	6.9	6.9	6.9	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		23.0	23.0		23.0	23.0	30.0	30.0	30.0	30.0	30.0	
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	
Act Effct Green (s)	80.1	66.0	66.0	93.6	74.5	74.5	15.5	15.5	15.5	15.5	15.5	
Actuated g/C Ratio	0.67	0.55	0.55	0.78	0.62	0.62	0.13	0.13	0.13	0.13	0.13	
v/c Ratio	0.57	0.64	0.18	0.63	1.08	0.10	0.25	0.01	0.45	0.64	0.31	
Control Delay	29.4	25.5	12.9	22.2	62.7	7.6	48.7	42.0	13.3	64.5	12.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	29.4	25.5	12.9	22.2	62.7	7.6	48.7	42.0	13.3	64.5	12.6	
LOS	C	C	B	C	E	A	D	D	B	E	B	
Approach Delay		24.8			58.5			21.4			42.4	
Approach LOS		C			E			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 45.5		Intersection LOS: D	
Intersection Capacity Utilization 98.9%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: Meadowridge Drive & Dundas Street



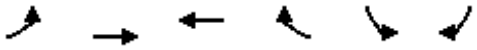
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	1761	162	244	3336	92	41	2	143	107	2	77
Future Volume (veh/h)	130	1761	162	244	3336	92	41	2	143	107	2	77
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	141	1797	165	249	3404	100	42	2	146	116	2	84
Adj No. of Lanes	1	3	1	1	3	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.98	0.98	0.98	0.98	0.92	0.98	0.92	0.98	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	3437	1070	322	3503	1091	149	221	188	205	4	184
Arrive On Green	0.09	1.00	1.00	0.06	0.69	0.69	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1306	1863	1583	1235	37	1552
Grp Volume(v), veh/h	141	1797	165	249	3404	100	42	2	146	116	0	86
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1306	1863	1583	1235	0	1589
Q Serve(g_s), s	5.3	0.0	0.0	5.1	75.6	2.5	3.7	0.1	10.7	11.0	0.0	6.1
Cycle Q Clear(g_c), s	5.3	0.0	0.0	5.1	75.6	2.5	9.8	0.1	10.7	11.1	0.0	6.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Lane Grp Cap(c), veh/h	144	3437	1070	322	3503	1091	149	221	188	205	0	188
V/C Ratio(X)	0.98	0.52	0.15	0.77	0.97	0.09	0.28	0.01	0.78	0.57	0.00	0.46
Avail Cap(c_a), veh/h	144	3437	1070	388	3503	1091	397	574	488	440	0	490
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.3	0.0	0.0	7.7	17.6	6.2	53.8	46.7	51.3	51.6	0.0	49.3
Incr Delay (d2), s/veh	68.2	0.6	0.3	7.8	9.9	0.2	1.0	0.0	6.8	2.4	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	0.2	0.1	5.7	38.2	1.1	1.4	0.1	5.1	3.9	0.0	2.7
LnGrp Delay(d),s/veh	106.5	0.6	0.3	15.4	27.5	6.4	54.8	46.7	58.1	54.0	0.0	51.0
LnGrp LOS	F	A	A	B	C	A	D	D	E	D		D
Approach Vol, veh/h		2103			3753			190			202	
Approach Delay, s/veh		7.7			26.1			57.3			52.7	
Approach LOS		A			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.5	87.3		21.1	10.0	88.9		21.1
Change Period (Y+Rc), s	4.0	* 6.2		* 6.9	4.5	* 6.2		* 6.9
Max Green Setting (Gmax), s	12.0	* 54		* 37	5.5	* 60		* 37
Max Q Clear Time (g_c+I1), s	7.1	2.0		13.1	7.3	77.6		12.7
Green Ext Time (p_c), s	0.4	28.3		1.1	0.0	0.0		0.9

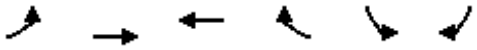
Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



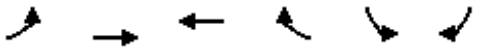
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	39	2171	4048	138	81	23
Future Volume (vph)	39	2171	4048	138	81	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	100.0			70.0	60.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	65.0				25.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	5085	5085	1583	1770	1583
Flt Permitted	0.045				0.950	
Satd. Flow (perm)	84	5085	5085	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				105		
Link Speed (k/h)		70	70		50	
Link Distance (m)		350.0	450.0		200.0	
Travel Time (s)		18.0	23.1		14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	2360	4400	150	88	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	2360	4400	150	88	25
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
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (m)	2.0	10.0	10.0	2.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6	2.0	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.2	24.2	24.2	24.2	24.9	24.9



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Split (s)	95.1	95.1	95.1	95.1	24.9	24.9
Total Split (%)	79.3%	79.3%	79.3%	79.3%	20.8%	20.8%
Maximum Green (s)	88.9	88.9	88.9	88.9	18.0	18.0
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.5	2.5	2.5	2.5	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.9	6.9
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	88.9	88.9	88.9	88.9	18.0	18.0
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.15	0.15
v/c Ratio	0.68	0.63	1.17	0.13	0.33	0.11
Control Delay	55.5	2.3	97.6	1.7	49.6	45.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	2.3	97.6	1.7	49.6	45.5
LOS	E	A	F	A	D	D
Approach Delay		3.3	94.4		48.7	
Approach LOS		A	F		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.17			
Intersection Signal Delay: 62.7		Intersection LOS: E	
Intersection Capacity Utilization 93.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 5: Dundas Street & Street 'A'



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	2171	4048	138	81	23
Future Volume (veh/h)	39	2171	4048	138	81	23
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	42	2360	4400	150	88	25
Adj No. of Lanes	1	3	3	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	60	3767	3767	1173	266	237
Arrive On Green	1.00	1.00	0.74	0.74	0.15	0.15
Sat Flow, veh/h	16	5253	5253	1583	1774	1583
Grp Volume(v), veh/h	42	2360	4400	150	88	25
Grp Sat Flow(s),veh/h/ln	16	1695	1695	1583	1774	1583
Q Serve(g_s), s	0.0	0.0	88.9	3.3	5.3	1.6
Cycle Q Clear(g_c), s	88.9	0.0	88.9	3.3	5.3	1.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	60	3767	3767	1173	266	237
V/C Ratio(X)	0.70	0.63	1.17	0.13	0.33	0.11
Avail Cap(c_a), veh/h	60	3767	3767	1173	266	237
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	0.0	15.5	4.5	45.6	44.0
Incr Delay (d2), s/veh	50.8	0.8	78.8	0.2	3.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.3	68.3	1.5	2.9	0.8
LnGrp Delay(d),s/veh	95.3	0.8	94.3	4.7	48.9	44.9
LnGrp LOS	F	A	F	A	D	D
Approach Vol, veh/h		2402	4550		113	
Approach Delay, s/veh		2.4	91.4		48.0	
Approach LOS		A	F		D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		95.1		24.9		95.1		
Change Period (Y+Rc), s		* 6.2		* 6.9		* 6.2		
Max Green Setting (Gmax), s		* 89		* 18		* 89		
Max Q Clear Time (g_c+I1), s		90.9		7.3		90.9		
Green Ext Time (p_c), s		0.0		0.3		0.0		

Intersection Summary	
HCM 2010 Ctrl Delay	60.4
HCM 2010 LOS	E

Notes

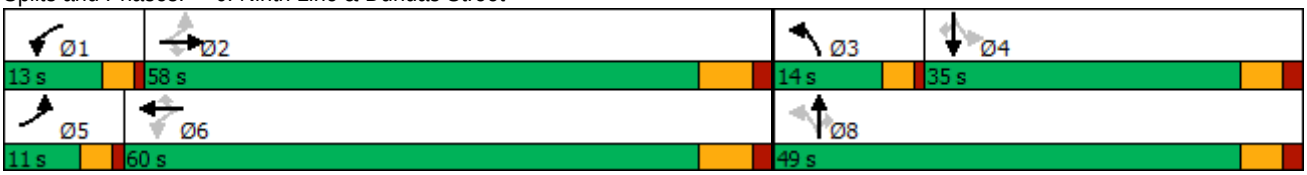
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

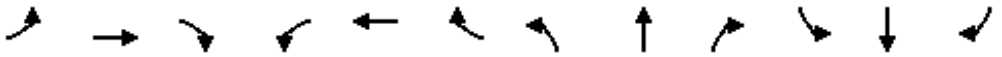
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	1815	327	155	3170	144	461	575	441	107	373	369
Future Volume (vph)	145	1815	327	155	3170	144	461	575	441	107	373	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		50.0	200.0		65.0	150.0		90.0	115.0		50.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	100.0			100.0			100.0			100.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.078			0.075			0.347			0.426		
Satd. Flow (perm)	145	5085	1583	140	5085	1583	646	3539	1583	794	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			186			100			134			118
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		450.0			200.0			200.0			200.0	
Travel Time (s)		23.1			10.3			12.0			12.0	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	151	1891	341	161	3302	150	480	599	459	111	389	384
Shared Lane Traffic (%)												
Lane Group Flow (vph)	151	1891	341	161	3302	150	480	599	459	111	389	384
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	5.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	11.0	32.0	32.0	11.0	32.0	32.0	10.0	24.0	24.0	35.0	35.0	35.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	11.0	58.0	58.0	13.0	60.0	60.0	14.0	49.0	49.0	35.0	35.0	35.0
Total Split (%)	9.2%	48.3%	48.3%	10.8%	50.0%	50.0%	11.7%	40.8%	40.8%	29.2%	29.2%	29.2%
Maximum Green (s)	7.0	51.0	51.0	9.0	53.0	53.0	10.0	43.0	43.0	29.0	29.0	29.0
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		12.0	12.0				22.0	22.0	22.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)	61.3	51.2	51.2	65.0	53.1	53.1	40.9	38.9	38.9	24.8	24.8	24.8
Actuated g/C Ratio	0.53	0.44	0.44	0.56	0.46	0.46	0.35	0.34	0.34	0.21	0.21	0.21
v/c Ratio	0.87	0.84	0.42	0.79	1.42	0.19	1.48	0.51	0.74	0.66	0.51	0.89
Control Delay	64.4	33.8	12.0	50.3	219.2	8.2	260.7	32.3	31.6	60.4	42.5	53.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	33.8	12.0	50.3	219.2	8.2	260.7	32.3	31.6	60.4	42.5	53.7
LOS	E	C	B	D	F	A	F	C	C	E	D	D
Approach Delay		32.6			202.9			103.4			49.6	
Approach LOS		C			F			F			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 116			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.48			
Intersection Signal Delay: 120.4		Intersection LOS: F	
Intersection Capacity Utilization 124.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 6: Ninth Line & Dundas Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	1815	327	155	3170	144	461	575	441	107	373	369
Future Volume (veh/h)	145	1815	327	155	3170	144	461	575	441	107	373	369
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	151	1891	341	161	3302	150	480	599	459	111	389	384
Adj No. of Lanes	1	3	1	1	3	1	1	2	1	1	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	163	2203	686	195	2246	699	311	1268	567	181	855	383
Arrive On Green	0.06	0.43	0.43	0.07	0.44	0.44	0.08	0.36	0.36	0.24	0.24	0.24
Sat Flow, veh/h	1774	5085	1583	1774	5085	1583	1774	3539	1583	531	3539	1583
Grp Volume(v), veh/h	151	1891	341	161	3302	150	480	599	459	111	389	384
Grp Sat Flow(s),veh/h/ln	1774	1695	1583	1774	1695	1583	1774	1770	1583	531	1770	1583
Q Serve(g_s), s	6.1	40.3	18.7	6.0	53.0	7.0	10.0	15.7	31.4	24.5	11.2	29.0
Cycle Q Clear(g_c), s	6.1	40.3	18.7	6.0	53.0	7.0	10.0	15.7	31.4	26.2	11.2	29.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	163	2203	686	195	2246	699	311	1268	567	181	855	383
V/C Ratio(X)	0.92	0.86	0.50	0.83	1.47	0.21	1.55	0.47	0.81	0.61	0.45	1.00
Avail Cap(c_a), veh/h	163	2203	686	210	2246	699	311	1268	567	181	855	383
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	30.7	24.6	27.2	33.5	20.7	39.9	29.7	34.8	45.3	38.8	45.5
Incr Delay (d2), s/veh	48.6	4.6	2.6	21.7	214.1	0.7	260.9	0.3	8.6	6.0	0.4	46.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	19.7	8.6	4.0	69.3	3.2	35.5	7.7	15.1	3.9	5.6	17.6
LnGrp Delay(d),s/veh	79.2	35.3	27.1	48.9	247.6	21.4	300.8	30.0	43.4	51.3	39.1	92.4
LnGrp LOS	E	D	C	D	F	C	F	C	D	D	D	F
Approach Vol, veh/h		2383			3613			1538			884	
Approach Delay, s/veh		36.9			229.3			118.5			63.8	
Approach LOS		D			F			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	12.0	59.0	14.0	35.0	11.0	60.0		49.0
Change Period (Y+Rc), s	4.0	7.0	4.0	6.0	4.0	7.0		6.0
Max Green Setting (Gmax), s	9.0	51.0	10.0	29.0	7.0	53.0		43.0
Max Q Clear Time (g_c+I1), s	8.0	42.3	12.0	31.0	8.1	55.0		33.4
Green Ext Time (p_c), s	0.1	7.8	0.0	0.0	0.0	0.0		4.7

Intersection Summary	
HCM 2010 Ctrl Delay	137.2
HCM 2010 LOS	F

Appendix G

Parking, Pedestrian and Transit Plans by Korsiak Planning

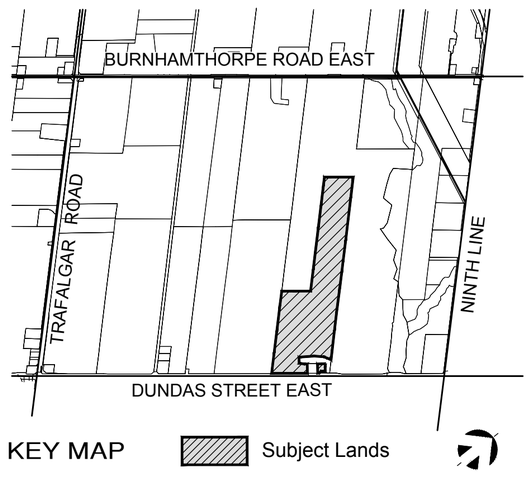
PRELIMINARY ON-STREET PARKING ANALYSIS

24T-

Argo (Joshua Creek) Developments Ltd.

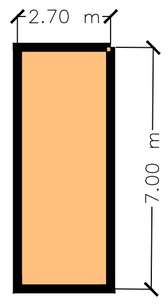
PART OF LOT 8
CONCESSION 1, NORTH OF DUNDAS STREET
GEOGRAPHIC TOWNSHIP OF TRAFALGAR
NOW IN THE
TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON

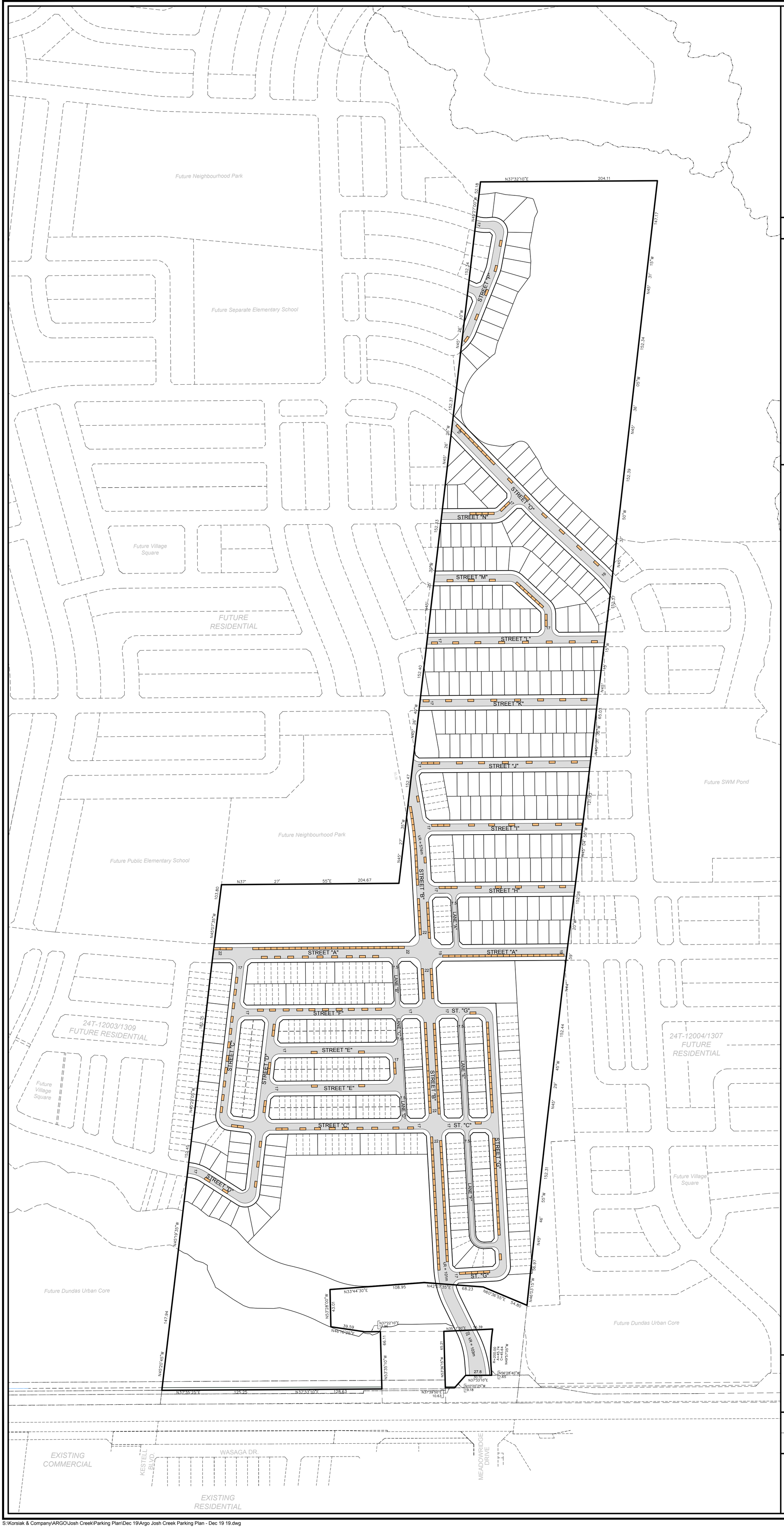
Argo (Joshua Creek) Developments Ltd.



± 335 On-street parking spaces
± 600 Residential units
± 0.56 Visitor parking space/unit

TYPICAL ON-STREET PARKING SPACE





SCALE 1:2000	December 19, 2019
DRAWN BY: SE	CHECKED BY: KC

KORSIAK | Urban Planning
206-277 Lakeshore Road East
Oakville, Ontario L6J 1H9
T: 905-257-0227
info@korsiak.com

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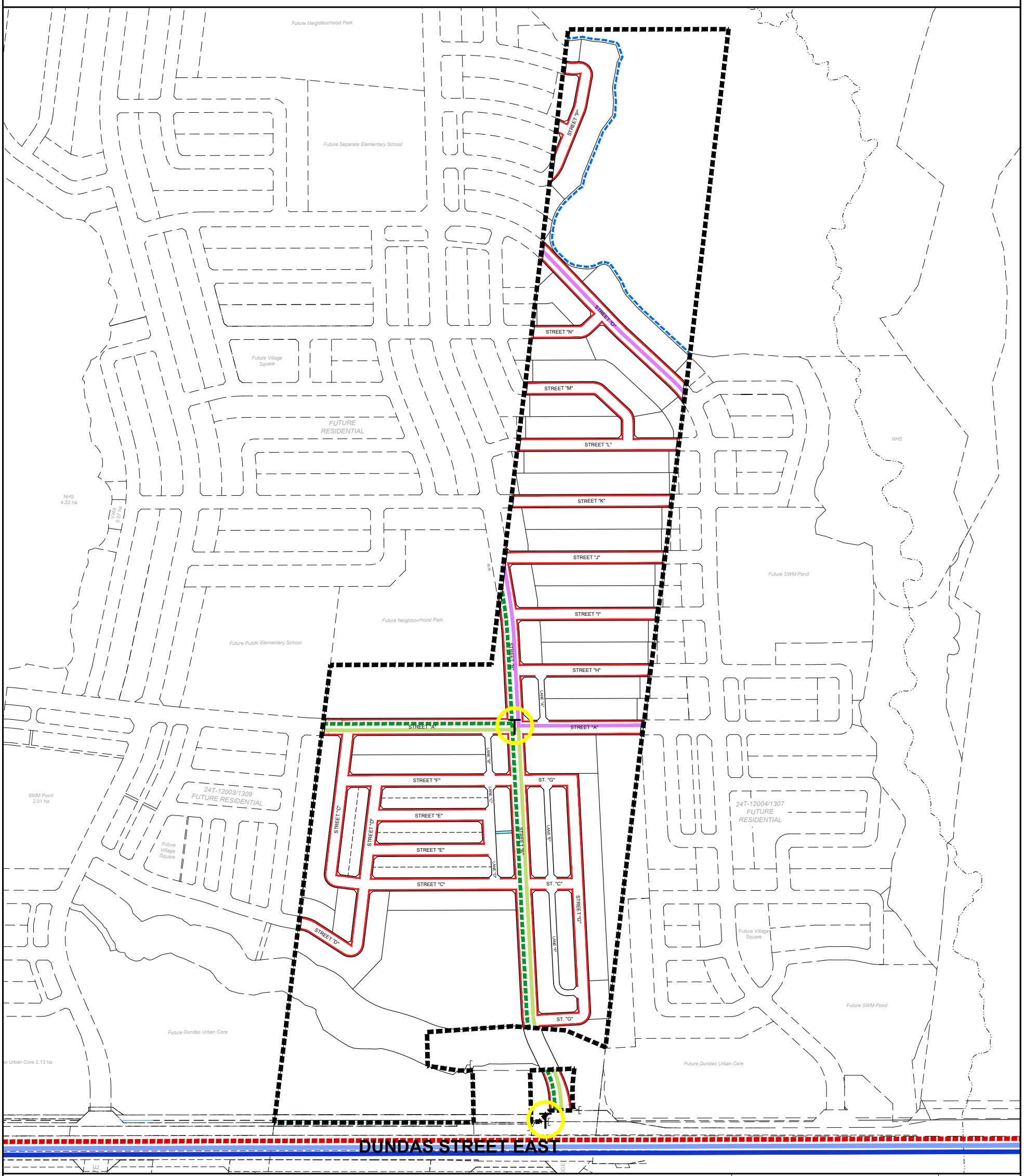
Legend

- Sidewalk
- Walkway
- Major Trail System**
- Regional Bicycle Facility**
- Signed Bike Route**
- Busway Corridor*
- Primary Transit Corridor Service*
- Community Service*
- Secondary Transit Corridor Service*
- T — Potential Transit Stop Location

* From Figure NOE4 - Transportation Plan - NOESP
** From Figure 1 - North Oakville Trails Plan



Argo - Joshua Creek

PEDESTRIAN CIRCULATION / TRANSIT FACILITY PLAN

NTS

December 9, 2019

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KORSIAK Urban Planning
206-277 Lakeshore Road East
Oakville, Ontario L6J 1H9
T: 905-257-0227
info@korsiak.com