

**Regional Road 25 Municipal
Class Environmental Assessment
Transportation Planning Report**



Prepared for:
Halton Region

Prepared by:
Stantec Consulting Ltd.

January 2, 2019

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Sign-off Sheet

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Sign-off Sheet

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Introduction
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1.0 INTRODUCTION

Halton Region has retained Stantec Consulting Ltd. (Stantec) to undertake a Municipal Class Environmental Assessment (MCEA) of Regional Road 25, from Steeles Avenue (Regional Road 8) to 5 Side Road in the Town of Milton, Ontario. The Study Area is illustrated in **Figure 1**.

The purpose of this Transportation Planning Study is to identify corridor needs and deficiencies in terms of transportation and traffic issues, and to provide justification for improvements on Regional Road 25. The *Halton Region Transportation Master Plan (2031) – The Road to Change published in 2011* indicates that widening from 4 to 6 lanes along Regional Road 25 from Steeles Avenue to 5 Side Road is required to meet future travel demand. The *Implementation Agreement with the Ontario Ministry of Transportation for Road Improvements at Regional Road 25 and Highway 401, Ward 2, Town of Milton, Public Works February 2017* recommended that funding previously identified for road improvements at Regional Road 25 and Highway 401 for 2022 be accelerated to 2017 to fund the cost of a change order to MTO's bridge replacement contract. The change order would allow the future design of the bridge to incorporate Halton Region's future design requirements including the accommodation of six lanes of traffic, speed change lanes for the Highway 401 on-ramps, and active transportation facilities.

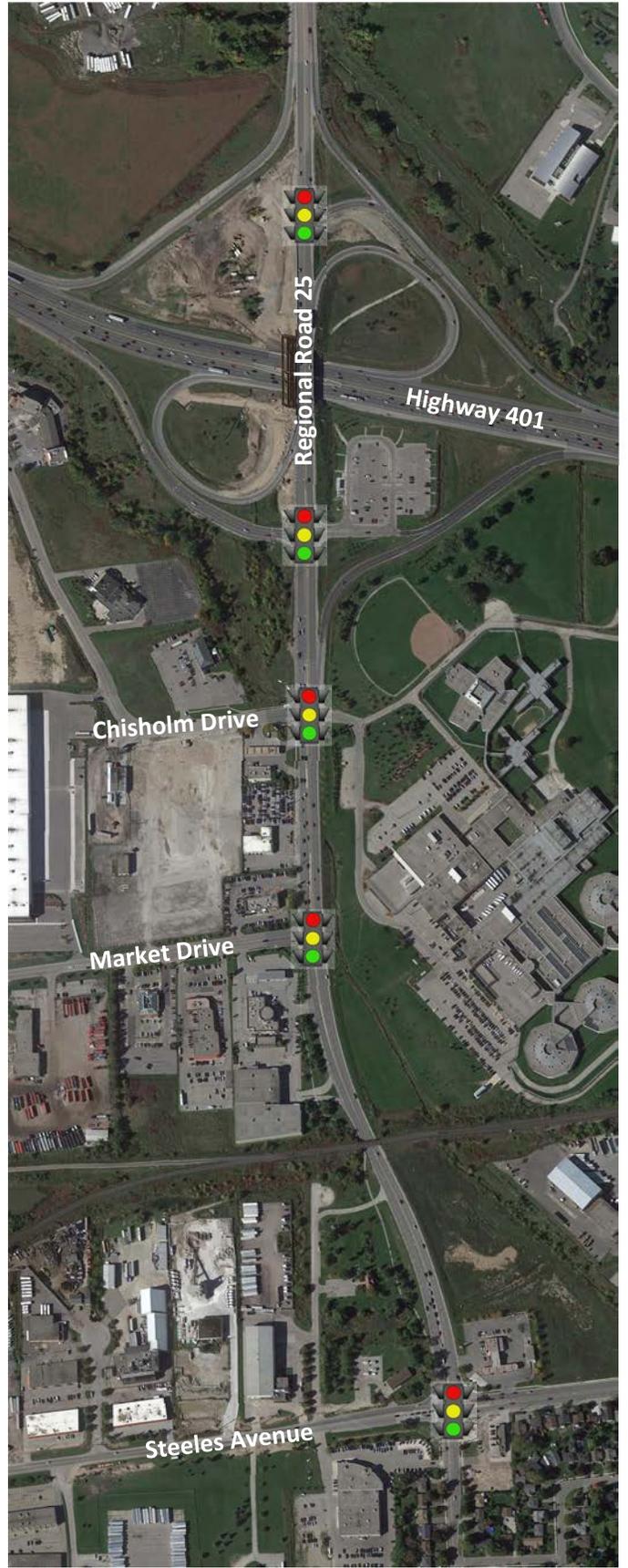


Figure 1 - Study Area

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Background Documents
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2.0 BACKGROUND DOCUMENTS

To assure relevant information regarding the Study Area is applied to the analyses, a detailed review of background documents was undertaken. The background documents are summarized below and provide details regarding the Regional Road 25 widening, transit initiatives, and nearby road works which will impact traffic along the Regional Road 25 corridor.

Implementation Agreement with the MTO for Road Improvements at Regional Road 25 and Highway 401, Ward 2, Town of Milton, Public Works February 2017

The February 2017 Letter from the Halton Region Public Works department recommends that \$7,293,000 in funding that was previously identified for road improvements at Regional Road 25 and Highway 401 for 2022 be accelerated to 2017 to fund the cost of a change order to MTO's bridge replacement contract to incorporate Halton Region's future design requirements at the Regional Road 25/Highway 401 bridge. This cost includes the increase in width of the structure to accommodate six lanes of traffic along Regional Road 25, including two parallel speed change lanes, and active transportation facilities.

At the time of the Letter, MTO was undertaking works to construct a bridge structure at Regional Road 25 and Highway 401 to accommodate the ultimate highway cross-section of eight core lanes and four collector lanes through the Town of Milton. The west half of the replacement bridge was constructed to reduce impacts to Regional Road 25 during construction. Halton Region stated that it is looking to work together with the MTO in assuring that both Halton Region's future needs and the MTO's future needs are met with the bridge replacement, such that the widening of Regional Road 25 to a six-lane cross-section is incorporated into the bridge replacement works.

It was noted that a Municipal Class Environmental Assessment to confirm the required road improvements, commencing in 2017, is anticipated to include a four to six-lane widening of Regional Road 25. Stage One of the bridge replacement at Regional Road 25/Highway 401 was completed at the end of 2017 and Stage Two is planned for 2018. MTO indicated to Halton Region in spring of 2017 that the design provisions for the future six-lane configuration, active transportation infrastructure, and direct on-ramp tapers were not incorporated into the bridge construction contract. Following a technical review, it was determined that the majority of Halton Region's design preferences could be integrated into the MTO's current bridge contract through a contract change order. That change order is being implemented now.

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Staff Report – Mobility Management Strategy for Halton, Public Works February 2017

The purpose of the Staff Report was to secure Council's endorsement of the Mobility Management Strategy including the Transit Priority Mobility Network. The Mobility Management Strategy for Halton has been developed to guide the evolution of a region-wide inter and intra transportation network over 25 years to 2041 and was noted to be in alignment with many supporting provincial, regional, and local transportation initiatives. The noted next steps were to assess the region-wide grid network, its connection to the Major Transit Station Areas, and the infrastructure necessary to unlock the potential of the Major Transit Station Area.

Mobility Management Strategy for Halton, WSP | Parsons Brinckerhoff January 2017

The purpose of the Mobility Management Strategy was to analyze the region-wide issues facing Halton today and those that are likely to arise through 2041, and to develop the Mobility Management Strategy vision, goals, and associated strategies to assist in guiding the evolution of the region's immediate and longer-term transportation system. The Report focuses on increasing the modal share of public transit and active transportation modes.

The Report identifies a transit priority mobility network to 2041, which includes:

- Mobility link (Local service connecting Municipalities) on Regional Road 25 along James Snow Parkway to the south-east (Milton GO Station to Acton GO Station)
- Transport priority corridor along Regional Road 25 south of Steeles Avenue (from Bronte GO Station to Steeles Avenue)

Roads Capital Projects, Public Works 2016

Planned roads capital projects that will affect the corridor are as follows:

1. James Snow Parkway – Widening 4 to 6 lanes from Highway 401 to 5 Side Road (2030)
2. Steeles Avenue – Widening 2 to 4 lanes from Industrial Drive to Martin Street (2017)
3. Steeles Avenue – Widening 4 to 6 lanes from Regional Road 25 to Trafalgar Road (2024)
4. Regional Road 25 – Widening 4 to 6 lanes from Steeles Avenue to 5 Side Road (2022)
5. Regional Road 25 – Widening 2 to 4 lanes from 5 Side Road to 10 Side Road (2024)

Preliminary Design Report Highway 401 Improvements from Trafalgar Road to Regional Road 25, URS March 2015

The purpose of the preliminary design report was to evaluate and assess various alternatives for the replacement of the Highway 401 overpass bridges to allow for the widening of Highway 401, and to recommend preferred alternatives. The preferred alternative for the Regional Road 25 interchange was a shift to the west so that half of the new bridge would be constructed to the west of the existing overpass while the existing overpass is open to traffic.



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According to the Report, Regional Road 25 showed a high number of single vehicle collisions at the E-N off-ramp (a channelized entry which adds a northbound lane to Regional Road 25). To reduce the number of single-vehicle collisions, it was recommended that the channelized right turn on the off-ramp be eliminated, with the E-N movement accommodated at the signalized off-ramp intersection.

Short-term cross-section requirements for 2021 may include widening of Highway 401 from a six-lane core to an eight-lane core from the James Snow Parkway to Regional Road 25 by building to the outside of existing lanes. Long-term (2031) recommended improvements include widening Highway 401 from a six-lane core to a ten-lane core (two HOV lanes and eight general purpose lanes) from James Snow Parkway to Regional Road 25 by building to the outside of the existing lanes.

The design of the new interchange at Regional Road 25/Highway 401 shows:

- The addition of a northbound right turn auxiliary lane into the MTO Carpool Lot at Regional Road 25/Highway 401 Eastbound Off-Ramp (S. Terminal) and allowing left/through/right turns in the middle lane of the eastbound off-ramp as opposed to the existing through/right movement.
- Tapering of the on-ramp lanes before the overpass to provide deceleration lanes onto both on-ramp loops, along with the reduction of the radius of the on-ramp loops.
- Realignment of the westbound off-ramp at Regional Road 25/Highway 401 Westbound Off-Ramp (N. Terminal) to route the E-N traffic through the signalized off-ramp intersection, allowing both left and right turning movements in the middle off-ramp lane. The westbound off-ramp will have two lanes with an added lane for the right turn.

Traffic Analysis Report Tremaine Road (Regional Road 22) Highway 401 Interchange Detail Design, McCormick Rankin December 2012

The purpose of the work was to provide project management and detail design services for the realignment of Tremaine Road northerly from Steeles Avenue to Campbellville Road (5 Side Road), including the introduction of a new Highway 401 interchange with Tremaine Road.

Halton Region TMP (The Road to Change) 2031, Halton Region September 2011

Figure 3.6 – Halton Region 2021 Capital Roads Program identified the James Snow Parkway extension to 5 Side Road as beginning construction in 2011. The Region's transit mode share targets are 5% for 2016, 10% for 2021, 15% for 2026, and 20% for 2031. It is mentioned that these targets must be accommodated in order to maintain current levels of service. Transit improvements will also be required in neighbouring municipalities and by Metrolinx to develop a transit supportive road network. A potential GO rail extension beyond Milton is identified, along with a potential new GO station on Tremaine Road which is subject to further study by Metrolinx.



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Existing Conditions
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3.0 EXISTING CONDITIONS

3.1 ROADS AND TRAFFIC CONTROL

The Regional Road 25 corridor operates under the jurisdiction of Halton Region, with the exception of the Highway 401 interchange which operates under the Ministry of Transportation's jurisdiction. The site conditions of the roads and intersections along the Regional Road 25 corridor are described below with reference made to *Map 3 – Functional Plan of Major Transportation Facilities* of the Halton Region *Official Plan*. Site conditions include geometric characteristics, types of traffic control, speed limits, signage, etc.

Martin Street (Regional Road 25) is a four-lane major arterial roadway which runs north-south. The posted speed limit along Regional Road 25 between 5 Side Road and James Snow Parkway is 70 km/h, and between James Snow Parkway and Steeles Avenue is posted at 50 km/h. The roadway briefly becomes five lanes between High Point Drive and the Highway 401 westbound off-ramp due to the added lane from the E-N off-ramp. All intersections along the corridor from Steeles Avenue to 5 Side Road are signalized. At the intersection with Steeles Avenue a channelized right turn is provided on the E-N movement. Signage is posted prohibiting trucks from entering Martin Street south of Steeles Avenue E, at which point Martin Street's designation changes from major arterial to major road.

Steeles Avenue East (Regional Road 8) is a four-lane major arterial roadway with a posted speed limit of 50 km/h. Steeles Avenue E runs east-west and reduces to a two-lane roadway west of Regional Road 25. Two-way left-turn lanes are provided between Regional Road 25 and Ontario Street N. Widening from 4 to 6 lanes is planned along Steeles Avenue from Regional Road 25 and Trafalgar Road in 2024. Widening from 2 to 4 lanes from Industrial Drive to Regional Road 25 is to be completed in 2018.

Market Drive is a two-lane local roadway which runs east-west and has no posted speed limit. It is therefore assumed that the statutory speed limit of 50 km/h governs. The west leg at the intersection with Regional Road 25 widens to provide two entry lanes, and separate left and right turn lanes on to Regional Road 25.

Chisholm Drive is a two-lane local roadway which runs east-west and has a posted speed limit of 50 km/h. The east leg of the intersection with Regional Road 25 is an access to the Maplehurst Correctional Complex and Vanier Centre for Women. The west leg provides two entry lanes and separated left/through and right turn lanes.

Highway 401 (Macdonald-Cartier Freeway) is a six-lane provincial freeway which runs east-west with a posted maximum speed limit of 100 km/h. The Highway 401/Regional Road 25 interchange has a Parclo A-4 configuration. The MTO plans to widen Highway 401 to an eight-lane core from Regional Road 25 to James Snow Parkway by 2021, and to a ten-lane core with two HOV lanes by 2031.



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High Point Drive is a two-lane local roadway which runs east-west and has no posted speed limit. It is therefore assumed that the statutory speed limit of 50 km/h governs. The west leg at the intersection with Regional Road 25 currently provides access to a single property only. The east leg provides an auxiliary left turn lane to Regional Road 25.

James Snow Parkway (Regional Road 4) is a four-lane major arterial roadway with a posted speed limit of 60 km/h. James Snow Parkway runs east-west and currently terminates west of Escarpment Way. The planned extension to 5 Side Road (as illustrated in the 2011 Halton Region TMP) has not yet been constructed, but is planned to connect with both 5 Side Road and the Tremaine Road extension. An extension of James Snow Parkway is planned south of Britannia Road to Highway 407 ETR in the Region's Transportation Master Plan, with the year of construction identified as 2031.

Escarpment Way is a two-lane local roadway with a posted speed limit of 50 km/h. Escarpment Way runs east-west at the intersection with Regional Road 25, and north-south a short distance west of the intersection. Auxiliary left turn lanes are provided on all approaches at the intersection of Regional Road 25/Escarpment Way.

5 Side Road is a two-lane minor arterial roadway which runs east-west and has a posted limit of 60 km/h. 5 Side Road becomes Campbellville Road west of Dublin Line. Signage is posted opposite to the eastbound approach prohibiting right turns on red.

3.2 TRANSIT

The Regional Road 25 corridor from Steeles Avenue E to 5 Side Road is currently served regularly by Milton Transit and GO Transit buses. Milton Transit provides both conventional buses and buses which accommodate special needs in the Town of Milton. The corridor is serviced by 1A – Industrial (West to East), 1B – Industrial (East to West), and 1C – Industrial. Routes 1A and 1B provide regular service throughout the weekdays, and 1C operates only on Saturdays. Route schedules and maps are attached for reference.

GO Transit routes which service the Regional Road 25/Highway 401 carpool lot include:

1. Route 24 – Cambridge/Milton;
2. Route 25 – Waterloo/Mississauga; and
3. Route 29 – Guelph/Mississauga.

3.3 ACTIVE TRANSPORTATION

Under existing conditions, Regional Road 25 provides limited active transportation facilities, including a multi-use path between Steeles Avenue and Market Drive, and sidewalk from Market Drive to Chisholm Drive. Sidewalks and multi-use paths are provided on the majority intersecting roads including Peddie Road, James Snow Parkway, High Point Drive, Chisholm Drive, Market Drive, and Steeles Avenue. These existing active transportation facilities largely service the industrial land uses along the corridor. Existing facilities are illustrated on **Figure 2** and **Figure 3**.



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Figure 2 - Existing Walking Network



Figure 3 - Existing Cycling Network



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3.4 EXISTING TRAFFIC VOLUMES

Turning movement count (TMC) and automatic traffic recorder (ATR) count data within the Study Area were provided by Halton Region. Available TMCs were provided to Stantec along Regional Road 25 dated May 2015 to November 2016, with the intersections at the Highway 401 interchange dated October 2013. ATR counts were conducted in November 2015. Apart from the Regional Road 25/Steeles Avenue intersection, all TMCs were conducted for the same time periods of 7:00 a.m. to 9:00 a.m., 11:00 a.m. to 2:00 p.m., and 3:00 p.m. to 6:00 p.m. for the morning, mid-day, and afternoon periods. The intersection of Regional Road 25/Steeles Avenue was counted for the period 5:30 a.m. to 10:00 a.m., 12:00 p.m. to 2:00 p.m., and 3:00 p.m. to 10:00 p.m. Volumes for the Highway 401 on-ramps were not available and were taken from the March 2015 report titled *Preliminary Design Report Highway 401 Improvements from Trafalgar Road to Regional Road 25*, prepared by URS.

Counted and extracted volumes were balanced to represent 2016 conditions. The balanced existing 2016 base year a.m. and p.m. peak hour traffic volumes for the Study Area are shown in **Figure 4** and **Figure 5**. All traffic data is included for reference in **Appendix B**.

Segment from Highway 401 EB Off-Ramp to Steeles Avenue

Segment from 5 Side Road to Highway 401 WB Off-Ramp

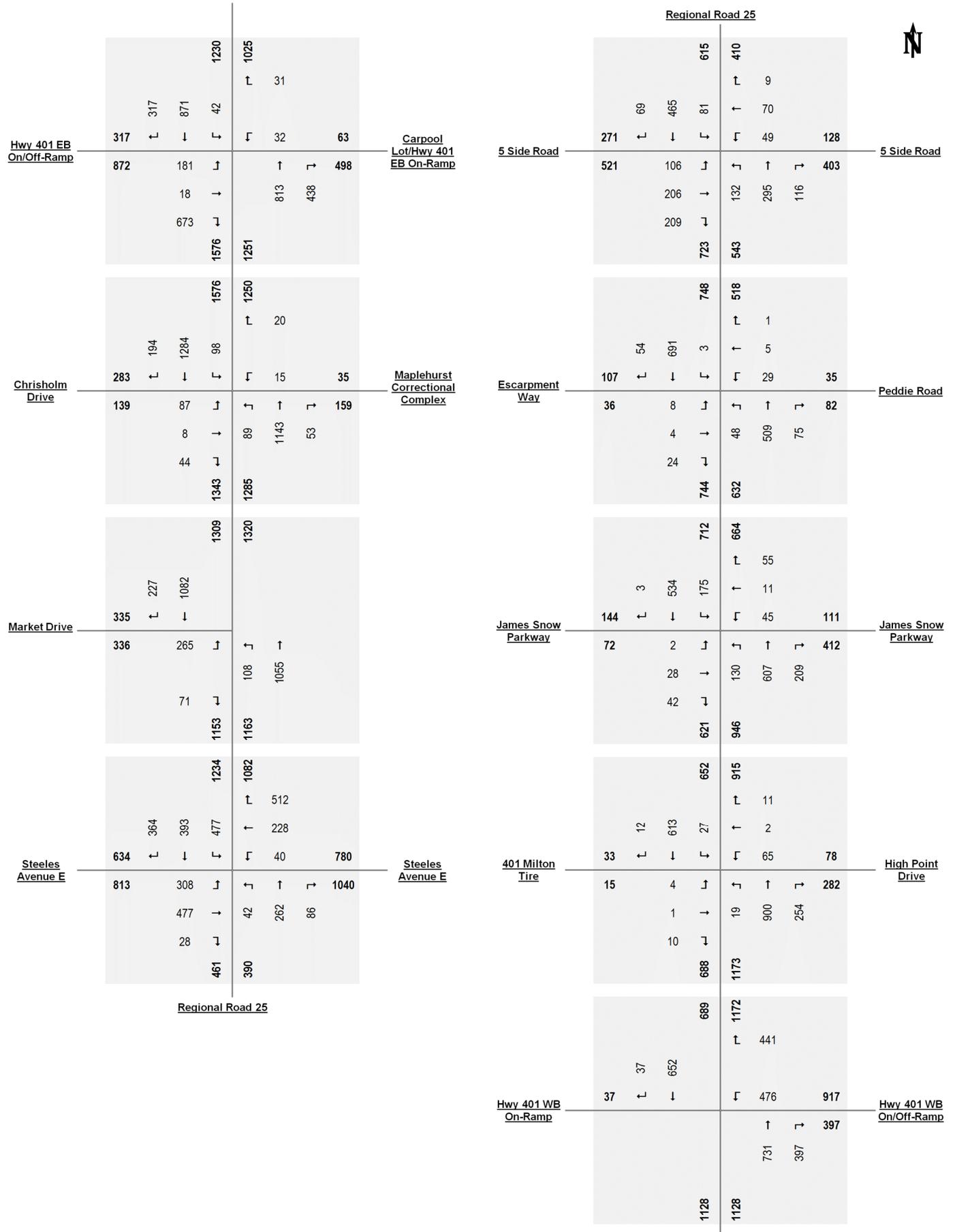


Figure 4 - Existing 2016 Traffic Volumes AM

Segment from Highway 401 EB Off-Ramp to Steeles Avenue

Segment from 5 Side Road to Highway 401 WB Off-Ramp

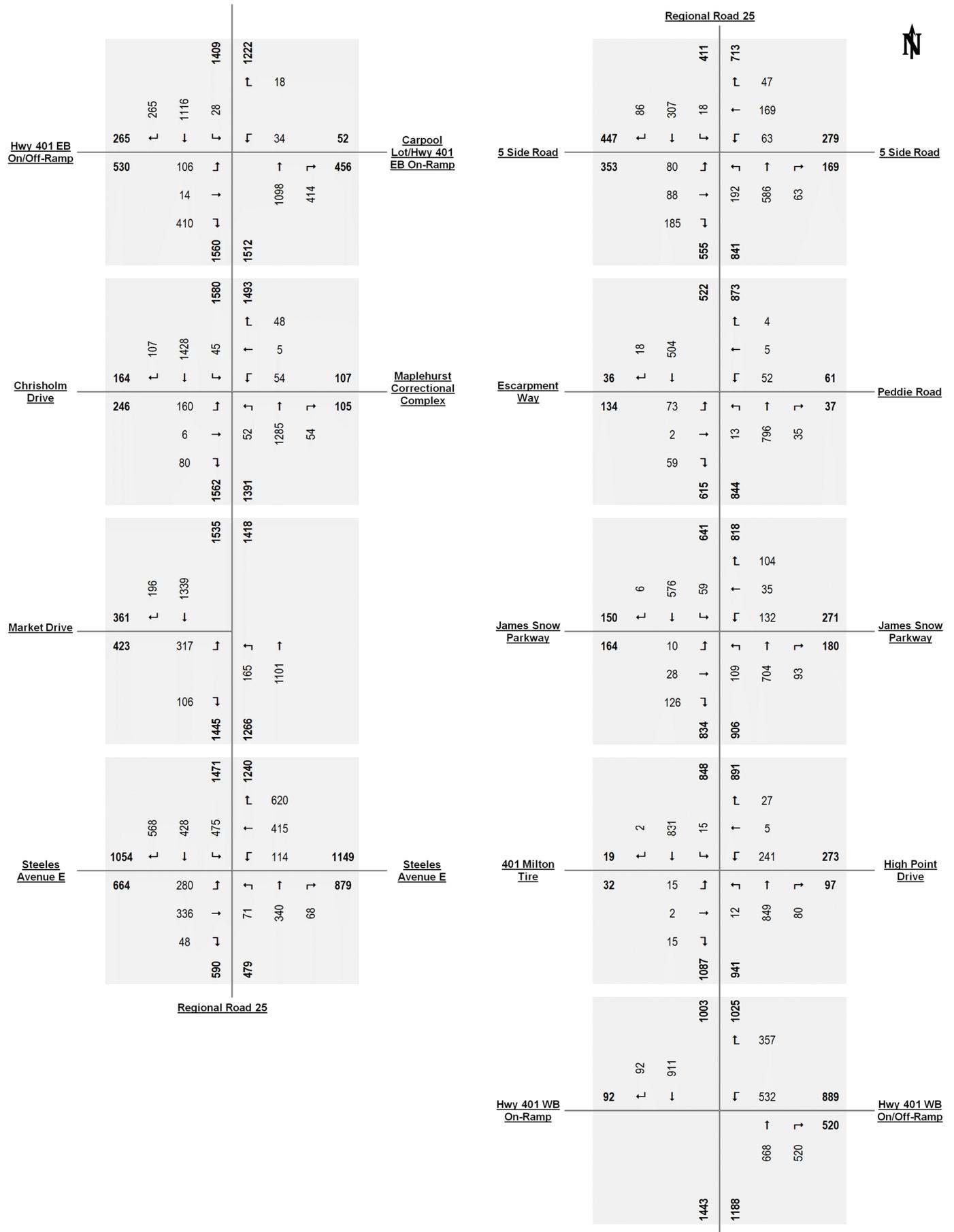


Figure 5 - Existing 2016 Traffic Volumes PM

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3.5 BASE YEAR (2016) TRAFFIC OPERATIONS

The quality of intersection operations at signalized and unsignalized intersections is evaluated in terms of level of service (LOS), speed, and volume to capacity (v/c) as defined by the *Highway Capacity Manual, 6th Edition* (HCM). LOS is evaluated on the basis of average control delay per vehicle and includes deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Capacity is evaluated in terms of ratio of demand flow to capacity with an at-capacity condition represented by a v/c ratio of 1.00 (i.e. volume demand equals capacity). For signalized intersections LOS ranges from LOS A for 10 seconds or less average delay to LOS F for average delay greater than 80 seconds.

To assess the existing peak hour traffic conditions, a level of service analysis is undertaken for the Study Area intersections using TrafficWare Synchro 9.1 Software, which implements the methods of the 2000/2010 Highway Capacity Manual. The key parameters used in the analysis include:

- Existing lane configurations;
- Heavy vehicle percentages as derived from traffic count data;
- Calculated peak hour factors (PHFs) for the Study Area intersections. It is noted that this factor adjusts the hourly volumes to better represent conditions during the peak 15 minutes of intersection operations; and
- Synchro default values for all other inputs.

The results of the analysis for existing conditions are summarized in **Table 1** and **Table 2**, with a detailed summary provided in **Table 3**. Synchro analysis outputs are provided for reference in **Appendix C**. The analysis of traffic operations is in accordance with Halton Region's *Transportation Impact Study Guidelines*. To determine the volume to capacity ratios along the mid-block sections, a theoretical capacity of 1,900 vehicles per lane per hour is applied which is consistent with the default saturated flow rate used in the Synchro analysis software. Level of service at intersections is recorded for the intersection approach, with v/c recorded for the critical v/c of the approach. Volume to capacity ratios of 0.85 and above are highlighted.

As shown in the following summary, all north-south movements along the Regional Road 25 corridor operate under acceptable levels of service and volume-to-capacity ratios. All mid-block segments are below their theoretical capacities. Some deficiencies are observed along the eastbound and westbound approaches, with the overall intersection of Regional Road 25/Steeles Avenue operating at capacity in the p.m. peak hour. It is noted that the operations at the intersection of Regional Road 25/Steeles Avenue are anticipated to improve with the intersection improvements currently underway.

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Table 1 - Existing 2016 Corridor Operations AM Peak Hour

Intersection / Section along Regional Road 25	Southbound			Northbound		
	Volume	LOS	V/C	Volume	LOS	V/C
Intersection of 5 Side Road	615	C	0.48	543	B	0.63
RR25, between 5 Side Road and Peddie Road	723	---	0.19	518	---	0.14
Intersection of Peddie Road	748	A	0.31	632	A	0.23
RR25, between Peddie Road and James Snow Pkwy	744	---	0.20	664	---	0.17
Intersection of James Snow Parkway	712	A	0.37	946	A	0.33
RR25, between James Snow Pkwy and High Point Dr	621	---	0.16	915	---	0.24
Intersection of High Point Drive	652	A	0.28	1173	A	0.35
RR25, between High Point Dr and Hwy 401 WB Off-Ramp	688	---	0.18	1172	---	0.31
Intersection of Highway 401 WB Off-Ramp	689	A	0.35	1128	A	0.35
RR25, between Hwy 401 WB Off-Ramp and Hwy 401 EB Off-Ramp	1128	---	0.30	1025	---	0.18
Intersection of Highway 401 EB Off-Ramp	1230	B	0.53	1251	B	0.53
RR25, between Hwy 401 EB Off-Ramp and Chisholm Dr	1576	---	0.41	1250	---	0.33
Intersection of Chisholm Drive	1576	A	0.59	1285	A	0.57
RR25, between Chisholm Drive and Market Drive	1343	---	0.35	1320	---	0.35
Intersection of Market Drive	1309	A	0.63	1163	B	0.50
RR25, between Market Drive and Steeles Avenue	1153	---	0.30	1082	---	0.28
Intersection of Steeles Avenue	1234	B	0.78	390	C	0.32

v/c equal to or greater than 0.85 are highlighted; critical v/c of approach recorded at intersections

Table 2 - Existing 2016 Corridor Operations PM Peak Hour

Intersection / Section along Regional Road 25	Southbound			Northbound		
	Volume	LOS	V/C	Volume	LOS	V/C
Intersection of 5 Side Road	411	B	0.29	841	A	0.40
RR25, between 5 Side Road and Peddie Road	555	---	0.15	873	---	0.23
Intersection of Peddie Road	522	A	0.21	844	A	0.30
RR25, between Peddie Road and James Snow Pkwy	615	---	0.16	818	---	0.22
Intersection of James Snow Parkway	641	B	0.35	906	A	0.37
RR25, between James Snow Pkwy and High Point Dr	834	---	0.22	891	---	0.23
Intersection of High Point Drive	848	B	0.48	941	B	0.36
RR25, between High Point Dr and Hwy 401 WB Off-Ramp	1087	---	0.29	1025	---	0.27
Intersection of Highway 401 WB Off-Ramp	1003	A	0.41	1188	A	0.33
RR25, between Hwy 401 WB Off-Ramp and Hwy 401 EB Off-Ramp	1443	---	0.38	1222	---	0.21
Intersection of Highway 401 EB Off-Ramp	1409	B	0.56	1512	B	0.57
RR25, between Hwy 401 EB Off-Ramp and Chisholm Dr	1560	---	0.41	1493	---	0.39
Intersection of Chisholm Drive	1580	B	0.76	1391	B	0.69
RR25, between Chisholm Drive and Market Drive	1562	---	0.41	1418	---	0.37
Intersection of Market Drive	1535	B	0.83	1266	B	0.72
RR25, between Market Drive and Steeles Avenue	1445	---	0.38	1240	---	0.33
Intersection of Steeles Avenue	1471	B	0.83	479	C	0.40

v/c equal to or greater than 0.85 are highlighted; the ICU percentage is shown under v/c for intersections



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Table 3 – Existing 2016 Traffic | Peak Hour Level of Service Analysis

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay	v/c	Q	LOS	Delay	v/c	Q
Regional Road 25 / 5 Side Road <i>Signalized</i>	EB	Left	C	26	0.29	33	C	35	0.38	26
		Through/Right	E	62	0.95	144	D	49	0.77	60
	WB	Left	C	21	0.28	13	C	27	0.35	16
		Through/Right	B	18	0.12	19	C	28	0.40	46
	NB	Left	C	23	0.65	43	A	7	0.41	39
		Dual Through	A	8	0.22	21	A	6	0.32	48
		Right	B	15	0.09	8	A	6	0.05	<1
	SB	Left	C	24	0.25	27	B	17	0.07	8
		Thru-Thru/Right	C	26	0.48	67	B	19	0.28	45
	Overall Intersection			C	30	0.77	-	B	20	0.53
Regional Road 25 / Escarpment Way – Peddie Road <i>Signalized</i>	EB	Left	D	44	0.11	7	D	48	0.55	28
		Through/Right	D	44	0.08	10	D	41	0.06	12
	WB	Left	D	51	0.49	16	D	47	0.51	22
		Through/Right	D	44	0.05	5	D	41	0.04	6
	NB	Left	A	4	0.13	12	A	2	0.03	<1
		Dual Through	A	4	0.24	42	A	5	0.31	78
		Right	A	7	0.06	11	A	3	0.03	1
	SB	Left	A	2	0.00	<1	-1	-	-	-
		Thru-Thru/Right	A	2	0.32	25	A	3	0.22	22
	Overall Intersection			A	6	0.34	-	A	9	0.34
Regional Road 25 / James Snow Parkway <i>Signalized</i>	EB	Left	D	41	0.02	3	C	35	0.05	6
		Dual Through	D	41	0.10	7	C	35	0.06	6
		Right	D	41	0.04	4	C	35	0.09	15
	WB	Left	D	47	0.51	21	D	47	0.68	44
		Dual Through	D	41	0.04	4	C	35	0.07	7
		Right	D	41	0.06	7	C	35	0.08	13
	NB	Left	A	5	0.23	14	A	4	0.22	9
		Dual Through	A	10	0.33	40	A	8	0.37	27
		Right	C	21	0.16	15	A	5	0.07	<1
	SB	Left	A	4	0.39	8	A	5	0.16	6
Thru-Thru/Right		A	4	0.29	18	B	10	0.35	46	
Overall Intersection			B	12	0.41	-	B	15	0.43	-
Regional Road 25 / High Point Drive <i>Signalized</i>	EB	Left	D	40	0.03	4	C	28	0.06	7
		Through/Right	D	40	0.02	5	C	27	0.02	5
	WB	Left	D	52	0.62	26	D	47	0.80	71
		Through/Right	D	40	0.03	6	C	27	0.03	7
	NB	Left	A	4	0.04	5	B	12	0.06	7
		Thru-Thru-Thru/Right	A	4	0.35	51	B	14	0.36	72
	SB	Left	A	2	0.10	2	A	6	0.07	3
		Thru-Thru/Right	A	2	0.29	10	A	10	0.48	112
Overall Intersection			A	6	0.39	-	B	16	0.57	-



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Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour				
			LOS	Delay	v/c	Q	LOS	Delay	v/c	Q	
Regional Road 25 / Highway 401 WB Off-Ramp <i>Signalized</i>	WB	Dual Left	D	41	0.74	63	D	40	0.74	66	
		Right	A	<1	0.35	<1	A	<1	0.24	<1	
	NB	Dual Through	B	13	0.35	98	A	3	0.30	10	
		Right	A	<1	0.26	<1	A	<1	0.33	<1	
	SB	Dual Through	A	3	0.35	12	A	4	0.41	26	
Overall Intersection			B	12	0.47	-	A	9	0.49	-	
Regional Road 25 / Highway 401 EB Off-Ramp <i>Signalized</i>	EB	Left	D	36	0.53	48	D	44	0.58	36	
		Through/Right	D	43	0.72	65	D	40	0.39	34	
		Right	D	43	0.71	64	D	40	0.36	32	
	WB	Left/Through/Right	D	43	0.07	7	D	43	0.05	3	
	NB	Thru-Thru/Right	B	15	0.54	79	B	16	0.58	113	
		SB	Left	B	16	0.21	20	B	11	0.16	7
			Dual Through	B	19	0.54	122	B	13	0.57	117
			Right	A	<1	0.21	<1	A	<1	0.17	<1
	Overall Intersection			C	23	0.57	-	B	18	0.55	-
Regional Road 25 / Chisholm Drive <i>Signalized</i>	EB	Left/Through	E	57	0.71	34	D	50	0.75	52	
		Right	D	38	0.04	4	C	32	0.08	12	
	WB	Left/Through/Right	D	38	0.03	2	C	35	0.32	25	
	NB	Left	A	8	0.35	8	B	17	0.31	6	
		Thru-Thru/Right	A	7	0.59	56	B	12	0.71	181	
	SB	Left	A	5	0.32	10	A	7	0.26	4	
		Dual Through	A	8	0.62	72	B	12	0.77	205	
		Right	A	8	0.15	8	A	2	0.10	2	
Overall Intersection			A	10	0.61	-	B	15	0.73	-	
Regional Road 25 / Market Drive <i>Signalized</i>	EB	Left	D	46	0.77	76	D	47	0.81	90	
		Right	C	30	0.05	10	C	29	0.07	12	
	NB	Left	B	10	0.39	17	C	33	0.73	54	
		Dual Through	A	10	0.50	89	B	11	0.54	96	
	SB	Dual Through	A	10	0.63	54	B	19	0.83	183	
		Right	A	8	0.19	16	B	15	0.19	18	
Overall Intersection			B	14	0.66	-	B	20	0.81	-	
Regional Road 25 / Steeles Avenue E <i>Signalized</i>	EB	Left	F	139	1.16	132	F	269	1.48	184	
		Thru-Thru/Right	C	33	0.47	69	C	29	0.34	51	
	WB	Left	D	45	0.29	21	E	55	0.67	56	
		Thru-Thru/Right	E	64	0.87	83	F	288	1.51	201	
	NB	Left	C	30	0.15	19	C	34	0.26	29	
		Thru-Thru/Right	C	31	0.31	50	C	34	0.40	61	
	SB	Left	C	23	0.80	103	C	28	0.84	102	
		Through	B	15	0.39	78	B	17	0.43	87	
		Right	B	14	0.26	14	B	17	0.45	42	
Overall Intersection			D	44	0.98	-	F	120	1.15	-	

v/c equal to or greater than 0.85 for through, shared through/turning movements and overall intersections, 0.95 for exclusive movements, and LOS E/F are highlighted; Delay in seconds; Queue = 95th Percentile Queue in metres.

¹ - No volumes counted on movement



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4.0 FORECAST CONDITIONS

4.1 ACTIVE TRANSPORTATION IMPROVEMENTS

Anticipated active transportation improvements within the Study Area are found through the Region's Active Transportation Master Plan, dated May 2015. An opportunity is present to improve the active transportation facilities along the Regional Road 25 corridor. Map 4 Regional Walking Network of the 2015 Active Transportation Master Plan has identified sidewalks and bike lanes on both sides of Regional Road 25. With active transportation improvements in place along the corridor, accessibility to the employment areas along the corridor through active modes of transportation will be significantly improved. The proposed active transportation improvements are illustrated in **Figure 6** and **Figure 7**.

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	Prop. Sidewalk
	Prop. Multi-use
	Prop. Cycling

Figure 6 - Proposed Walking Facilities Figure 7 - Proposed Biking Facilities



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4.2 REGIONAL TRAFFIC FORECAST

Halton Region’s EMME Transportation Model was used to forecast travel demand in the 2021, 2026, and 2031 horizon years. The Region’s model incorporates the *Best Planning Estimates of Population and Employment, 2011-2031*, which estimates the growth in the Region for each Traffic Zone at each horizon year, and also incorporates the projected Roads Capital Projects (2016-2031) consistent with the Region’s September 2011 TMP. The model is calibrated to the 2011 Transportation Tomorrow Survey (TTS) for the 2011 base year.

Based on Region’s Transportation Model inputs, application of growth rates was prescribed by the Region along the Regional Road 25 corridor. The traffic volumes forecasted at key road segments by applying these growth rates are summarized in **Table 4**.

Table 4 - Forecasted PM Peak Hour Traffic Volume from the Region’s EMME Model, Annualized Growth Rate and Projected Growth Rate to 2031 Horizon

Segment	Forecasted Volume (EMME)			Annualized Projected Growth Rate to 2026 (%)	Projected Growth Rate to 2031 (%)
	2021	2026*	2031		
Regional Road 25 north of Highway 401					
Northbound	810	986	1037	1.9%	31%
Southbound	1039	1255	1413	3.9%	77%
Regional Road 25 south of Highway 401					
Northbound	1562	1867	1863	3.5%	67%
Southbound	1215	1536	1410	2.0%	35%

* Governing Horizon Year

The Region’s model estimates that the highest number of trips will occur in 2026. Annualized growth rates were generated from the model’s base year (2011) to the 2026 model forecast year, as noted in **Table 4**. This rate was further projected to the 2031 horizon to forecast traffic demand on Regional Road 25 and applied to 2016 traffic count data. The projected growth rate was calculated as follows:

$$Growth_{2031\ Horizon} = \left(\frac{Volume_{2026}^{Emme}}{Volume_{2011}^{Emme}} \right)^{(2031-2016)/(2026-2011)}$$

Where: $Growth_{2031\ Horizon}$: Projected growth to 2031 Horizon, to be applied to 2016 count data

$Volume_{2026}^{Emme}$: Volume forecasted by Region’s Model at 2026 Horizon

$Volume_{2011}^{Emme}$: Volume used in Region’s Model at Base Year (2011)

The projected growth rates were then allocated to individual turning movements based on the direction of travel at the beginning or the terminating end of the movement that aligns with the dominant travel direction (northbound or southbound) on Regional Road 25.



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The Region's model only reflects PM peak hour conditions. AM peak hour growth rates were taken to be the PM rates from the opposing turning movement direction.

Note that the proposed Highway 401 / Tremaine Road interchange was adopted in the 2021 horizon. Despite redistribution of traffic to the new interchange, the model continues to exhibit growth on Regional Road 25 to the 2026 horizon. This growth is more pronounced in the southbound direction in the PM (and conversely, in the northbound direction in the AM).

4.3 DEVELOPMENTS IN THE CORRIDOR

Halton Region has identified five developments which are anticipated to impact the Regional Road 25 Study Area from 5 Side Road to Steeles Avenue. These developments include 2 Mansewood Court, 2800 High Point Drive, 8300 & 8400 Parkhill Drive, Giuseppe Zanchin and ZAG Properties, and the expansion of the GO Carpool Lot at Regional Road 25/Highway 401. All new trips generated by these developments have been incorporated in to the forecast volumes along Regional Road 25. A brief description of each of the aforementioned developments is provided below.

2 Mansewood Court consists part of a larger industrial subdivision and includes a 756.3 m² building with a parking lot. The development is located at the northeast quadrant of the intersection of Regional Road 25/5 Side Road, and may be used as a truck parking lot. ITE LUC 030 – Intermodal Truck Terminal was used to provide a conservative estimate of generated trips.

2800 High Point Drive consists of a 49,021 ft² expansion to an existing office building located on the southeast quadrant of the intersection of Regional Road 25/High Point Drive. Site generated trips were forecast through a proxy survey of the existing facility.

8300 & 8400 Parkhill Drive consists of two warehouse buildings (21,998 m²) with office space (1,430 m²). 8300 and 8400 Parkhill Drive are located north of the Highway 401 interchange and can be accessed via High Point Drive. ITE LUC 150 – Warehousing and LUC 710 – General Office Building were used to estimate the number of trips generated by these developments.

Giuseppe Zanchin and ZAG are proposing the construction of six automobile retail buildings (combined GFA of 110,302 ft²), a gas/service station and car wash, a restaurant with drive-thru (7,000 ft²), a bank (4,090 ft²), along with a convenience restaurant with drive-thru (3,000 ft²). The developments are located on the southwest and northwest quadrants of the intersection of Regional Road 25 with James Snow Parkway. It is noted that a portion of the development has been built out with a Tim Hortons, On The Run, and an Esso fueling station on the northwest quadrant of Regional Road 25/James Snow Parkway, however, this development had not been in place at the time of the turning movement counts and was not accounted for. To account for the additional trips from the built-out portion, the estimated trips from the Traffic Impact Study (TIS) have not been reduced beyond the applied reduction for pass-by and internal trip capture.

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GO Transit Carpool Lot located at Regional Road 25/Highway 401 has recently been expanded by Metrolinx, with up to 100 additional parking spaces. Under existing conditions there are 200 parking spaces available at the carpool lot. Therefore, it has been assumed for analysis purposes that the carpool lot expansion will result in a 50% increase to existing volumes at the carpool access.

The Giuseppe Zanchin and ZAG TIS was conducted for PM and Saturday peak hour trips. The number of vehicular trips which are generated by this development during the AM peak hour is estimated using information contained in the Institute of Transportation Engineers (ITE) publication, "Trip Generation, 8th Edition" with trip reductions for pass-by trips and internal capture applied as used in the conducted TIS. The table below summarizes the estimated a.m. and p.m. peak hour trip generation for each development.

Table 5 - Nearby Development Trip Generation

Development	A.M. Peak Hour			P.M. Peak Hour		
	In	Out	Total	In	Out	Total
2 Mansewood Court	21	30	51	20	26	46
2800 High Point Drive	61	6	67	34	42	76
8300 & 8400 Parkhill Drive	94	20	114	35	137	172
Giuseppe Zanchin and ZAG	252	149	401	247	291	538
Carpool Lot Expansion	64	32	96	31	26	57
Total	492	237	729	367	522	889

Trip distribution for 2 Maneswood Court and other developments was assumed to follow traffic patterns observed in the balanced forecast traffic volumes. Trip assignments within the conducted TIS's did not extend throughout the full Regional Road 25 corridor. Therefore, to account for the increase in traffic at all intersections along the corridor, the distributions were used to extend development trips. Because a.m. peak hour data for the full analysis area of the Giuseppe Zanchin and ZAG development was not available, distribution of p.m. peak hour trips within its analysis area was applied to the a.m. generated trips.

4.4 ROAD IMPROVEMENTS

Several road improvements have been noted during the background document review which will impact the Regional Road 25 corridor in the Study Area. These improvements include a realignment and widening of Tremaine Road (to 4 lanes), a new Tremaine Road interchange with Highway 401, widening from 2 to 4 lanes along Steeles Avenue from Industrial Drive to Regional Road 25, future widening from 4 to 6 lanes along Steeles Avenue from Regional Road 25 to Trafalgar Road, and the on-going MTO reconstruction of the Regional Road 25 / Highway 401 interchange.



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Planning assumptions from background documents have been incorporated in to the forecast transportation network and are as follows:

1. Reconstructed Steeles Avenue intersection configuration as per Stantec's Detail Design for the Steeles Avenue widening from 2 to 4 lanes from Industrial Drive to Martin Street (Regional Road 25):
 - a. Dual southbound left-turn lanes;
 - b. Elimination of the channelized southbound right-turn; and
 - c. Dual eastbound left-turn lanes.
2. One additional through lane in each direction assumed for the Steeles Avenue widening from 4 to 6 lanes from Regional Road 25 to Trafalgar Road; and
3. North of Steeles Avenue, signals provide north-south pedestrian crossing phases every cycle to accommodate cyclists travelling on the proposed Regional Road 25 cycling network.

The forecast volumes for the 2031 horizon year are illustrated in **Figure 8** and **Figure 9**.

Segment from Highway 401 EB Off-Ramp to Steeles Avenue

Segment from 5 Side Road to Highway 401 WB Off-Ramp

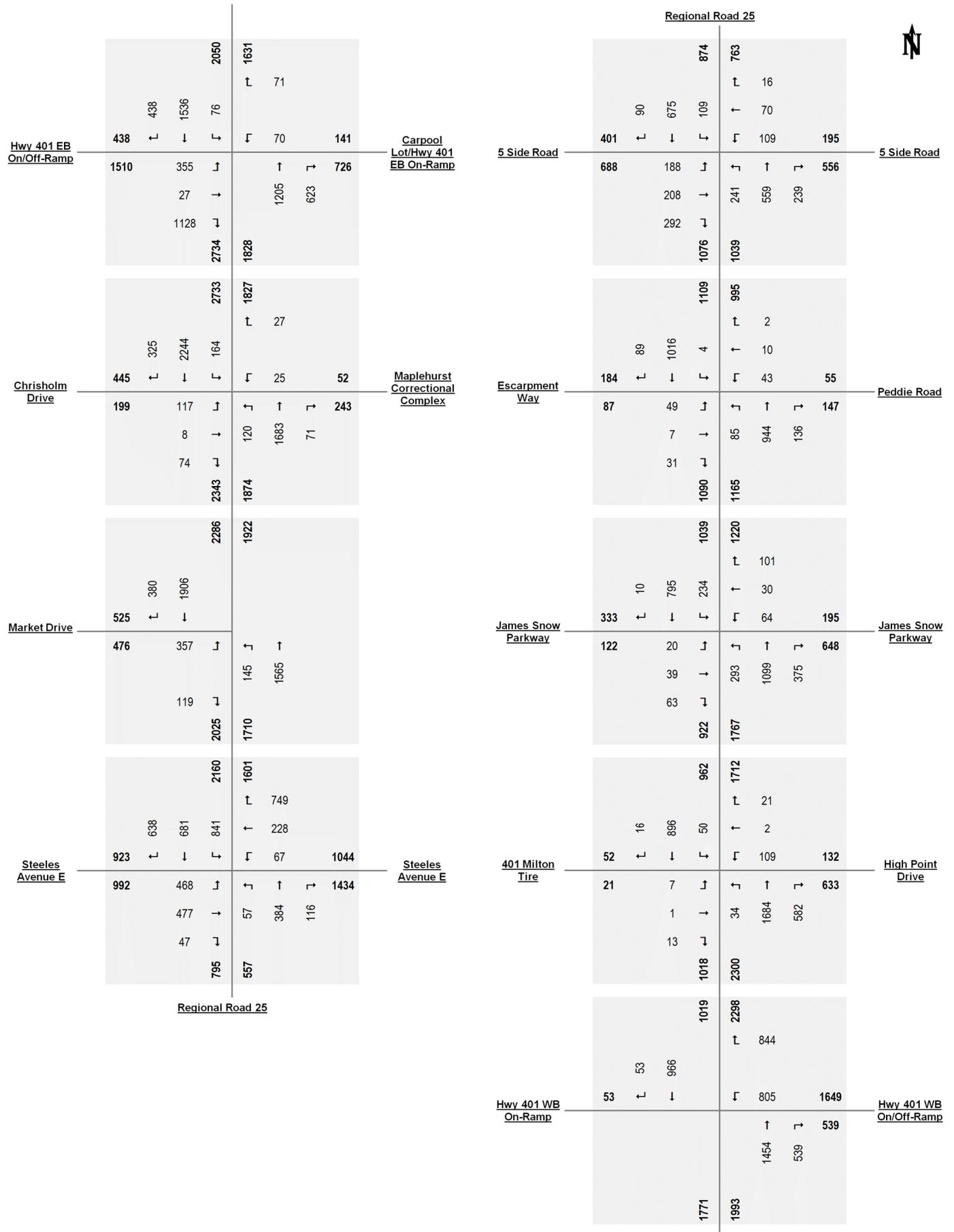


Figure 8 – Forecast 2031 Traffic Volumes AM

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4.5 PROJECTED OPERATIONS

4.5.1 Future 2031 Operating Performance: “Do Nothing” Without Improvements

The forecast 2031 operations along the Regional Road 25 corridor are first assessed under a “Do Nothing” scenario to determine the effectiveness of widening along the corridor. The network has been adjusted to reflect future conditions with the noted road improvements and increases in background traffic due to nearby developments and population and employment growth. Signal timing splits at the intersections along the corridor have been optimized to best accommodate the projected growth trends. The operations for the “Do Nothing” scenario along the corridor intersections are summarized in **Table 6** and **Table 7**, with a detailed summary of the Synchro analysis results provided in **Table 8**.

To determine the volume to capacity ratios along the mid-block sections, a theoretical capacity of 1900 vehicles per lane per hour was applied which is consistent with the default saturated flow rate used in the Synchro analysis software. Level of service at intersections was recorded for the intersection approach, with v/c recorded for the critical v/c of the approach. Volume to capacity ratios of 0.85 and above are highlighted.

Under the “Do Nothing” 2031 condition, it is observed that intersection capacity deficiencies are anticipated south of the intersection of Regional Road 25/Peddie Road. Deficiencies in both the northbound and southbound directions are noted, with the southbound direction operating worse in both the a.m. and p.m. peak hour. Operations at the intersection of Regional Road 25/Steeles Avenue are anticipated to deteriorate in the horizon year even with the planned improvements (which include provision of southbound and eastbound dual left turn lanes).

The eastbound left turning movement at Regional Road 25/Market Drive is anticipated to operate over capacity due to significant volumes for this movement during the p.m. peak hour. An additional eastbound left turn lane is recommended to improve the forecast conditions for this movement.

High westbound left turning volumes are forecast at the intersection of Regional Road 25/High Point Drive. The commercial area to the east is served only by High Point Drive and Parkhill Drive, leaving little opportunity for alternate routing. To improve the forecast conditions along the westbound left turning movement in the a.m. and p.m. peak hours, it is recommended to add an advanced westbound left turn phase.

The eastbound through/right movement at the intersection of Regional Road 25/5 Side Road is anticipated to reach capacity due to the forecast increase in volumes. It is noted that the eastbound right turning movement will fail with the present right turn-on-red prohibition, even with an auxiliary right turn lane provided. It is recommended to provide an auxiliary right turn lane and to allow right turns on red on the eastbound approach. Satisfactory sightlines must be provided for the southbound and eastbound approaches in order to allow right turns on red.



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Extensions in cycle length to 120 seconds are required at some intersections along the study corridor to accommodate pedestrian signal timings, and to ensure coordination throughout the corridor.

The following summarizes the recommended improvements to accommodate the significant increase in traffic:

- Widening from 4 to 6 lanes between Steeles Avenue and 5 Side Road;
- Additional eastbound left turn lane at Regional Road 25/Market Drive;
- Auxiliary northbound right turn lane at Regional Road 25/Chisholm Drive;
- Advanced westbound left turn phase at Regional Road 25/High Point Drive;
- Auxiliary eastbound right turn lane at Regional Road 25/5 Side Road and removal of right turn-on-red prohibition; and
- Increasing the signal cycle length to 120 seconds in the a.m. and p.m. peak hours along the corridor to improve operations and ensure coordination.

It is worth noting that the CNR overpass structure between Steeles Avenue and Market Drive is currently only able to accommodate 5 lanes crossing beneath it. As such, the structure will need to be widened to accommodate a total of 6 lanes plus multi-use pathways and bicycle lanes. Without provision of the additional northbound through lane at the intersection with Market Drive, at-capacity operations and extensive queueing are anticipated to occur on the northbound approach and extend past the overpass structure. If an additional eastbound left turn lane is not implemented, the northbound movements will approach or reach capacity in the p.m. peak hour and experience significant delay. Provision of the additional eastbound lane will improve the volume to capacity ratio and delay, but not the extensive queueing.

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Table 6 – “Do Nothing” 2031 Forecast Corridor Operations AM Peak Hour

Intersection / Section along Regional Road 25	Southbound			Northbound		
	Volume	LOS	V/C	Volume	LOS	V/C
Intersection of 5 Side Road	874	C	0.73	1039	D	0.92
RR25, between 5 Side Road and Peddie Road	1076	---	0.28	995	---	0.26
Intersection of Peddie Road	1109	A	0.50	1165	B	0.46
RR25, between Peddie Road and James Snow Pkwy	1090	---	0.29	1220	---	0.32
Intersection of James Snow Parkway	1039	B	0.60	1767	C	0.93
RR25, between James Snow Pkwy and High Point Dr	922	---	0.24	1712	---	0.30
Intersection of High Point Drive	962	A	0.79	2300	B	0.76
RR25, between High Point Dr and Hwy 401 WB Off-Ramp	1018	---	0.27	2298	---	0.40
Intersection of Highway 401 WB Off-Ramp	1019	A	0.61	1993	C	0.81
RR25, between Hwy 401 WB Off-Ramp and Hwy 401 EB Off-Ramp	1771	---	0.47	1631	---	0.43
Intersection of Highway 401 EB Off-Ramp	2050	F	1.30	1828	F	1.11
RR25, between Hwy 401 EB Off-Ramp and Chisholm Dr	2734	---	0.72	1827	---	0.48
Intersection of Chisholm Drive	2733	F	1.24	1874	D	1.03
RR25, between Chisholm Drive and Market Drive	2343	---	0.62	1922	---	0.51
Intersection of Market Drive	2286	F	1.21	1710	B	0.80
RR25, between Market Drive and Steeles Avenue	2025	---	0.53	1601	---	0.42
Intersection of Steeles Avenue	2160	C	0.88	557	C	0.47

v/c equal to or greater than 0.85 are highlighted; critical v/c of approach recorded at intersections

Table 7 - “Do Nothing” 2031 Forecast Corridor Operations PM Peak Hour

Intersection / Section along Regional Road 25	Southbound			Northbound		
	Volume	LOS	V/C	Volume	LOS	V/C
Intersection of 5 Side Road	794	C	0.69	1230	C	0.83
RR25, between 5 Side Road and Peddie Road	1103	---	0.29	1271	---	0.33
Intersection of Peddie Road	1046	A	0.48	1175	B	0.48
RR25, between Peddie Road and James Snow Pkwy	1198	---	0.32	1165	---	0.31
Intersection of James Snow Parkway	1311	E	1.04	1296	C	0.70
RR25, between James Snow Pkwy and High Point Dr	1657	---	0.44	1276	---	0.22
Intersection of High Point Drive	1638	F	1.24	1379	C	0.71
RR25, between High Point Dr and Hwy 401 WB Off-Ramp	2205	---	0.58	1489	---	0.26
Intersection of Highway 401 WB Off-Ramp	2055	A	0.86	1866	A	0.55
RR25, between Hwy 401 WB Off-Ramp and Hwy 401 EB Off-Ramp	2575	---	0.68	2125	---	0.56
Intersection of Highway 401 EB Off-Ramp	2264	C	1.05	2640	E	1.15
RR25, between Hwy 401 EB Off-Ramp and Chisholm Dr	2286	---	0.60	2607	---	0.69
Intersection of Chisholm Drive	2313	F	1.37	2436	F	1.53
RR25, between Chisholm Drive and Market Drive	2289	---	0.60	2482	---	0.65
Intersection of Market Drive	2252	F	1.32	2227	F	1.48
RR25, between Market Drive and Steeles Avenue	2131	---	0.56	2184	---	0.57
Intersection of Steeles Avenue	2165	E	1.13	828	D	0.75

v/c equal to or greater than 0.85 are highlighted; the ICU percentage is shown under v/c for intersections



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Table 8 – “Do Nothing” 2031 Forecast Traffic | Peak Hour Level of Service Analysis

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay	v/c	Q	LOS	Delay	v/c	Q
Regional Road 25 / 5 Side Road <i>Signalized</i>	EB	Left	E	55	0.81	80	C	34	0.46	38
		Through/Right	F	430	1.84	225	F	144	1.17	142
	WB	Left	D	45	0.74	38	F	82	0.95	59
		Through/Right	C	25	0.18	25	C	25	0.39	58
	NB	Left	E	73	0.92	88	D	45	0.83	84
		Dual Through	B	16	0.35	63	B	19	0.49	96
		Right	D	53	0.18	38	D	51	0.09	26
	SB	Left	C	32	0.47	38	C	25	0.19	13
		Thru-Thru/Right	C	33	0.73	103	C	31	0.69	96
	Overall Intersection			F	107	1.17	-	D	49	0.96
Regional Road 25 / Escarpment Way – Peddie Road <i>Signalized</i>	EB	Left	D	45	0.43	22	D	47	0.69	50
		Through/Right	D	42	0.11	11	D	36	0.22	21
	WB	Left	D	47	0.51	20	D	41	0.56	33
		Through/Right	D	41	0.08	8	C	34	0.04	7
	NB	Left	B	15	0.38	23	B	10	0.08	6
		Dual Through	B	14	0.46	128	B	15	0.48	150
		Right	C	22	0.11	15	B	18	0.05	10
	SB	Left	A	3	0.01	<1	-1	-	-	-
		Thru-Thru/Right	A	3	0.50	28	A	5	0.48	35
	Overall Intersection			B	12	0.50	-	B	15	0.52
Regional Road 25 / James Snow Parkway <i>Signalized</i>	EB	Left	D	39	0.18	11	C	29	0.23	22
		Dual Through	D	38	0.10	9	C	27	0.06	8
		Right	D	38	0.05	9	C	29	0.30	29
	WB	Left	D	45	0.54	27	D	48	0.81	70
		Dual Through	D	38	0.08	7	C	27	0.07	9
		Right	D	39	0.12	15	C	27	0.11	13
	NB	Left	B	13	0.56	55	E	56	0.70	89
		Dual Through	C	30	0.93	178	C	21	0.64	72
		Right	C	32	0.29	33	C	31	0.10	11
	SB	Left	C	34	0.57	55	B	13	0.47	12
Thru-Thru/Right		B	15	0.60	76	E	65	1.04	200	
Overall Intersection			C	26	0.74	-	D	42	0.90	-
Regional Road 25 / High Point Drive <i>Signalized</i>	EB	Left	C	34	0.04	5	B	17	0.05	8
		Through/Right	C	34	0.02	5	B	17	0.05	9
	WB	Left	D	49	0.67	38	F	146	1.22	230
		Through/Right	C	35	0.09	9	B	17	0.08	13
	NB	Left	A	8	0.10	6	D	38	0.33	9
		Thru-Thru/Right	B	20	0.76	186	C	32	0.71	128
	SB	Left	E	64	0.79	28	C	28	0.60	4
		Thru-Thru/Right	A	3	0.46	15	F	123	1.24	232
Overall Intersection			B	17	0.77	-	F	89	1.23	-



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Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay	v/c	Q	LOS	Delay	v/c	Q
Regional Road 25 / Highway 401 WB Off-Ramp <i>Signalized</i>	WB	Left-Left	D	44	0.89	111	D	49	0.90	104
		Right	A	3	0.68	<1	A	<1	0.33	<1
	NB	Dual Through	C	27	0.81	140	B	13	0.47	57
		Right	A	<1	0.35	<1	A	<1	0.55	14
	SB	Dual Through	A	6	0.61	32	A	10	0.86	40
Overall Intersection			B	18	0.84	-	B	14	0.87	-
Regional Road 25 / Highway 401 EB Off-Ramp <i>Signalized</i>	EB	Left	C	33	0.71	102	D	39	0.59	45
		Through/Right	F	126	1.16	212	D	47	0.75	66
		Right	F	124	1.15	209	D	48	0.76	67
	WB	Left/Through/Right	E	63	0.69	47	D	43	0.12	16
	NB	Thru-Thru/Right	F	89	1.11	164	E	77	1.15	177
	SB	Left	F	171	1.16	38	F	114	1.05	22
		Dual Through	F	165	1.30	272	C	26	0.95	268
		Right	A	<1	0.29	<1	A	<1	0.33	<1
	Overall Intersection			F	109	1.16	-	D	48	0.99
Regional Road 25 / Chisholm Drive <i>Signalized</i>	EB	Left/Through	D	49	0.69	42	E	65	0.92	103
		Right	C	34	0.06	11	C	25	0.14	18
	WB	Left/Through/Right	C	34	0.04	6	C	29	0.43	38
	NB	Left	C	30	0.58	20	C	28	0.60	6
		Thru-Thru/Right	D	40	1.03	171	F	259	1.53	363
	SB	Left	C	34	0.62	18	D	37	0.40	13
		Dual Through	F	121	1.24	265	F	203	1.37	390
		Right	A	9	0.33	7	A	34	0.17	23
Overall Intersection			E	75	1.07	-	F	202	1.25	-
Regional Road 25 / Market Drive <i>Signalized</i>	EB	Left	D	51	0.86	112	F	105	1.10	196
		Right	C	27	0.09	13	C	25	0.11	15
	NB	Left	D	38	0.74	51	F	272	1.48	119
		Dual Through	B	18	0.80	174	E	56	1.05	286
	SB	Dual Through	F	115	1.21	186	F	169	1.32	97
		Right	B	17	0.42	22	C	24	0.31	14
Overall Intersection			E	63	1.07	-	F	114	1.39	-
Regional Road 25 / Steeles Avenue E <i>Signalized</i>	EB	Dual Left	D	44	0.86	69	F	112	1.12	96
		Thru-Thru-Thru/Right	C	28	0.31	44	C	21	0.19	28
	WB	Left	D	45	0.44	31	D	40	0.59	59
		Thru-Thru-Thru/Right	E	55	1.23	72	F	86	1.69	166
	NB	Left	C	34	0.28	24	E	66	0.75	62
		Thru-Thru/Right	C	35	0.47	71	D	44	0.74	110
	SB	Dual Left	C	28	0.88	85	F	108	1.13	125
		Through	C	24	0.71	177	C	32	0.75	178
		Right	B	20	0.51	41	D	50	0.93	237
Overall Intersection			C	35	0.93	-	E	68	1.18	-

v/c equal to or greater than 0.85 for through, shared through/turning movements and overall intersections, 0.95 for exclusive movements, and LOS E/F are highlighted; Delay in seconds; Queue = 95th Percentile Queue in metres

¹ - No volumes counted on movement



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4.5.2 Future 2031 Operating Performance: “Widening from Steeles Avenue to 5 Side Road” With Improvements

This section assesses the operations along the study corridor assuming that widening from 2 to 3 lanes is implemented in both directions from Steeles Avenue to 5 Side Road. Auxiliary right turn lanes have been removed in the north-south directions at the intersections of Regional Road 25 with 5 Side Road, Peddie Road, and James Snow Parkway to assess operational need for the right turn lanes. The MTO will be removing the channelized East-North right turn lane at the Highway 401 WB off-ramp and realigning the movement to the signalized intersection. The removal of the channelized right turn lane is recommended in order to reduce weaving between the Highway 401 WB off-ramp and High Point Drive, and to improve the safety of the proposed pedestrian and cyclist crossings of the East-North ramp. A significant increase in volume is projected for the northbound right turning movement at High Point Drive and the East-North movement at the Highway 401 WB off-ramp, which will increase the potential for conflict due to weaving in the area between Highway 401 and High Point Drive.

The 2031 forecast operations along the Regional Road 25 corridor, with widening in place from Steeles Avenue and 5 Side Road, are summarized in **Table 9** and **Table 10**. A detailed summary is provided in **Table 11**.

With the additional widening and other recommended improvements in place, significant operational improvements are projected along the corridor. All movements, with the exception of the intersection of Regional Road 25/Steeles Avenue, will have sufficient capacity.

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Table 9 - "Full Widening" 2031 Forecast Corridor Operations AM Peak Hour

Intersection / Section along Regional Road 25	Southbound			Northbound		
	Volume	LOS	V/C	Volume	LOS	V/C
Intersection of 5 Side Road	874	C	0.65	1039	C	0.85
RR25, between 5 Side Road and Peddie Road	1076	---	0.19	995	---	0.17
Intersection of Peddie Road	1109	A	0.36	1165	A	0.33
RR25, between Peddie Road and James Snow Pkwy	1090	---	0.19	1220	---	0.21
Intersection of James Snow Parkway	1039	B	0.71	1767	B	0.68
RR25, between James Snow Pkwy and High Point Dr	922	---	0.16	1712	---	0.30
Intersection of High Point Drive	962	A	0.40	2300	B	0.84
RR25, between High Point Dr and Hwy 401 WB Off-Ramp	1018	---	0.18	2298	---	0.30
Intersection of Highway 401 WB Off-Ramp	1019	C	0.67	1993	B	0.82
RR25, between Hwy 401 WB Off-Ramp and Hwy 401 EB Off-Ramp	1771	---	0.31	1631	---	0.29
Intersection of Highway 401 EB Off-Ramp	2050	C	0.84	1828	D	0.92
RR25, between Hwy 401 EB Off-Ramp and Chisholm Dr	2734	---	0.48	1827	---	0.32
Intersection of Chisholm Drive	2733	B	0.79	1874	A	0.65
RR25, between Chisholm Drive and Market Drive	2343	---	0.41	1922	---	0.34
Intersection of Market Drive	2286	A	0.67	1710	B	0.69
RR25, between Market Drive and Steeles Avenue	2025	---	0.36	1601	---	0.28
Intersection of Steeles Avenue	2160	D	0.88	557	C	0.47

v/c equal to or greater than 0.85 are highlighted; critical v/c of approach recorded at intersections

Table 10 - "Full Widening" 2031 Forecast Corridor Operations PM Peak Hour

Intersection / Section along Regional Road 25	Southbound			Northbound		
	Volume	LOS	V/C	Volume	LOS	V/C
Intersection of 5 Side Road	794	C	0.51	1230	A	0.67
RR25, between 5 Side Road and Peddie Road	1103	---	0.19	1271	---	0.22
Intersection of Peddie Road	1046	A	0.32	1175	A	0.34
RR25, between Peddie Road and James Snow Pkwy	1198	---	0.21	1165	---	0.20
Intersection of James Snow Parkway	1311	B	0.60	1296	B	0.72
RR25, between James Snow Pkwy and High Point Dr	1657	---	0.29	1276	---	0.22
Intersection of High Point Drive	1638	C	0.87	1379	C	0.71
RR25, between High Point Dr and Hwy 401 WB Off-Ramp	2205	---	0.39	1489	---	0.20
Intersection of Highway 401 WB Off-Ramp	2055	A	0.64	1866	A	0.55
RR25, between Hwy 401 WB Off-Ramp and Hwy 401 EB Off-Ramp	2575	---	0.45	2125	---	0.37
Intersection of Highway 401 EB Off-Ramp	2264	B	0.57	2640	A	0.81
RR25, between Hwy 401 EB Off-Ramp and Chisholm Dr	2286	---	0.40	2607	---	0.46
Intersection of Chisholm Drive	2313	C	0.89	2436	C	0.93
RR25, between Chisholm Drive and Market Drive	2289	---	0.40	2482	---	0.44
Intersection of Market Drive	2252	A	0.86	2227	B	0.88
RR25, between Market Drive and Steeles Avenue	2131	---	0.37	2184	---	0.38
Intersection of Steeles Avenue	2165	F	1.13	828	D	0.75

v/c equal to or greater than 0.85 are highlighted; the ICU percentage is shown under v/c for intersections



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Table 11 – “Full Widening” 2031 Forecast Traffic | Peak Hour Level of Service Analysis

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour				
			LOS	Delay	v/c	Q	LOS	Delay	v/c	Q	
Regional Road 25 / 5 Side Road <i>Signalized</i>	EB	Left	E	67	0.84	83	E	60	0.69	44	
		Through	D	50	0.67	79	D	47	0.40	36	
		Right	D	42	0.29	28	D	46	0.33	32	
	WB	Left	D	40	0.60	38	D	44	0.62	49	
		Through/Right	C	32	0.19	29	D	41	0.55	71	
	NB	Left	E	61	0.85	85	B	14	0.67	50	
		Dual Through	A	10	0.32	36	A	7	0.40	86	
		Right	B	11	0.18	10	A	7	0.09	6	
	SB	Left	C	31	0.41	45	B	18	0.14	15	
		Thru-Thru/Right	C	33	0.65	125	C	22	0.51	115	
	Overall Intersection			C	33	0.85	-	C	24	0.70	-
Regional Road 25 / Escarpment Way – Peddie Road <i>Signalized</i>	EB	Left	E	56	0.49	25	E	58	0.72	59	
		Through/Right	D	51	0.12	13	D	44	0.23	25	
	WB	Left	E	61	0.57	24	D	53	0.61	39	
		Through/Right	D	51	0.09	9	D	42	0.04	8	
	NB	Left	A	4	0.36	<1	A	3	0.07	1	
		Thru-Thru-Thru/Right	A	<1	0.36	2	A	3	0.34	18	
	SB	Left	A	2	0.01	<1	-1	-	-	-	
		Thru-Thru-Thru/Right	A	2	0.33	28	A	7	0.32	39	
	Overall Intersection			A	5	0.38	-	B	12	0.41	-
	Regional Road 25 / James Snow Parkway <i>Signalized</i>	EB	Left	D	48	0.19	13	D	36	0.24	27
Dual Through			D	47	0.11	10	C	34	0.07	10	
Right			D	47	0.05	13	C	35	0.17	18	
WB		Left	E	57	0.59	31	E	62	0.85	86	
		Dual Through	D	47	0.09	9	C	34	0.07	11	
		Right	D	47	0.12	17	C	34	0.11	15	
NB		Left	B	17	0.66	49	D	47	0.72	64	
		Thru-Thru-Thru/Right	B	19	0.68	90	A	8	0.47	39	
SB		Left	C	35	0.71	43	B	17	0.46	24	
		Thru-Thru-Thru/Right	A	6	0.32	59	B	16	0.60	66	
Overall Intersection			B	20	0.71	-	C	22	0.78	-	
Regional Road 25 / High Point Drive <i>Signalized</i>	EB	Left	E	58	0.14	7	E	55	0.30	14	
		Through/Right	E	57	0.05	7	D	52	0.05	11	
	WB	Left	D	48	0.57	40	E	63	0.99	187	
		Through/Right	D	40	0.03	8	B	19	0.08	14	
	NB	Left	A	9	0.11	6	D	40	0.39	13	
		Thru-Thru-Thru/Right	B	15	0.84	241	C	27	0.71	105	
	SB	Left	D	46	0.40	18	D	48	0.63	21	
		Thru-Thru-Thru/Right	A	3	0.31	20	C	23	0.87	94	
Overall Intersection			B	14	0.78	-	C	32	0.95	-	

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Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay	v/c	Q	LOS	Delay	v/c	Q
Regional Road 25 / Highway 401 WB Off-Ramp <i>Signalized</i>	WB	Left-Left/Right	C	28	0.80	142	D	44	0.82	111
		Right	D	45	0.91	209	D	45	0.76	109
	NB	Triple Through	C	23	0.82	161	B	13	0.35	52
		Right	A	<1	0.35	1	A	<1	0.55	135
	SB	Triple Through	C	21	0.61	79	A	9	0.64	64
Overall Intersection			C	24	0.87	-	B	17	0.71	-
Regional Road 25 / Highway 401 EB Off-Ramp <i>Signalized</i>	EB	Left	C	23	0.61	81	D	37	0.51	48
		Through/Right	D	42	0.89	197	D	44	0.71	91
		Right	D	36	0.84	173	D	41	0.63	79
	WB	Left/Through/Right	D	38	0.30	30	D	51	0.09	12
	NB	Thru-Thru-Thru/Right	D	40	0.92	172	A	9	0.81	215
	SB	Left	C	33	0.52	26	C	26	0.49	17
		Triple Through	D	41	0.84	176	B	15	0.57	103
		Right	A	<1	0.29	<1	A	<1	0.33	<1
	Overall Intersection			D	35	0.96	-	B	16	0.82
Regional Road 25 / Chisholm Drive <i>Signalized</i>	EB	Left/Through	E	57	0.69	49	F	86	0.97	128
		Right	D	42	0.06	8	C	32	0.16	24
	WB	Left/Through/Right	D	42	0.04	2	D	37	0.51	51
	NB	Left	D	45	0.65	41	D	35	0.63	23
		Triple Through	A	5	0.62	49	C	23	0.93	177
		Right	A	2	0.05	2	A	8	0.08	5
	SB	Left	C	23	0.62	29	C	33	0.49	16
		Triple Through	B	13	0.79	133	C	23	0.89	125
		Right	A	5	0.27	3	A	10	0.14	7
Overall Intersection			B	13	0.77	-	C	26	0.93	-
Regional Road 25 / Market Drive <i>Signalized</i>	EB	Dual Left	D	53	0.74	60	D	52	0.81	85
		Right	D	43	0.09	16	D	38	0.10	17
	NB	Left	D	44	0.69	27	C	35	0.88	56
		Triple Through	A	7	0.46	72	B	12	0.61	149
	SB	Triple Through	A	2	0.67	8	A	8	0.86	93
		Right	A	<1	0.34	<1	A	1	0.28	<1
Overall Intersection			B	10	0.71	-	B	16	0.88	-
Regional Road 25 / Steeles Avenue E <i>Signalized</i>	EB	Dual Left	D	44	0.86	69	F	112	1.12	96
		Thru-Thru-Thru/Right	C	28	0.31	44	C	21	0.19	28
	WB	Left	D	45	0.44	31	D	40	0.59	59
		Thru-Thru-Thru/Right	E	55	1.23	72	F	86	1.69	166
	NB	Left	C	34	0.28	24	E	66	0.75	62
		Thru-Thru/Right	C	35	0.47	71	D	44	0.74	110
	SB	Dual Left	D	48	0.88	117	F	117	1.13	121
		Through	C	30	0.71	160	D	47	0.75	204
Right		E	71	0.51	97	F	88	0.93	244	
Overall Intersection			D	46	0.93	-	E	76	1.18	-

v/c equal to or greater than 0.85 for through, shared through/turning movements and overall intersections, 0.95 for exclusive movements, and LOS E/F are highlighted; Delay in seconds; Queue = 95th Percentile Queue in metres



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4.5.3 Summary

“Do Nothing” operational analysis conducted along the Regional Road 25 corridor from 5 Side Road to Steeles Avenue for the 2031 horizon year indicates that intersection operations will significantly deteriorate if network improvements are not implemented. Poor volume to capacity ratios and levels of service are anticipated from James Snow Parkway to Steeles Avenue.

Application of the recommended improvements will alleviate the majority of deficiencies along the corridor. Some movements are observed to continue operating above the thresholds, however, all movements, with the exception of at Regional Road 25/Steeles Avenue, are anticipated to operate with sufficient capacity.

Based on the analysis of study corridor intersections, the following improvements are recommended:

- Widening from 4 to 6 lanes between Steeles Avenue and 5 Side Road;
- Additional eastbound left turn lane at Regional Road 25/Market Drive;
- Auxiliary northbound right turn lane at Regional Road 25/Chisholm Drive;
- Advanced westbound left turn phase at Regional Road 25/High Point Drive;
- Auxiliary eastbound right turn lane at Regional Road 25/5 Side Road; and
- Increasing the signal cycle length to 120 seconds in the a.m. and p.m. peak hours along the corridor to improve operations and ensure coordination.

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5.0 ROAD SAFETY REVIEW

A Road Safety Review is conducted as part of this Study to assess the safety conditions of the mid-block road sections and intersections along Regional Road 25, and to determine if any safety improvements are to be incorporated in the redesign of the roadway.

Halton Region staff have provided collision history data along Regional Road 25 from Steeles Avenue to 5 Side Road. Provided data include the yearly Halton Region Comprehensive Road Safety Action Plan (CROSAP) Potential for Safety Improvement (PSI) intersection and mid-block section rankings for 2013 and 2015, and available collision data along mid-block sections and intersections from 2012 to 2016. The available data is summarized and reviewed in the following sections. Data available from the CROSAP is summarized and reviewed first, as the available collision data contains more recent data. Issues identified in previous years of CROSAP are checked against data available in the following years with the collision summaries to identify potential trends. The Halton Region 2015 Transportation Progress Report was reviewed and it is noted that no Study Area intersections or road segments were included in the 2015 Safety Review Recommendations.

5.1 COMPREHENSIVE ROAD SAFETY ACTION PLAN

The CROSAP is an on-going improvement program which guides the implementation of a road safety management system for Regional Roads in Halton Region. A screening process is used which evaluates the actual safety performance of the Regional Road intersections against their expected performance. The expected performance of a facility (intersection and/or road segment) is derived through a comparison group with similar traffic, design, and control characteristics. This method of assessing the safety operations of roadways aims to overcome the difficulties created by potential regression-to-the-mean bias created by fluctuations in collision rates from year to year. An Empirical Bayesian technique is used to compare the safety performance of intersections and to estimate the expected long-term crash experience. As explained by the United States' Federal Highway Administration (FHWA) in the *Crash Modification Factors In Practice* document, the expected long-term crash experience is a weighted average of the observed crashes at the site and predicted crashes from a safety performance function (SPF). SPFs, which calculate the predicted number of crashes at an intersection or road segment, can be calculated through the average annual daily traffic (AADT).

The PSI values below indicate that if safety measures were introduced to bring the accident history of a facility to a nominal level, the potential savings in societal costs would equal the total PSI value's equivalent of property-damage-only (PDO) collisions annually. For example, if safety measures at Steeles Avenue/Regional Road 25 reduced collision rates to a nominal level according to 2015 data, potential savings in societal costs would be equal to 31 PDO collisions annually.



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As shown in the summary below, the majority of the Study Area intersections are ranked relatively low on Halton Region's PSI ranking lists for 2013 and 2015. The intersection of Steeles Avenue with Regional Road 25 is observed to have significantly increased in PSI rankings in 2015 resulting in it being ranked the 4th highest intersection in Halton Region. The intersections of Regional Road 25 with Market Drive and Chisholm Drive are also noted to have increased, however, they remain relatively low on the PSI rankings.

Table 12 - 2013 & 2015 Intersection PSI Rank

Intersection Location on RR 25	Total PSI (PSI Rank)	
	2013	2015
5 Side Road	4.77 (42)	5.02 (85)
Peddie Road	0.77 (206)	1.27 (203)
James Snow Parkway	0.98 (180)	1.66 (180)
High Point Drive	1.16 (166)	2.46 (150)
Highway 401 WB Off-Ramp	0.00 (360)	0.16 (319)
Highway 401 EB Off-Ramp	0.00 (350)	0.88 (223)
Chisholm Drive	0.00 (349)	6.28 (69)
Market Drive	1.30 (156)	6.57 (64)
Steeles Avenue	4.03 (59)	30.67 (4)

Table 13 - 2013 & 2015 Mid-Block PSI Rank

Mid-Block Section on RR 25	PSI Rank	
	2013	2015
Between 5 Side Rd & Peddie Rd	206	458
Between Peddie Rd & James Snow Pkwy	150	422
Between James Snow Pkwy & High Point Dr	86	132
Between High Point Dr & Hwy 401 WB On-Ramp	303	507
Between Hwy 401 WB Off-Ramp & Hwy 401 WB Off-Ramp	242	490
Between Hwy 401 WB Off-Ramp & Hwy 401 WB On-Ramp	452	489
Between Hwy 401 WB On-Ramp & Hwy 401 EB On-Ramp	419	488
Between Hwy 401 EB On-Ramp & Hwy 401 EB Off-Ramp	451	352
Between Hwy 401 EB Off-Ramp & Hwy 401 EB On-Ramp	450	334
Between Hwy 401 EB On-Ramp & Chisholm Dr	233	302
Between Chisholm Dr & Market Dr	83	55
Between Market Dr & Steeles Ave	175	95

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5.2 ASSESSMENT OF COLLISION HISTORY

This section uses available collision data provided by Halton Region for the Regional Road 25 corridor intersections from 2012 to 2016 to identify trends in collisions and to identify possible opportunities for improvement. Data are reviewed to identify whether apparent driver action, driver condition, environment, lighting, impact type, and classification indicate improvement potential. **Table 14** summarizes the total number of recorded collisions for each intersection and road segment on a yearly basis.

Table 14 shows a trend of the total number of collisions increasing since 2013, however, as shown in **Table 15** this increase is attributed to non-reportable collisions. The number of non-fatal injuries has remained relatively consistent over the period with a spike in 2015, and the property-damage only collisions are also observed to remain consistent. The intersection of Steeles Avenue/Regional Road 25 experiences the highest number of collisions along the study corridor. The combination of collisions at the intersection of Steeles Avenue/Regional Road 25 and the road segment between Steeles Avenue and Market Drive comprise 36% of the total collisions along the corridor. Market Drive, Chisholm Drive, and 5 Side Road follow Steeles Avenue as experiencing the highest number of collisions and have been noted to have a higher PSI ranking than the other intersections along the corridor.

Each intersection experiences varying traffic volumes which should be principally considered when assessing trends, given varying degrees of exposure to traffic. To review all intersections and road segments more consistently, the peak hour volume found through available turning movement counts is incorporated in the assessment. The collision rates expressed as collisions per million vehicles entering are summarized in **Table 16**. An intersection or road segment with a collision rate which is less than or equal to 1.00 is generally reflective of a normal propensity for collisions and can be attributable to basic human error. Values above 1.00 may be an indication that an opportunity for improvement exists apart from normal human error, in which case countermeasures could be considered. The collision rate (CR) is defined as:

$$CR = \frac{C_{AV}}{\left(\frac{365 * V_{max} * 10}{1,000,000}\right)} \quad C_{AV} = \text{Average yearly collisions}, V_{max} = \text{Peak hourly volume}$$

The summary of collision rates along the study corridor as summarized in **Table 16** indicates that the intersection with Steeles Avenue East experiences a collision rate of 1.24 collisions per million vehicles entering, which is above what would be considered to be attributed to human error. All other sites are below 1.00 collisions per million entering vehicles, nevertheless, all intersections and road segments will be considered in the following review of other variables to determine whether any patterns can be identified which relate to possible opportunity for improvement.

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Table 14 - 2012 to 2016 Number of Collisions by Year

Intersections / Mid-blocks Along Study Corridor	2012	2013	2014	2015	2016	Total
5 Side Road	4	4	5	4	5	22
Between Peddie Road & 5 Side Road	1	1				2
Peddie Road		2	2	2		6
Between James Snow Parkway & Peddie Road	2	1		1	2	6
James Snow Parkway	2	2	1	4	3	12
Between High Point Drive & James Snow Parkway	4	4	2	3	4	17
High Point Drive	3	4	1	3	1	12
Between Highway 401 WB On-Ramp & High Point Drive	2					2
Highway 401 WB On-Ramp			1		1	2
Between Highway 401 WB Off-Ramp & Highway 401 WB On-Ramp					1	1
Highway 401 WB Off-Ramp			1	1	2	4
Highway 401 WB Bridge On-Ramp				1		1
Between Highway 401 EB Off-Ramp & Highway 401 WB On-Ramp			1			1
Highway 401 EB Off-Ramp			1	2	1	4
Between Chisholm Drive & Highway 401 EB On-Ramp	2			1		3
Chisholm Drive	6	1	6	9	4	26
Between Market Drive & Chisholm Drive	7	4	1	1	1	14
Market Drive	6	2	1	8	8	25
Between Steeles Avenue & Market Drive	1	2	2	1	1	7
Steeles Avenue East	14	5	12	27	26	84
Total	54	32	37	68	60	251

Table 15 – 2012 to 2016 Collision History Classification by Year

Classification	2012	2013	2014	2015	2016	Total
Non-fatal injury	7	6	5	13	8	39
PDO	39	24	28	30	31	152
Non-reportable	8	2	4	25	21	60
Total	54	32	37	68	60	251

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Table 16 - Average Collision Rate by Location

Intersections / Mid-blocks Along RR 25	Total Collisions	Avg. Yearly Collisions	Peak Hour Volume	Collision Rate (C / MVE)
5 Side Road	22	4	1,884	0.58
Between Peddie Road & 5 Side Road	2	0	1,396	0
Peddie Road	6	1	1,561	0.18
Between James Snow Parkway & Peddie Road	6	1	1,459	0.19
James Snow Parkway	12	2	1,982	0.28
Between High Point Drive & James Snow Parkway	17	3	1,740	0.47
High Point Drive	12	2	2,094	0.26
Between Highway 401 WB On-Ramp & High Point Drive	2	0	2,028	0
Highway 401 WB On-Ramp	2	0	2,028	0
Between Highway 401 WB Off-Ramp & Highway 401 WB On-Ramp	1	0	2,631	0
Highway 401 WB Off-Ramp	4	1	3,080	0.09
Highway 401 WB Bridge On-Ramp	1	0	2,631	0
Between Highway 401 EB Off-Ramp & Highway 401 WB On-Ramp	1	0	2,631	0
Highway 401 EB Off-Ramp	4	1	3,503	0.08
Between Chisholm Drive & Highway 401 EB On-Ramp	3	1	3,073	0.09
Chisholm Drive	26	5	3,324	0.41
Between Market Drive & Chisholm Drive	14	3	2,953	0.28
Market Drive	25	5	3,224	0.42
Between Steeles Avenue & Market Drive	7	1	2,711	0.1
Steeles Avenue East	84	17	3,763	1.24

Table 17 compares the number of non-fatal injuries, PDO, and non-reportable collisions at the intersections and road segments along the Regional Road 25 corridor. Non-reportable collisions are defined as minor collisions which result in damages under \$2,000 and do not need to be reported to police or a collision reporting centre. No fatalities occurred along the corridor from 2012 to 2016. The summary of collisions by classification highlights that 15% resulted in injury, which comprises a small proportion of the number of collisions.

REGIONAL ROAD 25 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT TRANSPORTATION PLANNING REPORT

Road Safety Review
January 2, 2019

Table 17 - 2012 to 2016 Collision History by Classification

Intersections / Mid-blocks Along RR 25	Non-fatal Injury	PDO	Non-reportable	Total
5 Side Road	3	17	2	22
Between Peddie Road & 5 Side Road		2		2
Peddie Road		6		6
Between James Snow Parkway & Peddie Road	2	3	1	6
James Snow Parkway	2	8	2	12
Between High Point Drive & James Snow Parkway		13	4	17
High Point Drive	3	5	4	12
Between Highway 401 WB On-Ramp & High Point Drive		1	1	2
Highway 401 WB On-Ramp		2		2
Between Highway 401 WB Off-Ramp & Highway 401 WB On-Ramp			1	1
Highway 401 WB Off-Ramp		3	1	4
Highway 401 WB Bridge On-Ramp		1		1
Between Highway 401 EB Off-Ramp & Highway 401 WB On-Ramp	1			1
Highway 401 EB Off-Ramp	2	2		4
Between Chisholm Drive & Highway 401 EB On-Ramp	1	2		3
Chisholm Drive	4	15	7	26
Between Market Drive & Chisholm Drive	3	8	3	14
Market Drive	4	13	8	25
Between Steeles Avenue & Market Drive		5	2	7
Steeles Avenue East	14	46	24	84
Total	39	152	60	251

The intersection of Regional Road 25 with Steeles Avenue was ranked #4 in the PSI ranking list in 2015, signifying it was one of the highest collision-prone intersections in all of Halton Region. This intersection experienced 84 collisions from 2012 to 2016 inclusive. Of the 84 collisions, 21 had been recorded with the drivers' condition being inattentive and another 5 unknown or not recorded resulting in 58 normal condition collisions. The remaining 58 normal condition collisions resulted in 7 non-fatal injury, 33 PDO, and 18 non-reportable collisions. The majority of the remaining collisions were caused by driver error; apparent driver actions indicate that 13 collisions were due to drivers following too close, 8 turning improperly, 3 disobeying traffic control, 10 failing to yield the right-of-way, and 1 improperly changing lanes. 19 drivers were driving properly at the time of collision, 1 driver lost control, 2 collisions were recorded as other, and 1 was not recorded. The highest proportion of collisions are noted to have occurred in the southbound direction with 11 collisions, however, the collisions were spread out on all approaches and among left turn, through, and right turn lanes. No collision-prone conditions or trends are observed at the intersection of Regional Road 25 with Steeles Avenue.

The intersection of Regional Road 25 with Market Drive was ranked #64 in the PSI ranking list in 2015 and experienced a total of 25 collisions within the study period. Of the 25 collisions, 7 collisions were recorded with inattentive driver conditions and are not attributable to collision-

REGIONAL ROAD 25 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT TRANSPORTATION PLANNING REPORT

Road Safety Review
January 2, 2019

prone road geometry. The remaining 18 collisions were the result of 2 non-fatal injury, 9 PDO, and 7 non-reportable collisions. The majority of the remaining collisions were due to driver error; apparent driver actions show that 2 collisions were due to drivers following too close, 3 driving too fast for the road condition, 3 turning improperly, and 2 failing to yield the right-of-way. 5 drivers were recorded driving properly, 1 lost control, and 2 were not recorded. Environmental and lighting conditions do not appear to be large contributing factors to the collisions. The remaining 8 collisions were spread out relatively evenly across all approaches, with all collisions occurring while vehicles were slowing or stopped. There do not appear to be any collision-prone conditions or trends at the intersection of Regional Road 25 with Market Drive.

The intersection of Regional Road 25 with Chisholm Drive was ranked #69 in the PSI ranking list in 2015 and experienced a total of 26 collisions across the study period. Of the 26 collisions, only 4 collisions were recorded with inattentive driver conditions. The remaining 22 collisions were comprised of 4 non-fatal injury, 12 PDO, and 6 non-reportable collisions. The majority of the remaining collisions were due to driver error; apparent driver actions show that 2 drivers were following too close, 4 turned improperly, 2 disobeyed traffic control, and 2 failed to yield the right-of-way. Wet, packed snow, and icy road conditions were recorded for approximately half of the 12 collisions that were not due to driver error. Of the 12 remaining collisions, 7 collisions occurred along the southbound approach and 5 of the southbound collisions occurred on the through lane. The southbound through collisions were relatively spread out among going ahead, slowing or stopping, reversing, and stopped vehicle maneuvers. No collision-prone conditions or trends are observed at the intersection of Regional Road 25 with Steeles Avenue.

The intersection of Regional Road 25 with 5 Side Road was ranked #85 in the PSI ranking list in 2015 and experienced a total of 22 collisions throughout the study period. Of the 22 collisions, 5 collisions were recorded with inattentive driver conditions and are not attributable to collision-prone road geometry. The 17 remaining collisions comprised of 2 non-fatal injury, 13 PDO, and 2 non-reportable collisions. Approximately half of the remaining collisions were the result of driver error; apparent driver actions show that 2 drivers had been following too close, 1 driving too fast for the road condition, 2 improperly turning, 2 disobeying the traffic control, and 1 failed to yield the right-of-way. Environmental condition and lighting do not appear to be large contributing factors. The remaining collisions are evenly distributed along the eastbound, northbound, and southbound approaches. There does not appear to be any collision-prone conditions or trends at the intersection of Regional Road 25 with 5 Side Road.

Based on the above safety assessment, no collision-prone conditions are identified along the Regional Road 25 study corridor. The intersection of Regional Road 25 with Steeles Avenue had been ranked #4 on the 2015 PSI ranking list and received a collision rate above 1.00, however, the review of the available collision data did not detect a significant contributor to the number of collisions. It is assumed that the intersection improvements planned as part of the Steeles Avenue widening program (2018 completion) will improve safety conditions at the intersection due to the elimination of the channelized southbound right turn and additional capacity provided on critical movements.



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Road Safety Review
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The Preliminary Design Report Highway 401 Improvements from Trafalgar Road to Regional Road 25 March 2015 report prepared by URS had identified an alternate design for the Highway 401 westbound off-ramp interchange to reduce the collision rate for the channelized westbound right turn. Since the release of the report, the future interchange design has shifted back to resembling the existing interchange with a large radius along the channelized right turn. With the proposed implementation of bike facilities along Regional Road 25, it is anticipated that the high speeds of the off-ramp may create hazardous conditions for cyclists travelling northbound. It is recommended to create a tight radius curve for the off-ramp such that vehicles will reduce their speeds when navigating the turn and improve safety conditions for cyclists.

REGIONAL ROAD 25 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT TRANSPORTATION PLANNING REPORT

Roundabout Feasibility Study
January 2, 2019

6.0 ROUNDABOUT FEASIBILITY STUDY

A Roundabout Feasibility Study has been prepared as part of the Regional Road 25 Environmental Assessment to determine whether the signalized intersections along the corridor are candidates for conversion to roundabout intersection control types. The Regional Road 25 Roundabout Feasibility Study is attached for reference in **Appendix D**. The Roundabout Feasibility Study was completed in accordance with the Regional Municipality of Halton's roundabout suitability guidelines highlighted in the *Guidelines for the use of Modern Roundabouts on Regional Arterial Roadways*.

The conclusion of the Study is that only the intersection of Regional Road 25 with 5 Side Road should be further considered for the implementation of a two-lane roundabout. The other signalized intersections along the Study Area corridor would experience substantial negative impacts, with little to no operational benefits over a signalized intersection.

REGIONAL ROAD 25 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT TRANSPORTATION PLANNING REPORT

Conclusions and Recommendations
January 2, 2019

7.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions of this Study are summarized below.

1. Operational conditions:
 - a. Under existing 2016 conditions, the traffic analysis indicates that all northbound and southbound movements within the Study Area operate with acceptable levels of service and volume to capacity ratios.
 - b. Under 2031 forecast “Do Nothing” conditions, intersections are anticipated to experience capacity deficiencies in both directions along the Regional Road 25 corridor indicating the need for widening and other improvements including additional left turn lanes and auxiliary right turn lanes.
 - c. 2031 forecast conditions with the improvements in place are observed to be significantly improved from the “Do Nothing” scenario. All intersections with the exception of Steeles Avenue are anticipated to operate within their theoretical capacities.
2. Road safety review:
 - a. All intersections and mid-blocks along the corridor, with the exception of the Regional Road 25/Steeles Avenue intersection, have low average collision rates. No collision-prone conditions are identified through the safety assessment. It is assumed that the reconstruction of the intersection, which is part of the Steeles Avenue widening program (2018 completion), will improve safety conditions at this intersection.
3. Active transportation:
 - a. Under existing conditions, there is limited opportunity to utilize active modes of transportation along the Regional Road 25 corridor. The proposed improvements identified in the Region’s Active Transportation Master Plan would significantly improve the ability to walk and bike along the corridor.
4. Roundabout Feasibility Study:
 - a. Only the intersection of Regional Road 25 with 5 Side Road should be further considered for implementation of a two-lane roundabout. The other signalized intersections along the Study Area corridor would experience substantial negative impacts, with little to no operational benefits over a signalized intersection.

REGIONAL ROAD 25 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT TRANSPORTATION PLANNING REPORT

Conclusions and Recommendations
January 2, 2019

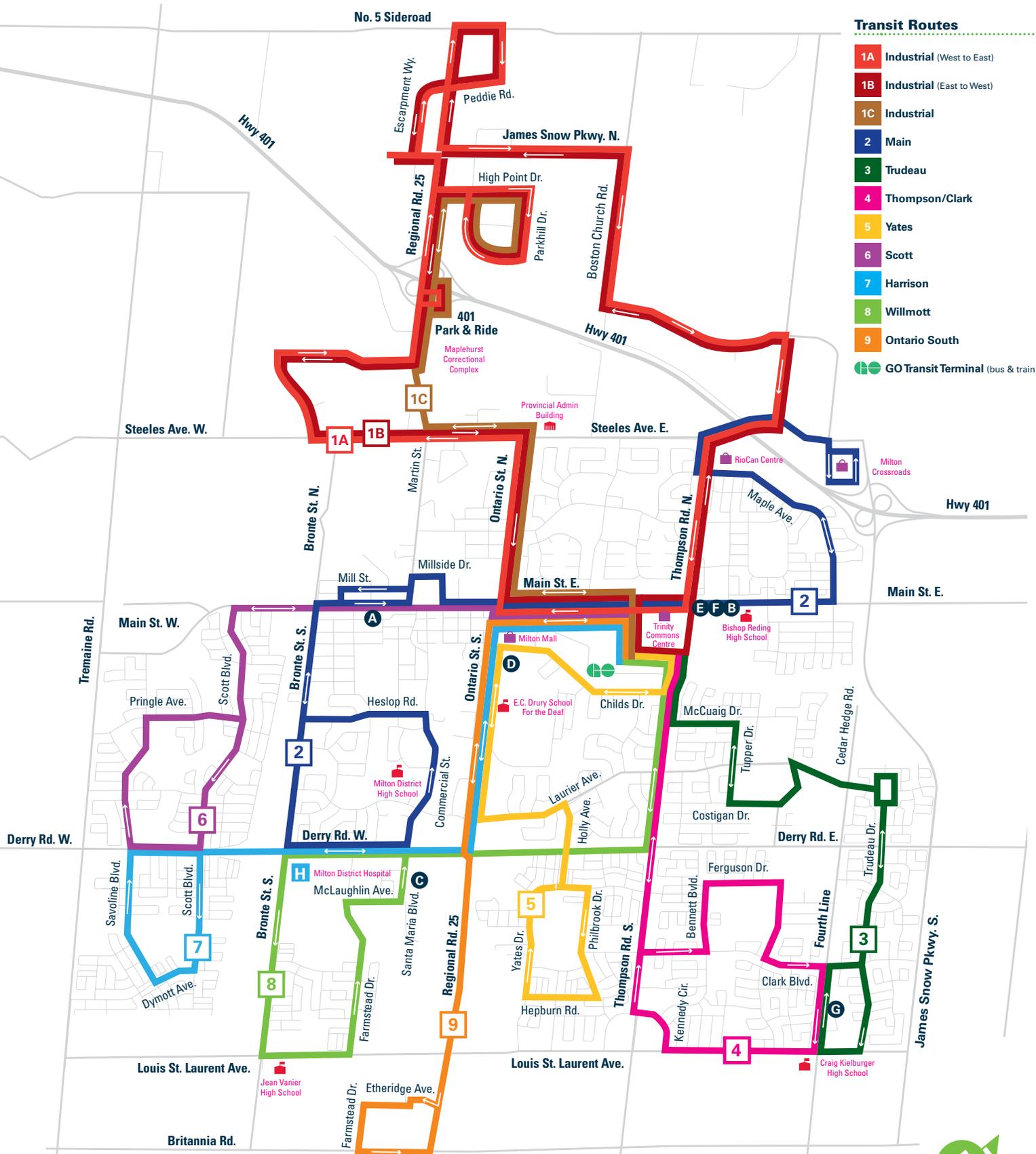
The recommendations of the Study are summarized below.

1. Widen Regional Road 25 from 4 to 6 lanes from Steeles Avenue to 5 Side Road to accommodate forecast volumes and address anticipated capacity deficiencies.
2. Implement the proposed MTO design for the reconfiguration of the Highway 401 Westbound Off-Ramp intersection.
3. Implement westbound left turn advance phase at Regional Road 25/High Point Drive.
4. Implement an additional auxiliary left turn lane along the eastbound approach to Regional Road 25/Market Drive.
5. Implement an auxiliary right turn lane along the northbound approach to Regional Road 25/Chisholm Drive, and the eastbound approach to Regional Road 25/5 Side Road.
6. Allow right turns on red on the eastbound approach to Regional Road 25/5 Side Road to accommodate forecast traffic volumes. Adequate sightlines must be provided on the southbound and eastbound approaches.
7. Implement the active transportation improvements identified in the Region's *Active Transportation Master Plan*, including on-road bike lanes and multi-use pathways on both sides of Regional Road 25.
8. Increasing the signal cycle length to 120 seconds in the a.m. and p.m. peak hours along the corridor to improve operations and ensure coordination.
9. Consider the intersection of Regional Road 25 with 5 Side Road for the implementation of a two-lane roundabout.

**REGIONAL ROAD 25 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT TRANSPORTATION
PLANNING REPORT**

Appendix A – Bus Schedules and Route Maps
January 2, 2019

Appendix A – BUS SCHEDULES AND ROUTE MAPS



Transit Routes

- 1A Industrial (West to East)**
- 1B Industrial (East to West)**
- 1C Industrial**
- 2 Main**
- 3 Trudeau**
- 4 Thompson/Clark**
- 5 Yates**
- 6 Scott**
- 7 Harrison**
- 8 Willmott**
- 9 Ontario South**
- GO Transit Terminal (bus & train)**





Contact(s)

Milton Transit
 150 Mary Street
 Milton, ON
 L9T 6Z5

Phone: (905) 864-4141
 TTY: (905) 878-1657
 Fax: (905) 864-3222

Map: [Milton Transit](#)
 Email: [Information](#)

Industrial Special

Milton Transit provides service on weekdays (1A and 1B Industrial routes) and Saturdays (**1C Industrial route, effective April 8, 2017**) to the 401 Industrial Business Park area during morning and afternoon peak periods. This service includes special weekday AM pick-up service before conventional service begins, from 4:55am to 5:25am (revised to 4:45 to 5:15 am effective September 6, 2016). The AM Pick-up service connects passengers to the 1A/B Industrial via the Milton GO Station. For route-specific maps and schedules, see the links below.

- [Route Map](#) (Includes **NEW 1C Industrial**, Saturdays only, effective April 8, 2017)
- [AM Pick-up](#)
- [Trans-Cab](#)

1A Industrial - West to East (Clockwise)

Leave Milton GO	Main & Ontario	Steeles & Ontario	Industrial & Steeles	RR 25 & 401 GO Park-&-Ride	High Point & Park Hill	James Snow & Wedge	RR 25 & No. 5 Side Road	James Snow & RR 25	Boston Church & Lawson	Steeles & Esquesing	Thompson & Steeles	Arrive Milton GO
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Westbound to No. 5 Side Road

Eastbound to Milton GO

Monday - Friday

AM

5:15 5:18 5:20 5:24 5:29 5:32 5:37 5:41 5:44 5:49 5:54 5:56 6:00

Leave Milton GO	Main & Ontario	Steeles & Ontario	Industrial & Steeles	RR 25 & 401 GO Park- &- Ride	High Point & Park Hill	James Snow & Wedge	RR 25 & No. 5 Side Road	James Snow & RR 25	Boston Church & Lawson	Steeles & Esquesing	Thompson & Steeles	Arrive Milton GO
6:00	6:03	6:05	6:09	6:14	6:17	6:22	6:26	6:29	6:34	6:39	6:41	6:45
6:45	6:48	6:50	6:54	6:59	7:02	7:07	7:11	7:14	7:19	7:24	7:26	7:30
7:30	7:33	7:35	7:39	7:44	7:47	7:52	7:56	7:59	8:04	8:09	8:11	8:15
8:20	8:23	8:25	8:29	8:34	8:37	8:42	8:46	8:49	8:54	8:59	9:01	9:05

PM

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2:40	2:43	2:45	2:49	2:54	2:57	3:02	3:06	3:09	3:14	3:19	3:21	3:25
3:25	3:28	3:30	3:34	3:39	3:42	3:47	3:51	3:54	3:59	4:04	4:06	4:10
4:10	4:13	4:15	4:19	4:24	4:27	4:32	4:36	4:39	4:44	4:49	4:51	4:55
4:55	4:58	5:00	5:04	5:09	5:12	5:17	5:21	5:24	5:29	5:34	5:36	5:40

1B Industrial - East to West (Counter-clockwise)

Leave Milton GO	Thompson & Steeles	Steeles & Esquesing	Boston Church & Lawson	James Snow & RR 25	RR 25 & No. 5 Side Rd.	James Snow & Wedge	High Point & Park Hill	RR 25 & 401 GO Park- &- Ride	Industrial & Steeles	Steeles & Ontario	Main & Ontario	Arrive Milton GO
Eastbound to RR 25					Westbound to Milton GO							

Monday - Friday

AM

5:35	5:38	5:40	5:44	5:48	5:49	5:53	5:58	6:00	6:05	6:08	6:11	6:15
6:20	6:23	6:25	6:29	6:33	6:34	6:38	6:43	6:45	6:50	6:53	6:56	7:00
7:00	7:03	7:05	7:09	7:13	7:14	7:18	7:23	7:25	7:30	7:33	7:36	7:40
7:40	7:43	7:45	7:49	7:53	7:54	7:58	8:03	8:05	8:10	8:13	8:16	8:20

PM

2:20	2:23	2:25	2:29	2:33	2:34	2:38	2:43	2:45	2:50	2:53	2:56	3:00
3:00	3:03	3:05	3:09	3:13	3:14	3:18	3:23	3:25	3:30	3:33	3:36	3:40
3:40	3:43	3:45	3:49	3:53	3:54	3:58	4:03	4:05	4:10	4:13	4:16	4:20

Leave Milton GO	Thompson & Steeles	Steeles & Esquesing	Boston Church & Lawson	James Snow & RR 25	RR 25 & No. 5 Side Rd.	James Snow & Wedge	High Point & Park Hill	RR 25 & 401 GO Park-&-Ride	Industrial & Steeles	Steeles & Ontario	Main & Ontario	Arrive Milton GO
4:20	4:23	4:25	4:29	4:33	4:34	4:38	4:43	4:45	4:50	4:53	4:56	5:00
5:00	5:03	5:05	5:09	5:13	5:14	5:18	5:23	5:25	5:30	5:33	5:36	5:40

1C Industrial (Saturdays only), effective April 8, 2017

Leave Milton GO	Main & Ontario	Steeles & Ontario	RR 25 & 401 GO Park-and-Ride	High Point & Park Hill	RR 25 & 401 GO Park-and-Ride	Steeles & Ontario	Main & Ontario	Arrive Milton GO
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Northbound to High Point Dr

Southbound to Milton GO

Saturday

AM

8:10	8:13	8:15	8:18	8:23	8:28	8:32	8:34	8:36
9:10	9:13	9:15	9:18	9:23	9:28	9:32	9:34	9:36
10:10	10:13	10:15	10:18	10:23	10:28	10:32	10:34	10:36
11:10	11:13	11:15	11:18	11:23	11:28	11:32	11:34	11:36

PM

12:10	12:13	12:15	12:18	12:23	12:28	12:32	12:34	12:36
1:10	1:13	1:15	1:18	1:23	1:28	1:32	1:34	1:36
2:10	2:13	2:15	2:18	2:23	2:28	2:32	2:34	2:36
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4:10	4:13	4:15	4:18	4:23	4:28	4:32	4:34	4:36
5:10	5:13	5:15	5:18	5:23	5:28	5:32	5:34	5:36
6:10	6:13	6:15	6:18	6:23	6:28	6:32	6:34	6:36
7:10	7:13	7:15	7:18	7:23	7:28	7:32	7:34	7:36

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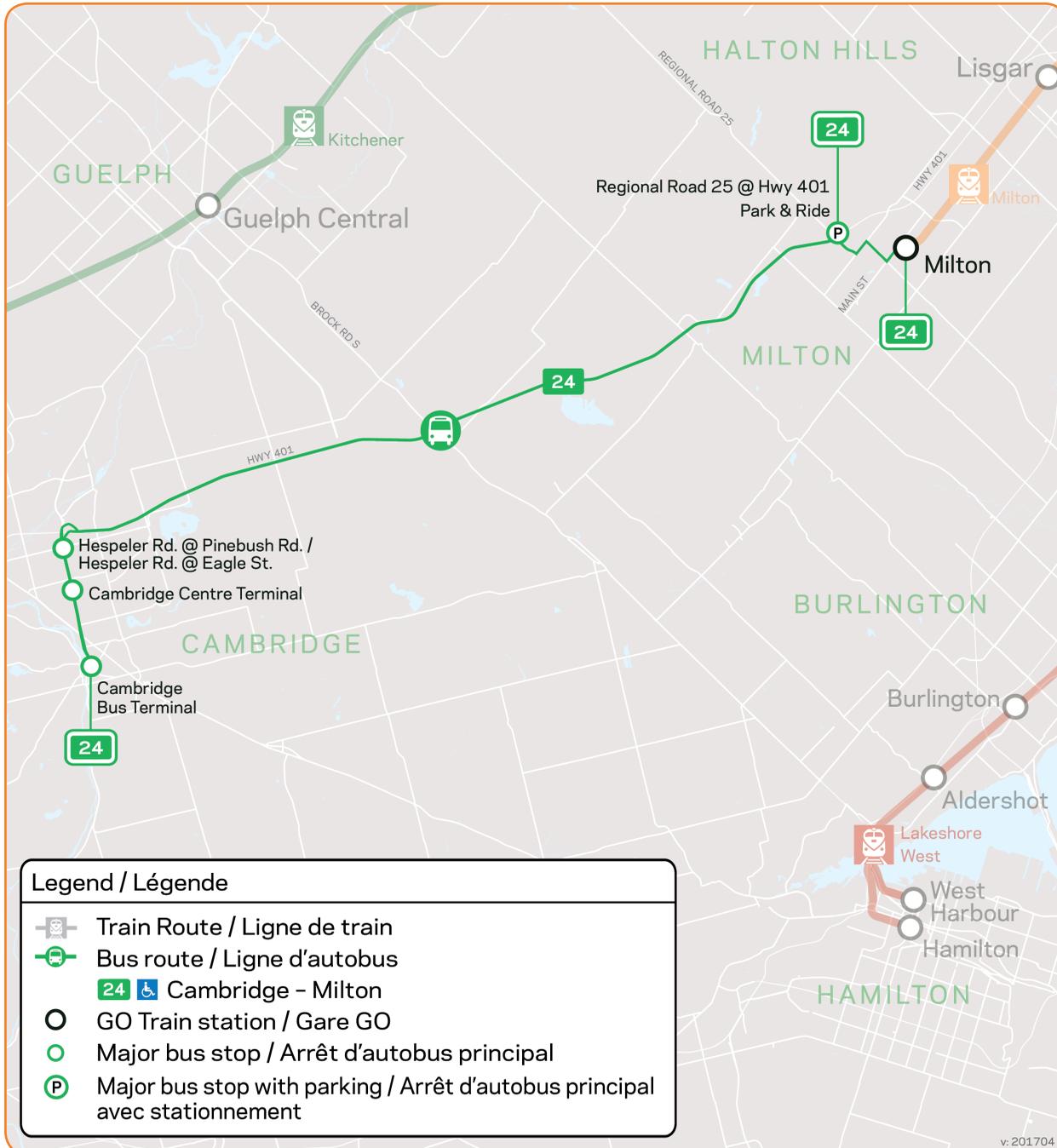
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24

Route number
Nombre d'itinéraire

Cambridge/Milton



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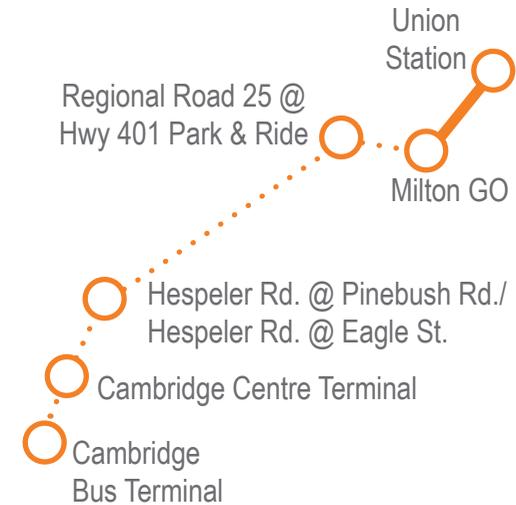


03-06-2017

Cambridge/Milton

GO Bus Schedule

Horaire des autobus GO



Monday to Friday only
Du lundi au vendredi seulement
GO Bus route 24
La route 24 d'autobus GO
Includes Milton GO Train
Inclut la train GO Milton

Effective/ À partir de:
8 APRIL 2017
8 AVRIL 2017



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Step 1

Find the station or terminal you are departing from. Stops are listed across the top in the order they are served.

Step 2

The top of the schedule tells you what day the schedule is for and the direction of travel.

Step 3

Look across the rows for available departure times.

Step 4

Not all trains or buses stop at every station. If you see → the train or bus will not stop at that station.

Comment lire nos horaires

Étape 1

Trouvez votre gare ou terminus de départ. La liste des arrêts est donnée en haut dans l'ordre dans lequel ils sont desservis.

Étape 2

Le coin supérieur gauche vous indique le jour pour lequel l'horaire est donné et la direction de circulation.

Étape 3

Regardez dans les rangées pour obtenir les heures de départ offertes.

Étape 4

Les trains ou les autobus ne s'arrêtent pas tous à chaque gare. Si vous voyez le symbole → le train ou l'autobus ne s'arrêtera pas à cette gare.

Legend/Légende

-  Train trips/Horaire des trains
-  Bus trips/Horaire des autobus



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Parking available./ Stationnement disponible.

Schedule times shown in 24-hour clock

Indications selon un système horaire de 24 heures



Midnight to noon
00 01 - 12 00

De minuit à midi:
00 01 - 12 00

Noon to midnight
12 01 - 24 00

De midi à minuit:
12 01 - 24 00

Notes

- h Connecting bus trips will wait until the train has arrived before departing./ Les correspondances d'autobus attendront jusqu'à ce que le train soit arrivé avant de partir.

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Monday to Friday (except holidays) Du lundi au vendredi (sauf les jours fériés)																																	
EASTBOUND / EN DIRECTION EST												WESTBOUND / EN DIRECTION OUEST																					
Route Number Nombre d'itinéraire	Trip Number N° du trajet	Zone →	Cambridge 26	Dp	Cambridge 26	Cambridge Centre Terminal	Cambridge 26	Hespeler Rd. @ Pinebush Rd.	Milton 24	Milton 24	Ar	Transfer - Correspondances	Milton 24	Dp	Toronto 2	Ar	Route Number Nombre d'itinéraire	Trip Number N° du trajet	Zone →	Toronto 2	Dp	Milton 24	Ar	Transfer - Correspondances	Milton 24	Dp	Milton 24	Regional Rd 25 @ Hwy. 401	Cambridge 26	Hespeler Rd. @ Eagle St.	Cambridge 26	Cambridge Centre Terminal	Cambridge 26
24	24090		05 44		05 50		05 53		06 17		06 29	152		06 44		07 45	24	21385		12 30		13 40	24431		13 45h		13 54		14 19		14 22		14 35
24	24130		06 14		06 20		06 23		06 47		06 59	156		07 14		08 15	24	21435		13 50		15 00	24491		15 05h		15 14		15 39		15 42		16 00
24	24160		06 47		06 53		06 56		07 20		07 32	162		07 47		08 48	24	21475		14 45		16 10	24561		16 15h		16 24		16 54		16 57		17 15
24	24200		07 21		07 27		07 30		07 59		08 11	166		08 26		09 30	24	151		16 10		17 09	24621		17 17h		17 26		17 56		17 59		18 12
																	24	159		17 25		18 24	24681		18 32h		18 41		19 06		19 09		19 22
																	24	165		18 25		19 24	24721		19 32h		19 41		20 06		20 09		20 22
																	24	167		19 10		20 09	24751		20 17h		20 26		20 51		20 54		21 07
																	24	21785		21 00		22 00	24821		22 05h		22 14		22 39		22 42		22 50

Bicycles

- Bicycles are not allowed in Union Station or on-board eastbound trains during morning rush hour (6:30-9:30) and westbound trains during evening rush hour (15:30-18:30).
- Foldable bicycles are allowed on-board trains at all times.

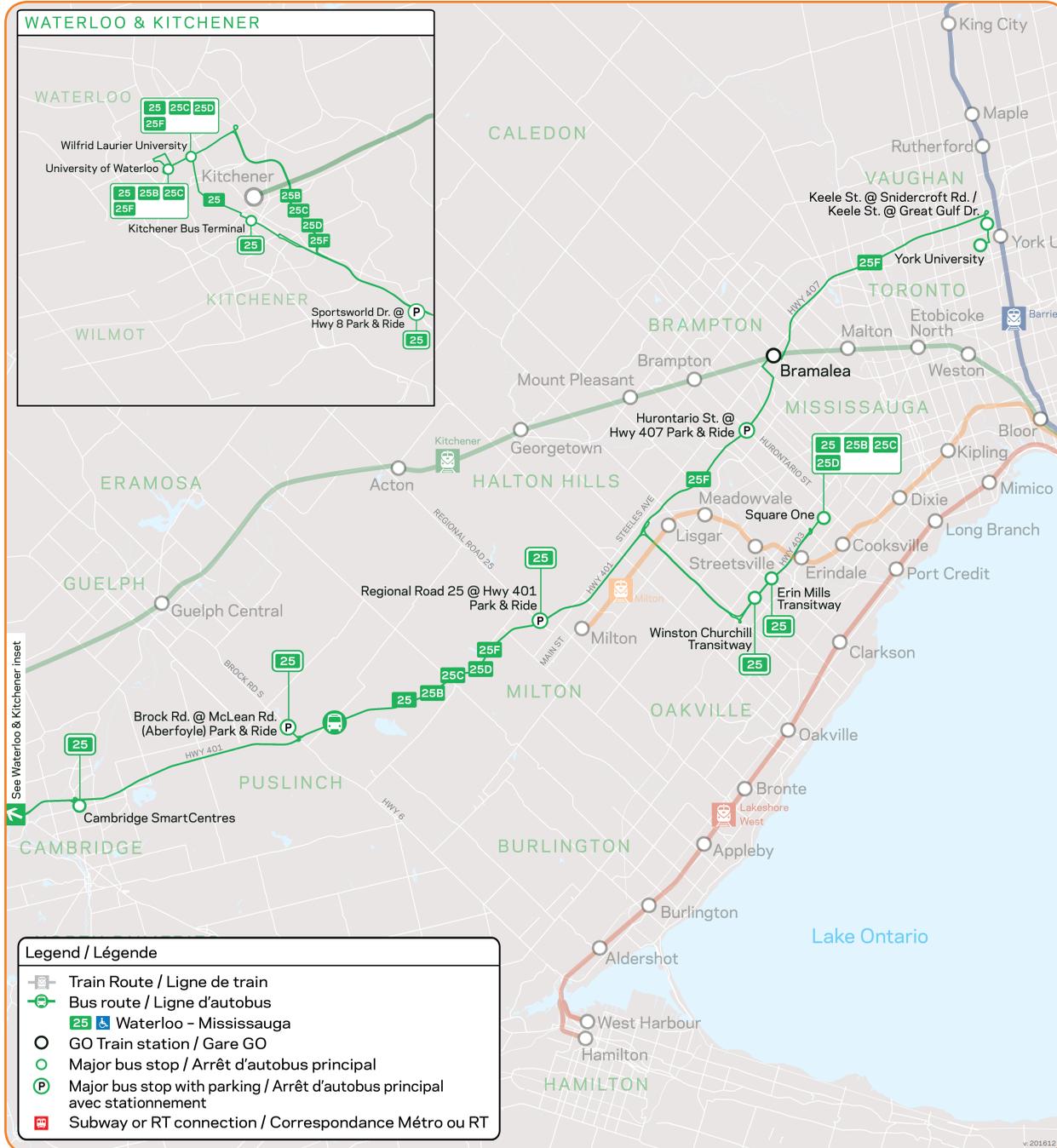
Vélos

- Les vélos ne sont pas permis à la gare Union ou dans les trains en direction est durant les heures de pointe du matin (entre 6 h 30 et 9 h 30) et dans les trains en direction ouest durant les heures de pointe de la soirée (entre 15 h 30 et 18 h 30).
- Les vélos pliables sont permis à bord des trains en tout temps.

25

Route number
Nombre d'itinéraire

Waterloo/Mississauga



ALL GOOD TO GO

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Triplinx – The official transit trip planner for the Greater Toronto & Hamilton area, at triplinx.ca

BON DÉPART EN TOUT TEMPS AVEC GO

gotransit.com – site Web accessible d'un ordinateur de bureau ou d'un appareil mobile fournissant tous les renseignements sur GO

Alertes On The GO – nouvelles personnalisées sur le service et les retards envoyées directement dans votre boîte de réception; inscrivez-vous sur gotransit.com/OnTheGOFR

PRESTO – économies et aspect pratique assurés avec une carte PRESTO; obtenez la vôtre sur prestocard.ca

Triplinx – planificateur de trajet de transport en commun officiel de la région du grand Toronto et de Hamilton, sur triplinx.ca

416 869 3200
1 888 GET ON GO (438 6646)
1 800 387 3652 TTY/ATS
gotransit.com/schedules



03-06-2017

Waterloo/ Mississauga

GO Bus Schedule

Horaire des autobus GO

Route 25 - Waterloo - Kitchener - Cambridge - Aberfoyle - Milton - Mississauga - Brampton - Vaughan - North York - Toronto



Daily
Quotidiennement
GO Bus route 25
La route 25 d'autobus GO

Effective/ À partir de:
8 APRIL 2017
8 AVRIL



METROLINX

How to read our schedules

Step 1

Find the station or terminal you are departing from. Stops are listed across the top in the order they are served.

Step 2

The top of the schedule tells you what day the schedule is for and the direction of travel.

Step 3

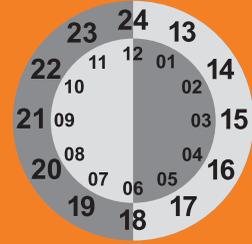
Look across the rows for available departure times.

Step 4

Not all trains or buses stop at every station. If you see → the train or bus will not stop at that station.

Schedule times shown in 24-hour clock

Midnight to noon
00 01 - 12 00
Noon to midnight
12 01 - 24 00



Legend

 Bus trips

→ Trip does not serve this location.



GO Bus service is accessible to passengers using mobility devices at this location.



Parking available.

For the latest schedule information and updates, please visit gotransit.com/schedules.

Notes

Th-Fri Trip operates on Thursdays and Fridays ONLY.

Fri Trip operates on Fridays ONLY. If Friday is a holiday the trip operates on the Thursday before the holiday.

D Stops to discharge passengers on request only.

P Trip does not operate starting April 23, 2017.

Bicycles

1. Bicycles are not allowed in Union Station or on-board eastbound trains during morning rush hour (6:30-9:30) and westbound trains during evening rush hour (15:30-18:30).

2. Foldable bicycles are allowed on-board trains at all times.

Comment lire nos horaires

Étape 1

Trouvez votre gare ou terminus de départ. La liste des arrêts est donnée en haut dans l'ordre dans lequel ils sont desservis.

Étape 2

Le coin supérieur gauche vous indique le jour pour lequel l'horaire est donné et la direction de circulation.

Étape 3

Regardez dans les rangées pour obtenir les heures de départ offertes.

Étape 4

Les trains ou les autobus ne s'arrêtent pas tous à chaque gare. Si vous voyez le symbole → le train ou l'autobus ne s'arrêtera pas à cette gare.

Indications selon un système horaire de 24 heures

De minuit à midi:
00 01 - 12 00
De midi à minuit:
12 01 - 24 00



Légende

 Horaire des autobus

→ Trajet ne sert pas cette station.



Service d'autobus GO accessible aux personnes utilisant des aides à la mobilité à cet endroit.



Stationnement disponible.

Pour consulter les horaires les plus récents et les mises à jour, veuillez visiter gotransit.com/schedules.

Notes

Th-Fri Service offert les jeudis et vendredis SEULEMENT.

Fri Service offert les vendredis SEULEMENT ou les jeudis précédant un vendredi férié.

D Arrêt sur demande seulement.

P Le trajet ne sera plus offert à compter du 23 avril 2017.

Vélos

1. Les vélos ne sont pas permis à la gare Union ou dans les trains en direction est durant les heures de pointe du matin (entre 6 h 30 et 9 h 30) et dans les trains en direction ouest durant les heures de pointe de la soirée (entre 15 h 30 et 18 h 30).

2. Les vélos pliables sont permis à bord des trains en tout temps.

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

EASTBOUND / EN DIRECTION EST

Route Number Nombre d'itinéraire	Zone→	Trip Number N° du trajet	Exception 1	Exception 2	Waterloo 27	Waterloo 27	Kitchener 27	Kitchener 26	Cambridge 26	Puslinch 39	Milton 24	Mississauga 21	Mississauga 20	Ar	Brampton 22	Brampton 32	Vaughan 19	North York 19	Dp	
					University of Waterloo	Wilfrid Laurier University	Kitchener Bus Terminal	Sportsworld Dr. @ Hwy. 8	Hespeler Rd. @ Pinebush Rd.	Brock Rd. @ McLean Rd. (Aberfoyle)	Regional Rd 25. @ Hwy. 401	Mississauga 21	Winston Churchill Transitway	Erin Mills Transitway	Square One	Hurontario St. @ Hwy. 407	Bramalea GO	Keele St. @ Snidercroft Rd.	York University	
25	25140				05 25	05 28	05 43	05 55	06 04	06 20	06 36	06 55	07 00	07 15						
25	25200				06 20	06 23	06 38	06 50	06 59	07 15	07 31	07 52	07 57	08 15						
25	25250				07 15	07 18	07 36	07 48	07 57	08 15	08 31	08 52	08 57	09 15						
25	25290				08 25	08 28	08 46	08 58	09 07	09 25	09 41	10 00	10 05	10 15						
25	25330				09 25	09 28	09 46	09 58	10 07	10 25	10 41	11 00	11 05	11 15						
25	25370				10 25	10 28	10 46	10 58	11 07	11 25	11 41	12 00	12 05	12 15						
25B	25414	Fri	P		11 10	→	→	→	→	→	→	→	→	12 20						
25C	25412	Th-Fri			11 20	11 23	→	→	→	→	→	→	→	12 35						
25	25410				11 20	11 23	11 45	11 57	12 06	12 25	12 41	13 00	13 05	13 15						
25C	25452	Th-Fri			12 20	12 23	→	→	→	→	→	→	→	13 35						
25	25450				12 20	12 23	12 45	12 57	13 06	13 25	13 41	14 00	14 05	14 15						
25C	25492	Th-Fri			13 20	13 23	→	→	→	→	→	→	→	14 35						
25	25490				13 20	13 23	13 45	13 57	14 06	14 25	14 41	15 00	15 05	15 15						
25F	25518	Fri	P		13 30	13 33	→	→	→	→	→	→	→	14 32	14 47	15 01	15 10			
25B	25554	Fri			14 05	→	→	→	→	→	→	→	→	15 20						
25C	25552	Th-Fri			14 15	14 18	→	→	→	→	→	→	→	15 35						
25	25550				14 15	14 18	14 40	14 52	15 01	15 20	15 36	15 55	16 00	16 15						
25F	25578	Fri			14 30	14 33	→	→	→	→	→	→	→	15 35	15 50	16 04	16 15			
25B	25614	Fri			15 00	→	→	→	→	→	→	→	→	16 15						
25C	25612	Th-Fri			15 10	15 13	→	→	→	→	→	→	→	16 30						
25	25610				15 10	15 13	15 37	15 49	16 01	16 20	16 36	16 55	17 00	17 15						
25F	25648	Fri			15 30	15 33	→	→	→	→	→	→	→	16 45	17 00	17 14	17 25			
25B	25674	Th-Fri			16 00	→	→	→	→	→	→	→	→	17 20						
25C	25672				16 10	16 13	→	→	→	→	→	→	→	17 35						
25	25670				16 10	16 13	16 37	16 49	17 01	17 20	17 36	17 55	18 00	18 15						
25F	25688	Fri			16 30	16 33	→	→	→	→	→	→	→	17 50	18 05	18 19	18 30			
25B	25714	Fri			17 00	→	→	→	→	→	→	→	→	18 20						
25C	25712				17 10	17 13	→	→	→	→	→	→	→	18 35						
25	25710				17 10	17 13	17 37	17 49	18 01	18 20	18 36	18 55	19 00	19 15						
25F	25728	Fri			17 30	17 33	→	→	→	→	→	→	→	18 42	18 57	19 11	19 20			
25B	25754	Fri			18 05	→	→	→	→	→	→	→	→	19 20						
25C	25752				18 15	18 18	→	→	→	→	→	→	→	19 35						
25	25750				18 15	18 18	18 39	18 51	19 02	19 20	19 36	19 55	20 00	20 15						
25F	25788	Fri	P		18 30	18 33	→	→	→	→	→	→	→	19 32	19 47	20 01	20 10			
25B	25794	Fri			19 10	→	→	→	→	→	→	→	→	20 20						
25C	25792	Th-Fri			19 20	19 23	→	→	→	→	→	→	→	20 35						
25	25790				19 20	19 23	19 41	19 53	20 02	20 20	20 36	20 55	21 00	21 15						
25C	25832	Th-Fri			20 25	20 28	→	→	→	→	→	→	→	21 35						
25	25830				20 25	20 28	20 46	20 58	21 07	21 25	21 41	21 57	22 02	22 15						
25	25860				21 25	21 28	21 46	21 58	22 07	22 25	22 41	22 57	23 02	23 15						
25	25890				22 25	22 28	22 46	22 58	23 07	23 25	23 41	23 57	00 02	00 15						

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

WESTBOUND / EN DIRECTION OUEST

Route Number Nombre d'itinéraire	Zone→	Trip Number N° du trajet	Exception 1	Exception 2	North York 19	Vaughan 19	Brampton 32	Brampton 22	Mississauga 20	Dp	Mississauga 21	Mississauga 21	Milton 24	Puslinch 39	Cambridge 26	Kitchener 26	Kitchener 27	Waterloo 27	Waterloo 27	Ar	
					York University	Keele St. @ Snidercroft Rd.	Bramalea GO	Hurontario St. @ Hwy. 407	Square One	Erin Mills Transitway	Winston Churchill Transitway	Regional Rd 25. @ Hwy. 401	Brock Rd. @ McLean Rd. (Aberfoyle)	Hespeler Rd. @ Pinebush Rd.	Sportsworld Dr. @ Hwy. 8	Kitchener Bus Terminal	Wilfrid Laurier University	University of Waterloo			
25	25051								05 40	05 48	05 53	06 13	06 30	06 47	06 54	07 10	07 20	07 30			
25C	25113								06 30	→	→	→	→	→	→	→	→	07 30	07 40		
25	25111								06 40	06 48	06 53	07 13	07 30	07 47	07 54	08 12	08 25	08 35			
25C	25231								07 30	→	→	→	→	→	→	→	→	08 35	08 45		
25	25171								07 40	07 48	07 53	08 13	08 30	08 47	08 54	09 12	09 25	09 35			
25	25221								08 40	08 48	08 53	09 13	09 30	09 47	09 54	10 12	10 25	10 35			
25	25271								09 40	09 48	09 53	10 13	10 30	10 47	10 54	11 12	11 25	11 35			
25	25301								10 40	10 48	10 53	11 13	11 30	11 47	11 54	12 10	12 20	12 30			
25	25341								11 40	11 48	11 53	12 13	12 30	12 47	12 54	13 10	13 20	13 30			
25C	25383	Th-Fri							12 30	→	→	→	→	→	→	→	→	13 30	13 40		
25F	25371	Fri			12 25	12 29	12 45	12 57	→	→	→	→	→	→	→	→	→	13 50	14 00		
25	25381								12 40	12 48	12 53	13 13	13 30	13 47	13 54	14 10	14 20	14 30			
25C	25423	Th-Fri							13 30	→	→	→	→	→	→	→	→	14 35	14 45		
25F	25411	Fri			13 25	13 29	13 45	13 57	→	→	→	→	→	→	→	→	→	14 55	15 05		
25	25421								13 40	13 48	13 53	14 13	14 30	14 47	14 54	15 12	15 25	15 35			
25C	25463	Th-Fri							14 30	→	→	→	→	→	→	→	→	15 35	15 45		
25F	25441	Fri			14 25	14 29	14 47	14 59	→	→	→	→	→	→	→	→	→	16 00	16 10		
25	25461								14 40	14 48	14 53	15 13	15 30	15 47	15 54	16 12	16 25	16 35			
25C	25523	Th-Fri							15 30	→	→	→	→	→	→	→	→	16 40	16 50		
25F	25551	Fri			15 25	15 29	15 47	15 59	→	→	→	→	→	→	→	→	→	17 05	17 15		
25	25521								15 40	15 48	15 53	16 15	16 35	16 52	16 59	17 22	17 35	17 45			
25C	25585	Th-Fri							16 30	→	→	→	→	→	→	→	→	17 45	17 55		
25F	25591	Fri	P		16 25	16 32	16 55	17 08	→	→	→	→	→	→	→	→	→	18 10	18 20		
25	25581								16 40	16 48	16 53	17 15	17 35	17 52	17 59	18 22	18 35	18 45			
25C	25645	Th-Fri							17 30	→	→	→	→	→	→	→	→	18 40	18 50		
25	25641								17 40	17 48	17 53	18 15	18 35	18 52	18 59	19 17	19 30	19 40			
25	25711								18 40	18 48	18 53	19 13	19 30	19 47	19 54	20 10	20 20	20 30			
25C	25725	Th-Fri							19 30	→	→	→	→	→	→	→	→	20 30	20 40		
25	25721								19 40	19 48	19 53	20 13	20 30	20 47	20 54	21 10	21 20	21 30			
25	25771								20 40	20 48	20 53	21 13	21 30	21 47	21 54	22 10	22 20	22 30			
25	25801								21 40	21 48	21 53	22 13	22 30	22 46	22 52	23 05	23 15	23 25			
25	25841								22 40	22 48	22 53	23 13	23 30	23 46	23 52	00 02	00 12	00 20			
25	25871								23 40	23 48	23 53	00 13	00 30	00 46	00 52	01 02	01 12	01 20			

**Saturday
Samedi**

EASTBOUND / EN DIRECTION EST

Route Number Nombre d'itinéraire	Trip Number N° du trajet	Zone →	Waterloo 27	Dp	Waterloo 27	Kitchener 27	Kitchener 26	Cambridge 26	Puslinch 39	Milton 24	Mississauga 21	Mississauga 21	Mississauga 20	Ar
			University of Waterloo		Wilfrid Laurier University	Kitchener Bus Terminal	Sportsworld Dr. @ Hwy. 8	Hespeler Rd. @ Pinebush Rd.	Brock Rd. @ McLean Rd. (Aberfoyle)	Regional Rd 25. @ Hwy. 401	Winston Churchill Transitway	Erin Mills Transitway	Square One	
25	25210	06 35	06 38	06 53	07 05	07 14	07 30	07 46	08 04	08 09	08 20			
25	25250	07 35	07 38	07 53	08 05	08 14	08 30	08 46	09 04	09 09	09 20			
25C	25292	08 30	08 33	→	→	→	→	→	→	→	09 40			
25	25290	08 30	08 33	08 50	09 02	09 11	09 30	09 46	10 04	10 09	10 20			
25C	25332	09 30	09 33	→	→	→	→	→	→	→	10 40			
25	25330	09 30	09 33	09 50	10 02	10 11	10 30	10 46	11 04	11 09	11 20			
25C	25372	10 30	10 33	→	→	→	→	→	→	→	11 40			
25	25370	10 30	10 33	10 50	11 02	11 11	11 30	11 46	12 04	12 09	12 20			
25C	25412	11 30	11 33	→	→	→	→	→	→	→	12 40			
25	25410	11 30	11 33	11 50	12 02	12 11	12 30	12 46	13 04	13 09	13 20			
25C	25452	12 30	12 33	→	→	→	→	→	→	→	13 40			
25	25450	12 30	12 33	12 50	13 02	13 11	13 30	13 46	14 04	14 09	14 20			
25C	25502	13 30	13 33	→	→	→	→	→	→	→	14 40			
25	25500	13 30	13 33	13 50	14 02	14 11	14 30	14 46	15 04	15 09	15 20			
25C	25562	14 30	14 33	→	→	→	→	→	→	→	15 40			
25	25560	14 30	14 33	14 50	15 02	15 11	15 30	15 46	16 04	16 09	16 20			
25C	25622	15 30	15 33	→	→	→	→	→	→	→	16 40			
25	25620	15 30	15 33	15 50	16 02	16 11	16 30	16 46	17 04	17 09	17 20			
25	25670	16 30	16 33	16 50	17 02	17 11	17 30	17 46	18 04	18 09	18 20			
25	25710	17 30	17 33	17 50	18 02	18 11	18 30	18 46	19 04	19 09	19 20			
25	25750	18 30	18 33	18 50	19 02	19 11	19 30	19 46	20 04	20 09	20 20			
25	25790	19 30	19 33	19 50	20 02	20 11	20 30	20 46	21 04	21 09	21 20			
25	25830	20 35	20 38	20 51	21 03	21 12	21 30	21 46	22 04	22 09	22 20			
25	25860	21 35	21 38	21 51	22 03	22 12	22 30	22 46	23 04	23 09	23 20			
25	25890	22 35	22 38	22 51	23 03	23 12	23 30	23 46	00 04	00 09	00 20			

**Saturday
Samedi**

WESTBOUND / EN DIRECTION OUEST

Route Number Nombre d'itinéraire	Trip Number N° du trajet	Zone →	Mississauga 20	Dp	Mississauga 21	Mississauga 21	Milton 24	Puslinch 39	Cambridge 26	Kitchener 26	Kitchener 27	Waterloo 27	Waterloo 27	Ar
			Square One		Erin Mills Transitway	Winston Churchill Transitway	Regional Rd 25. @ Hwy. 401	Brock Rd. @ McLean Rd. (Aberfoyle)	Hespeler Rd. @ Pinebush Rd.	Sportsworld Dr. @ Hwy. 8	Kitchener Bus Terminal	Wilfrid Laurier University	University of Waterloo	
25	25081	06 10	06 18	06 23	06 43	07 00	07 16	07 22	07 35	07 45	07 55			
25	25151	07 10	07 18	07 23	07 43	08 00	08 16	08 22	08 35	08 45	08 55			
25	25201	08 10	08 18	08 23	08 43	09 00	09 17	09 24	09 37	09 50	10 00			
25	25241	09 10	09 18	09 23	09 43	10 00	10 17	10 24	10 37	10 50	11 00			
25	25281	10 10	10 18	10 23	10 43	11 00	11 17	11 24	11 37	11 50	12 00			
25	25321	11 10	11 18	11 23	11 43	12 00	12 17	12 24	12 42	12 55	13 05			
25	25361	12 10	12 18	12 23	12 43	13 00	13 17	13 24	13 42	13 55	14 05			
25	25401	13 10	13 18	13 23	13 43	14 00	14 17	14 24	14 42	14 55	15 05			
25	25441	14 10	14 18	14 23	14 43	15 00	15 17	15 24	15 42	15 55	16 05			
25	25491	15 10	15 18	15 23	15 43	16 00	16 17	16 24	16 42	16 55	17 05			
25	25551	16 10	16 18	16 23	16 43	17 00	17 17	17 24	17 42	17 55	18 05			
25C	25583	16 40	→	→	→	→	→	→	→	→	17 40	17 50		
25	25611	17 10	17 18	17 23	17 43	18 00	18 17	18 24	18 42	18 55	19 05			
25C	25643	17 40	→	→	→	→	→	→	→	→	18 40	18 50		
25	25661	18 10	18 18	18 23	18 43	19 00	19 17	19 24	19 42	19 55	20 05			
25C	25683	18 40	→	→	→	→	→	→	→	→	19 40	19 50		
25	25701	19 10	19 18	19 23	19 43	20 00	20 17	20 24	20 42	20 55	21 05			
25	25741	20 10	20 18	20 23	20 43	21 00	21 17	21 24	21 37	21 50	22 00			
25	25781	21 10	21 18	21 23	21 43	22 00	22 16	22 22	22 35	22 45	22 55			
25	25841	22 10	22 18	22 23	22 43	23 00	22 16	23 22	23 35	23 45	23 55			
25	25851	23 10	23 18	23 23	23 43	24 00	00 16	00 22	00 35	00 45	00 55			
25	25901	00 10	00 18	00 23	00 43	01 00	01 16	01 22	01 35	01 45	01 55			

Sunday Dimanche																	
EASTBOUND / EN DIRECTION EST																	
Route Number Nombre d'itinéraire	Zone→	Waterloo 27 Dp	Waterloo 27	Kitchener 27	Kitchener 26	Cambridge 26	Puslinch 39	Milton 24	Mississauga 21	Mississauga 21	Mississauga 20	Brampton 22	Brampton 32	Vaughan 19	North York 19	Ar	
Trip Number N° du trajet	Exceptions	University of Waterloo	Wilfrid Laurier University	Kitchener Bus Terminal	Kitchener @ Hwy. 8	Hespeler Rd. @ Pinebush Rd.	Brock Rd. @ McLean Rd. (Aberfoyle)	Regional Rd 25. @ Hwy. 401	Winston Churchill Transitway	Winston Churchill Transitway	Erin Mills Transitway	Square One	Hurontario St. @ Hwy. 407	Bramalea GO	Keele St. @ Snidercroft Rd.	York University	
25	25210		06 35	06 38	06 53	07 05	07 14	07 30	07 46	08 04	08 09	08 20					
25	25250		07 35	07 38	07 53	08 05	08 14	08 30	08 46	09 04	09 09	09 20					
25	25290		08 30	08 33	08 50	09 02	09 11	09 30	09 46	10 04	10 09	10 20					
25	25330		09 30	09 33	09 50	10 02	10 11	10 30	10 46	11 04	11 09	11 20					
25	25370		10 30	10 33	10 50	11 02	11 11	11 30	11 46	12 04	12 09	12 20					
25	25410		11 30	11 33	11 50	12 02	12 11	12 30	12 46	13 04	13 09	13 20					
25	25450		12 30	12 33	12 50	13 02	13 11	13 30	13 46	14 04	14 09	14 20					
25	25500		13 30	13 33	13 50	14 02	14 11	14 30	14 46	15 04	15 09	15 20					
25	25560		14 30	14 33	14 50	15 02	15 11	15 30	15 46	16 04	16 09	16 20					
25C	25622		15 30	15 33	→	→	→	→	→	→	→	16 40					
25	25620		15 30	15 33	15 50	16 02	16 11	16 30	16 46	17 04	17 09	17 20					
25F	25668	P	15 45	15 48	→	→	→	→	→	→	→	→	16 53	17 02	17 16	17 25	
25C	25672	P	16 30	16 33	→	→	→	→	→	→	→	17 40					
25	25670		16 30	16 33	16 50	17 02	17 11	17 30	17 46	18 04	18 09	18 20					
25C	25712		17 30	17 33	→	→	→	→	→	→	→	18 40					
25	25710		17 30	17 33	17 50	18 02	18 11	18 30	18 46	19 04	19 09	19 20					
25F	25748		17 45	17 48	→	→	→	→	→	→	→	→	18 53	19 02	19 16	19 25	
25C	25754	P	18 20	18 23	→	→	→	→	→	→	→	19 30					
25	25750		18 30	18 33	18 50	19 02	19 11	19 30	19 46	20 04	20 09	20 20					
25C	25792		19 30	19 33	→	→	→	→	→	→	→	20 40					
25	25790		19 30	19 33	19 50	20 02	20 11	20 30	20 46	21 04	21 09	21 20					
25F	25828		19 50	19 53	→	→	→	→	→	→	→	→	20 56	21 05	21 19	21 25	
25C	25832	P	20 35	20 38	→	→	→	→	→	→	→	21 45					
25	25830		20 35	20 38	20 51	21 03	21 12	21 30	21 46	22 04	22 09	22 20					
25C	25862		21 35	21 38	→	→	→	→	→	→	→	22 45					
25	25860		21 35	21 38	21 51	22 03	22 12	22 30	22 46	23 04	23 09	23 20					
25F	25888		21 50	21 53	→	→	→	→	→	→	→	→	22 56	23 05	23 19	23 25	
25	25890	P	22 35	22 38	22 51	23 03	23 12	23 30	23 46	00 04	00 09	00 20					

Sunday Dimanche																
WESTBOUND / EN DIRECTION OUEST																
Route Number Nombre d'itinéraire	Zone→	North York 19 Dp	Vaughan 19	Brampton 32	Brampton 22	Mississauga 20 Dp	Mississauga 21	Mississauga 21	Milton 24	Puslinch 39	Cambridge 26	Kitchener 26	Kitchener 27	Waterloo 27	Waterloo 27	Ar
Trip Number N° du trajet	Exceptions	York University	Keele St. @ Snidercroft Rd.	Bramalea GO	Hurontario St. @ Hwy. 407	Square One	Erin Mills Transitway	Winston Churchill Transitway	Regional Rd 25. @ Hwy. 401	Brock Rd. @ McLean Rd. (Aberfoyle)	Hespeler Rd. @ Pinebush Rd.	Sportsworld Dr. @ Hwy. 8	Kitchener Bus Terminal	Wilfrid Laurier University	University of Waterloo	
25	25081					06 10	06 18	06 23	06 43	07 00	07 16	07 22	07 35	07 45	07 55	
25	25151					07 10	07 18	07 23	07 43	08 00	08 16	08 22	08 35	08 45	08 55	
25	25201					08 10	08 18	08 23	08 43	09 00	09 17	09 24	09 37	09 50	10 00	
25	25241					09 10	09 18	09 23	09 43	10 00	10 17	10 24	10 37	10 50	11 00	
25	25281					10 10	10 18	10 23	10 43	11 00	11 17	11 24	11 37	11 50	12 00	
25	25321					11 10	11 18	11 23	11 43	12 00	12 17	12 24	12 42	12 55	13 05	
25	25361					12 10	12 18	12 23	12 43	13 00	13 17	13 24	13 42	13 55	14 05	
25	25401					13 10	13 18	13 23	13 43	14 00	14 17	14 24	14 42	14 55	15 05	
25C	25423					13 40	→	→	→	→	→	→	→	14 40	14 50	
25F	25405	P	13 25	13 29	13 45	13 56	→	→	→	→	→	→	→	14 55	15 05	
25	25441					14 10	14 18	14 23	14 43	15 00	15 17	15 24	15 42	15 55	16 05	
25C	25463	P				14 40	→	→	→	→	→	→	→	15 40	15 50	
25	25491					15 10	15 18	15 23	15 43	16 00	16 17	16 24	16 42	16 55	17 05	
25C	25521					15 40	→	→	→	→	→	→	→	16 40	16 50	
25F	25505		15 25	15 29	15 45	15 56	→	→	→	→	→	→	→	16 55	17 05	
25	25551					16 10	16 18	16 23	16 43	17 00	17 17	17 24	17 42	17 55	18 05	
25C	25583	P				16 40	→	→	→	→	→	→	→	17 40	17 50	
25	25611					17 10	17 18	17 23	17 43	18 00	18 17	18 24	18 42	18 55	19 05	
25C	25643					17 40	→	→	→	→	→	→	→	18 40	18 50	
25F	25605		17 25	17 29	17 45	17 56	→	→	→	→	→	→	→	18 55	19 05	
25	25661					18 10	18 18	18 23	18 43	19 00	19 17	19 24	19 42	19 55	20 05	
25C	25683	P				18 40	→	→	→	→	→	→	→	19 40	19 50	
25	25701					19 10	19 18	19 23	19 43	20 00	20 17	20 24	20 42	20 55	21 05	
25C	25723					19 40	→	→	→	→	→	→	→	20 40	20 50	
25F	25705		19 25	19 29	19 45	19 56	→	→	→	→	→	→	→	20 55	21 05	
25	25741					20 10	20 18	20 23	20 43	21 00	21 17	21 24	21 37	21 50	22 00	
25C	25763	P				20 40	→	→	→	→	→	→	→	21 40	21 50	
25F	25755		20 25	20 29	20 45	20 56	→	→	→	→	→	→	→	21 55	22 05	
25	25781					21 10	21 18	21 23	21 43	22 00	22 16	22 22	22 35	22 45	22 55	
25	25841					22 10	22 18	22 23	22 43	23 00	23 16	23 22	23 35	23 45	23 55	
25	25851					23 10	23 18	23 23	23 43	24 00	00 16	00 22	00 35	00 45	00 55	

Load up your PRESTO card with these convenient self-serve options.



ADD-VALUE LOAD

Load funds to your card online anytime and for any amount.



AUTOLOAD

Set it and forget it with this online option. Your card automatically gets refilled when it nears empty.



SELF-SERVE RELOAD MACHINE

Available at Union Station and many TTC locations, these machines let you pay-as-you-go.

Utilisez ces options libre-service pour charger votre carte PRESTO.



AJOUT DE FONDS

Ajoutez des fonds (n'importe quel montant) à votre carte sur le Web à toute heure du jour.



CHARGEMENT AUTOMATIQUE

Configurez en ligne le chargement automatique, et vous n'aurez plus jamais d'inquiétudes au sujet du solde de votre carte. Des fonds s'ajoutent à votre carte automatiquement lorsque le solde s'approche de zéro.



BORNE DE RECHARGEMENT LIBRE-SERVICE

Ces bornes à la gare Union et dans de nombreux emplacements de la TTC vous permettent de payer vos déplacements au fur et à mesure.

For more information please visit gotransit.com/PRESTO

Pour plus de détails, visitez gotransit.com/cartePRESTO

29

Route number
Nombre d'itinéraire

Guelph/Mississauga



ALL GOOD TO GO

gotransit.com – Desktop and mobile website for everything you need to know about GO.

On The GO alerts – Customized service and delay updates sent right to your inbox. Sign up at gotransit.com/OnTheGO

PRESTO – Tap into convenience and savings with a PRESTO card. Get one at prestocard.ca

Triplinx – The official transit trip planner for the Greater Toronto & Hamilton area, at triplinx.ca

BON DÉPART EN TOUT TEMPS AVEC GO

gotransit.com – site Web accessible d'un ordinateur de bureau ou d'un appareil mobile fournissant tous les renseignements sur GO

Alertes On The GO – nouvelles personnalisées sur le service et les retards envoyées directement dans votre boîte de réception; inscrivez-vous sur gotransit.com/OnTheGOFR

PRESTO – économies et aspect pratique assurés avec une carte PRESTO; obtenez la vôtre sur prestocard.ca

Triplinx – planificateur de trajet de transport en commun officiel de la région du grand Toronto et de Hamilton, sur triplinx.ca

416 869 3200

1 888 GET ON GO (438 6646)

1 800 387 3652 TTY/ATS

gotransit.com/schedules

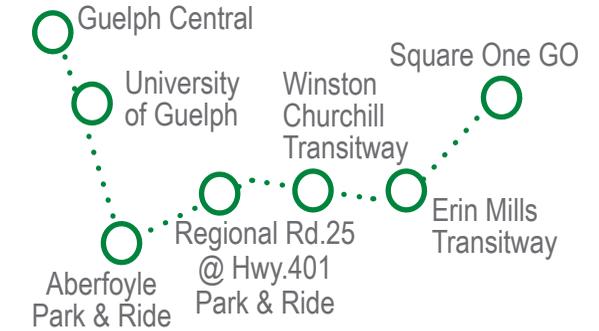


03-06-2017

Guelph/Mississauga

GO Bus Schedule

Horaire des autobus GO



Daily
Quotidiennement

GO Bus route 29
La route 29 d'autobus GO

Effective/ À partir de:

8 APRIL
AVRIL **2017**



METROLINX

How to read our schedules

Step 1

Find the station or terminal you are departing from. Stops are listed across the top in the order they are served.

Step 2

The top of the schedule tells you what day the schedule is for and the direction of travel.

Step 3

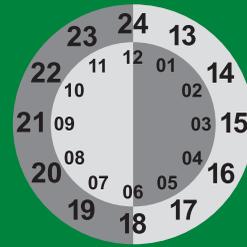
Look across the rows for available departure times.

Step 4

Not all trains or buses stop at every station. If you see → the train or bus will not stop at that station.

Schedule times shown in 24-hour clock

Midnight to noon
00 01 - 12 00
Noon to midnight
12 01 - 24 00



Legend

 Bus trips



GO Bus service is accessible to passengers using mobility devices at this location.



Parking available.

For the latest schedule information and updates, please visit gotransit.com/schedules.

Comment lire nos horaires

Étape 1

Trouvez votre gare ou terminus de départ. La liste des arrêts est donnée en haut dans l'ordre dans lequel ils sont desservis.

Étape 2

Le coin supérieur gauche vous indique le jour pour lequel l'horaire est donné et la direction de circulation.

Étape 3

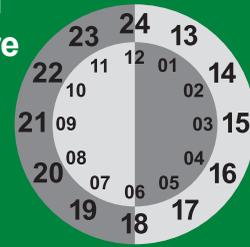
Regardez dans les rangées pour obtenir les heures de départ offertes.

Étape 4

Les trains ou les autobus ne s'arrêtent pas tous à chaque gare. Si vous voyez le symbole → le train ou l'autobus ne s'arrêtera pas à cette gare.

Indications selon un système horaire de 24 heures

De minuit à midi:
00 01 - 12 00
De midi à minuit:
12 01 - 24 00



Légende

 Horaire des autobus



Service d'autobus GO accessible aux personnes utilisant des aides à la mobilité à cet endroit.



Stationnement disponible.

Pour consulter les horaires les plus récents et les mises à jour, veuillez visiter gotransit.com/schedules.

Notes

L Trip does not operate starting April 23, 2017.

Bicycles

1. Bicycles are not allowed in Union Station or on-board eastbound trains during morning rush hour (6:30-9:30) and westbound trains during evening rush hour (15:30-18:30).

2. Foldable bicycles are allowed on-board trains at all times.

Notes

L Le trajet ne sera plus offert à compter du 23 avril 2017.

Vélos

1. Les vélos ne sont pas permis à la gare Union ou dans les trains en direction est durant les heures de pointe du matin (entre 6 h 30 et 9 h 30) et dans les trains en direction ouest durant les heures de pointe de la soirée (entre 15 h 30 et 18 h 30).

2. Les vélos pliables sont permis à bord des trains en tout temps.

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

EASTBOUND / EN DIRECTION EST

Route Number Nombre d'itinéraire	Zone →							
	Trip Number N° du trajet	Guelph 39	Guelph 39	Puslinch 39	Milton 24	Mississauga 21	Mississauga 21	Mississauga 20
29	29050	05 15	05 25	05 40	05 56	06 15	06 20	06 35
29	29080	06 15	06 25	06 40	06 56	07 15	07 20	07 35
29	29220	07 10	07 20	07 35	07 51	08 12	08 17	08 35
29	29350	08 10	08 20	08 35	08 51	09 12	09 17	09 35
29	29430	10 20	10 30	10 45	11 01	11 20	11 25	11 35
29	29450	11 15	11 30	11 45	12 01	12 20	12 25	12 35
29	29490	12 15	12 30	12 45	13 01	13 20	13 25	13 35
29	29520	13 15	13 30	13 45	14 01	14 20	14 25	14 35
29	29550	14 15	14 30	14 45	15 01	15 20	15 25	15 35
29	29600	15 10	15 25	15 40	15 56	16 15	16 20	16 35
29	29660	16 10	16 25	16 40	16 56	17 15	17 20	17 35
29	29720	17 10	17 25	17 40	17 56	18 15	18 20	18 35
29	29780	18 10	18 25	18 40	18 56	19 15	19 20	19 35
29	29830	20 15	20 25	20 40	20 56	21 15	21 20	21 35

WESTBOUND / EN DIRECTION OUEST

Route Number Nombre d'itinéraire	Zone →								
	Trip Number N° du trajet	Exception 1	Square One	Erin Mills Transitway	Winston Churchill Transitway	Regional Rd. 25 @ Hwy. 401	Brock Rd. @ McLean Rd. (Aberfoyle)	University of Guelph	Guelph 39
29	29031		07 20	07 28	07 33	07 53	08 10	08 25	08 40
29	29061	L	07 50	07 58	08 03	08 23	08 40	08 55	09 10
29	29091		08 20	08 28	08 33	08 53	09 10	09 25	09 40
29	29131		09 20	09 28	09 33	09 53	10 10	10 25	10 35
29	29171		10 20	10 28	10 33	10 53	11 10	11 25	11 35
29	29211		11 20	11 28	11 33	11 53	12 10	12 25	12 35
29	29271		13 20	13 28	13 33	13 53	14 10	14 25	14 35
29	29361		15 20	15 28	15 33	15 55	16 15	16 30	16 40
29	29471		16 20	16 28	16 33	16 55	17 15	17 35	17 45
29	29591		17 20	17 28	17 33	17 55	18 15	18 35	18 45
29	29721		18 20	18 28	18 33	18 55	19 15	19 30	19 40
29	29841		19 20	19 28	19 33	19 53	20 10	20 25	20 35
29	29861		20 20	20 28	20 33	20 53	21 10	21 25	21 35
29	29911		22 20	22 28	22 33	22 53	23 10	23 25	23 35

Saturday and Sunday
Samedi et dimanche

EASTBOUND / EN DIRECTION EST

Route Number Nombre d'itinéraire	Zone →							
	Trip Number N° du trajet	Guelph 39	Guelph 39	Puslinch 39	Milton 24	Mississauga 21	Winston Churchill Transitway	Erin Mills Transitway
29	29190	06 50	07 00	07 15	07 31	07 49	07 54	08 05
29	29240	07 50	08 00	08 15	08 31	08 49	08 54	09 05
29	29280	08 50	09 00	09 15	09 31	09 49	09 54	10 05
29	29320	09 45	10 00	10 15	10 31	10 49	10 54	11 05
29	29360	10 45	11 00	11 15	11 31	11 49	11 54	12 05
29	29400	11 45	12 00	12 15	12 31	12 49	12 54	13 05
29	29440	12 45	13 00	13 15	13 31	13 49	13 54	14 05
29	29480	13 45	14 00	14 15	14 31	14 49	14 54	15 05
29	29540	14 45	15 00	15 15	15 31	15 49	15 54	16 05
29	29600	15 45	16 00	16 15	16 31	16 49	16 54	17 05
29	29660	16 45	17 00	17 15	17 31	17 49	17 54	18 05
29	29700	17 45	18 00	18 15	18 31	18 49	18 54	19 05
29	29740	18 50	19 00	19 15	19 31	19 49	19 54	20 05
29	29780	19 50	20 00	20 15	20 31	20 49	20 54	21 05
29	29820	20 50	21 00	21 15	21 31	21 49	21 54	22 05
29	29850	21 50	22 00	22 15	22 31	22 49	22 54	23 05

WESTBOUND / EN DIRECTION OUEST

Route Number Nombre d'itinéraire	Zone →							
	Trip Number N° du trajet	Square One	Erin Mills Transitway	Winston Churchill Transitway	Milton 24	Regional Rd. 25 @ Hwy. 401	Brock Rd. @ McLean Rd. (Aberfoyle)	University of Guelph
29	29211	08 25	08 33	08 38	08 58	09 15	09 30	09 40
29	29251	09 25	09 33	09 38	09 58	10 15	10 30	10 40
29	29291	10 25	10 33	10 38	10 58	11 15	11 30	11 40
29	29331	11 25	11 33	11 38	11 58	12 15	12 30	12 40
29	29371	12 25	12 33	12 38	12 58	13 15	13 30	13 40
29	29411	13 25	13 33	13 38	13 58	14 15	14 30	14 40
29	29451	14 25	14 33	14 38	14 58	15 15	15 30	15 40
29	29501	15 25	15 33	15 38	15 58	16 15	16 30	16 40
29	29561	16 25	16 33	16 38	16 58	17 15	17 30	17 40
29	29621	17 25	17 33	17 38	17 58	18 15	18 30	18 40
29	29671	18 25	18 33	18 38	18 58	19 15	19 30	19 40
29	29711	19 25	19 33	19 38	19 58	20 15	20 30	20 40
29	29751	20 25	20 33	20 38	20 58	21 15	21 30	21 40
29	29791	21 25	21 33	21 38	21 58	22 15	22 30	22 40
29	29831	22 25	22 33	22 38	22 58	23 15	23 30	23 40
29	29861	23 25	23 33	23 38	23 58	00 15	00 30	00 40

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AUTOLOAD

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SELF-SERVE RELOAD MACHINE

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AJOUT DE FONDS

Ajoutez des fonds (n'importe quel montant) à votre carte sur le Web à toute heure du jour.



CHARGEMENT AUTOMATIQUE

Configurez en ligne le chargement automatique, et vous n'aurez plus jamais d'inquiétudes au sujet du solde de votre carte. Des fonds s'ajoutent à votre carte automatiquement lorsque le solde s'approche de zéro.



BORNE DE RECHARGEMENT LIBRE-SERVICE

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Pour plus de détails, visitez gotransit.com/cartePRESTO

**REGIONAL ROAD 25 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT TRANSPORTATION
PLANNING REPORT**

Appendix B – Traffic Data
January 2, 2019

Appendix B – TRAFFIC DATA

Steeles Ave E @ Martin St

Morning Peak Diagram

Specified Period

From: 5:30:00
To: 10:00:00

One Hour Peak

From: 7:45:00
To: 8:45:00

Municipality: Halton Region
Site #: 0000002920
Intersection: Steeles Ave E & Martin St
TFR File #: 7
Count date: 1-Nov-2016

Weather conditions:
Clear/Dry
Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Steeles Ave E runs W/E

North Leg Total: 2316
North Entering: 1234
North Peds: 1
Peds Cross: \bowtie

Heavys	27	3	48	78
Trucks	4	7	6	17
Cars	333	383	423	1139
Totals	364	393	477	



Heavys	57
Trucks	11
Cars	1014
Totals	1082

East Leg Total: 1820
East Entering: 780
East Peds: 3
Peds Cross: \bowtie

Heavys	Trucks	Cars	Totals
50	11	573	634

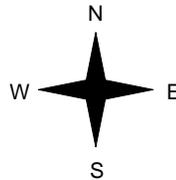


Martin St

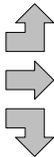
Cars	Trucks	Heavys	Totals
462	8	42	512
201	7	20	228
40	0	0	40
703	15	62	



Steeles Ave E



Heavys	Trucks	Cars	Totals
10	2	296	308
15	7	455	477
2	0	26	28
27	9	777	



Steeles Ave E



Cars	Trucks	Heavys	Totals
961	15	64	1040

Peds Cross: \bowtie
West Peds: 3
West Entering: 813
West Leg Total: 1447

Cars	449	Cars	39	256	83	378
Trucks	7	Trucks	0	1	2	3
Heavys	5	Heavys	3	5	1	9
Totals	461	Totals	42	262	86	



Peds Cross: \bowtie
South Peds: 0
South Entering: 390
South Leg Total: 851

Comments

Steeles Ave E @ Martin St

Mid-day Peak Diagram

Specified Period

From: 12:00:00

To: 14:00:00

One Hour Peak

From: 12:00:00

To: 13:00:00

Municipality: Halton Region
Site #: 0000002920
Intersection: Steeles Ave E & Martin St
TFR File #: 7
Count date: 1-Nov-2016

Weather conditions:
 Clear/Dry
Person(s) who counted:
 Cam

**** Signalized Intersection ****

Major Road: Steeles Ave E runs W/E

North Leg Total: 2095
 North Entering: 1054
 North Peds: 0
 Peds Cross: \times

Heavys	35	1	53	89
Trucks	8	3	13	24
Cars	248	314	379	941
Totals	291	318	445	



Heavys	65
Trucks	27
Cars	949
Totals	1041

East Leg Total: 1621
 East Entering: 831
 East Peds: 0
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
47	17	483	547

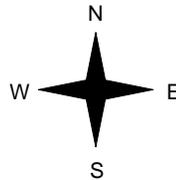


Martin St

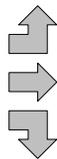
Cars	Trucks	Heavys	Totals
475	14	48	537
207	8	10	225
69	0	0	69
751	22	58	



Steeles Ave E



Heavys	Trucks	Cars	Totals
15	12	224	251
17	4	251	272
1	1	37	39
33	17	512	



Steeles Ave E



Peds Cross: \times
 West Peds: 1
 West Entering: 562
 West Leg Total: 1109

Cars	420	Cars	28	250	69	347
Trucks	4	Trucks	1	1	1	3
Heavys	2	Heavys	2	2	3	7
Totals	426	Totals	31	253	73	



Martin St



Peds Cross: \times
 South Peds: 0
 South Entering: 357
 South Leg Total: 783

Comments

Steeles Ave E @ Martin St

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 22:00:00

One Hour Peak

From: 16:30:00

To: 17:30:00

Municipality: Halton Region
Site #: 0000002920
Intersection: Steeles Ave E & Martin St
TFR File #: 7
Count date: 1-Nov-2016

Weather conditions:
Clear/Dry
Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Steeles Ave E runs W/E

North Leg Total: 2711
 North Entering: 1471
 North Peds: 5
 Peds Cross: \bowtie

Heavys	11	2	29	42
Trucks	3	2	8	13
Cars	554	424	438	1416
Totals	568	428	475	



Heavys	38
Trucks	15
Cars	1187
Totals	1240

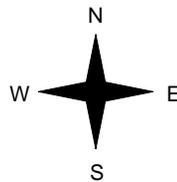
East Leg Total: 2028
 East Entering: 1149
 East Peds: 2
 Peds Cross: \bowtie

Heavys	Trucks	Cars	Totals
23	11	1020	1054



Steeles Ave E

Heavys	Trucks	Cars	Totals
11	8	261	280
8	3	325	336
0	0	48	48
19	11	634	



Martin St



Cars	Trucks	Heavys	Totals
589	5	26	620
395	8	12	415
113	1	0	114
1097	14	38	

Steeles Ave E



Cars	Trucks	Heavys	Totals
830	11	38	879

Peds Cross: \bowtie
 West Peds: 8
 West Entering: 664
 West Leg Total: 1718

Cars	585	Cars	71	337	67	475
Trucks	3	Trucks	0	2	0	2
Heavys	2	Heavys	0	1	1	2
Totals	590	Totals	71	340	68	



Peds Cross: \bowtie
 South Peds: 1
 South Entering: 479
 South Leg Total: 1069

Comments

Steeles Ave E @ Martin St

Total Count Diagram

Municipality: Halton Region
Site #: 0000002920
Intersection: Steeles Ave E & Martin St
TFR File #: 7
Count date: 1-Nov-2016

Weather conditions:
 Clear/Dry
Person(s) who counted:
 Cam

**** Signalized Intersection ****

Major Road: Steeles Ave E runs W/E

North Leg Total: 26168
 North Entering: 13697
 North Peds: 19
 Peds Cross: \bowtie

Heavys	216	15	435	666
Trucks	55	18	87	160
Cars	4398	3773	4700	12871
Totals	4669	3806	5222	

Heavys	611
Trucks	170
Cars	11690
Totals	12471

East Leg Total: 19180
 East Entering: 9830
 East Peds: 29
 Peds Cross: \bowtie

Heavys	Trucks	Cars	Totals
387	125	7885	8397

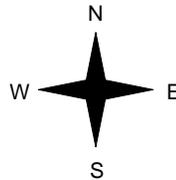


Martin St

Cars	Trucks	Heavys	Totals
5211	91	464	5766
3053	66	154	3273
784	3	4	791
9048	160	622	



Steeles Ave E



Heavys	Trucks	Cars	Totals
127	60	3257	3444
141	41	3145	3327
8	1	392	401
276	102	6794	



Martin St



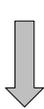
Steeles Ave E



Cars	Trucks	Heavys	Totals
8628	138	584	9350

Peds Cross: \bowtie
 West Peds: 49
 West Entering: 7172
 West Leg Total: 15569

Cars	4949
Trucks	22
Heavys	27
Totals	4998



Cars	434	3222	783	4439
Trucks	4	19	10	33
Heavys	17	20	8	45
Totals	455	3261	801	

Peds Cross: \bowtie
 South Peds: 12
 South Entering: 4517
 South Leg Total: 9515

Comments

Martin St @ Market 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 #: 0000002583
Intersection: Martin St & Market Dr
TFR File #: 2
Count date: 19-Oct-2015

Weather conditions:
Sunny/Dry
Person(s) who counted:
Teresa
Ela M

**** Signalized Intersection ****

Major Road: Martin St runs N/S

North Leg Total: 3608
 North Entering: 1796
 North Peds: 0
 Peds Cross: \times

Heavys	19	59	78
Trucks	10	31	41
Cars	282	1395	1677
Totals	311	1485	



Heavys	78
Trucks	51
Cars	1683
Totals	1812

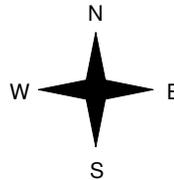
Heavys	Trucks	Cars	Totals
23	17	419	459



Martin St



Market Dr



Heavys	Trucks	Cars	Totals
28	19	317	364
10	5	82	97
38	24	399	



Martin St

Peds Cross: \times
 West Peds: 3
 West Entering: 461
 West Leg Total: 920

Cars	1477
Trucks	36
Heavys	69
Totals	1582



Cars	137	1366	1503
Trucks	7	32	39
Heavys	4	50	54
Totals	148	1448	

Peds Cross: \times
 South Peds: 0
 South Entering: 1596
 South Leg Total: 3178

Comments

Martin St @ Market Dr

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 11:45:00

To: 12:45:00

Municipality: Halton Region
Site #: 0000002583
Intersection: Martin St & Market Dr
TFR File #: 2
Count date: 19-Oct-2015

Weather conditions:

Sunny/Dry

Person(s) who counted:

Teresa

Ela M

** Signalized Intersection **

Major Road: Martin St runs N/S

North Leg Total: 2431
 North Entering: 1316
 North Peds: 0
 Peds Cross: \times

Heavys	33	153	186
Trucks	12	53	65
Cars	176	889	1065
Totals	221	1095	



Heavys	117
Trucks	59
Cars	939
Totals	1115

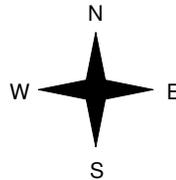
Heavys	Trucks	Cars	Totals
49	22	434	505



Martin St



Market Dr



Heavys	Trucks	Cars	Totals
27	19	274	320
12	5	168	185
39	24	442	



Martin St



Peds Cross: \times
 West Peds: 10
 West Entering: 505
 West Leg Total: 1010

Cars	1057
Trucks	58
Heavys	165
Totals	1280



Cars	258	665	923
Trucks	10	40	50
Heavys	16	90	106
Totals	284	795	

Peds Cross: \times
 South Peds: 0
 South Entering: 1079
 South Leg Total: 2359

Comments

Martin St @ Market Dr

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:15:00

To: 17:15:00

Municipality: Halton Region
Site #: 0000002583
Intersection: Martin St & Market Dr
TFR File #: 2
Count date: 19-Oct-2015

Weather conditions:

Sunny/Dry

Person(s) who counted:

Teresa

Ela M

** Signalized Intersection **

Major Road: Martin St runs N/S

North Leg Total: 3871
 North Entering: 2012
 North Peds: 0
 Peds Cross: ∇

Heavys	21	53	74
Trucks	3	27	30
Cars	233	1675	1908
Totals	257	1755	



Heavys	80
Trucks	38
Cars	1741
Totals	1859

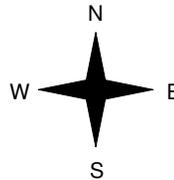
Heavys	Trucks	Cars	Totals
27	4	442	473



Martin St



Market Dr



Heavys	Trucks	Cars	Totals
30	12	373	415
4	4	131	139
34	16	504	



Martin St

Peds Cross: ∇
 West Peds: 7
 West Entering: 554
 West Leg Total: 1027

Cars	1806
Trucks	31
Heavys	57
Totals	1894



Cars	209	1368	1577
Trucks	1	26	27
Heavys	6	50	56
Totals	216	1444	

Peds Cross: ∇
 South Peds: 0
 South Entering: 1660
 South Leg Total: 3554

Comments

Martin St @ Market Dr

Total Count Diagram

Municipality: Halton Region
Site #: 0000002583
Intersection: Martin St & Market Dr
TFR File #: 2
Count date: 19-Oct-2015

Weather conditions:
 Sunny/Dry
Person(s) who counted:
 Teresa
 Ela M

**** Signalized Intersection ****

Major Road: Martin St runs N/S

North Leg Total: 23455
 North Entering: 11976
 North Peds: 1
 Peds Cross: ∇

Heavys	257	670	927
Trucks	71	278	349
Cars	1668	9032	10700
Totals	1996	9980	



Heavys	793
Trucks	424
Cars	10262
Totals	11479

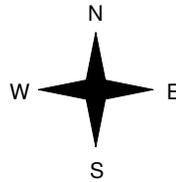
Heavys	Trucks	Cars	Totals
317	122	3201	3640



Martin St



Market Dr



Heavys	Trucks	Cars	Totals
249	131	2575	2955
66	49	1030	1145
315	180	3605	



Martin St



Peds Cross: ∇
 West Peds: 34
 West Entering: 4100
 West Leg Total: 7740

Cars	10062
Trucks	327
Heavys	736
Totals	11125



Cars	1533	7687	9220
Trucks	51	293	344
Heavys	60	544	604
Totals	1644	8524	

Peds Cross: ∇
 South Peds: 0
 South Entering: 10168
 South Leg Total: 21293

Comments

Martin St @ Chisholm Dr

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:00:00

To: 8:00:00

Municipality: Halton Region
Site #: 0000002584
Intersection: Martin St & Chisholm Dr
TFR File #: 2
Count date: 15-Jun-2015

Weather conditions:
 Cloudy
Person(s) who counted:
 Leszek
 Radek

**** Signalized Intersection ****

Major Road: Martin St runs N/S

North Leg Total: 2562
 North Entering: 1429
 North Peds: 0
 Peds Cross: \times

Heavys	24	74	0	98
Trucks	7	18	4	29
Cars	145	1072	85	1302
Totals	176	1164	89	



Heavys	98
Trucks	34
Cars	1001
Totals	1133

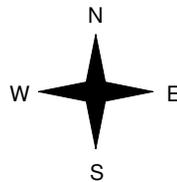
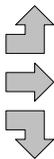
East Leg Total: 176
 East Entering: 32
 East Peds: 6
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
30	12	215	257



Chisholm Dr

Heavys	Trucks	Cars	Totals
19	1	59	79
0	1	6	7
8	3	29	40
27	5	94	



Martin St

Cars	Trucks	Heavys	Totals
13	5	0	18
0	0	0	0
13	1	0	14
26	6	0	

Driveway



Cars	Trucks	Heavys	Totals
137	7	0	144

Peds Cross: \times
 West Peds: 1
 West Entering: 126
 West Leg Total: 383

Cars	1114
Trucks	22
Heavys	82
Totals	1218



Cars	70	929	46	1045
Trucks	5	28	2	35
Heavys	6	79	0	85
Totals	81	1036	48	

Peds Cross: \times
 South Peds: 2
 South Entering: 1165
 South Leg Total: 2383

Comments

Martin St @ Chisholm Dr

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 12:00:00

To: 13:00:00

Municipality: Halton Region
Site #: 0000002584
Intersection: Martin St & Chisholm Dr
TFR File #: 2
Count date: 15-Jun-2015

Weather conditions:

Cloudy

Person(s) who counted:

Leszek

Radek

** Signalized Intersection **

Major Road: Martin St runs N/S

North Leg Total: 1994
 North Entering: 996
 North Peds: 0
 Peds Cross: \times

Heavys	36	87	1	124
Trucks	6	30	0	36
Cars	60	747	29	836
Totals	102	864	30	



Heavys	120
Trucks	47
Cars	831
Totals	998

East Leg Total: 127
 East Entering: 42
 East Peds: 1
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
46	7	153	206

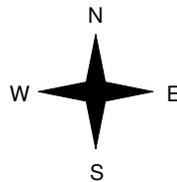


Martin St

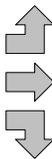
Cars	Trucks	Heavys	Totals
12	1	3	16
0	0	0	0
25	1	0	26
37	2	3	



Chisholm Dr



Heavys	Trucks	Cars	Totals
35	4	52	91
0	0	5	5
3	3	79	85
38	7	136	



Martin St



Driveway



Cars	Trucks	Heavys	Totals
83	1	1	85

Peds Cross: \times
 West Peds: 0
 West Entering: 181
 West Leg Total: 387

Cars	851	Cars	93	767	49	909
Trucks	34	Trucks	1	42	1	44
Heavys	90	Heavys	10	82	0	92
Totals	975	Totals	104	891	50	



Peds Cross: \times
 South Peds: 1
 South Entering: 1045
 South Leg Total: 2020

Comments

Martin St @ Chisholm Dr

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:30:00

To: 17:30:00

Municipality: Halton Region
Site #: 0000002584
Intersection: Martin St & Chisholm Dr
TFR File #: 2
Count date: 15-Jun-2015

Weather conditions:

Cloudy

Person(s) who counted:

Leszek

Radek

** Signalized Intersection **

Major Road: Martin St runs N/S

North Leg Total: 2896
 North Entering: 1489
 North Peds: 2
 Peds Cross: \times

Heavys	25	47	0	72
Trucks	2	21	4	27
Cars	74	1278	38	1390
Totals	101	1346	42	



Heavys	52
Trucks	25
Cars	1330
Totals	1407

East Leg Total: 200
 East Entering: 101
 East Peds: 1
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
31	3	121	155

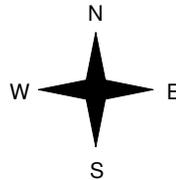


Martin St

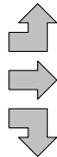
Cars	Trucks	Heavys	Totals
45	0	0	45
5	0	0	5
47	4	0	51
97	4	0	



Chisholm Dr



Heavys	Trucks	Cars	Totals
16	2	133	151
0	0	6	6
6	0	69	75
22	2	208	



Driveway



Cars	Trucks	Heavys	Totals
92	7	0	99

Martin St



Peds Cross: \times
 West Peds: 3
 West Entering: 232
 West Leg Total: 387

Cars	1394	Cars	42	1152	48	1242
Trucks	25	Trucks	1	23	3	27
Heavys	53	Heavys	6	36	0	42
Totals	1472	Totals	49	1211	51	



Peds Cross: \times
 South Peds: 1
 South Entering: 1311
 South Leg Total: 2783

Comments

Martin St @ Chisholm Dr

Total Count Diagram

Municipality: Halton Region
Site #: 0000002584
Intersection: Martin St & Chisholm Dr
TFR File #: 2
Count date: 15-Jun-2015

Weather conditions:
 Cloudy
Person(s) who counted:
 Leszek
 Radek

**** Signalized Intersection ****

Major Road: Martin St runs N/S

North Leg Total: 18437
 North Entering: 9513
 North Peds: 3
 Peds Cross: \bowtie

Heavys	183	622	7	812
Trucks	45	223	10	278
Cars	639	7487	297	8423
Totals	867	8332	314	



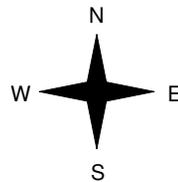
Heavys	756
Trucks	328
Cars	7840
Totals	8924

East Leg Total: 1195
 East Entering: 544
 East Peds: 22
 Peds Cross: \bowtie

Heavys	Trucks	Cars	Totals
242	70	1112	1424



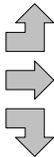
Chisholm Dr



Cars	Trucks	Heavys	Totals
237	16	4	257
19	2	1	22
252	13	0	265
508	31	5	



Heavys	Trucks	Cars	Totals
190	26	602	818
0	2	31	33
52	19	365	436
242	47	998	



Driveway



Martin St



Cars	Trucks	Heavys	Totals
620	23	8	651

Peds Cross: \bowtie
 West Peds: 10
 West Entering: 1287
 West Leg Total: 2711

Cars	8104	Cars	454	7001	292	7747
Trucks	255	Trucks	23	286	11	320
Heavys	674	Heavys	58	562	1	621
Totals	9033	Totals	535	7849	304	



Peds Cross: \bowtie
 South Peds: 19
 South Entering: 8688
 South Leg Total: 17721

Comments

Martin St @ Hwy 401 EB Off Ramp

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:00:00

To: 8:00:00

Municipality: Milton
Site #: 1028030100
Intersection: Martin St & Hwy 401 Off Ramp
TFR File #: 3
Count date: 8-Oct-2013

Weather conditions:
 Clear/Dry
Person(s) who counted:
 Leszek

**** Signalized Intersection ****

Major Road: Martin St runs N/S

North Leg Total: 1841
 North Entering: 868
 North Peds: 0
 Peds Cross: \times

Heavys	0	61	2	63
Trucks	0	23	1	24
Cars	0	744	37	781
Totals	0	828	40	



Heavys	66
Trucks	22
Cars	885
Totals	973

East Leg Total: 180
 East Entering: 59
 East Peds: 8
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
0	0	0	0

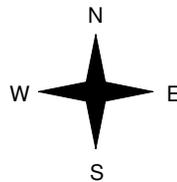


Martin St

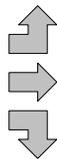
Cars	Trucks	Heavys	Totals
25	2	2	29
0	0	0	0
27	2	1	30
52	4	3	



Hwy 401 Off Ramp



Heavys	Trucks	Cars	Totals
16	4	152	172
3	0	14	17
37	6	596	639
56	10	762	



Martin St



Car Pool



Cars	Trucks	Heavys	Totals
113	3	5	121

Peds Cross: \times
 West Peds: 1
 West Entering: 828
 West Leg Total: 828

Cars	1367	Cars	0	708	62	770
Trucks	31	Trucks	0	16	2	18
Heavys	99	Heavys	0	48	0	48
Totals	1497	Totals	0	772	64	



Peds Cross: \times
 South Peds: 1
 South Entering: 836
 South Leg Total: 2333

Comments

Martin St @ Hwy 401 EB Off Ramp

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 13:00:00

To: 14:00:00

Municipality: Milton
Site #: 1028030100
Intersection: Martin St & Hwy 401 Off Ramp
TFR File #: 3
Count date: 8-Oct-2013

Weather conditions:
 Clear/Dry
Person(s) who counted:
 Leszek

**** Signalized Intersection ****

Major Road: Martin St runs N/S

North Leg Total: 1500
 North Entering: 762
 North Peds: 0
 Peds Cross: \times

Heavys	0	88	2	90
Trucks	0	29	0	29
Cars	0	632	11	643
Totals	0	749	13	



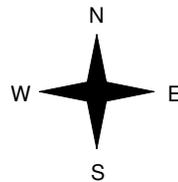
Heavys	108
Trucks	31
Cars	599
Totals	738

East Leg Total: 38
 East Entering: 9
 East Peds: 4
 Peds Cross: \times

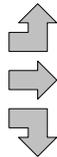
Heavys	Trucks	Cars	Totals
0	0	0	0



Hwy 401 Off Ramp



Heavys	Trucks	Cars	Totals
20	5	51	76
2	0	5	7
55	13	215	283
77	18	271	



Martin St



Cars	Trucks	Heavys	Totals
3	0	2	5
0	0	0	0
4	0	0	4
7	0	2	



Car Pool



Cars	Trucks	Heavys	Totals
24	0	5	29

Peds Cross: \times
 West Peds: 0
 West Entering: 366
 West Leg Total: 366

Cars	851
Trucks	42
Heavys	143
Totals	1036



Cars	0	545	8	553
Trucks	0	26	0	26
Heavys	0	86	1	87
Totals	0	657	9	

Peds Cross: \times
 South Peds: 2
 South Entering: 666
 South Leg Total: 1702

Comments

Martin St @ Hwy 401 EB Off Ramp

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 15:45:00

To: 16:45:00

Municipality: Milton
Site #: 1028030100
Intersection: Martin St & Hwy 401 Off Ramp
TFR File #: 3
Count date: 8-Oct-2013

Weather conditions:

Clear/Dry

Person(s) who counted:

Leszek

** Signalized Intersection **

Major Road: Martin St runs N/S

North Leg Total: 2012

North Entering: 973

North Peds: 0

Peds Cross: \times

Heavys	0	55	3	58
Trucks	0	12	2	14
Cars	0	882	19	901
Totals	0	949	24	



Heavys 90

Trucks 32

Cars 917

Totals 1039

East Leg Total: 96

East Entering: 44

East Peds: 6

Peds Cross: \times

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

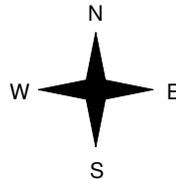


Martin St

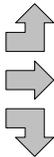
Cars	12	2	1	15
Trucks	0	0	0	0
Heavys	28	1	0	29
Totals	40	3	1	



Hwy 401 Off Ramp



Heavys	31	7	52	90
Trucks	1	0	11	12
Cars	33	13	303	349
Totals	65	20	366	



Martin St

Car Pool



Cars	45	3	4	52
Trucks				
Heavys				
Totals	45	3	4	52

Peds Cross: \times

West Peds: 0

West Entering: 451

West Leg Total: 451

Cars	1213	Cars	0	853	15	868
Trucks	26	Trucks	0	23	1	24
Heavys	88	Heavys	0	58	0	58
Totals	1327	Totals	0	934	16	



Peds Cross: \times

South Peds: 0

South Entering: 950

South Leg Total: 2277

Comments

Martin St @ Hwy 401 EB Off Ramp

Total Count Diagram

Municipality: Milton
Site #: 1028030100
Intersection: Martin St & Hwy 401 Off Ramp
TFR File #: 3
Count date: 8-Oct-2013

Weather conditions:
 Clear/Dry
Person(s) who counted:
 Leszek

**** Signalized Intersection ****

Major Road: Martin St runs N/S

North Leg Total: 13367
 North Entering: 6427
 North Peds: 1
 Peds Cross: \times

Heavys	0	512	19	531
Trucks	0	171	6	177
Cars	0	5557	162	5719
Totals	0	6240	187	



Heavys	745
Trucks	222
Cars	5973
Totals	6940

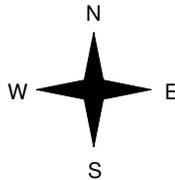
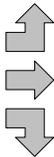
East Leg Total: 726
 East Entering: 276
 East Peds: 43
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
0	0	0	0



Hwy 401 Off Ramp

Heavys	Trucks	Cars	Totals
185	30	568	783
16	1	72	89
350	65	2526	2941
551	96	3166	



Martin St

Cars	Trucks	Heavys	Totals
80	6	17	103
0	0	0	0
167	5	1	173
247	11	18	

Car Pool



Cars	Trucks	Heavys	Totals
400	13	37	450

Peds Cross: \times
 West Peds: 6
 West Entering: 3813
 West Leg Total: 3813

Cars	8250	Cars	0	5325	166	5491
Trucks	241	Trucks	0	186	6	192
Heavys	863	Heavys	0	543	2	545
Totals	9354	Totals	0	6054	174	



Peds Cross: \times
 South Peds: 9
 South Entering: 6228
 South Leg Total: 15582

Comments

Martin St @ Hwy 401 WB Off Ramp

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: Milton
Site #: 1028060100
Intersection: Martin St & Hwy 401 WB Off Ramp
TFR File #: 4
Count date: 9-Oct-2013

Weather conditions:
Clear/Dry
Person(s) who counted:
Leszek

**** Signalized Intersection ****

Major Road: Martin St runs N/S

North Leg Total: 1567
 North Entering: 560
 North Peds: 0
 Peds Cross: \times

Heavys	120	0	120
Trucks	15	0	15
Cars	425	0	425
Totals	560	0	

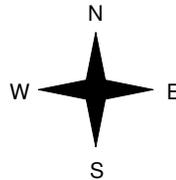


Heavys	123
Trucks	24
Cars	860
Totals	1007

East Leg Total: 788
 East Entering: 788
 East Peds: 0
 Peds Cross: \times



Martin St



Cars	Trucks	Heavys	Totals
297	10	72	379
359	8	42	409
656	18	114	

Hwy 401 WB Off Ramp



Martin St



Cars	Trucks	Heavys	Totals
0	0	0	0

Cars	784	Cars	563	0	563
Trucks	23	Trucks	14	0	14
Heavys	162	Heavys	51	0	51
Totals	969	Totals	628	0	



Peds Cross: \times
 South Peds: 0
 South Entering: 628
 South Leg Total: 1597

Comments

Martin St @ Hwy 401 WB Off Ramp

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 13:00:00

To: 14:00:00

Municipality: Milton
Site #: 1028060100
Intersection: Martin St & Hwy 401 WB Off Ramp
TFR File #: 4
Count date: 9-Oct-2013

Weather conditions:
 Clear/Dry
Person(s) who counted:
 Leszek

**** Signalized Intersection ****

Major Road: Martin St runs N/S

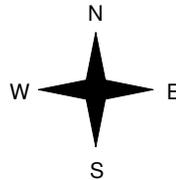
North Leg Total: 1478
 North Entering: 580
 North Peds: 1
 Peds Cross: \times

Heavys	174	0	174
Trucks	18	0	18
Cars	388	0	388
Totals	580	0	



Heavys	212
Trucks	23
Cars	663
Totals	898

East Leg Total: 872
 East Entering: 872
 East Peds: 4
 Peds Cross: \times



	Cars	Trucks	Heavys	Totals
	265	10	136	411
	398	7	56	461
	663	17	192	

Hwy 401 WB Off Ramp



Martin St



Cars	Trucks	Heavys	Totals
0	0	0	0

Cars	786
Trucks	25
Heavys	230
Totals	1041



Cars	398	0	398
Trucks	13	0	13
Heavys	76	0	76
Totals	487	0	

Peds Cross: \times
 South Peds: 0
 South Entering: 487
 South Leg Total: 1528

Comments

Martin St @ Hwy 401 WB Off Ramp

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:30:00

To: 17:30:00

Municipality: Milton
Site #: 1028060100
Intersection: Martin St & Hwy 401 WB Off Ramp
TFR File #: 4
Count date: 9-Oct-2013

Weather conditions:
 Clear/Dry
Person(s) who counted:
 Leszek

**** Signalized Intersection ****

Major Road: Martin St runs N/S

North Leg Total: 1704
 North Entering: 802
 North Peds: 0
 Peds Cross: \times

Heavys	47	0	47
Trucks	18	0	18
Cars	737	0	737
Totals	802	0	

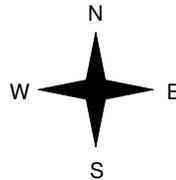


Heavys	56
Trucks	21
Cars	825
Totals	902

East Leg Total: 782
 East Entering: 782
 East Peds: 4
 Peds Cross: \times



Martin St



	Cars	Trucks	Heavys	Totals
	289	2	23	314
	437	5	26	468
	726	7	49	

Hwy 401 WB Off Ramp



Martin St



Cars	Trucks	Heavys	Totals
0	0	0	0

Cars	1174
Trucks	23
Heavys	73
Totals	1270



Cars	536	0	536
Trucks	19	0	19
Heavys	33	0	33
Totals	588	0	

Peds Cross: \times
 South Peds: 0
 South Entering: 588
 South Leg Total: 1858

Comments

Martin St @ Hwy 401 WB Off Ramp

Total Count Diagram

Municipality: Milton
Site #: 1028060100
Intersection: Martin St & Hwy 401 WB Off Ramp
TFR File #: 4
Count date: 9-Oct-2013

Weather conditions:
 Clear/Dry
Person(s) who counted:
 Leszek

**** Signalized Intersection ****

Major Road: Martin St runs N/S

North Leg Total: 12209
 North Entering: 5056
 North Peds: 3
 Peds Cross: \times

Heavys	949	0	949
Trucks	158	0	158
Cars	3949	0	3949
Totals	5056	0	

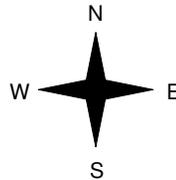


Heavys	1121
Trucks	182
Cars	5850
Totals	7153

East Leg Total: 6065
 East Entering: 6065
 East Peds: 14
 Peds Cross: \times



Martin St



	Cars	Trucks	Heavys	Totals
	2084	52	652	2788
	2901	51	325	3277
	4985	103	977	

Hwy 401 WB Off Ramp



Martin St



Cars	Trucks	Heavys	Totals
0	0	0	0

Cars	6850	Cars	3766	0	3766
Trucks	209	Trucks	130	0	130
Heavys	1274	Heavys	469	0	469
Totals	8333	Totals	4365	0	



Peds Cross: \times
 South Peds: 0
 South Entering: 4365
 South Leg Total: 12698

Comments

Regional Rd 25 @ High Point 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 #: 0000002608
Intersection: Regional Rd 25 & High Point Dr
TFR File #: 8
Count date: 11-May-2015

Weather conditions:

Cloudy/Dry

Person(s) who counted:

Les

** Signalized Intersection **

Major Road: Regional Rd 25 runs N/S

North Leg Total: 1418
 North Entering: 590
 North Peds: 0
 Peds Cross: \times

Heavys	3	97	2	102
Trucks	0	22	1	23
Cars	8	436	21	465
Totals	11	555	24	



Heavys	110
Trucks	22
Cars	696
Totals	828

East Leg Total: 326
 East Entering: 71
 East Peds: 0
 Peds Cross: \times

Heavys	5	Trucks	0	Cars	25	Totals	30
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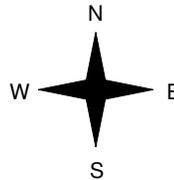


Regional Rd 25

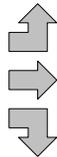
Cars	3	Trucks	1	Heavys	6	Totals	10
Cars	1	Trucks	0	Heavys	1	Totals	2
Cars	33	Trucks	10	Heavys	16	Totals	59
Totals	37	11	23				



Driveway



Heavys	1	Trucks	0	Cars	3	Totals	4
Heavys	1	Trucks	0	Cars	0	Totals	1
Heavys	6	Trucks	1	Cars	2	Totals	9
Heavys	8	Trucks	1	Cars	5	Totals	



High Point Dr



Cars	224	Trucks	3	Heavys	28	Totals	255
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Cars 224 Trucks 3 Heavys 28 Totals 255

Peds Cross: \times
 West Peds: 1
 West Entering: 14
 West Leg Total: 44

Cars	471	Cars	16	690	203	909
Trucks	33	Trucks	0	21	2	23
Heavys	119	Heavys	1	103	25	129
Totals	623	Totals	17	814	230	



Peds Cross: \times
 South Peds: 0
 South Entering: 1061
 South Leg Total: 1684

Comments

Regional Rd 25 @ High Point Dr

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 12:00:00

To: 13:00:00

Municipality: Halton Region
Site #: 0000002608
Intersection: Regional Rd 25 & High Point Dr
TFR File #: 8
Count date: 11-May-2015

Weather conditions:

Cloudy/Dry

Person(s) who counted:

Les

** Signalized Intersection **

Major Road: Regional Rd 25 runs N/S

North Leg Total: 1256
 North Entering: 606
 North Peds: 0
 Peds Cross: \times

Heavys	0	155	6	161
Trucks	0	24	2	26
Cars	3	402	14	419
Totals	3	581	22	



Heavys	156
Trucks	28
Cars	466
Totals	650

East Leg Total: 295
 East Entering: 140
 East Peds: 1
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
1	1	12	14

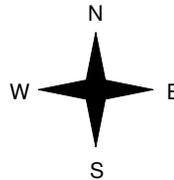


Regional Rd 25

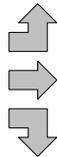
Cars	Trucks	Heavys	Totals
12	2	0	14
1	0	0	1
98	5	22	125
111	7	22	



Driveway



Heavys	Trucks	Cars	Totals
2	0	2	4
0	0	1	1
1	0	8	9
3	0	11	



High Point Dr



Regional Rd 25



Cars	Trucks	Heavys	Totals
113	12	30	155

Peds Cross: \times
 West Peds: 0
 West Entering: 14
 West Leg Total: 28

Cars	508	Cars	8	452	98	558
Trucks	29	Trucks	1	26	10	37
Heavys	178	Heavys	1	154	24	179
Totals	715	Totals	10	632	132	



Peds Cross: \times
 South Peds: 0
 South Entering: 774
 South Leg Total: 1489

Comments

Regional Rd 25 @ High Point Dr

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:00:00

To: 17:00:00

Municipality: Halton Region
Site #: 0000002608
Intersection: Regional Rd 25 & High Point Dr
TFR File #: 8
Count date: 11-May-2015

Weather conditions:

Cloudy/Dry

Person(s) who counted:

Les

** Signalized Intersection **

Major Road: Regional Rd 25 runs N/S

North Leg Total: 1626
 North Entering: 793
 North Peds: 0
 Peds Cross: \times

Heavys	0	111	1	112
Trucks	0	18	2	20
Cars	2	648	11	661
Totals	2	777	14	



Heavys	71
Trucks	14
Cars	748
Totals	833

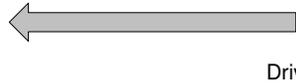
East Leg Total: 346
 East Entering: 255
 East Peds: 0
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
3	1	14	18

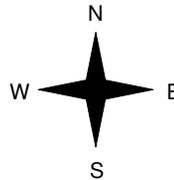


Regional Rd 25

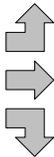
Cars	Trucks	Heavys	Totals
23	1	1	25
5	0	0	5
197	6	22	225
225	7	23	



Driveway



Heavys	Trucks	Cars	Totals
3	1	10	14
0	1	1	2
3	1	10	14
6	3	21	



High Point Dr



Regional Rd 25

Cars	Trucks	Heavys	Totals
67	7	17	91

Peds Cross: \times
 West Peds: 1
 West Entering: 30
 West Leg Total: 48

Cars	855
Trucks	25
Heavys	136
Totals	1016



Cars	7	715	55	777
Trucks	1	12	4	17
Heavys	3	67	16	86
Totals	11	794	75	

Peds Cross: \times
 South Peds: 0
 South Entering: 880
 South Leg Total: 1896

Comments

Regional Rd 25 @ High Point Dr

Total Count Diagram

Municipality: Halton Region

Site #: 0000002608

Intersection: Regional Rd 25 & High Point Dr

TFR File #: 8

Count date: 11-May-2015

Weather conditions:

Cloudy/Dry

Person(s) who counted:

Les

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total: 10736

North Entering: 5126

North Peds: 7

Peds Cross: \times

Heavys	8	923	18	949
Trucks	1	159	10	170
Cars	28	3869	110	4007
Totals	37	4951	138	



Heavys 882

Trucks 146

Cars 4582

Totals 5610

East Leg Total: 2514

East Entering: 1363

East Peds: 8

Peds Cross: \times

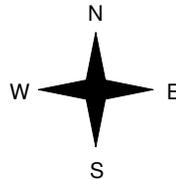
Heavys	Trucks	Cars	Totals
32	6	115	153



Regional Rd 25



Driveway



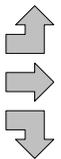
Cars	Trucks	Heavys	Totals
118	10	22	150
15	1	2	18
986	50	159	1195
1119	61	183	



High Point Dr



Heavys	Trucks	Cars	Totals
10	2	38	50
1	1	2	4
28	5	53	86
39	8	93	



Regional Rd 25



Cars	Trucks	Heavys	Totals
910	61	180	1151

Peds Cross: \times

West Peds: 9

West Entering: 140

West Leg Total: 293

Cars	4908	Cars	72	4426	798	5296
Trucks	214	Trucks	4	134	50	188
Heavys	1110	Heavys	22	850	161	1033
Totals	6232	Totals	98	5410	1009	



Peds Cross: \times

South Peds: 1

South Entering: 6517

South Leg Total: 12749

Comments

Regional Rd 25 @ James Snow Pkwy

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 #: 0000002660
Intersection: Regional Rd 25 & James Snow Pkw
TFR File #: 9
Count date: 11-May-2015

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Les

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total: 1369
 North Entering: 708
 North Peds: 0
 Peds Cross: \times

Heavys	0	84	53	137
Trucks	0	13	3	16
Cars	3	434	118	555
Totals	3	531	174	



Heavys	121
Trucks	14
Cars	526
Totals	661

East Leg Total: 521
 East Entering: 111
 East Peds: 1
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
14	0	129	143

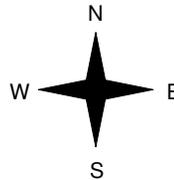


Regional Rd 25

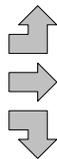
Cars	Trucks	Heavys	Totals
17	4	34	55
9	0	2	11
26	2	17	45
52	6	53	



James Snow Pkwy



Heavys	Trucks	Cars	Totals
1	0	1	2
5	0	23	28
8	3	31	42
14	3	55	



Regional Rd 25

James Snow Pkwy



Cars	Trucks	Heavys	Totals
318	4	88	410

Peds Cross: \times
 West Peds: 0
 West Entering: 72
 West Leg Total: 215

Cars	491	Cars	117	508	177	802
Trucks	18	Trucks	0	10	1	11
Heavys	109	Heavys	12	86	30	128
Totals	618	Totals	129	604	208	



Peds Cross: \times
 South Peds: 0
 South Entering: 941
 South Leg Total: 1559

Comments

Regional Rd 25 @ James Snow Pkwy

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 #: 0000002660
Intersection: Regional Rd 25 & James Snow Pkw
TFR File #: 9
Count date: 11-May-2015

Weather conditions:

Cloudy/Dry

Person(s) who counted:

Les

** Signalized Intersection **

Major Road: Regional Rd 25 runs N/S

North Leg Total: 1215
 North Entering: 605
 North Peds: 0
 Peds Cross: \times

Heavys	1	153	37	191
Trucks	0	17	3	20
Cars	2	366	26	394
Totals	3	536	66	



Heavys	180
Trucks	28
Cars	402
Totals	610

East Leg Total: 400
 East Entering: 195
 East Peds: 7
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
21	3	59	83

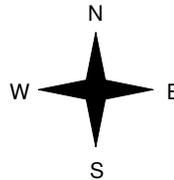


Regional Rd 25

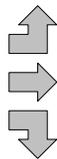
Cars	Trucks	Heavys	Totals
44	2	32	78
9	0	3	12
78	8	19	105
131	10	54	



James Snow Pkwy



Heavys	Trucks	Cars	Totals
1	0	1	2
8	1	6	15
9	3	45	57
18	4	52	



Regional Rd 25

James Snow Pkwy



Cars	Trucks	Heavys	Totals
126	10	69	205

Peds Cross: \times
 West Peds: 0
 West Entering: 74
 West Leg Total: 157

Cars	489
Trucks	28
Heavys	181
Totals	698

Cars	48	357	94	499
Trucks	3	26	6	35
Heavys	17	147	24	188
Totals	68	530	124	



Peds Cross: \times
 South Peds: 0
 South Entering: 722
 South Leg Total: 1420

Comments

Regional Rd 25 @ James Snow Pkwy

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 15:45:00

To: 16:45:00

Municipality: Halton Region
Site #: 0000002660
Intersection: Regional Rd 25 & James Snow Pkw
TFR File #: 9
Count date: 11-May-2015

Weather conditions:

Cloudy/Dry

Person(s) who counted:

Les

** Signalized Intersection **

Major Road: Regional Rd 25 runs N/S

North Leg Total: 1693
 North Entering: 744
 North Peds: 0
 Peds Cross: \nless

Heavys	0	100	17	117
Trucks	0	17	3	20
Cars	7	551	49	607
Totals	7	668	69	



Heavys	77
Trucks	21
Cars	851
Totals	949

East Leg Total: 524
 East Entering: 315
 East Peds: 0
 Peds Cross: \nless

Heavys	Trucks	Cars	Totals
15	5	154	174

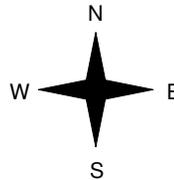


Regional Rd 25

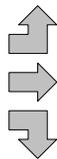
Cars	Trucks	Heavys	Totals
95	3	23	121
36	1	4	41
126	2	25	153
257	6	52	



James Snow Pkwy



Heavys	Trucks	Cars	Totals
1	0	11	12
5	1	26	32
6	5	135	146
12	6	172	



Regional Rd 25

James Snow Pkwy



Cars	Trucks	Heavys	Totals
159	6	44	209

Peds Cross: \nless
 West Peds: 0
 West Entering: 190
 West Leg Total: 364

Cars	812
Trucks	24
Heavys	131
Totals	967



Cars	111	745	84	940
Trucks	4	18	2	24
Heavys	11	53	22	86
Totals	126	816	108	

Peds Cross: \nless
 South Peds: 0
 South Entering: 1050
 South Leg Total: 2017

Comments

Regional Rd 25 @ James Snow Pkwy

Total Count Diagram

Municipality: Halton Region
Site #: 0000002660
Intersection: Regional Rd 25 & James Snow Pkw
TFR File #: 9
Count date: 11-May-2015

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Les

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total: 10489
 North Entering: 5111
 North Peds: 1
 Peds Cross: \times

Heavys	1	923	272	1196
Trucks	2	125	23	150
Cars	26	3329	410	3765
Totals	29	4377	705	



Heavys	912
Trucks	158
Cars	4308
Totals	5378

East Leg Total: 3440
 East Entering: 1606
 East Peds: 12
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
129	22	675	826

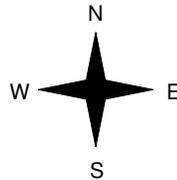


Regional Rd 25

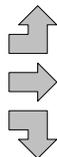
Cars	Trucks	Heavys	Totals
429	21	202	652
108	2	29	139
622	36	157	815
1159	59	388	



James Snow Pkwy



Heavys	Trucks	Cars	Totals
3	0	27	30
35	3	115	153
75	21	482	578
113	24	624	



Regional Rd 25

James Snow Pkwy



Cars	Trucks	Heavys	Totals
1291	56	487	1834

Peds Cross: \times
 West Peds: 1
 West Entering: 761
 West Leg Total: 1587

Cars	4433	Cars	541	3852	766	5159
Trucks	182	Trucks	18	137	30	185
Heavys	1155	Heavys	99	707	180	986
Totals	5770	Totals	658	4696	976	



Peds Cross: \times
 South Peds: 2
 South Entering: 6330
 South Leg Total: 12100

Comments

Regional Rd 25 @ Peddie Rd

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 #: 0000002609
Intersection: Regional Rd 25 & Peddie Rd
TFR File #: 10
Count date: 13-May-2015

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Les

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total: 1301
 North Entering: 769
 North Peds: 0
 Peds Cross: \times

Heavys	1	112	0	113
Trucks	0	14	0	14
Cars	55	584	3	642
Totals	56	710	3	



Heavys	125
Trucks	19
Cars	388
Totals	532

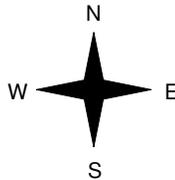
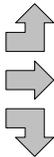
East Leg Total: 120
 East Entering: 36
 East Peds: 0
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
17	1	92	110



Escarpment Way

Heavys	Trucks	Cars	Totals
1	0	7	8
1	0	3	4
16	1	8	25
18	1	18	



Regional Rd 25



Cars	Trucks	Heavys	Totals
0	0	1	1
4	1	0	5
17	3	10	30
21	4	11	



Peddie Rd



Cars	Trucks	Heavys	Totals
66	0	18	84

Peds Cross: \times
 West Peds: 0
 West Entering: 37
 West Leg Total: 147

Cars	609	Cars	33	381	60	474
Trucks	18	Trucks	0	19	0	19
Heavys	138	Heavys	16	123	17	156
Totals	765	Totals	49	523	77	



Peds Cross: \times
 South Peds: 0
 South Entering: 649
 South Leg Total: 1414

Comments

Regional Rd 25 @ Peddie Rd

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 12:45:00

To: 13:45:00

Municipality: Halton Region
Site #: 0000002609
Intersection: Regional Rd 25 & Peddie Rd
TFR File #: 10
Count date: 13-May-2015

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Les

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total: 1140
 North Entering: 566
 North Peds: 1
 Peds Cross: \times

Heavys	0	192	0	192
Trucks	0	13	0	13
Cars	10	350	1	361
Totals	10	555	1	



Heavys	122
Trucks	21
Cars	431
Totals	574

East Leg Total: 88
 East Entering: 45
 East Peds: 1
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
16	1	40	57

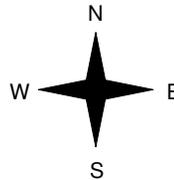


Regional Rd 25

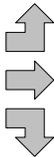
Cars	Trucks	Heavys	Totals
1	0	0	1
0	0	0	0
28	1	15	44
29	1	15	



Escarpment Way



Heavys	Trucks	Cars	Totals
0	1	10	11
0	1	0	1
21	1	16	38
21	3	26	



Peddie Rd



Regional Rd 25



Cars	Trucks	Heavys	Totals
25	2	16	43

Peds Cross: \times
 West Peds: 1
 West Entering: 50
 West Leg Total: 107

Cars	394	Cars	30	420	24	474
Trucks	15	Trucks	1	20	1	22
Heavys	228	Heavys	16	122	16	154
Totals	637	Totals	47	562	41	



Peds Cross: \times
 South Peds: 0
 South Entering: 650
 South Leg Total: 1287

Comments

Regional Rd 25 @ Peddie Rd

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:30:00

To: 17:30:00

Municipality: Halton Region
Site #: 0000002609
Intersection: Regional Rd 25 & Peddie Rd
TFR File #: 10
Count date: 13-May-2015

Weather conditions:

Cloudy/Dry

Person(s) who counted:

Les

** Signalized Intersection **

Major Road: Regional Rd 25 runs N/S

North Leg Total: 1373
 North Entering: 514
 North Peds: 0
 Peds Cross: \times

Heavys	0	41	0	41
Trucks	1	17	0	18
Cars	17	438	0	455
Totals	18	496	0	



Heavys	34
Trucks	15
Cars	810
Totals	859

East Leg Total: 96
 East Entering: 60
 East Peds: 1
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
5	3	28	36

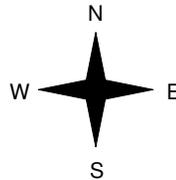


Regional Rd 25

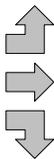
Cars	Trucks	Heavys	Totals
4	0	0	4
3	2	0	5
37	3	11	51
44	5	11	



Escarpment Way



Heavys	Trucks	Cars	Totals
0	2	70	72
0	0	2	2
10	2	46	58
10	4	118	



Peddie Rd



Regional Rd 25



Cars	Trucks	Heavys	Totals
23	1	12	36

Peds Cross: \times
 West Peds: 0
 West Entering: 132
 West Leg Total: 168

Cars	521	Cars	8	736	21	765
Trucks	22	Trucks	0	13	1	14
Heavys	62	Heavys	5	34	12	51
Totals	605	Totals	13	783	34	



Peds Cross: \times
 South Peds: 0
 South Entering: 830
 South Leg Total: 1435

Comments

Regional Rd 25 @ Peddie Rd

Total Count Diagram

Municipality: Halton Region
Site #: 0000002609
Intersection: Regional Rd 25 & Peddie Rd
TFR File #: 10
Count date: 13-May-2015

Weather conditions:
 Cloudy/Dry
Person(s) who counted:
 Les

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total: 9511 North Entering: 4566 North Peds: 1 Peds Cross: \bowtie	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black;">Heavys 3</td> <td style="border-right: 1px solid black;">998</td> <td style="border-right: 1px solid black;">1</td> <td style="border-right: 1px solid black;">1002</td> </tr> <tr> <td style="border-right: 1px solid black;">Trucks 4</td> <td style="border-right: 1px solid black;">110</td> <td style="border-right: 1px solid black;">0</td> <td style="border-right: 1px solid black;">114</td> </tr> <tr> <td style="border-right: 1px solid black;">Cars 151</td> <td style="border-right: 1px solid black;">3289</td> <td style="border-right: 1px solid black;">10</td> <td style="border-right: 1px solid black;">3450</td> </tr> <tr> <td style="border-right: 1px solid black;">Totals 158</td> <td style="border-right: 1px solid black;">4397</td> <td style="border-right: 1px solid black;">11</td> <td></td> </tr> </table>	Heavys 3	998	1	1002	Trucks 4	110	0	114	Cars 151	3289	10	3450	Totals 158	4397	11		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black;">Heavys 809</td> <td style="border-right: 1px solid black;">Trucks 142</td> <td style="border-right: 1px solid black;">Cars 3994</td> <td style="border-right: 1px solid black;">Totals 4945</td> </tr> </table>	Heavys 809	Trucks 142	Cars 3994	Totals 4945	East Leg Total: 776 East Entering: 399 East Peds: 6 Peds Cross: \bowtie																																													
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Comments

Regional Rd 25 @ Campbellville Rd

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 #: 0000002610
Intersection: Regional Rd 25 & Campbellville Rd
TFR File #: 11
Count date: 14-May-2015

Weather conditions:
Clear/Dry
Person(s) who counted:
Les

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total: 1052
 North Entering: 631
 North Peds: 0
 Peds Cross: \times

Heavys	2	14	2	18
Trucks	2	9	1	12
Cars	67	454	80	601
Totals	71	477	83	



Heavys	33
Trucks	16
Cars	372
Totals	421

East Leg Total: 545
 East Entering: 131
 East Peds: 0
 Peds Cross: \times

Heavys	Trucks	Cars	Totals
91	4	184	279

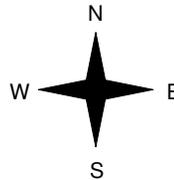


Regional Rd 25

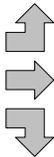
Cars	Trucks	Heavys	Totals
8	1	0	9
60	1	11	72
38	5	7	50
106	7	18	



Campbellville Rd



Heavys	Trucks	Cars	Totals
3	1	105	109
19	0	193	212
88	3	124	215
110	4	422	



5 Side Rd



Regional Rd 25



Cars	Trucks	Heavys	Totals
382	6	26	414

Peds Cross: \times
 West Peds: 1
 West Entering: 536
 West Leg Total: 815

Cars	616	Cars	57	259	109	425
Trucks	17	Trucks	1	14	5	20
Heavys	109	Heavys	78	30	5	113
Totals	742	Totals	136	303	119	



Peds Cross: \times
 South Peds: 0
 South Entering: 558
 South Leg Total: 1300

Comments

Regional Rd 25 @ Campbellville Rd

Mid-day Peak Diagram

Specified Period

From: 11:00:00
To: 14:00:00

One Hour Peak

From: 13:00:00
To: 14:00:00

Municipality: Halton Region
Site #: 0000002610
Intersection: Regional Rd 25 & Campbellville Rd
TFR File #: 11
Count date: 14-May-2015

Weather conditions:
Clear/Dry
Person(s) who counted:
Les

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total: 633
North Entering: 348
North Peds: 0
Peds Cross: \times

Heavys	2	25	1	28
Trucks	2	9	0	11
Cars	27	269	13	309
Totals	31	303	14	



Heavys	28
Trucks	13
Cars	244
Totals	285

East Leg Total: 251
East Entering: 128
East Peds: 0
Peds Cross: \times

Heavys	98
Trucks	9
Cars	160
Totals	267

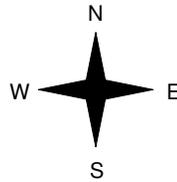


Regional Rd 25

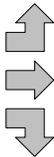
Cars	12	0	0	12
Trucks	51	4	7	62
Heavys	44	2	8	54
Totals	107	6	15	



Campbellville Rd



Heavys	4
Trucks	1
Cars	30
Totals	35
Heavys	10
Trucks	0
Cars	44
Totals	54
Heavys	108
Trucks	4
Cars	92
Totals	204
Heavys	122
Trucks	5
Cars	166
Totals	



5 Side Rd



Cars	93
Trucks	7
Heavys	23
Totals	123

Peds Cross: \times
West Peds: 0
West Entering: 293
West Leg Total: 560

Cars	405	Cars	82	202	36	320
Trucks	15	Trucks	3	12	7	22
Heavys	141	Heavys	89	24	12	125
Totals	561	Totals	174	238	55	



Regional Rd 25

Peds Cross: \times
South Peds: 1
South Entering: 467
South Leg Total: 1028

Comments

Regional Rd 25 @ Campbellville Rd

Afternoon Peak Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:00:00

To: 17:00:00

Municipality: Halton Region
Site #: 0000002610
Intersection: Regional Rd 25 & Campbellville Rd
TFR File #: 11
Count date: 14-May-2015

Weather conditions:
Clear/Dry
Person(s) who counted:
Les

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

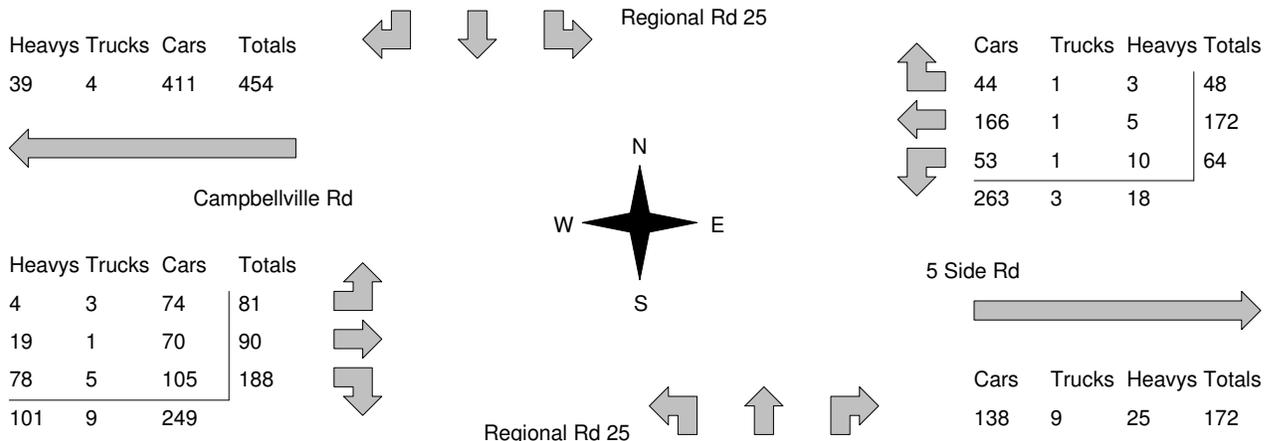
North Leg Total: 1142
 North Entering: 417
 North Peds: 0
 Peds Cross: \times

Heavys	5	13	1	19
Trucks	2	9	2	13
Cars	80	290	15	385
Totals	87	312	18	



Heavys	27
Trucks	16
Cars	682
Totals	725

East Leg Total: 456
 East Entering: 284
 East Peds: 0
 Peds Cross: \times



Peds Cross: \times
 West Peds: 0
 West Entering: 359
 West Leg Total: 813

Cars	448	Cars	165	564	53	782
Trucks	15	Trucks	1	12	6	19
Heavys	101	Heavys	29	20	5	54
Totals	564	Totals	195	596	64	

Peds Cross: \times
 South Peds: 0
 South Entering: 855
 South Leg Total: 1419

Comments

Regional Rd 25 @ Campbellville Rd

Total Count Diagram

Municipality: Halton Region
Site #: 0000002610
Intersection: Regional Rd 25 & Campbellville Rd
TFR File #: 11
Count date: 14-May-2015

Weather conditions:
 Clear/Dry
Person(s) who counted:
 Les

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total: 7080
 North Entering: 3380
 North Peds: 5
 Peds Cross: \bowtie

Heavys	18	152	10	180
Trucks	16	76	5	97
Cars	435	2430	238	3103
Totals	469	2658	253	



Heavys	240
Trucks	130
Cars	3330
Totals	3700

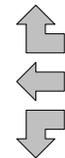
East Leg Total: 2860
 East Entering: 1337
 East Peds: 1
 Peds Cross: \bowtie

Heavys	Trucks	Cars	Totals
575	46	1808	2429

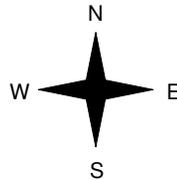


Regional Rd 25

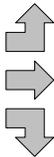
Cars	Trucks	Heavys	Totals
166	9	6	181
636	11	48	695
374	24	63	461
1176	44	117	



Campbellville Rd



Heavys	Trucks	Cars	Totals
22	19	486	527
88	4	633	725
736	27	725	1488
846	50	1844	



5 Side Rd



Regional Rd 25



Cars	Trucks	Heavys	Totals
1312	52	159	1523

Peds Cross: \bowtie
 West Peds: 1
 West Entering: 2740
 West Leg Total: 5169

Cars	3529	Cars	737	2678	441	3856
Trucks	127	Trucks	19	102	43	164
Heavys	951	Heavys	509	212	61	782
Totals	4607	Totals	1265	2992	545	



Peds Cross: \bowtie
 South Peds: 5
 South Entering: 4802
 South Leg Total: 9409

Comments

Prepared For: Halton Region
 Prepared By: **PYRAMID Traffic Inc.**
 Location: REG. RD. #25 north of Hwy 401 off-ramp
 Start Date: Tuesday Nov 24, 2015

Site ID: 102506
 Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary	Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	28	44		12:15	146	199	1328
0:30	21	16		12:30	188	159	1363
0:45	25	21		12:45	180	189	1388
1:00	20	29	204	13:00	166	180	1407
1:15	21	30	183	13:15	151	167	1380
1:30	13	22	181	13:30	164	184	1381
1:45	17	24	176	13:45	141	172	1325
2:00	17	21	165	14:00	157	163	1299
2:15	19	14	147	14:15	163	213	1357
2:30	24	18	154	14:30	201	191	1401
2:45	25	27	165	14:45	180	211	1479
3:00	19	35	181	15:00	194	173	1526
3:15	7	32	187	15:15	184	241	1575
3:30	13	66	224	15:30	190	184	1557
3:45	22	39	233	15:45	175	214	1555
4:00	32	33	244	16:00	196	216	1600
4:15	35	26	266	16:15	180	257	1612
4:30	35	34	256	16:30	191	248	1677
4:45	57	53	305	16:45	174	295	1757
5:00	61	70	371	17:00	186	180	1711
5:15	47	92	449	17:15	173	296	1743
5:30	74	126	580	17:30	199	243	1746
5:45	87	155	712	17:45	136	189	1602
6:00	133	185	899	18:00	149	164	1549
6:15	116	206	1082	18:15	130	185	1395
6:30	138	215	1235	18:30	106	122	1181
6:45	147	277	1417	18:45	122	101	1079
7:00	177	206	1482	19:00	101	92	959
7:15	162	173	1495	19:15	88	103	835
7:30	164	234	1540	19:30	103	71	781
7:45	149	252	1517	19:45	90	63	711
8:00	197	251	1582	20:00	97	78	693
8:15	194	211	1652	20:15	98	75	675
8:30	210	253	1717	20:30	78	48	627
8:45	226	190	1732	20:45	70	54	598
9:00	233	151	1668	21:00	84	48	555
9:15	202	148	1613	21:15	60	48	490
9:30	170	142	1462	21:30	58	56	478
9:45	152	169	1367	21:45	77	68	499
10:00	136	142	1261	22:00	78	41	486
10:15	146	151	1208	22:15	68	60	506
10:30	130	147	1173	22:30	64	43	499
10:45	128	150	1130	22:45	60	86	500
11:00	157	144	1153	23:00	54	56	491
11:15	165	145	1166	23:15	57	86	506
11:30	135	177	1201	23:30	62	34	495
11:45	153	191	1267	23:45	33	38	420
12:00	139	188	1293	0:00	34	24	368

AM Peak: **1732**

PM Peak: **1757**

24 HR VOLUME: **23147**

Prepared For: Halton Region
 Prepared By: *PYRAMID* Traffic Inc.
 Location: REG. RD. #25 south of Campbellville Rd
 Start Date: Tuesday Nov 24, 2015

Site ID: 102507
 Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	15	21	
0:30	18	5	
0:45	15	14	
1:00	19	15	122
1:15	12	12	110
1:30	3	10	100
1:45	8	12	91
2:00	12	8	77
2:15	13	4	70
2:30	12	9	78
2:45	11	12	81
3:00	4	7	72
3:15	3	5	63
3:30	14	7	63
3:45	8	14	62
4:00	10	15	76
4:15	9	18	95
4:30	16	15	105
4:45	31	33	147
5:00	37	47	206
5:15	15	68	262
5:30	24	112	367
5:45	32	143	478
6:00	28	179	601
6:15	45	203	766
6:30	54	253	937
6:45	91	268	1121
7:00	102	239	1255
7:15	116	167	1290
7:30	139	250	1372
7:45	101	260	1374
8:00	117	273	1423
8:15	122	229	1491
8:30	115	294	1511
8:45	129	193	1472
9:00	136	171	1389
9:15	113	144	1295
9:30	128	154	1168
9:45	94	142	1082
10:00	88	113	976
10:15	93	112	924
10:30	113	123	878
10:45	101	99	842
11:00	112	90	843
11:15	110	102	850
11:30	114	135	863
11:45	98	128	889
12:00	108	112	907

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
12:15	114	128	937
12:30	130	99	917
12:45	134	141	966
13:00	116	120	982
13:15	143	120	1003
13:30	126	133	1033
13:45	102	120	980
14:00	106	109	959
14:15	114	128	938
14:30	132	128	939
14:45	153	133	1003
15:00	156	110	1054
15:15	191	135	1138
15:30	163	125	1166
15:45	172	106	1158
16:00	162	136	1190
16:15	188	140	1192
16:30	181	145	1230
16:45	202	142	1296
17:00	166	112	1276
17:15	202	127	1277
17:30	201	141	1293
17:45	157	118	1224
18:00	142	107	1195
18:15	141	123	1130
18:30	99	81	968
18:45	131	63	887
19:00	121	71	830
19:15	81	66	713
19:30	101	53	687
19:45	93	43	629
20:00	104	53	594
20:15	85	54	586
20:30	69	35	536
20:45	63	35	498
21:00	81	42	464
21:15	58	38	421
21:30	54	34	405
21:45	44	41	392
22:00	63	32	364
22:15	46	36	350
22:30	47	31	340
22:45	53	38	346
23:00	49	29	329
23:15	54	42	343
23:30	65	23	353
23:45	31	17	310
0:00	31	10	273

AM Peak: 1511

PM Peak: 1296

24 HR VOLUME: 17457

Prepared For: Halton Region
 Prepared By: *PYRAMID* Traffic Inc.
 Location: REG. RD. #25 btwn Steeles Avenue & Market Dr
 Start Date: Thursday Nov 26, 2015

Site ID: 102514
 Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	40	39	
0:30	22	53	
0:45	37	28	
1:00	26	28	273
1:15	15	37	246
1:30	14	39	224
1:45	15	20	194
2:00	11	22	173
2:15	7	30	158
2:30	13	26	144
2:45	16	28	153
3:00	15	31	166
3:15	15	15	159
3:30	16	24	160
3:45	14	22	152
4:00	18	15	139
4:15	29	12	150
4:30	34	16	160
4:45	51	31	206
5:00	61	30	264
5:15	74	31	328
5:30	106	63	447
5:45	140	66	571
6:00	163	75	718
6:15	167	125	905
6:30	207	123	1066
6:45	189	135	1184
7:00	201	183	1330
7:15	193	237	1468
7:30	252	218	1608
7:45	212	240	1736
8:00	286	257	1895
8:15	225	271	1961
8:30	260	227	1978
8:45	220	200	1946
9:00	206	219	1828
9:15	181	204	1717
9:30	215	188	1633
9:45	214	160	1587
10:00	207	185	1554
10:15	217	189	1575
10:30	195	189	1556
10:45	225	183	1590
11:00	231	207	1636
11:15	224	193	1647
11:30	204	190	1657
11:45	252	210	1711
12:00	226	231	1730

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
12:15	244	256	1813
12:30	254	259	1932
12:45	274	281	2025
13:00	254	240	2062
13:15	279	282	2123
13:30	249	253	2112
13:45	288	268	2113
14:00	267	249	2135
14:15	278	231	2083
14:30	243	235	2059
14:45	255	280	2038
15:00	238	296	2056
15:15	218	316	2081
15:30	247	275	2125
15:45	235	268	2093
16:00	266	276	2101
16:15	261	327	2155
16:30	276	274	2183
16:45	283	325	2288
17:00	291	324	2361
17:15	307	364	2444
17:30	293	357	2544
17:45	260	311	2507
18:00	266	320	2478
18:15	223	305	2335
18:30	248	288	2221
18:45	228	279	2157
19:00	216	268	2055
19:15	180	252	1959
19:30	151	218	1792
19:45	152	196	1633
20:00	133	179	1461
20:15	136	187	1352
20:30	126	147	1256
20:45	122	163	1193
21:00	106	161	1148
21:15	123	149	1097
21:30	109	121	1054
21:45	119	127	1015
22:00	125	142	1015
22:15	116	109	968
22:30	123	105	966
22:45	66	122	908
23:00	89	122	852
23:15	59	118	804
23:30	63	102	741
23:45	54	51	658
0:00	53	55	555

AM Peak: 1978

PM Peak: 2544

24 HR VOLUME: 31985

Prepared For: Halton Region

Prepared By: *PYRAMID* Traffic Inc.

Location: REG. RD. #25 btwn Market Dr & Hwy 401 EB ramp

Start Date: Thursday Nov 26, 2015

Site ID: 102515

Interval: 15 min.

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
0:15	33	50	
0:30	30	46	
0:45	33	32	
1:00	24	24	272
1:15	18	40	247
1:30	23	30	224
1:45	17	28	204
2:00	12	23	191
2:15	44	22	199
2:30	19	25	190
2:45	29	26	200
3:00	20	30	215
3:15	18	14	181
3:30	27	29	193
3:45	14	28	180
4:00	23	20	173
4:15	34	22	197
4:30	38	19	198
4:45	54	44	254
5:00	69	62	342
5:15	103	57	446
5:30	132	97	618
5:45	165	130	815
6:00	198	177	1059
6:15	179	169	1247
6:30	246	187	1451
6:45	238	205	1599
7:00	202	290	1716
7:15	243	264	1875
7:30	326	251	2019
7:45	259	271	2106
8:00	312	277	2203
8:15	251	290	2237
8:30	306	248	2214
8:45	276	200	2160
9:00	221	250	2042
9:15	225	218	1944
9:30	203	201	1794
9:45	228	175	1721
10:00	198	213	1661
10:15	210	220	1648
10:30	199	216	1659
10:45	181	202	1639
11:00	206	202	1636
11:15	217	200	1623
11:30	181	190	1579
11:45	215	222	1633
12:00	229	279	1733

Period Ending	Channel 1 NB	Channel 2 SB	Hourly Summary
12:15	174	288	1778
12:30	260	274	1941
12:45	270	272	2046
13:00	249	246	2033
13:15	253	271	2095
13:30	255	266	2082
13:45	276	238	2054
14:00	259	253	2071
14:15	245	199	1991
14:30	229	250	1949
14:45	268	315	2018
15:00	239	291	2036
15:15	287	273	2152
15:30	278	246	2197
15:45	278	309	2201
16:00	292	262	2225
16:15	364	298	2327
16:30	314	265	2382
16:45	311	308	2414
17:00	294	308	2462
17:15	349	362	2511
17:30	330	330	2592
17:45	260	293	2526
18:00	263	299	2486
18:15	231	312	2318
18:30	224	251	2133
18:45	205	281	2066
19:00	210	228	1942
19:15	200	233	1832
19:30	168	185	1710
19:45	162	174	1560
20:00	128	159	1409
20:15	157	149	1282
20:30	161	139	1229
20:45	127	168	1188
21:00	104	139	1144
21:15	111	143	1092
21:30	116	136	1044
21:45	114	120	983
22:00	120	149	1009
22:15	122	111	988
22:30	104	101	941
22:45	66	126	899
23:00	50	107	787
23:15	87	93	734
23:30	88	80	697
23:45	52	48	605
0:00	37	51	536

AM Peak: 2237

PM Peak: 2592

24 HR VOLUME: 33383



Date: 22-Apr-14

Intersection: RR 25 & Maplehurst C.C./Chisholm Dr.

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X		X	X	X		X	x	x	x	x
Direction	SBLT	NB		EB	NBLT	SB		WB				
Min Green	7	20		10	7	20		10				
Veh Ext.	3.0			3.0	3.0			3.0				
Yellow	3	3.3		3.3	3	3.3		3.3				
Red	1	2.7		2.9	1	2.7		2.9				
Walk		7		7		7		7				
Don't Walk		20		26		20		26				
Max 1												
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall		x				x						
Notes:												



Date: 22-Apr-14

Intersection: RR 25 & High Point Drive

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X		X		X		X	x	x	x	x
Direction		NB		EB		SB		WB				
Min Green		20		10		20		10				
Veh Ext.				3.0				3.0				
Yellow		4.2		3.3		4.2		3.3				
Red		1.7		2.7		1.7		2.7				
Walk		7		7		7		7				
Don't Walk		28		29		28		29				
Max 1												
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall		x				x						
Notes:												



Date: 5-Jun-17

Intersection: RR 25 & Hwy 401 WB Ramp (S. Terminal)

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X		X		X		X	x	x		
Direction		NB		EB		SB		WB				
Min Green		20		10		20		10				
Veh Ext.				3.0				3.0				
Yellow		3.3		3.3		3.3		3.3				
Red		2.7		2.5		2.7		2.5				
Walk		7		7								
Don't Walk		25		23								
Max 1												
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall		x										
Notes:	Phases 4 & 8 Split Phases 4+7 EB Phases 3+8 WB											



Date: 5-Jun-17

Intersection: RR 25 & Hwy 401 WB Ramp (N. Terminal)

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X				X		X				
Direction		NB				SB		WB				
Min Green		20				20		10				
Veh Ext.								3.0				
Yellow		3.3				3.3		3.3				
Red		2.2				2.2		2.2				
Walk												
Don't Walk												
Max 1												
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall												
Notes:												



Date: 22-Apr-14

Intersection: RR 25 & James Snow Pkwy

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X		X	X	X		X	x	x	x	x
Direction	SBLT	NB		EB	NBLT	SB		WB				
Min Green	7	20		10	7	20		10				
Veh Ext.	3.0			3.0	3.0			3.0				
Yellow	3	4.2		3.3	3	4.2		3.3				
Red	1	2.2		3	1	2.2		3				
Walk		7		7		7		7				
Don't Walk		29		30		29		30				
Max 1												
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall		x				x						
Notes:												



Date: 22-Apr-14

Intersection: RR 25 & Market Drive

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7		2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X		X	X	X			x	x	x	
Direction		NB		EB	NBLT	SB						
Min Green		20		10	7	20						
Veh Ext.				3.0	3.0							
Yellow		3.3		3.3	3	3.3						
Red		2.7		2.7	1	2.7						
Walk		7		7		7						
Don't Walk		21		29		21						
Max 1												
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall		x				x						
Notes:												



Date: 22-Apr-14

Intersection: RR 25 & No 5 Side Road

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X	X	X	X	X		X				
Direction		NB	WBLT	EB	NBLT	SB		WB				
Min Green		20	7	10	7	20		10				
Veh Ext.			3.0	3.0	3.0			3.0				
Yellow		4.2	3	3.7	3	4.2		3.7				
Red		1.5	1	1.9	1	1.5		1.9				
Walk												
Don't Walk												
Max 1												
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall												
Notes:												



Date: 22-Apr-14

Intersection: RR 25 & Peddie Road/Escarpment Way

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X		X		X		X	x	x	x	x
Direction		NB		EB		SB		WB				
Min Green		20		10		20		10				
Veh Ext.				3.0				3.0				
Yellow		4.2		3.3		4.2		3.3				
Red		1.8		2.4		1.8		2.4				
Walk		7		7		7		7				
Don't Walk		25		23		25		23				
Max 1												
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall		x				x						
Notes:												



Date: 22-Apr-14

Intersection: RR 25 & Steeles Ave.

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X		X		X	X	X	x	x	x	x
Direction	SBLT	NB		EB		SB	EBLT	WB				
Min Green	7	20		10		20	7	10				
Veh Ext.	3.0			3.0			3.0	3.0				
Yellow	3	3.3		3.3		3.3	3	3.3				
Red	1	2.7		2.5		2.7	1	2.5				
Walk		7		7		7		7				
Don't Walk		24		23		24		23				
Max 1												
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall		x				x						
Notes:												

**REGIONAL ROAD 25 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT TRANSPORTATION
PLANNING REPORT**

Appendix C – Synchro Analysis Outputs
January 2, 2019

Appendix C – SYNCHRO ANALYSIS OUTPUTS

Queues

101: Regional Road 25 & 5 Side Road

05/29/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	118	461	54	88	147	328	129	90	594
v/c Ratio	0.29	0.95	0.26	0.13	0.63	0.22	0.17	0.24	0.48
Control Delay	27.1	59.9	18.4	15.7	29.4	8.6	3.5	26.4	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	59.9	18.4	15.7	29.4	8.6	3.5	26.4	26.3
Queue Length 50th (m)	17.5	80.5	6.0	9.3	16.0	18.1	4.4	13.4	49.4
Queue Length 95th (m)	32.5	#143.9	13.2	18.9	#42.8	20.7	7.9	26.8	67.0
Internal Link Dist (m)		361.7		299.6		351.5			238.1
Turn Bay Length (m)	75.0		70.0		75.0		75.0	30.0	
Base Capacity (vph)	427	503	209	717	235	1499	781	369	1240
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.92	0.26	0.12	0.63	0.22	0.17	0.24	0.48

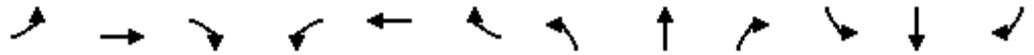
Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

101: Regional Road 25 & 5 Side Road

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	206	209	49	70	9	132	295	116	81	465	69
Future Volume (vph)	106	206	209	49	70	9	132	295	116	81	465	69
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.92		1.00	0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1398		1456	1606		1142	3139	1495	1736	3358	
Flt Permitted	0.70	1.00		0.20	1.00		0.30	1.00	1.00	0.55	1.00	
Satd. Flow (perm)	1279	1398		303	1606		362	3139	1495	1011	3358	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	118	229	232	54	78	10	147	328	129	90	517	77
RTOR Reduction (vph)	0	37	0	0	5	0	0	0	68	0	12	0
Lane Group Flow (vph)	118	424	0	54	83	0	147	328	61	90	582	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	4%	9%	42%	24%	17%	11%	58%	15%	8%	4%	5%	6%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	32.1	32.1		41.7	41.7		47.0	47.0	47.0	35.8	35.8	
Effective Green, g (s)	32.1	32.1		41.7	41.7		47.0	47.0	47.0	35.8	35.8	
Actuated g/C Ratio	0.32	0.32		0.42	0.42		0.47	0.47	0.47	0.36	0.36	
Clearance Time (s)	5.6	5.6		4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	410	448		190	669		226	1475	702	361	1202	
v/s Ratio Prot		c0.30		c0.02	0.05		c0.05	0.10			0.17	
v/s Ratio Perm	0.09			0.10			c0.26		0.04	0.09		
v/c Ratio	0.29	0.95		0.28	0.12		0.65	0.22	0.09	0.25	0.48	
Uniform Delay, d1	25.4	33.1		20.2	17.9		17.8	15.7	14.6	22.6	24.9	
Progression Factor	1.00	1.00		1.00	1.00		0.91	0.50	0.99	1.00	1.00	
Incremental Delay, d2	0.4	28.9		0.8	0.1		6.5	0.3	0.2	1.6	1.4	
Delay (s)	25.8	62.0		21.0	18.0		22.7	8.2	14.7	24.3	26.3	
Level of Service	C	E		C	B		C	A	B	C	C	
Approach Delay (s)		54.7			19.2			13.1			26.1	
Approach LOS		D			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

102: Regional Road 25 & Escarpment Way/Peddie Road

05/29/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	9	30	32	6	52	553	82	3	810
v/c Ratio	0.07	0.23	0.30	0.04	0.12	0.23	0.07	0.00	0.31
Control Delay	40.6	21.5	48.9	37.2	6.4	4.8	3.1	3.0	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.6	21.5	48.9	37.2	6.4	4.8	3.1	3.0	2.4
Queue Length 50th (m)	1.7	0.8	6.2	1.0	3.0	19.5	1.3	0.1	19.0
Queue Length 95th (m)	6.5	9.5	15.5	4.8	12.2	41.8	10.9	m0.2	m25.3
Internal Link Dist (m)		165.7		110.1		512.8			351.5
Turn Bay Length (m)	25.0		55.0		75.0		125.0	35.0	
Base Capacity (vph)	460	386	356	504	426	2453	1153	730	2638
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.08	0.09	0.01	0.12	0.23	0.07	0.00	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 102: Regional Road 25 & Escarpment Way/Peddie Road

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↑↗	
Traffic Volume (vph)	8	4	24	29	5	1	48	509	75	3	691	54
Future Volume (vph)	8	4	24	29	5	1	48	509	75	3	691	54
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.87		1.00	0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1597	1019		1262	1389		1357	2843	1324	1805	3056	
Flt Permitted	0.75	1.00		0.74	1.00		0.35	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	1267	1019		980	1389		494	2843	1324	846	3056	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	4	26	32	5	1	52	553	82	3	751	59
RTOR Reduction (vph)	0	24	0	0	1	0	0	0	15	0	2	0
Lane Group Flow (vph)	9	6	0	32	5	0	52	553	67	3	808	0
Heavy Vehicles (%)	13%	25%	68%	43%	20%	100%	33%	27%	22%	0%	18%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2		2	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	6.7	6.7		6.7	6.7		81.6	81.6	81.6	81.6	81.6	
Effective Green, g (s)	6.7	6.7		6.7	6.7		81.6	81.6	81.6	81.6	81.6	
Actuated g/C Ratio	0.07	0.07		0.07	0.07		0.82	0.82	0.82	0.82	0.82	
Clearance Time (s)	5.7	5.7		5.7	5.7		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	84	68		65	93		403	2319	1080	690	2493	
v/s Ratio Prot		0.01			0.00			0.19			c0.26	
v/s Ratio Perm	0.01			c0.03			0.11		0.05	0.00		
v/c Ratio	0.11	0.08		0.49	0.05		0.13	0.24	0.06	0.00	0.32	
Uniform Delay, d1	43.8	43.8		45.0	43.7		1.9	2.1	1.8	1.7	2.3	
Progression Factor	1.00	1.00		1.00	1.00		2.00	1.91	4.10	0.99	0.86	
Incremental Delay, d2	0.6	0.5		5.8	0.2		0.6	0.2	0.1	0.0	0.3	
Delay (s)	44.4	44.3		50.8	43.9		4.4	4.3	7.4	1.7	2.3	
Level of Service	D	D		D	D		A	A	A	A	A	
Approach Delay (s)		44.3			49.7			4.6			2.3	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Queues

103: Regional Road 25 & James Snow Pkwy

05/29/2017

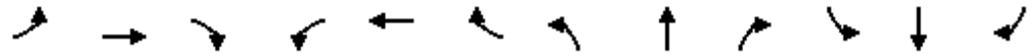


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	2	30	46	49	12	60	141	660	227	190	583
v/c Ratio	0.02	0.08	0.21	0.43	0.03	0.33	0.22	0.33	0.23	0.37	0.28
Control Delay	37.5	38.6	4.7	51.8	37.5	9.9	3.9	11.1	4.8	4.7	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	38.6	4.7	51.8	37.5	9.9	3.9	11.1	4.8	4.7	4.5
Queue Length 50th (m)	0.4	2.9	0.0	9.6	1.1	0.0	7.7	39.8	12.8	2.0	8.3
Queue Length 95th (m)	2.5	7.1	3.7	20.6	3.7	7.4	13.7	40.0	15.2	7.9	18.2
Internal Link Dist (m)		134.9			153.9			258.8			512.8
Turn Bay Length (m)	55.0		80.0	85.0		40.0	30.0			75.0	
Base Capacity (vph)	367	1183	545	381	1183	419	639	2029	982	507	2048
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.03	0.08	0.13	0.01	0.14	0.22	0.33	0.23	0.37	0.28

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 103: Regional Road 25 & James Snow Pkwy

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	28	42	45	11	55	130	607	209	175	534	3
Future Volume (vph)	2	28	42	45	11	55	130	607	209	175	534	3
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4	6.4	4.0	6.4	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1203	3059	1282	1271	3059	956	1656	3112	1386	1367	3059	
Flt Permitted	0.75	1.00	1.00	0.74	1.00	1.00	0.43	1.00	1.00	0.38	1.00	
Satd. Flow (perm)	949	3059	1282	986	3059	956	753	3112	1386	542	3059	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	30	46	49	12	60	141	660	227	190	580	3
RTOR Reduction (vph)	0	0	41	0	0	54	0	0	82	0	0	0
Lane Group Flow (vph)	2	30	5	49	12	6	141	660	145	190	583	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	50%	18%	26%	42%	18%	69%	9%	16%	15%	32%	18%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	9.8	9.8	9.8	9.8	9.8	9.8	71.8	63.9	63.9	75.2	65.6	
Effective Green, g (s)	9.8	9.8	9.8	9.8	9.8	9.8	71.8	63.9	63.9	75.2	65.6	
Actuated g/C Ratio	0.10	0.10	0.10	0.10	0.10	0.10	0.72	0.64	0.64	0.75	0.66	
Clearance Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4	6.4	4.0	6.4	
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	
Lane Grp Cap (vph)	93	299	125	96	299	93	611	1988	885	486	2006	
v/s Ratio Prot		0.01			0.00		0.02	0.21		c0.04	0.19	
v/s Ratio Perm	0.00		0.00	c0.05		0.01	0.15		0.10	c0.26		
v/c Ratio	0.02	0.10	0.04	0.51	0.04	0.06	0.23	0.33	0.16	0.39	0.29	
Uniform Delay, d1	40.8	41.1	40.8	42.8	40.8	40.9	4.3	8.3	7.3	3.7	7.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.15	2.82	0.86	0.51	
Incremental Delay, d2	0.1	0.1	0.1	4.5	0.1	0.3	0.2	0.4	0.4	0.5	0.4	
Delay (s)	40.9	41.2	40.9	47.3	40.9	41.2	4.6	9.9	20.9	3.7	4.1	
Level of Service	D	D	D	D	D	D	A	A	C	A	A	
Approach Delay (s)		41.1			43.7			11.6			4.0	
Approach LOS		D			D			B			A	

Intersection Summary

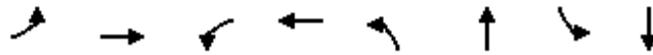
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

104: Regional Road 25 & Driveway/High Point Drive

05/29/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	12	68	14	20	1214	28	658
v/c Ratio	0.03	0.09	0.52	0.10	0.04	0.35	0.10	0.28
Control Delay	35.5	20.5	54.0	20.8	6.2	4.5	2.6	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	20.5	54.0	20.8	6.2	4.5	2.6	1.8
Queue Length 50th (m)	0.7	0.2	13.3	0.4	0.5	9.7	0.5	6.7
Queue Length 95th (m)	3.8	5.2	26.0	5.9	5.2	51.3	1.7	9.8
Internal Link Dist (m)		98.3		127.8		439.1		258.8
Turn Bay Length (m)	15.0		30.0		70.0		30.0	
Base Capacity (vph)	432	353	376	383	571	3500	287	2355
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.03	0.18	0.04	0.04	0.35	0.10	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 104: Regional Road 25 & Driveway/High Point Drive

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↑↑↑		↔	↔	
Traffic Volume (vph)	4	1	10	65	2	11	19	900	254	27	613	12
Future Volume (vph)	4	1	10	65	2	11	19	900	254	27	613	12
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	0.87		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1444	911		1253	991		1702	4387		1597	2970	
Flt Permitted	0.75	1.00		0.75	1.00		0.40	1.00		0.21	1.00	
Satd. Flow (perm)	1138	911		989	991		720	4387		361	2970	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	1	11	68	2	12	20	947	267	28	645	13
RTOR Reduction (vph)	0	10	0	0	11	0	0	24	0	0	1	0
Lane Group Flow (vph)	4	2	0	68	3	0	20	1190	0	28	657	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	25%	100%	78%	44%	50%	70%	6%	15%	12%	13%	21%	27%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.2	11.2		11.2	11.2		76.9	76.9		76.9	76.9	
Effective Green, g (s)	11.2	11.2		11.2	11.2		76.9	76.9		76.9	76.9	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.77	0.77		0.77	0.77	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	127	102		110	110		553	3373		277	2283	
v/s Ratio Prot		0.00			0.00			c0.27			0.22	
v/s Ratio Perm	0.00			c0.07			0.03			0.08		
v/c Ratio	0.03	0.02		0.62	0.03		0.04	0.35		0.10	0.29	
Uniform Delay, d1	39.6	39.5		42.4	39.6		2.7	3.7		2.9	3.4	
Progression Factor	1.00	1.00		1.00	1.00		1.45	1.12		0.41	0.38	
Incremental Delay, d2	0.1	0.1		9.9	0.1		0.1	0.3		0.7	0.3	
Delay (s)	39.7	39.6		52.3	39.7		4.1	4.4		1.9	1.6	
Level of Service	D	D		D	D		A	A		A	A	
Approach Delay (s)		39.6			50.1			4.4			1.6	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

05/29/2017



Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	506	469	778	422	694
v/c Ratio	0.74	0.35	0.35	0.26	0.35
Control Delay	43.1	0.7	14.4	0.4	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	0.7	14.4	0.4	3.3
Queue Length 50th (m)	49.9	0.0	48.8	0.0	10.0
Queue Length 95th (m)	63.1	0.0	98.2	0.0	12.3
Internal Link Dist (m)	114.8		321.2		439.1
Turn Bay Length (m)				75.0	
Base Capacity (vph)	1235	1324	2204	1615	1955
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.35	0.35	0.26	0.35

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

05/29/2017



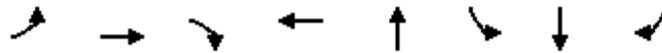
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↗	↕↕	↗		↕↕
Traffic Volume (vph)	476	441	731	397	0	652
Future Volume (vph)	476	441	731	397	0	652
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5	4.0		5.5
Lane Util. Factor	0.97	1.00	0.95	1.00		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	3127	1324	3282	1615		2911
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	3127	1324	3282	1615		2911
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	506	469	778	422	0	694
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	506	469	778	422	0	694
Heavy Vehicles (%)	12%	22%	10%	0%	0%	24%
Turn Type	Prot	Free	NA	Free		NA
Protected Phases	8		2			6
Permitted Phases		Free		Free		
Actuated Green, G (s)	21.8	100.0	67.2	100.0		67.2
Effective Green, g (s)	21.8	100.0	67.2	100.0		67.2
Actuated g/C Ratio	0.22	1.00	0.67	1.00		0.67
Clearance Time (s)	5.5		5.5			5.5
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	681	1324	2205	1615		1956
v/s Ratio Prot	c0.16		0.24			0.24
v/s Ratio Perm		c0.35		0.26		
v/c Ratio	0.74	0.35	0.35	0.26		0.35
Uniform Delay, d1	36.5	0.0	7.1	0.0		7.1
Progression Factor	1.00	1.00	1.83	1.00		0.36
Incremental Delay, d2	4.4	0.7	0.4	0.4		0.5
Delay (s)	40.9	0.7	13.3	0.4		3.0
Level of Service	D	A	B	A		A
Approach Delay (s)	21.6		8.7			3.0
Approach LOS	C		A			A

Intersection Summary

HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool L~~0~~ 05/29/2017



Lane Group	EBL	EBT	EBR	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	193	370	365	67	936	45	927	337
v/c Ratio	0.54	0.80	0.80	0.35	0.53	0.21	0.53	0.21
Control Delay	37.8	30.7	29.9	9.4	17.3	22.2	21.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	30.7	29.9	9.4	17.3	22.2	21.5	0.3
Queue Length 50th (m)	35.0	39.0	37.7	0.0	34.5	5.7	90.2	0.0
Queue Length 95th (m)	48.0	65.0	63.8	7.2	79.0	19.7	121.5	0.0
Internal Link Dist (m)		109.5		75.3	224.9		321.2	
Turn Bay Length (m)	30.0		30.0			30.0		75.0
Base Capacity (vph)	567	619	616	191	1764	218	1745	1582
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.60	0.59	0.35	0.53	0.21	0.53	0.21

Intersection Summary

HCM Signalized Intersection Capacity Analysis

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool Lanes 04/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	18	673	32	0	31	0	813	67	42	871	317
Future Volume (vph)	181	18	673	32	0	31	0	813	67	42	871	317
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	5.8		5.8			6.0		6.0	6.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00			0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99	0.99		1.00			1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.86	0.85		0.93			0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1612	1422	1415		1544			3308		1667	3282	1582
Flt Permitted	0.95	1.00	1.00		0.65			1.00		0.23	1.00	1.00
Satd. Flow (perm)	1612	1422	1415		1030			3308		411	3282	1582
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	193	19	716	34	0	33	0	865	71	45	927	337
RTOR Reduction (vph)	0	142	142	0	62	0	0	5	0	0	0	0
Lane Group Flow (vph)	193	228	223	0	5	0	0	931	0	45	927	337
Confl. Peds. (#/hr)			1	1			1		8	8		1
Heavy Vehicles (%)	12%	18%	7%	10%	0%	14%	0%	8%	3%	8%	10%	0%
Turn Type	Split	NA	Perm	Perm	NA			NA		Perm	NA	Free
Protected Phases	4	4			8			2			6	
Permitted Phases			4	8						6		Free
Actuated Green, G (s)	22.4	22.4	22.4		8.0			52.0		52.0	52.0	100.0
Effective Green, g (s)	22.4	22.4	22.4		8.0			52.0		52.0	52.0	100.0
Actuated g/C Ratio	0.22	0.22	0.22		0.08			0.52		0.52	0.52	1.00
Clearance Time (s)	5.8	5.8	5.8		5.8			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	361	318	316		82			1720		213	1706	1582
v/s Ratio Prot	0.12	c0.16						0.28			c0.28	
v/s Ratio Perm			0.16		0.01					0.11		c0.21
v/c Ratio	0.53	0.72	0.71		0.07			0.54		0.21	0.54	0.21
Uniform Delay, d1	34.2	35.9	35.8		42.5			16.0		12.9	16.1	0.0
Progression Factor	1.00	1.00	1.00		1.00			0.88		1.03	1.09	1.00
Incremental Delay, d2	1.5	7.5	7.0		0.3			1.0		2.1	1.2	0.3
Delay (s)	35.7	43.4	42.8		42.9			15.2		15.5	18.7	0.3
Level of Service	D	D	D		D			B		B	B	A
Approach Delay (s)		41.5			42.9			15.2			13.9	
Approach LOS		D			D			B			B	

Intersection Summary

HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.6
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

05/29/2017



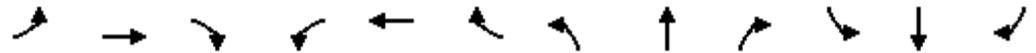
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	99	46	37	93	1246	102	1338	202
v/c Ratio	0.61	0.18	0.15	0.32	0.57	0.29	0.59	0.21
Control Delay	54.9	4.6	2.6	7.0	8.5	5.2	9.4	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	4.6	2.6	7.0	8.5	5.2	9.4	2.3
Queue Length 50th (m)	19.3	0.0	0.0	2.5	48.4	5.0	51.6	2.6
Queue Length 95th (m)	34.1	4.3	1.8	m7.8	56.2	m10.4	72.4	7.6
Internal Link Dist (m)	193.9		43.6		225.6		224.9	
Turn Bay Length (m)		15.0		45.0		30.0		85.0
Base Capacity (vph)	381	482	477	292	2203	353	2267	981
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.10	0.08	0.32	0.57	0.29	0.59	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↕	↕	↖	↕	↗
Traffic Volume (vph)	87	8	44	15	0	20	89	1143	53	98	1284	194
Future Volume (vph)	87	8	44	15	0	20	89	1143	53	98	1284	194
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1464	1244		1443		1583	3264		1735	3343	1351
Flt Permitted		0.72	1.00		0.83		0.15	1.00		0.17	1.00	1.00
Satd. Flow (perm)		1097	1244		1231		253	3264		316	3343	1351
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	91	8	46	16	0	21	93	1191	55	102	1338	202
RTOR Reduction (vph)	0	0	40	0	32	0	0	2	0	0	0	72
Lane Group Flow (vph)	0	99	6	0	5	0	93	1244	0	102	1338	130
Confl. Peds. (#/hr)			2	2			1		6	6		1
Heavy Vehicles (%)	25%	14%	28%	7%	0%	28%	14%	10%	4%	4%	8%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		12.8	12.8		12.8		70.7	64.3		71.3	64.6	64.6
Effective Green, g (s)		12.8	12.8		12.8		70.7	64.3		71.3	64.6	64.6
Actuated g/C Ratio		0.13	0.13		0.13		0.71	0.64		0.71	0.65	0.65
Clearance Time (s)		6.2	6.2		6.2		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		140	159		157		263	2098		320	2159	872
v/s Ratio Prot							c0.02	0.38		0.02	c0.40	
v/s Ratio Perm		c0.09	0.00		0.00		0.23			0.21		0.10
v/c Ratio		0.71	0.04		0.03		0.35	0.59		0.32	0.62	0.15
Uniform Delay, d1		41.8	38.2		38.2		6.4	10.3		5.8	10.4	6.9
Progression Factor		1.00	1.00		1.00		1.06	0.61		0.84	0.67	1.08
Incremental Delay, d2		15.0	0.1		0.1		0.7	1.1		0.5	1.1	0.3
Delay (s)		56.8	38.3		38.2		7.5	7.3		5.4	8.1	7.8
Level of Service		E	D		D		A	A		A	A	A
Approach Delay (s)		51.0			38.2			7.3			7.9	
Approach LOS		D			D			A			A	

Intersection Summary		
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.61	A
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	68.7%	16.2
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

Queues

108: Regional Road 25 & Market Drive

05/29/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	279	75	114	1111	1139	239
v/c Ratio	0.77	0.20	0.38	0.50	0.63	0.28
Control Delay	50.1	7.8	10.6	10.7	10.7	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	7.8	10.6	10.7	10.7	3.0
Queue Length 50th (m)	53.5	0.0	7.3	55.5	15.8	0.0
Queue Length 95th (m)	75.5	10.3	17.0	88.8	53.5	15.8
Internal Link Dist (m)	338.3			274.0	225.6	
Turn Bay Length (m)			55.0			55.0
Base Capacity (vph)	495	486	315	2224	1813	863
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.15	0.36	0.50	0.63	0.28

Intersection Summary

HCM Signalized Intersection Capacity Analysis

108: Regional Road 25 & Market Drive

05/29/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	265	71	108	1055	1082	227
Future Volume (vph)	265	71	108	1055	1082	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1597	1404	1687	3406	3406	1444
Flt Permitted	0.95	1.00	0.16	1.00	1.00	1.00
Satd. Flow (perm)	1597	1404	277	3406	3406	1444
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	279	75	114	1111	1139	239
RTOR Reduction (vph)	0	58	0	0	0	95
Lane Group Flow (vph)	279	17	114	1111	1139	144
Confl. Peds. (#/hr)			3			3
Heavy Vehicles (%)	13%	15%	7%	6%	6%	9%
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	22.7	22.7	65.3	65.3	53.2	53.2
Effective Green, g (s)	22.7	22.7	65.3	65.3	53.2	53.2
Actuated g/C Ratio	0.23	0.23	0.65	0.65	0.53	0.53
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	362	318	295	2224	1811	768
v/s Ratio Prot	c0.17		0.03	c0.33	c0.33	
v/s Ratio Perm		0.01	0.22			0.10
v/c Ratio	0.77	0.05	0.39	0.50	0.63	0.19
Uniform Delay, d1	36.2	30.2	9.5	8.9	16.5	12.2
Progression Factor	1.00	1.00	1.00	1.00	0.51	0.63
Incremental Delay, d2	9.7	0.1	0.8	0.8	1.4	0.4
Delay (s)	46.0	30.3	10.4	9.7	9.8	8.1
Level of Service	D	C	B	A	A	A
Approach Delay (s)	42.6			9.8	9.6	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

110: Regional Road 25 & Steeles Ave

05/29/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	321	526	42	771	44	363	497	409	379
v/c Ratio	1.14	0.47	0.29	0.92	0.15	0.32	0.78	0.39	0.38
Control Delay	127.8	33.1	48.1	39.7	34.7	30.2	24.8	15.7	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.8	33.1	48.1	39.7	34.7	30.2	24.8	15.7	2.4
Queue Length 50th (m)	~73.1	52.4	9.0	47.8	8.1	33.6	71.6	54.9	0.0
Queue Length 95th (m)	#132.3	69.1	20.5	#83.1	19.1	49.6	102.5	78.1	13.7
Internal Link Dist (m)		121.2		239.5		126.4		231.3	
Turn Bay Length (m)	40.0		25.0		50.0		125.0		
Base Capacity (vph)	282	1173	160	875	299	1119	670	1060	1000
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.45	0.26	0.88	0.15	0.32	0.74	0.39	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
110: Regional Road 25 & Steeles Ave

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	308	477	28	40	228	512	42	262	86	477	393	364
Future Volume (vph)	308	477	28	40	228	512	42	262	86	477	393	364
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.90		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3406		1805	2898		1684	3386		1625	1845	1459
Flt Permitted	0.17	1.00		0.46	1.00		0.52	1.00		0.44	1.00	1.00
Satd. Flow (perm)	302	3406		868	2898		925	3386		752	1845	1459
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	321	497	29	42	238	533	44	273	90	497	409	379
RTOR Reduction (vph)	0	3	0	0	347	0	0	24	0	0	0	161
Lane Group Flow (vph)	321	523	0	42	424	0	44	339	0	497	409	218
Confl. Peds. (#/hr)	1					1	3		3	3		3
Heavy Vehicles (%)	4%	5%	7%	0%	12%	10%	7%	2%	3%	11%	3%	9%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	39.2	39.2		20.2	20.2		38.8	38.8		69.0	69.0	69.0
Effective Green, g (s)	39.2	39.2		20.2	20.2		38.8	38.8		69.0	69.0	69.0
Actuated g/C Ratio	0.33	0.33		0.17	0.17		0.32	0.32		0.58	0.58	0.58
Clearance Time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	277	1112		146	487		299	1094		623	1060	838
v/s Ratio Prot	c0.14	0.15			0.15			0.10		c0.17	0.22	
v/s Ratio Perm	c0.23			0.05			0.05			c0.28		0.15
v/c Ratio	1.16	0.47		0.29	0.87		0.15	0.31		0.80	0.39	0.26
Uniform Delay, d1	34.7	32.1		43.6	48.6		28.8	30.5		16.1	13.9	12.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	104.0	0.3		1.1	15.6		1.0	0.7		7.0	1.1	0.8
Delay (s)	138.8	32.5		44.7	64.2		29.9	31.3		23.2	15.0	13.5
Level of Service	F	C		D	E		C	C		C	B	B
Approach Delay (s)		72.7			63.2			31.1			17.7	
Approach LOS		E			E			C			B	

Intersection Summary

HCM 2000 Control Delay	44.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Queues

101: Regional Road 25 & 5 Side Road

05/29/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	86	294	68	233	206	630	68	19	422
v/c Ratio	0.38	0.83	0.31	0.42	0.40	0.31	0.08	0.06	0.29
Control Delay	35.6	40.8	24.0	25.8	10.1	6.5	2.4	22.8	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	40.8	24.0	25.8	10.1	6.5	2.4	22.8	19.5
Queue Length 50th (m)	15.1	36.3	9.5	33.6	2.9	4.8	0.1	2.3	27.3
Queue Length 95th (m)	25.8	60.3	16.0	45.6	38.9	47.5	0.6	8.2	44.7
Internal Link Dist (m)		361.7		299.6		351.5			238.1
Turn Bay Length (m)	75.0		70.0		75.0		75.0	30.0	
Base Capacity (vph)	357	491	216	796	521	2008	836	297	1462
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.60	0.31	0.29	0.40	0.31	0.08	0.06	0.29

Intersection Summary

HCM Signalized Intersection Capacity Analysis
101: Regional Road 25 & 5 Side Road

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	88	185	63	169	47	192	586	63	18	307	86
Future Volume (vph)	80	88	185	63	169	47	192	586	63	18	307	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.90		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1656	1247		1543	1773		1570	3438	1380	1543	3257	
Flt Permitted	0.61	1.00		0.27	1.00		0.44	1.00	1.00	0.41	1.00	
Satd. Flow (perm)	1069	1247		435	1773		725	3438	1380	670	3257	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	86	95	199	68	182	51	206	630	68	19	330	92
RTOR Reduction (vph)	0	89	0	0	12	0	0	0	29	0	22	0
Lane Group Flow (vph)	86	205	0	68	221	0	206	630	39	19	400	0
Heavy Vehicles (%)	9%	22%	44%	17%	3%	6%	15%	5%	17%	17%	7%	8%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	21.5	21.5		31.1	31.1		57.6	57.6	57.6	43.4	43.4	
Effective Green, g (s)	21.5	21.5		31.1	31.1		57.6	57.6	57.6	43.4	43.4	
Actuated g/C Ratio	0.22	0.22		0.31	0.31		0.58	0.58	0.58	0.43	0.43	
Clearance Time (s)	5.6	5.6		4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	229	268		197	551		503	1980	794	290	1413	
v/s Ratio Prot		c0.16		0.02	c0.12		c0.04	0.18			0.12	
v/s Ratio Perm	0.08			0.09			c0.19		0.03	0.03		
v/c Ratio	0.38	0.77		0.35	0.40		0.41	0.32	0.05	0.07	0.28	
Uniform Delay, d1	33.5	36.9		25.8	27.1		10.6	11.0	9.3	16.5	18.3	
Progression Factor	1.00	1.00		1.00	1.00		0.64	0.48	0.65	1.00	1.00	
Incremental Delay, d2	1.0	12.3		1.1	0.5		0.5	0.4	0.1	0.4	0.5	
Delay (s)	34.6	49.2		26.9	27.6		7.4	5.7	6.1	16.9	18.8	
Level of Service	C	D		C	C		A	A	A	B	B	
Approach Delay (s)		45.9			27.4			6.1			18.7	
Approach LOS		D			C			A			B	

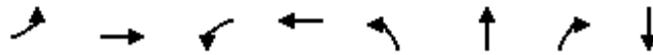
Intersection Summary

HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

102: Regional Road 25 & Escarpment Way/Peddie Road

05/29/2017



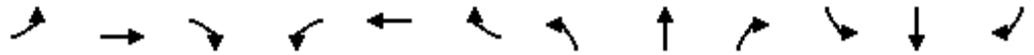
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	76	63	54	9	14	829	36	544
v/c Ratio	0.46	0.30	0.43	0.05	0.03	0.30	0.04	0.21
Control Delay	49.9	14.5	50.7	30.2	2.3	5.5	1.5	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	14.5	50.7	30.2	2.3	5.5	1.5	3.8
Queue Length 50th (m)	14.9	0.4	10.5	0.9	0.8	51.4	1.4	13.6
Queue Length 95th (m)	28.4	12.1	22.2	5.5	m0.9	78.0	1.0	22.2
Internal Link Dist (m)		165.7		110.1		512.8		351.5
Turn Bay Length (m)	25.0		55.0		75.0		125.0	
Base Capacity (vph)	503	528	388	528	499	2750	931	2595
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.12	0.14	0.02	0.03	0.30	0.04	0.21

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 102: Regional Road 25 & Escarpment Way/Peddie Road

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	2	59	52	5	4	13	796	35	0	504	18
Future Volume (vph)	73	2	59	52	5	4	13	796	35	0	504	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		6.0	6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00		0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	0.85		1.00	0.93		1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1752	1350		1421	1451		1308	3406	1145		3212	
Flt Permitted	0.75	1.00		0.72	1.00		0.45	1.00	1.00		1.00	
Satd. Flow (perm)	1387	1350		1071	1451		618	3406	1145		3212	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	76	2	61	54	5	4	14	829	36	0	525	19
RTOR Reduction (vph)	0	55	0	0	4	0	0	0	8	0	1	0
Lane Group Flow (vph)	76	8	0	54	5	0	14	829	28	0	543	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	3%	0%	21%	27%	40%	0%	38%	6%	38%	0%	12%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	9.9	9.9		9.9	9.9		78.4	78.4	78.4		78.4	
Effective Green, g (s)	9.9	9.9		9.9	9.9		78.4	78.4	78.4		78.4	
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.78	0.78	0.78		0.78	
Clearance Time (s)	5.7	5.7		5.7	5.7		6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	137	133		106	143		484	2670	897		2518	
v/s Ratio Prot		0.01			0.00			c0.24			0.17	
v/s Ratio Perm	c0.05			0.05			0.02		0.02			
v/c Ratio	0.55	0.06		0.51	0.04		0.03	0.31	0.03		0.22	
Uniform Delay, d1	42.9	40.8		42.7	40.7		2.4	3.1	2.4		2.8	
Progression Factor	1.00	1.00		1.00	1.00		0.64	1.49	1.12		1.12	
Incremental Delay, d2	4.8	0.2		3.8	0.1		0.1	0.3	0.1		0.2	
Delay (s)	47.7	41.0		46.6	40.9		1.6	4.9	2.7		3.3	
Level of Service	D	D		D	D		A	A	A		A	
Approach Delay (s)		44.7			45.7			4.7			3.3	
Approach LOS		D			D			A			A	

Intersection Summary		
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.34	A
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	47.1%	11.7
Analysis Period (min)	15	ICU Level of Service
		A

c Critical Lane Group

Queues

103: Regional Road 25 & James Snow Pkwy

05/29/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	11	29	133	139	37	109	115	741	98	62	612
v/c Ratio	0.05	0.06	0.36	0.68	0.07	0.34	0.21	0.37	0.12	0.15	0.35
Control Delay	31.3	31.6	8.5	54.0	31.9	9.2	4.8	8.6	1.7	4.6	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	31.6	8.5	54.0	31.9	9.2	4.8	8.6	1.7	4.6	11.5
Queue Length 50th (m)	1.9	2.6	0.0	26.9	3.3	0.0	6.1	32.4	1.2	2.4	31.5
Queue Length 95th (m)	6.3	6.1	14.5	43.7	7.2	13.4	9.3	26.8	0.0	6.2	46.0
Internal Link Dist (m)		134.9			153.9			258.8			512.8
Turn Bay Length (m)	55.0		80.0	85.0		40.0	30.0			75.0	
Base Capacity (vph)	498	1174	660	459	1247	583	536	2009	841	417	1770
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.02	0.20	0.30	0.03	0.19	0.21	0.37	0.12	0.15	0.35

Intersection Summary

HCM Signalized Intersection Capacity Analysis
103: Regional Road 25 & James Snow Pkwy

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	28	126	132	35	104	109	704	93	59	576	6
Future Volume (vph)	10	28	126	132	35	104	109	704	93	59	576	6
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4	6.4	4.0	6.4	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1671	3034	1495	1530	3223	1335	1612	3312	1324	1399	3059	
Flt Permitted	0.73	1.00	1.00	0.74	1.00	1.00	0.39	1.00	1.00	0.35	1.00	
Satd. Flow (perm)	1287	3034	1495	1187	3223	1335	656	3312	1324	520	3059	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	29	133	139	37	109	115	741	98	62	606	6
RTOR Reduction (vph)	0	0	110	0	0	90	0	0	39	0	0	0
Lane Group Flow (vph)	11	29	23	139	37	19	115	741	59	62	612	0
Heavy Vehicles (%)	8%	19%	8%	18%	12%	21%	12%	9%	22%	29%	18%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	17.3	17.3	17.3	17.3	17.3	17.3	68.0	59.9	59.9	64.0	57.9	
Effective Green, g (s)	17.3	17.3	17.3	17.3	17.3	17.3	68.0	59.9	59.9	64.0	57.9	
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17	0.17	0.68	0.60	0.60	0.64	0.58	
Clearance Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4	6.4	4.0	6.4	
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	
Lane Grp Cap (vph)	222	524	258	205	557	230	523	1983	793	386	1771	
v/s Ratio Prot		0.01			0.01		c0.02	c0.22		0.01	0.20	
v/s Ratio Perm	0.01		0.02	c0.12		0.01	0.13		0.04	0.09		
v/c Ratio	0.05	0.06	0.09	0.68	0.07	0.08	0.22	0.37	0.07	0.16	0.35	
Uniform Delay, d1	34.5	34.5	34.7	38.7	34.6	34.7	5.6	10.4	8.4	6.8	11.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.75	0.69	0.52	0.72	0.89	
Incremental Delay, d2	0.1	0.0	0.2	8.6	0.1	0.2	0.2	0.5	0.2	0.2	0.5	
Delay (s)	34.6	34.6	34.9	47.3	34.6	34.8	4.4	7.7	4.5	5.1	10.4	
Level of Service	C	C	C	D	C	C	A	A	A	A	B	
Approach Delay (s)		34.8			40.9			7.0			9.9	
Approach LOS		C			D			A			A	

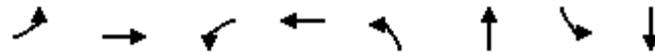
Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues

104: Regional Road 25 & Driveway/High Point Drive

05/29/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	16	18	265	35	13	1021	16	915
v/c Ratio	0.06	0.05	0.79	0.08	0.06	0.36	0.07	0.48
Control Delay	24.1	11.3	50.6	10.1	17.2	14.8	8.7	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	11.3	50.6	10.1	17.2	14.8	8.7	11.1
Queue Length 50th (m)	2.4	0.3	50.2	0.8	1.0	41.4	0.8	58.2
Queue Length 95th (m)	6.8	5.1	70.9	7.2	m6.7	72.1	m2.9	111.8
Internal Link Dist (m)		98.3		127.8		439.1		258.8
Turn Bay Length (m)	15.0		30.0		70.0		30.0	
Base Capacity (vph)	410	486	481	607	233	2841	242	1903
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.04	0.55	0.06	0.06	0.36	0.07	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

104: Regional Road 25 & Driveway/High Point Drive

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑↑		↖	↗	
Traffic Volume (vph)	15	2	15	241	5	27	12	849	80	15	831	2
Future Volume (vph)	15	2	15	241	5	27	12	849	80	15	831	2
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.87		1.00	0.87		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1399	1254		1612	1549		1327	4593		1492	3085	
Flt Permitted	0.73	1.00		0.75	1.00		0.27	1.00		0.25	1.00	
Satd. Flow (perm)	1082	1254		1265	1549		378	4593		393	3085	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	16	2	16	265	5	30	13	933	88	16	913	2
RTOR Reduction (vph)	0	12	0	0	22	0	0	8	0	0	0	0
Lane Group Flow (vph)	16	6	0	265	13	0	13	1013	0	16	915	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	29%	50%	29%	12%	0%	8%	36%	10%	27%	21%	17%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.4	26.4		26.4	26.4		61.7	61.7		61.7	61.7	
Effective Green, g (s)	26.4	26.4		26.4	26.4		61.7	61.7		61.7	61.7	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.62	0.62		0.62	0.62	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	285	331		333	408		233	2833		242	1903	
v/s Ratio Prot		0.00			0.01			0.22			c0.30	
v/s Ratio Perm	0.01			c0.21			0.03			0.04		
v/c Ratio	0.06	0.02		0.80	0.03		0.06	0.36		0.07	0.48	
Uniform Delay, d1	27.5	27.2		34.3	27.3		7.6	9.4		7.6	10.4	
Progression Factor	1.00	1.00		1.00	1.00		1.55	1.41		0.75	0.86	
Incremental Delay, d2	0.1	0.0		12.4	0.0		0.4	0.3		0.5	0.8	
Delay (s)	27.6	27.2		46.7	27.3		12.2	13.7		6.2	9.8	
Level of Service	C	C		D	C		B	B		A	A	
Approach Delay (s)		27.4			44.4			13.6			9.8	
Approach LOS		C			D			B			A	

Intersection Summary

HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

05/29/2017



Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	532	357	668	520	911
v/c Ratio	0.74	0.24	0.30	0.33	0.41
Control Delay	42.3	0.4	2.8	0.5	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	0.4	2.8	0.5	4.1
Queue Length 50th (m)	52.3	0.0	7.7	0.0	24.2
Queue Length 95th (m)	65.5	0.0	9.7	0.0	26.2
Internal Link Dist (m)	114.8		321.2		439.1
Turn Bay Length (m)				75.0	
Base Capacity (vph)	1456	1495	2215	1580	2236
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.37	0.24	0.30	0.33	0.41

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

05/29/2017



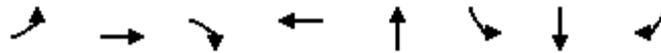
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↗	↕↕	↗		↕↕
Traffic Volume (vph)	532	357	668	520	0	911
Future Volume (vph)	532	357	668	520	0	911
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5	4.0		5.5
Lane Util. Factor	0.97	1.00	0.95	1.00		0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.98		1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	3273	1495	3312	1580		3343
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	3273	1495	3312	1580		3343
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	532	357	668	520	0	911
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	532	357	668	520	0	911
Confl. Peds. (#/hr)				4	4	
Heavy Vehicles (%)	7%	8%	9%	0%	0%	8%
Turn Type	Prot	Free	NA	Free		NA
Protected Phases	8		2			6
Permitted Phases		Free		Free		
Actuated Green, G (s)	22.1	100.0	66.9	100.0		66.9
Effective Green, g (s)	22.1	100.0	66.9	100.0		66.9
Actuated g/C Ratio	0.22	1.00	0.67	1.00		0.67
Clearance Time (s)	5.5		5.5			5.5
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	723	1495	2215	1580		2236
v/s Ratio Prot	c0.16		0.20			c0.27
v/s Ratio Perm		0.24		0.33		
v/c Ratio	0.74	0.24	0.30	0.33		0.41
Uniform Delay, d1	36.2	0.0	6.9	0.0		7.5
Progression Factor	1.00	1.00	0.33	1.00		0.44
Incremental Delay, d2	3.9	0.4	0.3	0.5		0.5
Delay (s)	40.1	0.4	2.6	0.5		3.8
Level of Service	D	A	A	A		A
Approach Delay (s)	24.2		1.7			3.8
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool L~~0~~ 05/29/2017



Lane Group	EBL	EBT	EBR	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	108	219	213	53	1139	29	1139	270
v/c Ratio	0.58	0.64	0.63	0.27	0.57	0.16	0.56	0.17
Control Delay	51.1	19.9	18.9	5.3	17.5	14.7	14.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	19.9	18.9	5.3	17.5	14.7	14.0	0.2
Queue Length 50th (m)	21.0	10.5	9.3	0.0	64.5	2.4	55.7	0.0
Queue Length 95th (m)	36.2	33.7	31.8	3.2	113.0	m7.4	117.0	0.0
Internal Link Dist (m)		109.5		75.3	224.9		321.2	
Turn Bay Length (m)	30.0		30.0			30.0		75.0
Base Capacity (vph)	447	591	584	199	2009	181	2051	1615
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.37	0.36	0.27	0.57	0.16	0.56	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool Lane 04/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	14	410	34	0	18	0	1098	19	28	1116	265
Future Volume (vph)	106	14	410	34	0	18	0	1098	19	28	1116	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	5.8		5.8			6.0		6.0	6.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00			0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00			1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.86	0.85		0.95			1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.97			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1271	1377	1358		1613			3304		1489	3374	1615
Flt Permitted	0.95	1.00	1.00		0.67			1.00		0.19	1.00	1.00
Satd. Flow (perm)	1271	1377	1358		1113			3304		299	3374	1615
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	108	14	418	35	0	18	0	1120	19	29	1139	270
RTOR Reduction (vph)	0	141	141	0	49	0	0	1	0	0	0	0
Lane Group Flow (vph)	108	78	72	0	4	0	0	1138	0	29	1139	270
Confl. Peds. (#/hr)									6	6		
Heavy Vehicles (%)	42%	8%	13%	3%	0%	20%	0%	9%	6%	21%	7%	0%
Turn Type	Split	NA	Perm	Perm	NA			NA		Perm	NA	Free
Protected Phases	4	4			8			2			6	
Permitted Phases			4	8						6		Free
Actuated Green, G (s)	14.7	14.7	14.7		8.0			59.7		59.7	59.7	100.0
Effective Green, g (s)	14.7	14.7	14.7		8.0			59.7		59.7	59.7	100.0
Actuated g/C Ratio	0.15	0.15	0.15		0.08			0.60		0.60	0.60	1.00
Clearance Time (s)	5.8	5.8	5.8		5.8			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	186	202	199		89			1972		178	2014	1615
v/s Ratio Prot	c0.08	0.06						c0.34			0.34	
v/s Ratio Perm			0.05		0.00					0.10		c0.17
v/c Ratio	0.58	0.39	0.36		0.05			0.58		0.16	0.57	0.17
Uniform Delay, d1	39.8	38.6	38.4		42.5			12.4		9.0	12.3	0.0
Progression Factor	1.00	1.00	1.00		1.00			1.22		1.01	0.96	1.00
Incremental Delay, d2	4.6	1.2	1.1		0.2			0.9		1.8	1.1	0.2
Delay (s)	44.3	39.8	39.6		42.7			16.0		10.9	12.8	0.2
Level of Service	D	D	D		D			B		B	B	A
Approach Delay (s)		40.6			42.7			16.0			10.4	
Approach LOS		D			D			B			B	

Intersection Summary

HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.6
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

05/29/2017



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	176	85	113	55	1424	48	1519	114
v/c Ratio	0.75	0.23	0.41	0.28	0.69	0.21	0.76	0.15
Control Delay	55.4	9.5	24.0	11.7	13.2	5.8	14.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	9.5	24.0	11.7	13.2	5.8	14.3	1.1
Queue Length 50th (m)	33.9	1.3	11.8	2.1	57.7	1.6	126.3	0.3
Queue Length 95th (m)	52.3	12.3	25.4	m6.3	#181.2	m4.0	#205.4	1.9
Internal Link Dist (m)	193.9		43.6		225.6		224.9	
Turn Bay Length (m)		15.0		45.0		30.0		85.0
Base Capacity (vph)	397	563	433	199	2061	234	1993	769
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.15	0.26	0.28	0.69	0.21	0.76	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	↗
Traffic Volume (vph)	160	6	80	54	5	48	52	1285	54	45	1428	107
Future Volume (vph)	160	6	80	54	5	48	52	1285	54	45	1428	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00	0.99		0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1622	1476		1662		1583	3413		1641	3438	1252
Flt Permitted		0.67	1.00		0.68		0.08	1.00		0.12	1.00	1.00
Satd. Flow (perm)		1140	1476		1162		140	3413		199	3438	1252
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	170	6	85	57	5	51	55	1367	57	48	1519	114
RTOR Reduction (vph)	0	0	61	0	36	0	0	2	0	0	0	44
Lane Group Flow (vph)	0	176	24	0	77	0	55	1422	0	48	1519	70
Confl. Peds. (#/hr)	2		1	1		2	3		1	1		3
Heavy Vehicles (%)	12%	0%	8%	8%	0%	0%	14%	5%	6%	10%	5%	27%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		20.7	20.7		20.7		64.6	58.7		61.6	57.2	57.2
Effective Green, g (s)		20.7	20.7		20.7		64.6	58.7		61.6	57.2	57.2
Actuated g/C Ratio		0.21	0.21		0.21		0.65	0.59		0.62	0.57	0.57
Clearance Time (s)		6.2	6.2		6.2		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		235	305		240		175	2003		186	1966	716
v/s Ratio Prot							c0.02	0.42		0.01	c0.44	
v/s Ratio Perm		c0.15	0.02		0.07		0.18			0.15		0.06
v/c Ratio		0.75	0.08		0.32		0.31	0.71		0.26	0.77	0.10
Uniform Delay, d1		37.2	32.0		33.7		12.0	14.6		10.4	16.4	9.7
Progression Factor		1.00	1.00		1.00		1.31	0.67		0.59	0.58	0.19
Incremental Delay, d2		12.3	0.1		0.8		0.9	1.8		0.7	2.7	0.2
Delay (s)		49.5	32.1		34.5		16.5	11.7		6.9	12.2	2.1
Level of Service		D	C		C		B	B		A	B	A
Approach Delay (s)		43.8			34.5			11.8			11.4	
Approach LOS		D			C			B			B	

Intersection Summary		
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio	0.73	
Actuated Cycle Length (s)	100.0	Sum of lost time (s) 16.2
Intersection Capacity Utilization	73.3%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

Queues

108: Regional Road 25 & Market Drive

05/29/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	334	112	174	1159	1409	206
v/c Ratio	0.82	0.24	0.72	0.53	0.83	0.26
Control Delay	51.1	6.4	36.3	12.2	20.6	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.1	6.4	36.3	12.2	20.6	6.9
Queue Length 50th (m)	63.8	0.0	17.5	64.7	37.6	1.3
Queue Length 95th (m)	90.4	12.1	#53.7	95.7	#183.0	m18.2
Internal Link Dist (m)	338.3			274.0	225.6	
Turn Bay Length (m)			55.0			55.0
Base Capacity (vph)	508	549	247	2167	1707	783
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.20	0.70	0.53	0.83	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

108: Regional Road 25 & Market Drive

05/29/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	317	106	165	1101	1339	196
Future Volume (vph)	317	106	165	1101	1339	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1641	1524	1752	3438	3438	1434
Flt Permitted	0.95	1.00	0.07	1.00	1.00	1.00
Satd. Flow (perm)	1641	1524	138	3438	3438	1434
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	334	112	174	1159	1409	206
RTOR Reduction (vph)	0	84	0	0	0	71
Lane Group Flow (vph)	334	28	174	1159	1409	135
Confl. Peds. (#/hr)			7			7
Heavy Vehicles (%)	10%	6%	3%	5%	5%	9%
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	25.0	25.0	63.0	63.0	49.6	49.6
Effective Green, g (s)	25.0	25.0	63.0	63.0	49.6	49.6
Actuated g/C Ratio	0.25	0.25	0.63	0.63	0.50	0.50
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	410	381	238	2165	1705	711
v/s Ratio Prot	c0.20		c0.07	0.34	c0.41	
v/s Ratio Perm		0.02	0.39			0.09
v/c Ratio	0.81	0.07	0.73	0.54	0.83	0.19
Uniform Delay, d1	35.3	28.7	22.3	10.3	21.5	14.0
Progression Factor	1.00	1.00	1.00	1.00	0.71	1.05
Incremental Delay, d2	11.8	0.1	11.0	1.0	3.3	0.4
Delay (s)	47.1	28.7	33.3	11.3	18.7	15.2
Level of Service	D	C	C	B	B	B
Approach Delay (s)	42.5			14.2	18.2	
Approach LOS	D			B	B	

Intersection Summary

HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

110: Regional Road 25 & Steeles Ave

05/29/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	400	405	120	1090	75	430	500	451	598
v/c Ratio	1.46	0.34	0.67	1.37	0.26	0.40	0.83	0.43	0.56
Control Delay	253.0	29.2	65.4	203.0	36.8	34.0	28.4	17.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	253.0	29.2	65.4	203.0	36.8	34.0	28.4	17.0	5.6
Queue Length 50th (m)	~119.7	37.6	28.0	~157.5	14.3	43.2	71.4	62.0	15.2
Queue Length 95th (m)	#183.7	51.4	#55.5	#201.1	29.4	61.0	101.5	87.3	42.3
Internal Link Dist (m)		121.2		239.5		126.4		231.3	
Turn Bay Length (m)	40.0		25.0		50.0		125.0		
Base Capacity (vph)	274	1190	178	796	287	1065	641	1050	1070
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.46	0.34	0.67	1.37	0.26	0.40	0.78	0.43	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

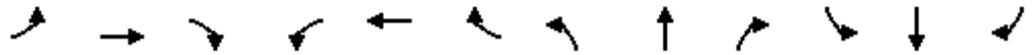
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
110: Regional Road 25 & Steeles Ave

05/29/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	336	48	114	415	620	71	340	68	475	428	568
Future Volume (vph)	380	336	48	114	415	620	71	340	68	475	428	568
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.91		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1687	3442		1785	3092		1796	3476		1671	1881	1550
Flt Permitted	0.15	1.00		0.51	1.00		0.50	1.00		0.38	1.00	1.00
Satd. Flow (perm)	271	3442		966	3092		950	3476		662	1881	1550
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	354	51	120	437	653	75	358	72	500	451	598
RTOR Reduction (vph)	0	9	0	0	225	0	0	13	0	0	0	205
Lane Group Flow (vph)	400	396	0	120	865	0	75	417	0	500	451	393
Confl. Peds. (#/hr)	5		1	1		5	8		2	2		8
Heavy Vehicles (%)	7%	3%	0%	1%	5%	5%	0%	1%	1%	8%	1%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	41.2	41.2		22.2	22.2		36.3	36.3		67.0	67.0	67.0
Effective Green, g (s)	41.2	41.2		22.2	22.2		36.3	36.3		67.0	67.0	67.0
Actuated g/C Ratio	0.34	0.34		0.18	0.18		0.30	0.30		0.56	0.56	0.56
Clearance Time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	270	1181		178	572		287	1051		594	1050	865
v/s Ratio Prot	c0.19	0.12			0.28			0.12		c0.19	0.24	
v/s Ratio Perm	c0.32			0.12			0.08			c0.28		0.25
v/c Ratio	1.48	0.34		0.67	1.51		0.26	0.40		0.84	0.43	0.45
Uniform Delay, d1	33.2	29.2		45.5	48.9		31.7	33.2		17.7	15.4	15.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	235.5	0.2		9.7	239.5		2.2	1.1		10.5	1.3	1.7
Delay (s)	268.8	29.4		55.2	288.4		33.9	34.3		28.1	16.7	17.4
Level of Service	F	C		E	F		C	C		C	B	B
Approach Delay (s)		148.3			265.3			34.2			20.7	
Approach LOS		F			F			C			C	

Intersection Summary

HCM 2000 Control Delay	120.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	121.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

101: Regional Road 25 & 5 Side Road

09/07/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	209	555	121	96	268	621	266	121	850
v/c Ratio	0.81	1.71	0.72	0.19	0.91	0.35	0.27	0.47	0.73
Control Delay	62.5	356.9	51.4	23.0	68.5	15.7	7.4	33.6	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	356.9	51.4	23.0	68.5	15.7	7.4	33.6	33.1
Queue Length 50th (m)	40.9	~158.3	17.9	12.3	39.8	25.8	7.8	19.4	79.1
Queue Length 95th (m)	#80.0	#225.4	#38.2	25.2	#87.8	62.9	38.2	38.4	102.7
Internal Link Dist (m)		361.7		299.6		351.5			238.1
Turn Bay Length (m)	75.0		70.0		75.0		75.0	30.0	
Base Capacity (vph)	259	325	167	508	302	1798	970	260	1160
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	1.71	0.72	0.19	0.89	0.35	0.27	0.47	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

101: Regional Road 25 & 5 Side Road

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	208	292	109	70	16	241	559	239	109	675	90
Future Volume (vph)	188	208	292	109	70	16	241	559	239	109	675	90
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.91		1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1352		1456	1594		1142	3139	1495	1736	3365	
Flt Permitted	0.69	1.00		0.16	1.00		0.16	1.00	1.00	0.42	1.00	
Satd. Flow (perm)	1269	1352		251	1594		190	3139	1495	761	3365	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	209	231	324	121	78	18	268	621	266	121	750	100
RTOR Reduction (vph)	0	50	0	0	8	0	0	0	114	0	11	0
Lane Group Flow (vph)	209	505	0	121	88	0	268	621	152	121	839	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	4%	9%	42%	24%	17%	11%	58%	15%	8%	4%	5%	6%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	20.4	20.4		31.4	31.4		57.3	57.3	57.3	34.2	34.2	
Effective Green, g (s)	20.4	20.4		31.4	31.4		57.3	57.3	57.3	34.2	34.2	
Actuated g/C Ratio	0.20	0.20		0.31	0.31		0.57	0.57	0.57	0.34	0.34	
Clearance Time (s)	5.6	5.6		4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	258	275		163	500		290	1798	856	260	1150	
v/s Ratio Prot		c0.37		c0.05	0.06		c0.18	0.20			0.25	
v/s Ratio Perm	0.16			0.18			c0.35		0.10	0.16		
v/c Ratio	0.81	1.84		0.74	0.18		0.92	0.35	0.18	0.47	0.73	
Uniform Delay, d1	38.0	39.8		27.9	24.9		23.2	11.4	10.2	25.7	28.9	
Progression Factor	1.00	1.00		1.00	1.00		1.78	1.32	5.15	1.00	1.00	
Incremental Delay, d2	17.2	390.0		16.6	0.2		31.8	0.5	0.4	5.9	4.1	
Delay (s)	55.2	429.8		44.5	25.1		72.9	15.5	52.7	31.6	32.9	
Level of Service	E	F		D	C		E	B	D	C	C	
Approach Delay (s)		327.3			35.9			37.4			32.8	
Approach LOS		F			D			D			C	

Intersection Summary

HCM 2000 Control Delay	107.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

102: Regional Road 25 & Escarpment Way/Peddie Road

09/07/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	42	47	13	92	1026	148	4	1201
v/c Ratio	0.36	0.28	0.42	0.08	0.37	0.45	0.13	0.01	0.49
Control Delay	47.1	21.1	51.7	35.0	22.0	16.5	5.9	3.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	21.1	51.7	35.0	22.0	16.5	5.9	3.8	3.5
Queue Length 50th (m)	10.3	1.5	9.2	2.1	16.2	95.3	8.8	0.1	26.3
Queue Length 95th (m)	21.6	11.3	20.3	7.5	m23.2	m128.0	m14.7	m0.2	m28.0
Internal Link Dist (m)		165.7		110.1		512.8			351.5
Turn Bay Length (m)	25.0		55.0		75.0		125.0	35.0	
Base Capacity (vph)	431	380	332	482	251	2301	1100	412	2476
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.11	0.14	0.03	0.37	0.45	0.13	0.01	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 102: Regional Road 25 & Escarpment Way/Peddie Road

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↗	
Traffic Volume (vph)	49	7	31	43	10	2	85	944	136	4	1016	89
Future Volume (vph)	49	7	31	43	10	2	85	944	136	4	1016	89
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	0.98		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1597	1045		1262	1403		1357	2843	1324	1805	3056	
Flt Permitted	0.75	1.00		0.73	1.00		0.22	1.00	1.00	0.27	1.00	
Satd. Flow (perm)	1259	1045		969	1403		311	2843	1324	509	3056	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	8	34	47	11	2	92	1026	148	4	1104	97
RTOR Reduction (vph)	0	31	0	0	2	0	0	0	32	0	3	0
Lane Group Flow (vph)	53	11	0	47	11	0	92	1026	116	4	1198	0
Heavy Vehicles (%)	13%	25%	68%	43%	20%	100%	33%	27%	22%	0%	18%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	9.7	9.7		9.7	9.7		78.6	78.6	78.6	78.6	78.6	
Effective Green, g (s)	9.7	9.7		9.7	9.7		78.6	78.6	78.6	78.6	78.6	
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.79	0.79	0.79	0.79	0.79	
Clearance Time (s)	5.7	5.7		5.7	5.7		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	122	101		93	136		244	2234	1040	400	2402	
v/s Ratio Prot		0.01			0.01			0.36			c0.39	
v/s Ratio Perm	0.04			c0.05			0.30		0.09	0.01		
v/c Ratio	0.43	0.11		0.51	0.08		0.38	0.46	0.11	0.01	0.50	
Uniform Delay, d1	42.6	41.2		42.9	41.1		3.3	3.6	2.5	2.3	3.8	
Progression Factor	1.00	1.00		1.00	1.00		3.81	3.93	8.66	1.06	0.78	
Incremental Delay, d2	2.5	0.5		4.3	0.3		2.2	0.3	0.1	0.0	0.2	
Delay (s)	45.0	41.7		47.1	41.4		14.6	14.4	21.9	2.5	3.1	
Level of Service	D	D		D	D		B	B	C	A	A	
Approach Delay (s)		43.6			45.9			15.3			3.1	
Approach LOS		D			D			B			A	

Intersection Summary

HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

103: Regional Road 25 & James Snow Pkwy

09/07/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	22	42	68	70	33	110	318	1195	408	254	875
v/c Ratio	0.18	0.10	0.28	0.54	0.08	0.49	0.54	0.93	0.50	0.57	0.60
Control Delay	39.6	36.6	9.3	54.5	36.2	15.1	12.8	31.9	5.3	33.9	14.9
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	39.6	36.6	9.3	54.5	36.2	15.1	12.8	31.9	5.3	33.9	14.9
Queue Length 50th (m)	4.1	4.0	0.0	13.6	3.2	0.0	18.6	47.0	2.5	33.6	39.2
Queue Length 95th (m)	10.9	8.5	9.2	26.7	7.2	15.4	m54.5	#178.2	m32.9	55.2	76.2
Internal Link Dist (m)		134.9			153.9			258.8			512.8
Turn Bay Length (m)	55.0		80.0	85.0		40.0	30.0			75.0	
Base Capacity (vph)	344	1131	525	360	1131	423	584	1290	813	448	1457
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.04	0.13	0.19	0.03	0.26	0.54	0.93	0.50	0.57	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
103: Regional Road 25 & James Snow Pkwy

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	39	63	64	30	101	293	1099	375	234	795	10
Future Volume (vph)	20	39	63	64	30	101	293	1099	375	234	795	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4	6.4	4.0	6.4	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1203	3059	1282	1271	3059	956	1656	3112	1386	1367	3059	
Flt Permitted	0.73	1.00	1.00	0.73	1.00	1.00	0.28	1.00	1.00	0.09	1.00	
Satd. Flow (perm)	930	3059	1282	974	3059	956	492	3112	1386	127	3059	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	42	68	70	33	110	318	1195	408	254	864	11
RTOR Reduction (vph)	0	0	59	0	0	95	0	0	239	0	1	0
Lane Group Flow (vph)	22	42	9	70	33	15	318	1195	169	254	874	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	50%	18%	26%	42%	18%	69%	9%	16%	15%	32%	18%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	13.4	13.4	13.4	13.4	13.4	13.4	63.7	41.5	41.5	73.9	47.7	
Effective Green, g (s)	13.4	13.4	13.4	13.4	13.4	13.4	63.7	41.5	41.5	73.9	47.7	
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.13	0.64	0.42	0.42	0.74	0.48	
Clearance Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4	6.4	4.0	6.4	
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	
Lane Grp Cap (vph)	124	409	171	130	409	128	571	1291	575	446	1459	
v/s Ratio Prot		0.01			0.01		0.12	c0.38		c0.16	0.29	
v/s Ratio Perm	0.02		0.01	c0.07		0.02	0.23		0.12	0.26		
v/c Ratio	0.18	0.10	0.05	0.54	0.08	0.12	0.56	0.93	0.29	0.57	0.60	
Uniform Delay, d1	38.4	38.0	37.8	40.4	37.9	38.1	8.5	27.8	19.5	20.6	19.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.47	0.76	1.61	1.56	0.67	
Incremental Delay, d2	0.7	0.1	0.1	4.2	0.1	0.4	0.8	9.4	0.9	1.5	1.7	
Delay (s)	39.1	38.1	37.9	44.7	38.0	38.5	13.3	30.4	32.3	33.6	14.5	
Level of Service	D	D	D	D	D	D	B	C	C	C	B	
Approach Delay (s)		38.2			40.4			28.0			18.8	
Approach LOS		D			D			C			B	

Intersection Summary

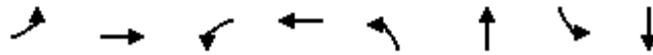
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

104: Regional Road 25 & Driveway/High Point Drive

09/07/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	15	115	24	36	2386	53	960
v/c Ratio	0.04	0.09	0.67	0.14	0.10	0.76	0.79	0.46
Control Delay	30.7	15.9	56.6	23.7	11.6	21.6	77.1	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	15.9	56.6	23.7	11.6	21.6	77.1	3.0
Queue Length 50th (m)	1.2	0.2	22.3	2.4	3.6	159.7	7.7	10.0
Queue Length 95th (m)	4.7	5.4	38.0	8.9	m5.7	185.8	m#27.7	15.0
Internal Link Dist (m)		98.3		127.8		439.1		258.8
Turn Bay Length (m)	15.0		30.0		70.0		30.0	
Base Capacity (vph)	406	336	355	356	348	3125	67	2102
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.04	0.32	0.07	0.10	0.76	0.79	0.46

Intersection Summary

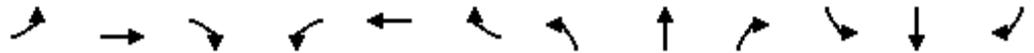
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 104: Regional Road 25 & Driveway/High Point Drive

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑↑		↖	↗	
Traffic Volume (vph)	7	1	13	109	2	21	34	1684	582	50	896	16
Future Volume (vph)	7	1	13	109	2	21	34	1684	582	50	896	16
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	0.86		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1444	910		1253	974		1702	4366		1597	2972	
Flt Permitted	0.74	1.00		0.75	1.00		0.27	1.00		0.06	1.00	
Satd. Flow (perm)	1127	910		987	974		493	4366		95	2972	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	1	14	115	2	22	36	1773	613	53	943	17
RTOR Reduction (vph)	0	12	0	0	8	0	0	38	0	0	1	0
Lane Group Flow (vph)	7	3	0	115	16	0	36	2348	0	53	959	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	25%	100%	78%	44%	50%	70%	6%	15%	12%	13%	21%	27%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.4	17.4		17.4	17.4		70.7	70.7		70.7	70.7	
Effective Green, g (s)	17.4	17.4		17.4	17.4		70.7	70.7		70.7	70.7	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.71	0.71		0.71	0.71	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	196	158		171	169		348	3086		67	2101	
v/s Ratio Prot		0.00			0.02			0.54			0.32	
v/s Ratio Perm	0.01			c0.12			0.07			c0.56		
v/c Ratio	0.04	0.02		0.67	0.09		0.10	0.76		0.79	0.46	
Uniform Delay, d1	34.3	34.2		38.6	34.7		4.6	9.3		9.7	6.3	
Progression Factor	1.00	1.00		1.00	1.00		1.74	2.03		0.94	0.33	
Incremental Delay, d2	0.1	0.1		10.0	0.2		0.4	1.2		54.9	0.6	
Delay (s)	34.4	34.3		48.6	34.9		8.4	20.0		64.0	2.7	
Level of Service	C	C		D	C		A	B		E	A	
Approach Delay (s)		34.3			46.2			19.8			5.9	
Approach LOS		C			D			B			A	

Intersection Summary

HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

09/07/2017



Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	856	898	1547	573	1028
v/c Ratio	0.89	0.68	0.81	0.35	0.61
Control Delay	45.6	2.8	28.9	0.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	2.8	28.9	0.3	6.3
Queue Length 50th (m)	83.0	0.0	141.9	0.0	24.6
Queue Length 95th (m)	#110.7	0.0	m139.7	m0.0	31.7
Internal Link Dist (m)	113.2		321.2		439.1
Turn Bay Length (m)				75.0	
Base Capacity (vph)	1016	1324	1913	1615	1696
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.68	0.81	0.35	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

09/07/2017



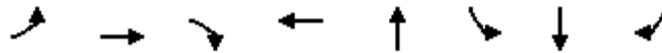
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↕↕	↔		↕↕
Traffic Volume (vph)	805	844	1454	539	0	966
Future Volume (vph)	805	844	1454	539	0	966
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5	4.0		5.5
Lane Util. Factor	0.97	1.00	0.95	1.00		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	3127	1324	3282	1615		2911
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	3127	1324	3282	1615		2911
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	856	898	1547	573	0	1028
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	856	898	1547	573	0	1028
Heavy Vehicles (%)	12%	22%	10%	0%	0%	24%
Turn Type	Prot	Free	NA	Free		NA
Protected Phases	8		2			6
Permitted Phases		Free		Free		
Actuated Green, G (s)	30.7	100.0	58.3	100.0		58.3
Effective Green, g (s)	30.7	100.0	58.3	100.0		58.3
Actuated g/C Ratio	0.31	1.00	0.58	1.00		0.58
Clearance Time (s)	5.5		5.5			5.5
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	959	1324	1913	1615		1697
v/s Ratio Prot	c0.27		c0.47			0.35
v/s Ratio Perm		0.68		0.35		
v/c Ratio	0.89	0.68	0.81	0.35		0.61
Uniform Delay, d1	33.1	0.0	16.4	0.0		13.4
Progression Factor	1.00	1.00	1.54	1.00		0.34
Incremental Delay, d2	10.6	2.8	2.1	0.3		1.5
Delay (s)	43.6	2.8	27.4	0.3		6.1
Level of Service	D	A	C	A		A
Approach Delay (s)	22.7		20.1			6.1
Approach LOS	C		C			A

Intersection Summary

HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool L~~0~~ 09/07/2017



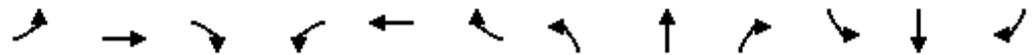
Lane Group	EBL	EBT	EBR	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	378	617	612	150	1414	81	1634	466
v/c Ratio	0.71	1.14	1.13	0.84	1.11	1.16	1.30	0.29
Control Delay	37.7	109.6	107.8	54.8	86.9	177.0	164.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	109.6	107.8	54.8	86.9	177.0	164.6	0.4
Queue Length 50th (m)	66.8	~138.8	~137.0	10.6	~171.2	~20.2	~232.6	0.0
Queue Length 95th (m)	101.6	#211.7	#209.4	#46.8 m	#164.2 m	#37.8	#272.3	m0.0
Internal Link Dist (m)		109.5		75.3	224.9		321.2	
Turn Bay Length (m)	30.0		30.0			30.0		75.0
Base Capacity (vph)	535	543	541	182	1276	70	1261	1582
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	1.14	1.13	0.82	1.11	1.16	1.30	0.29

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool Lane 09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘		↔			↕		↖	↗	↘
Traffic Volume (vph)	355	27	1128	70	0	71	0	1205	124	76	1536	438
Future Volume (vph)	355	27	1128	70	0	71	0	1205	124	76	1536	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	5.8		5.8			6.0		6.0	6.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00			0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99	0.99		1.00			1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.86	0.85		0.93			0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1612	1421	1415		1542			3300		1671	3282	1582
Flt Permitted	0.95	1.00	1.00		0.55			1.00		0.10	1.00	1.00
Satd. Flow (perm)	1612	1421	1415		868			3300		183	3282	1582
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	378	29	1200	74	0	76	0	1282	132	81	1634	466
RTOR Reduction (vph)	0	72	72	0	86	0	0	8	0	0	0	0
Lane Group Flow (vph)	378	545	540	0	64	0	0	1406	0	81	1634	466
Confl. Peds. (#/hr)			1	1			1		8	8		1
Heavy Vehicles (%)	12%	18%	7%	10%	0%	14%	0%	8%	3%	8%	10%	0%
Turn Type	Split	NA	Perm	Perm	NA			NA		Perm	NA	Free
Protected Phases	4	4			8			2			6	
Permitted Phases			4	8						6		Free
Actuated Green, G (s)	33.2	33.2	33.2		10.8			38.4		38.4	38.4	100.0
Effective Green, g (s)	33.2	33.2	33.2		10.8			38.4		38.4	38.4	100.0
Actuated g/C Ratio	0.33	0.33	0.33		0.11			0.38		0.38	0.38	1.00
Clearance Time (s)	5.8	5.8	5.8		5.8			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	535	471	469		93			1267		70	1260	1582
v/s Ratio Prot	0.23	c0.38						0.43			c0.50	
v/s Ratio Perm			0.38		c0.07					0.44		0.29
v/c Ratio	0.71	1.16	1.15		0.69			1.11		1.16	1.30	0.29
Uniform Delay, d1	29.1	33.4	33.4		43.0			30.8		30.8	30.8	0.0
Progression Factor	1.00	1.00	1.00		1.00			1.17		0.87	0.87	1.00
Incremental Delay, d2	4.2	92.2	90.1		19.9			53.1		144.0	138.3	0.4
Delay (s)	33.4	125.6	123.5		62.9			89.0		170.8	165.2	0.4
Level of Service	C	F	F		E			F		F	F	A
Approach Delay (s)		103.1			62.9			89.0			130.2	
Approach LOS		F			E			F			F	

Intersection Summary

HCM 2000 Control Delay	109.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.6
Intersection Capacity Utilization	112.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

09/07/2017



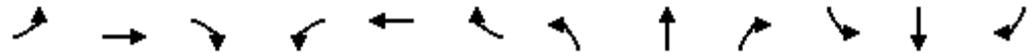
Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	130	77	54	125	1827	171	2338	339
v/c Ratio	0.69	0.27	0.19	0.57	1.03	0.61	1.23	0.40
Control Delay	56.1	9.8	5.3	27.2	43.1	23.7	124.9	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.1	9.8	5.3	27.2	43.1	23.7	124.9	4.5
Queue Length 50th (m)	25.2	0.0	0.0	11.5	~213.0	21.0	~303.8	11.5
Queue Length 95th (m)	41.8	11.4	6.0	m20.4	#171.3	m17.9	m#264.8	m6.6
Internal Link Dist (m)	193.9		43.6		225.6		224.9	
Turn Bay Length (m)		15.0		45.0		30.0		85.0
Base Capacity (vph)	353	462	453	218	1777	280	1894	854
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.17	0.12	0.57	1.03	0.61	1.23	0.40

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	↗
Traffic Volume (vph)	117	8	74	25	0	27	120	1683	71	164	2244	325
Future Volume (vph)	117	8	74	25	0	27	120	1683	71	164	2244	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00	0.99		1.00		1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1460	1244		1463		1583	3265		1736	3343	1351
Flt Permitted		0.70	1.00		0.81		0.07	1.00		0.07	1.00	1.00
Satd. Flow (perm)		1070	1244		1219		123	3265		129	3343	1351
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	122	8	77	26	0	28	125	1753	74	171	2338	339
RTOR Reduction (vph)	0	0	63	0	44	0	0	2	0	0	0	89
Lane Group Flow (vph)	0	130	14	0	10	0	125	1825	0	171	2338	250
Confl. Peds. (#/hr)			2	2			1		6	6		1
Heavy Vehicles (%)	25%	14%	28%	7%	0%	28%	14%	10%	4%	4%	8%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		17.7	17.7		17.7		63.8	54.3		68.4	56.6	56.6
Effective Green, g (s)		17.7	17.7		17.7		63.8	54.3		68.4	56.6	56.6
Actuated g/C Ratio		0.18	0.18		0.18		0.64	0.54		0.68	0.57	0.57
Clearance Time (s)		6.2	6.2		6.2		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		189	220		215		217	1772		277	1892	764
v/s Ratio Prot							0.05	0.56		c0.07	c0.70	
v/s Ratio Perm		c0.12	0.01		0.01		0.31			0.35		0.19
v/c Ratio		0.69	0.06		0.04		0.58	1.03		0.62	1.24	0.33
Uniform Delay, d1		38.6	34.2		34.1		21.2	22.9		24.8	21.7	11.6
Progression Factor		1.00	1.00		1.00		1.30	0.66		1.33	0.67	0.73
Incremental Delay, d2		10.0	0.1		0.1		2.2	24.6		0.4	106.5	0.1
Delay (s)		48.5	34.4		34.2		29.7	39.7		33.5	121.0	8.5
Level of Service		D	C		C		C	D		C	F	A
Approach Delay (s)		43.3			34.2			39.0			102.4	
Approach LOS		D			C			D			F	

Intersection Summary		
HCM 2000 Control Delay	74.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.07	E
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	95.3%	16.2
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

Queues

108: Regional Road 25 & Market Drive

09/07/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	376	125	153	1647	2006	400
v/c Ratio	0.86	0.26	0.74	0.80	1.21	0.50
Control Delay	54.3	6.2	39.2	19.6	117.1	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	6.2	39.2	19.6	117.1	9.3
Queue Length 50th (m)	71.1	0.0	14.6	130.5	~270.0	20.0
Queue Length 95th (m)	#112.1	13.0	#50.6	174.0 m	#186.3	m22.2
Internal Link Dist (m)	338.3			274.0	225.6	
Turn Bay Length (m)			55.0			55.0
Base Capacity (vph)	495	521	208	2068	1659	805
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.24	0.74	0.80	1.21	0.50

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
108: Regional Road 25 & Market Drive

09/07/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	357	119	145	1565	1906	380
Future Volume (vph)	357	119	145	1565	1906	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1597	1404	1687	3406	3406	1444
Flt Permitted	0.95	1.00	0.08	1.00	1.00	1.00
Satd. Flow (perm)	1597	1404	135	3406	3406	1444
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	376	125	153	1647	2006	400
RTOR Reduction (vph)	0	91	0	0	0	102
Lane Group Flow (vph)	376	34	153	1647	2006	298
Confl. Peds. (#/hr)			3			3
Heavy Vehicles (%)	13%	15%	7%	6%	6%	9%
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	27.3	27.3	60.7	60.7	48.7	48.7
Effective Green, g (s)	27.3	27.3	60.7	60.7	48.7	48.7
Actuated g/C Ratio	0.27	0.27	0.61	0.61	0.49	0.49
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	435	383	206	2067	1658	703
v/s Ratio Prot	c0.24		0.06	c0.48	c0.59	
v/s Ratio Perm		0.02	0.39			0.21
v/c Ratio	0.86	0.09	0.74	0.80	1.21	0.42
Uniform Delay, d1	34.6	27.1	24.2	15.0	25.6	16.6
Progression Factor	1.00	1.00	1.00	1.00	0.77	1.00
Incremental Delay, d2	16.2	0.1	13.5	3.3	95.0	0.2
Delay (s)	50.8	27.2	37.7	18.3	114.8	16.8
Level of Service	D	C	D	B	F	B
Approach Delay (s)	44.9			19.9	98.5	
Approach LOS	D			B	F	

Intersection Summary

HCM 2000 Control Delay	62.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

110: Martin Street/Regional Road 25 & Steeles Ave

09/07/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	488	546	70	1018	59	521	876	709	665
v/c Ratio	0.85	0.31	0.45	1.23dr	0.28	0.48	0.87	0.70	0.63
Control Delay	43.8	27.5	52.3	37.1	37.4	33.5	27.2	25.4	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	27.5	52.3	37.1	37.4	33.5	27.2	25.4	5.7
Queue Length 50th (m)	44.4	33.9	15.3	52.8	11.4	53.0	66.7	128.0	10.9
Queue Length 95th (m)	#69.1	43.8	31.1	71.7	24.4	70.7	#84.5	176.8	41.2
Internal Link Dist (m)		121.2		239.5		126.4		231.3	
Turn Bay Length (m)	40.0		50.0		50.0		160.0		
Base Capacity (vph)	574	1802	167	1184	210	1090	1030	1006	1056
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.30	0.42	0.86	0.28	0.48	0.85	0.70	0.63

Intersection Summary

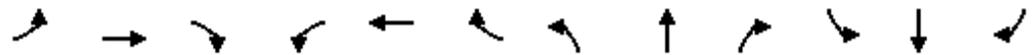
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

HCM Signalized Intersection Capacity Analysis
 110: Martin Street/Regional Road 25 & Steeles Ave

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕↔		↖↗	↕↔		↖↗	↕↔		↖↗	↕	↖↗
Traffic Volume (vph)	468	477	47	67	228	749	57	384	116	841	681	638
Future Volume (vph)	468	477	47	67	228	749	57	384	116	841	681	638
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	0.95		0.97	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.89		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	4865		1805	4113		1685	3396		3153	1845	1459
Flt Permitted	0.15	1.00		0.44	1.00		0.38	1.00		0.32	1.00	1.00
Satd. Flow (perm)	529	4865		832	4113		668	3396		1057	1845	1459
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	488	497	49	70	238	780	59	400	121	876	709	665
RTOR Reduction (vph)	0	10	0	0	360	0	0	23	0	0	0	261
Lane Group Flow (vph)	488	536	0	70	658	0	59	498	0	876	709	404
Confl. Peds. (#/hr)	1					1	3		3	3		3
Heavy Vehicles (%)	4%	5%	7%	0%	12%	10%	7%	2%	3%	11%	3%	9%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	42.8	42.8		22.8	22.8		37.7	37.7		65.4	65.4	65.4
Effective Green, g (s)	42.8	42.8		22.8	22.8		37.7	37.7		65.4	65.4	65.4
Actuated g/C Ratio	0.36	0.36		0.19	0.19		0.31	0.31		0.55	0.55	0.55
Clearance Time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	567	1735		158	781		209	1066		990	1005	795
v/s Ratio Prot	c0.11	0.11			0.16			0.15		c0.17	0.38	
v/s Ratio Perm	c0.19			0.08			0.09			c0.31		0.28
v/c Ratio	0.86	0.31		0.44	1.23dr		0.28	0.47		0.88	0.71	0.51
Uniform Delay, d1	31.6	27.9		43.0	46.9		31.0	33.1		18.8	20.2	17.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.7	0.1		2.0	8.2		3.4	1.5		9.5	4.2	2.3
Delay (s)	44.2	28.0		45.0	55.1		34.3	34.6		28.3	24.3	19.5
Level of Service	D	C		D	E		C	C		C	C	B
Approach Delay (s)		35.7			54.4			34.5			24.5	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		

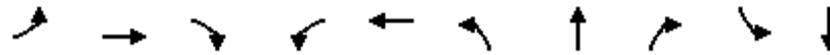
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Queues

101: Regional Road 25 & 5 Side Road

09/13/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	209	231	324	121	96	268	621	266	121	850
v/c Ratio	0.84	0.67	0.67	0.58	0.21	0.84	0.32	0.26	0.41	0.65
Control Delay	73.0	54.2	11.7	43.0	28.7	59.6	8.9	2.0	36.1	34.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.0	54.2	11.7	43.0	28.7	59.6	8.9	2.0	36.1	34.7
Queue Length 50th (m)	48.8	52.0	0.0	22.1	15.5	37.3	15.4	0.0	23.8	97.2
Queue Length 95th (m)	#82.5	78.7	28.4	37.7	29.1	#85.2	35.6	9.9	45.0	124.6
Internal Link Dist (m)		361.7			299.6		351.5			238.1
Turn Bay Length (m)	75.0		75.0	70.0		75.0			30.0	
Base Capacity (vph)	289	397	509	210	516	354	1936	1024	293	1307
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.58	0.64	0.58	0.19	0.76	0.32	0.26	0.41	0.65

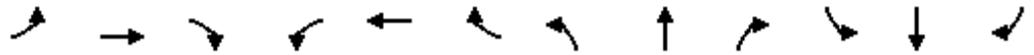
Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

101: Regional Road 25 & 5 Side Road

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	208	292	109	70	16	241	559	239	109	675	90
Future Volume (vph)	188	208	292	109	70	16	241	559	239	109	675	90
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	5.6	4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1743	1137	1456	1594		1142	3139	1495	1736	3365	
Flt Permitted	0.69	1.00	1.00	0.34	1.00		0.18	1.00	1.00	0.42	1.00	
Satd. Flow (perm)	1269	1743	1137	514	1594		220	3139	1495	761	3365	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	209	231	324	121	78	18	268	621	266	121	750	100
RTOR Reduction (vph)	0	0	260	0	7	0	0	0	102	0	8	0
Lane Group Flow (vph)	209	231	64	121	89	0	268	621	164	121	842	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	4%	9%	42%	24%	17%	11%	58%	15%	8%	4%	5%	6%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	23.7	23.7	23.7	34.7	34.7		74.0	74.0	74.0	46.3	46.3	
Effective Green, g (s)	23.7	23.7	23.7	34.7	34.7		74.0	74.0	74.0	46.3	46.3	
Actuated g/C Ratio	0.20	0.20	0.20	0.29	0.29		0.62	0.62	0.62	0.39	0.39	
Clearance Time (s)	5.6	5.6	5.6	4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	250	344	224	203	460		317	1935	921	293	1298	
v/s Ratio Prot		0.13		c0.03	0.06		c0.17	0.20			0.25	
v/s Ratio Perm	c0.16		0.06	0.14			c0.35		0.11	0.16		
v/c Ratio	0.84	0.67	0.29	0.60	0.19		0.85	0.32	0.18	0.41	0.65	
Uniform Delay, d1	46.3	44.5	41.0	34.8	32.1		22.0	11.0	9.9	26.9	30.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		2.02	0.73	1.02	1.00	1.00	
Incremental Delay, d2	20.8	5.1	0.7	4.6	0.2		17.8	0.4	0.4	4.3	2.5	
Delay (s)	67.1	49.6	41.7	39.5	32.3		62.1	8.4	10.5	31.2	32.7	
Level of Service	E	D	D	D	C		E	A	B	C	C	
Approach Delay (s)		51.0			36.3			21.4			32.5	
Approach LOS		D			D			C			C	

Intersection Summary

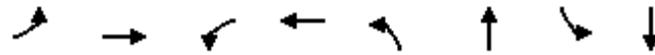
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

102: Regional Road 25 & Escarpment Way/Peddie Road

09/13/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	53	42	47	13	92	1174	4	1201
v/c Ratio	0.41	0.30	0.47	0.09	0.35	0.35	0.01	0.33
Control Delay	59.1	25.3	65.6	43.2	3.6	0.4	2.8	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	25.3	65.6	43.2	3.6	0.4	2.8	2.5
Queue Length 50th (m)	12.6	1.9	11.3	2.5	0.5	1.5	0.1	17.0
Queue Length 95th (m)	25.2	12.8	23.5	8.6	m0.7	1.7	m0.3	27.6
Internal Link Dist (m)		165.7		110.1		512.8		351.5
Turn Bay Length (m)	25.0		55.0		75.0		35.0	
Base Capacity (vph)	359	322	277	402	262	3371	360	3672
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.13	0.17	0.03	0.35	0.35	0.01	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 102: Regional Road 25 & Escarpment Way/Peddie Road

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	49	7	31	43	10	2	85	944	136	4	1016	89
Future Volume (vph)	49	7	31	43	10	2	85	944	136	4	1016	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frt	1.00	0.88		1.00	0.98		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1597	1045		1262	1403		1357	4027		1805	4391	
Flt Permitted	0.75	1.00		0.73	1.00		0.22	1.00		0.23	1.00	
Satd. Flow (perm)	1259	1045		969	1403		314	4027		430	4391	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	8	34	47	11	2	92	1026	148	4	1104	97
RTOR Reduction (vph)	0	31	0	0	2	0	0	8	0	0	4	0
Lane Group Flow (vph)	53	11	0	47	11	0	92	1166	0	4	1197	0
Heavy Vehicles (%)	13%	25%	68%	43%	20%	100%	33%	27%	22%	0%	18%	2%
Turn Type	Perm	NA										
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	10.4	10.4		10.4	10.4		97.9	97.9		97.9	97.9	
Effective Green, g (s)	10.4	10.4		10.4	10.4		97.9	97.9		97.9	97.9	
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.82	0.82		0.82	0.82	
Clearance Time (s)	5.7	5.7		5.7	5.7		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	109	90		83	121		256	3285		350	3582	
v/s Ratio Prot		0.01			0.01			0.29			0.27	
v/s Ratio Perm	0.04			0.05			0.29			0.01		
v/c Ratio	0.49	0.12		0.57	0.09		0.36	0.36		0.01	0.33	
Uniform Delay, d1	52.3	50.6		52.6	50.5		2.9	2.9		2.1	2.8	
Progression Factor	1.00	1.00		1.00	1.00		0.19	0.06		0.84	0.75	
Incremental Delay, d2	3.4	0.6		8.6	0.3		3.0	0.2		0.0	0.2	
Delay (s)	55.6	51.2		61.2	50.8		3.5	0.4		1.8	2.3	
Level of Service	E	D		E	D		A	A		A	A	
Approach Delay (s)		53.7			58.9			0.6			2.3	
Approach LOS		D			E			A			A	

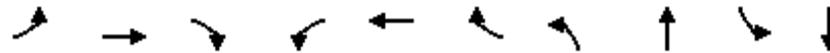
Intersection Summary

HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Queues

103: Regional Road 25 & James Snow Pkwy

09/13/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	42	68	70	33	110	318	1603	254	875
v/c Ratio	0.19	0.11	0.31	0.59	0.09	0.52	0.64	0.69	0.71	0.32
Control Delay	49.1	45.3	14.2	68.7	44.9	17.2	14.9	20.9	34.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	45.3	14.2	68.7	44.9	17.2	14.9	20.9	34.7	6.7
Queue Length 50th (m)	5.0	5.0	0.0	16.8	3.8	0.0	26.4	106.3	29.4	8.4
Queue Length 95th (m)	12.8	10.0	13.0	31.2	8.5	17.1	m48.9	89.8	42.5	59.3
Internal Link Dist (m)		134.9			153.9			258.8		512.8
Turn Bay Length (m)	55.0		80.0	85.0		40.0	30.0		75.0	
Base Capacity (vph)	287	945	443	301	945	371	628	2326	365	2725
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.04	0.15	0.23	0.03	0.30	0.51	0.69	0.70	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 103: Regional Road 25 & James Snow Pkwy

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑↑		↘	↑↑↑	
Traffic Volume (vph)	20	39	63	64	30	101	293	1099	375	234	795	10
Future Volume (vph)	20	39	63	64	30	101	293	1099	375	234	795	10
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4		4.0	6.4	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1203	3059	1282	1271	3059	956	1656	4296		1367	4396	
Flt Permitted	0.73	1.00	1.00	0.73	1.00	1.00	0.31	1.00		0.09	1.00	
Satd. Flow (perm)	930	3059	1282	974	3059	956	544	4296		133	4396	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	42	68	70	33	110	318	1195	408	254	864	11
RTOR Reduction (vph)	0	0	60	0	0	97	0	39	0	0	1	0
Lane Group Flow (vph)	22	42	8	70	33	13	318	1564	0	254	874	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	50%	18%	26%	42%	18%	69%	9%	16%	15%	32%	18%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	14.7	14.7	14.7	14.7	14.7	14.7	78.1	63.9		92.6	74.4	
Effective Green, g (s)	14.7	14.7	14.7	14.7	14.7	14.7	78.1	63.9		92.6	74.4	
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.12	0.65	0.53		0.77	0.62	
Clearance Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4		4.0	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	113	374	157	119	374	117	485	2287		356	2725	
v/s Ratio Prot		0.01			0.01		0.08	0.36		c0.15	0.20	
v/s Ratio Perm	0.02		0.01	c0.07		0.01	0.35			c0.40		
v/c Ratio	0.19	0.11	0.05	0.59	0.09	0.12	0.66	0.68		0.71	0.32	
Uniform Delay, d1	47.3	46.8	46.5	49.8	46.7	46.9	9.1	20.6		26.7	10.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.73	0.92		1.06	0.51	
Incremental Delay, d2	0.8	0.1	0.1	7.2	0.1	0.4	2.1	1.1		6.4	0.3	
Delay (s)	48.2	47.0	46.6	57.0	46.8	47.3	17.8	20.2		34.7	5.9	
Level of Service	D	D	D	E	D	D	B	C		C	A	
Approach Delay (s)		47.0			50.4			19.8			12.3	
Approach LOS		D			D			B			B	

Intersection Summary

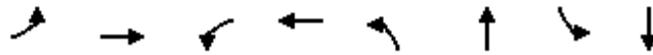
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

104: Regional Road 25 & Driveway/High Point Drive

09/13/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	7	15	115	24	36	2386	53	960
v/c Ratio	0.06	0.17	0.59	0.14	0.10	0.80	0.34	0.30
Control Delay	51.9	28.5	54.2	16.2	12.8	16.2	34.0	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	28.5	54.2	16.2	12.8	16.2	34.0	3.0
Queue Length 50th (m)	1.6	0.2	27.5	0.5	2.4	56.8	3.4	9.1
Queue Length 95th (m)	6.6	7.4	40.1	7.5	m5.1	#241.0	17.7	19.5
Internal Link Dist (m)		98.3		127.8		439.1		258.8
Turn Bay Length (m)	15.0		30.0		70.0		30.0	
Base Capacity (vph)	320	202	226	388	347	2990	166	3193
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.07	0.51	0.06	0.10	0.80	0.32	0.30

Intersection Summary

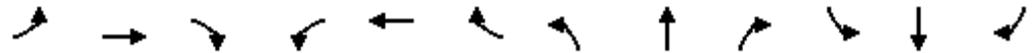
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 104: Regional Road 25 & Driveway/High Point Drive

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	7	1	13	109	2	21	34	1684	582	50	896	16
Future Volume (vph)	7	1	13	109	2	21	34	1684	582	50	896	16
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		5.9	5.9		3.0	5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	0.86		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1444	910		1253	974		1702	4366		1597	4270	
Flt Permitted	1.00	1.00		0.57	1.00		0.29	1.00		0.05	1.00	
Satd. Flow (perm)	1520	910		754	974		512	4366		84	4270	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	1	14	115	2	22	36	1773	613	53	943	17
RTOR Reduction (vph)	0	14	0	0	18	0	0	32	0	0	1	0
Lane Group Flow (vph)	7	1	0	115	6	0	36	2354	0	53	959	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	25%	100%	78%	44%	50%	70%	6%	15%	12%	13%	21%	27%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	4.0	4.0		22.0	22.0		77.2	77.2		86.1	86.1	
Effective Green, g (s)	4.0	4.0		22.0	22.0		77.2	77.2		86.1	86.1	
Actuated g/C Ratio	0.03	0.03		0.18	0.18		0.64	0.64		0.72	0.72	
Clearance Time (s)	6.0	6.0		3.0	6.0		5.9	5.9		3.0	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	50	30		200	178		329	2808		134	3063	
v/s Ratio Prot		0.00		c0.07	0.01			c0.54		c0.02	0.22	
v/s Ratio Perm	0.00			c0.03			0.07			0.26		
v/c Ratio	0.14	0.05		0.57	0.03		0.11	0.84		0.40	0.31	
Uniform Delay, d1	56.3	56.2		44.1	40.3		8.2	16.6		13.8	6.2	
Progression Factor	1.00	1.00		1.00	1.00		1.11	0.90		3.21	0.45	
Incremental Delay, d2	1.3	0.7		4.0	0.1		0.4	1.8		1.9	0.3	
Delay (s)	57.6	56.8		48.1	40.3		9.5	16.6		46.0	3.1	
Level of Service	E	E		D	D		A	B		D	A	
Approach Delay (s)		57.1			46.7			16.5			5.3	
Approach LOS		E			D			B			A	

Intersection Summary

HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.9
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

09/13/2018



Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	1197	557	1547	573	1028
v/c Ratio	0.80	0.91	0.82	0.35	0.61
Control Delay	28.7	47.2	24.0	0.8	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	47.2	24.0	0.8	21.6
Queue Length 50th (m)	114.3	125.3	109.8	0.0	43.1
Queue Length 95th (m)	141.7	#208.9	161.1	m1.0	78.9
Internal Link Dist (m)	113.2		321.2		439.1
Turn Bay Length (m)				75.0	
Base Capacity (vph)	1594	649	1893	1615	1680
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.75	0.86	0.82	0.35	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

09/13/2018



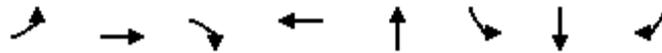
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔	↑↑↑	↔		↑↑↑
Traffic Volume (vph)	805	844	1454	539	0	966
Future Volume (vph)	805	844	1454	539	0	966
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	4.0		5.5
Lane Util. Factor	0.97	0.91	0.91	1.00		0.91
Frt	0.96	0.85	1.00	0.85		1.00
Flt Protected	0.97	1.00	1.00	1.00		1.00
Satd. Flow (prot)	2966	1205	4715	1615		4183
Flt Permitted	0.97	1.00	1.00	1.00		1.00
Satd. Flow (perm)	2966	1205	4715	1615		4183
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	856	898	1547	573	0	1028
RTOR Reduction (vph)	1	1	0	0	0	0
Lane Group Flow (vph)	1196	556	1547	573	0	1028
Heavy Vehicles (%)	12%	22%	10%	0%	0%	24%
Turn Type	Prot	Perm	NA	Free		NA
Protected Phases	8		2			6
Permitted Phases		8		Free		
Actuated Green, G (s)	60.8	60.8	48.2	120.0		48.2
Effective Green, g (s)	60.8	60.8	48.2	120.0		48.2
Actuated g/C Ratio	0.51	0.51	0.40	1.00		0.40
Clearance Time (s)	5.5	5.5	5.5			5.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1502	610	1893	1615		1680
v/s Ratio Prot	0.40		c0.33			0.25
v/s Ratio Perm		c0.46		0.35		
v/c Ratio	0.80	0.91	0.82	0.35		0.61
Uniform Delay, d1	24.5	27.1	32.0	0.0		28.5
Progression Factor	1.00	1.00	0.62	1.00		0.67
Incremental Delay, d2	3.0	17.8	3.0	0.5		1.6
Delay (s)	27.5	45.0	23.0	0.5		20.8
Level of Service	C	D	C	A		C
Approach Delay (s)	33.0		16.9			20.8
Approach LOS	C		B			C

Intersection Summary

HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool L09/13/2018



Lane Group	EBL	EBT	EBR	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	378	617	612	150	1414	81	1634	466
v/c Ratio	0.61	0.89	0.85	0.51	0.90	0.46	0.84	0.29
Control Delay	24.6	43.5	35.6	18.0	40.4	32.5	40.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
Total Delay	24.6	43.5	35.6	18.0	40.4	32.5	41.0	0.4
Queue Length 50th (m)	57.9	134.2	117.5	6.4	~136.4	13.3	150.0	0.0
Queue Length 95th (m)	81.3	#196.6	172.7	29.6	#172.0	m21.2	#174.2	0.0
Internal Link Dist (m)		109.5		75.3	224.9		321.2	
Turn Bay Length (m)	30.0		30.0			30.0		75.0
Base Capacity (vph)	676	749	775	297	1569	184	1951	1582
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	1	0	0	51	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.82	0.79	0.51	0.90	0.44	0.86	0.29

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool Lanes 09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘		↔			↑↑↑		↖	↑↑↑	↗
Traffic Volume (vph)	355	27	1128	70	0	71	0	1205	124	76	1536	438
Future Volume (vph)	355	27	1128	70	0	71	0	1205	124	76	1536	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	5.8		5.8			6.0		4.0	6.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00			0.91		1.00	0.91	1.00
Frbp, ped/bikes	1.00	0.99	0.99		1.00			1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.86	0.85		0.93			0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.98			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1612	1421	1415		1542			4741		1671	4715	1582
Flt Permitted	0.60	1.00	1.00		0.56			1.00		0.09	1.00	1.00
Satd. Flow (perm)	1021	1421	1415		879			4741		165	4715	1582
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	378	29	1200	74	0	76	0	1282	132	81	1634	466
RTOR Reduction (vph)	0	1	33	0	88	0	0	9	0	0	0	0
Lane Group Flow (vph)	378	616	579	0	62	0	0	1405	0	81	1634	466
Confl. Peds. (#/hr)			1	1			1		8	8		1
Heavy Vehicles (%)	12%	18%	7%	10%	0%	14%	0%	8%	3%	8%	10%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA			NA		pm+pt	NA	Free
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8						6		Free
Actuated Green, G (s)	58.5	58.5	58.5		28.5			38.7		49.7	49.7	120.0
Effective Green, g (s)	58.5	58.5	58.5		28.5			38.7		49.7	49.7	120.0
Actuated g/C Ratio	0.49	0.49	0.49		0.24			0.32		0.41	0.41	1.00
Clearance Time (s)	5.8	5.8	5.8		5.8			6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	616	692	689		208			1528		156	1952	1582
v/s Ratio Prot	0.12	c0.43						c0.30		0.03	c0.35	
v/s Ratio Perm	0.18		0.41		0.07					0.18		0.29
v/c Ratio	0.61	0.89	0.84		0.30			0.92		0.52	0.84	0.29
Uniform Delay, d1	21.5	27.8	26.7		37.5			39.1		26.2	31.5	0.0
Progression Factor	1.00	1.00	1.00		1.00			0.80		1.13	1.13	1.00
Incremental Delay, d2	1.8	13.6	9.1		0.8			8.7		2.4	3.7	0.4
Delay (s)	23.3	41.5	35.8		38.3			40.1		32.0	39.3	0.4
Level of Service	C	D	D		D			D		C	D	A
Approach Delay (s)		35.0			38.3			40.1			30.7	
Approach LOS		D			D			D			C	

Intersection Summary

HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

09/13/2018



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	77	54	125	1753	74	171	2338	339
v/c Ratio	0.69	0.27	0.19	0.64	0.62	0.08	0.62	0.79	0.36
Control Delay	64.5	6.1	2.2	49.6	5.7	0.5	24.6	14.2	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay	64.5	6.1	2.2	49.6	5.7	0.5	24.6	14.3	1.6
Queue Length 50th (m)	30.7	0.0	0.0	17.2	39.3	0.2	18.7	92.9	2.6
Queue Length 95th (m)	48.8	7.9	1.5	#41.4	49.1	1.5	m29.4	132.8	m2.7
Internal Link Dist (m)	193.9		43.6		225.6			224.9	
Turn Bay Length (m)		15.0		45.0		45.0	30.0		85.0
Base Capacity (vph)	313	414	407	194	2807	935	296	2942	941
Starvation Cap Reductn	0	0	0	0	0	0	0	53	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.19	0.13	0.64	0.62	0.08	0.58	0.81	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↔		↖	↑↑↑	↗	↖	↑↑↑	↗
Traffic Volume (vph)	117	8	74	25	0	27	120	1683	71	164	2244	325
Future Volume (vph)	117	8	74	25	0	27	120	1683	71	164	2244	325
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		4.0	6.0	6.0	4.0	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00	0.99		1.00		1.00	1.00	0.97	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1460	1244		1462		1583	4715	1502	1736	4803	1350
Flt Permitted		0.75	1.00		0.81		0.06	1.00	1.00	0.08	1.00	1.00
Satd. Flow (perm)		1140	1244		1218		93	4715	1502	155	4803	1350
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	122	8	77	26	0	28	125	1753	74	171	2338	339
RTOR Reduction (vph)	0	0	64	0	45	0	0	0	30	0	0	114
Lane Group Flow (vph)	0	130	13	0	9	0	125	1753	44	171	2338	225
Confl. Peds. (#/hr)			2	2			1		6	6		1
Heavy Vehicles (%)	25%	14%	28%	7%	0%	28%	14%	10%	4%	4%	8%	18%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)		19.9	19.9		19.9		81.8	71.4	71.4	86.0	73.5	73.5
Effective Green, g (s)		19.9	19.9		19.9		81.8	71.4	71.4	86.0	73.5	73.5
Actuated g/C Ratio		0.17	0.17		0.17		0.68	0.60	0.60	0.72	0.61	0.61
Clearance Time (s)		6.2	6.2		6.2		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		189	206		201		192	2805	893	275	2941	826
v/s Ratio Prot							0.06	0.37		c0.06	c0.49	
v/s Ratio Perm		c0.11	0.01		0.01		0.38		0.03	0.38		0.17
v/c Ratio		0.69	0.06		0.04		0.65	0.62	0.05	0.62	0.79	0.27
Uniform Delay, d1		47.1	42.2		42.1		25.9	15.7	10.1	16.0	17.6	10.8
Progression Factor		1.00	1.00		1.00		1.46	0.27	0.22	1.27	0.65	0.38
Incremental Delay, d2		10.0	0.1		0.1		7.0	1.0	0.1	2.4	1.3	0.4
Delay (s)		57.1	42.3		42.2		44.9	5.2	2.4	22.8	12.7	4.6
Level of Service		E	D		D		D	A	A	C	B	A
Approach Delay (s)		51.6			42.2			7.6			12.4	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.2
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

108: Regional Road 25 & Market Drive

09/13/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	376	125	153	1647	2006	400
v/c Ratio	0.73	0.37	0.68	0.46	0.68	0.41
Control Delay	56.2	10.3	41.7	7.5	1.8	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	10.3	41.7	7.5	1.8	0.8
Queue Length 50th (m)	46.1	0.0	21.1	47.5	3.2	0.0
Queue Length 95th (m)	60.2	16.4	m26.7	72.4	7.6	m0.0
Internal Link Dist (m)	338.3			274.0	225.6	
Turn Bay Length (m)	75.0		55.0			55.0
Base Capacity (vph)	800	455	260	3594	2969	976
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.27	0.59	0.46	0.68	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

108: Regional Road 25 & Market Drive

09/13/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	357	119	145	1565	1906	380
Future Volume (vph)	357	119	145	1565	1906	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3099	1404	1687	4893	4893	1443
Flt Permitted	0.95	1.00	0.06	1.00	1.00	1.00
Satd. Flow (perm)	3099	1404	101	4893	4893	1443
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	376	125	153	1647	2006	400
RTOR Reduction (vph)	0	104	0	0	0	101
Lane Group Flow (vph)	376	21	153	1647	2006	299
Confl. Peds. (#/hr)			3			3
Heavy Vehicles (%)	13%	15%	7%	6%	6%	9%
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	19.8	19.8	88.2	88.2	72.9	72.9
Effective Green, g (s)	19.8	19.8	88.2	88.2	72.9	72.9
Actuated g/C Ratio	0.17	0.17	0.74	0.74	0.61	0.61
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	511	231	223	3596	2972	876
v/s Ratio Prot	c0.12		c0.06	0.34	0.41	
v/s Ratio Perm		0.01	c0.44			0.21
v/c Ratio	0.74	0.09	0.69	0.46	0.67	0.34
Uniform Delay, d1	47.6	42.5	27.4	6.4	15.7	11.7
Progression Factor	1.00	1.00	1.38	1.07	0.06	0.00
Incremental Delay, d2	5.5	0.2	5.9	0.3	0.8	0.7
Delay (s)	53.1	42.6	43.7	7.1	1.7	0.7
Level of Service	D	D	D	A	A	A
Approach Delay (s)	50.5			10.2	1.6	
Approach LOS	D			B	A	

Intersection Summary

HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

110: Martin Street/Regional Road 25 & Steeles Ave

09/13/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	488	546	70	1018	59	521	876	709	665
v/c Ratio	0.85	0.31	0.45	1.23dr	0.28	0.48	0.87	0.70	0.63
Control Delay	43.8	27.5	52.3	37.1	37.4	33.5	43.0	31.1	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	27.5	52.3	37.1	37.4	33.5	43.0	31.1	13.7
Queue Length 50th (m)	44.4	33.9	15.3	52.8	11.4	53.0	80.4	106.7	43.8
Queue Length 95th (m)	#69.1	43.8	31.1	71.7	24.4	70.7	#116.8	159.7	96.8
Internal Link Dist (m)		121.2		239.5		126.4		231.3	
Turn Bay Length (m)	40.0		50.0		50.0		160.0		
Base Capacity (vph)	574	1802	167	1184	210	1090	1030	1006	1056
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.30	0.42	0.86	0.28	0.48	0.85	0.70	0.63

Intersection Summary

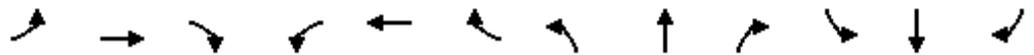
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

HCM Signalized Intersection Capacity Analysis
 110: Martin Street/Regional Road 25 & Steeles Ave

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕↔		↖↗	↕↔		↖↗	↕↔		↖↗	↕	↖↗
Traffic Volume (vph)	468	477	47	67	228	749	57	384	116	841	681	638
Future Volume (vph)	468	477	47	67	228	749	57	384	116	841	681	638
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	0.95		0.97	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.89		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	4865		1805	4113		1685	3396		3153	1845	1459
Flt Permitted	0.15	1.00		0.44	1.00		0.38	1.00		0.32	1.00	1.00
Satd. Flow (perm)	529	4865		832	4113		668	3396		1057	1845	1459
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	488	497	49	70	238	780	59	400	121	876	709	665
RTOR Reduction (vph)	0	10	0	0	360	0	0	23	0	0	0	261
Lane Group Flow (vph)	488	536	0	70	658	0	59	498	0	876	709	404
Confl. Peds. (#/hr)	1					1	3		3	3		3
Heavy Vehicles (%)	4%	5%	7%	0%	12%	10%	7%	2%	3%	11%	3%	9%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	42.8	42.8		22.8	22.8		37.7	37.7		65.4	65.4	65.4
Effective Green, g (s)	42.8	42.8		22.8	22.8		37.7	37.7		65.4	65.4	65.4
Actuated g/C Ratio	0.36	0.36		0.19	0.19		0.31	0.31		0.55	0.55	0.55
Clearance Time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	567	1735		158	781		209	1066		990	1005	795
v/s Ratio Prot	c0.11	0.11			0.16			0.15		c0.17	0.38	
v/s Ratio Perm	c0.19			0.08			0.09			c0.31		0.28
v/c Ratio	0.86	0.31		0.44	1.23dr		0.28	0.47		0.88	0.71	0.51
Uniform Delay, d1	31.6	27.9		43.0	46.9		31.0	33.1		18.8	20.2	17.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		2.11	1.31	4.05
Incremental Delay, d2	12.7	0.1		2.0	8.2		3.4	1.5		7.7	3.3	1.8
Delay (s)	44.2	28.0		45.0	55.1		34.3	34.6		47.4	29.8	71.4
Level of Service	D	C		D	E		C	C		D	C	E
Approach Delay (s)		35.7			54.4			34.5			48.9	
Approach LOS		D			D			C			D	

Intersection Summary

HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Queues

101: Regional Road 25 & 5 Side Road

09/07/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	113	465	163	251	288	906	128	35	819
v/c Ratio	0.46	1.11	0.93	0.41	0.81	0.49	0.16	0.19	0.69
Control Delay	40.1	101.1	79.2	25.3	45.7	19.6	10.1	26.7	30.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	101.1	79.2	25.3	45.7	19.6	10.1	26.7	30.3
Queue Length 50th (m)	19.9	~78.6	23.5	35.4	39.1	45.7	4.6	5.0	72.8
Queue Length 95th (m)	37.8	#141.8	#58.7	57.6	#83.6	96.0	25.5	13.3	95.6
Internal Link Dist (m)		361.7		299.6		351.5			238.1
Turn Bay Length (m)	75.0		70.0		75.0		75.0	30.0	
Base Capacity (vph)	245	419	176	616	371	1866	807	182	1184
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	1.11	0.93	0.41	0.78	0.49	0.16	0.19	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
101: Regional Road 25 & 5 Side Road

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗		↘	↗		↘	↑↑	↗	↘	↗↘	
Traffic Volume (vph)	105	89	343	152	170	63	268	843	119	33	608	153
Future Volume (vph)	105	89	343	152	170	63	268	843	119	33	608	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6		4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.88		1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1656	1200		1543	1756		1570	3438	1380	1543	3266	
Flt Permitted	0.60	1.00		0.15	1.00		0.18	1.00	1.00	0.31	1.00	
Satd. Flow (perm)	1052	1200		237	1756		301	3438	1380	511	3266	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	113	96	369	163	183	68	288	906	128	35	654	165
RTOR Reduction (vph)	0	139	0	0	13	0	0	0	58	0	22	0
Lane Group Flow (vph)	113	326	0	163	238	0	288	906	70	35	797	0
Heavy Vehicles (%)	9%	22%	44%	17%	3%	6%	15%	5%	17%	17%	7%	8%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.4	23.4		34.4	34.4		54.3	54.3	54.3	35.6	35.6	
Effective Green, g (s)	23.4	23.4		34.4	34.4		54.3	54.3	54.3	35.6	35.6	
Actuated g/C Ratio	0.23	0.23		0.34	0.34		0.54	0.54	0.54	0.36	0.36	
Clearance Time (s)	5.6	5.6		4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	246	280		172	604		349	1866	749	181	1162	
v/s Ratio Prot		c0.27		c0.07	0.14		c0.12	0.26			0.24	
v/s Ratio Perm	0.11			0.26			c0.33		0.05	0.07		
v/c Ratio	0.46	1.17		0.95	0.39		0.83	0.49	0.09	0.19	0.69	
Uniform Delay, d1	32.9	38.3		28.8	24.9		16.3	14.2	11.0	22.3	27.4	
Progression Factor	1.00	1.00		1.00	1.00		1.94	1.30	4.58	1.00	1.00	
Incremental Delay, d2	1.4	106.2		52.8	0.4		13.4	0.8	0.2	2.4	3.3	
Delay (s)	34.2	144.5		81.6	25.3		45.0	19.3	50.6	24.6	30.7	
Level of Service	C	F		F	C		D	B	D	C	C	
Approach Delay (s)		123.0			47.5			27.9			30.5	
Approach LOS		F			D			C			C	

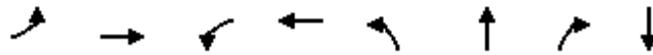
Intersection Summary

HCM 2000 Control Delay	48.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

102: Regional Road 25 & Escarpment Way/Peddie Road

09/07/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	166	115	99	14	18	1153	53	1090
v/c Ratio	0.69	0.38	0.56	0.06	0.08	0.48	0.06	0.48
Control Delay	52.6	17.2	48.3	24.9	14.7	16.6	7.7	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.6	17.2	48.3	24.9	14.7	16.6	7.7	5.8
Queue Length 50th (m)	32.1	6.8	18.7	1.6	1.3	102.7	0.5	30.2
Queue Length 95th (m)	50.2	21.0	33.0	6.5	m5.7	150.0	m10.0	m35.1
Internal Link Dist (m)		165.7		110.1		512.8		351.5
Turn Bay Length (m)	25.0		55.0		75.0		125.0	
Base Capacity (vph)	500	542	370	522	227	2411	826	2274
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.21	0.27	0.03	0.08	0.48	0.06	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 102: Regional Road 25 & Escarpment Way/Peddie Road

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	6	105	95	9	5	17	1107	51	0	998	48
Future Volume (vph)	159	6	105	95	9	5	17	1107	51	0	998	48
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		6.0	6.0	6.0		6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00		0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	0.86		1.00	0.95		1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1752	1359		1421	1430		1308	3406	1145		3209	
Flt Permitted	0.75	1.00		0.68	1.00		0.23	1.00	1.00		1.00	
Satd. Flow (perm)	1380	1359		1022	1430		322	3406	1145		3209	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	166	6	109	99	9	5	18	1153	53	0	1040	50
RTOR Reduction (vph)	0	63	0	0	4	0	0	0	15	0	2	0
Lane Group Flow (vph)	166	52	0	99	10	0	18	1153	38	0	1088	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	3%	0%	21%	27%	40%	0%	38%	6%	38%	0%	12%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2		6	
Actuated Green, G (s)	17.5	17.5		17.5	17.5		70.8	70.8	70.8		70.8	
Effective Green, g (s)	17.5	17.5		17.5	17.5		70.8	70.8	70.8		70.8	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.71	0.71	0.71		0.71	
Clearance Time (s)	5.7	5.7		5.7	5.7		6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	241	237		178	250		227	2411	810		2271	
v/s Ratio Prot		0.04			0.01			0.34			c0.34	
v/s Ratio Perm	c0.12			0.10			0.06		0.03			
v/c Ratio	0.69	0.22		0.56	0.04		0.08	0.48	0.05		0.48	
Uniform Delay, d1	38.7	35.4		37.7	34.3		4.5	6.4	4.4		6.5	
Progression Factor	1.00	1.00		1.00	1.00		2.18	2.20	3.96		0.76	
Incremental Delay, d2	7.9	0.5		3.7	0.1		0.6	0.6	0.1		0.4	
Delay (s)	46.6	35.9		41.4	34.3		10.4	14.7	17.5		5.2	
Level of Service	D	D		D	C		B	B	B		A	
Approach Delay (s)		42.2			40.6			14.8			5.2	
Approach LOS		D			D			B			A	

Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

103: Regional Road 25 & James Snow Pkwy

09/07/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	80	54	253	256	61	147	234	999	132	120	1260
v/c Ratio	0.23	0.07	0.47	0.81	0.07	0.31	0.70	0.64	0.19	0.46	1.04
Control Delay	27.3	23.8	11.1	52.3	24.0	5.7	50.2	22.7	8.2	13.3	65.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	23.8	11.1	52.3	24.0	5.7	50.2	22.7	8.2	13.3	65.8
Queue Length 50th (m)	12.6	4.2	11.3	48.4	4.8	0.0	43.1	48.7	3.4	6.1	~155.8
Queue Length 95th (m)	21.7	7.8	28.6	69.7	8.6	12.7	m#89.1	72.0	m11.4	11.6	#199.6
Internal Link Dist (m)		134.9			153.9			258.8			512.8
Turn Bay Length (m)	55.0		80.0	85.0		40.0	30.0			75.0	
Base Capacity (vph)	465	1122	666	428	1192	586	335	1572	697	262	1207
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.05	0.38	0.60	0.05	0.25	0.70	0.64	0.19	0.46	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

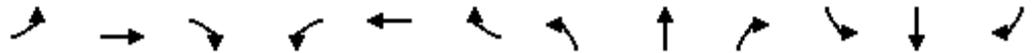
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
103: Regional Road 25 & James Snow Pkwy

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	76	51	240	243	58	140	222	949	125	114	1174	23
Future Volume (vph)	76	51	240	243	58	140	222	949	125	114	1174	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4	6.4	4.0	6.4	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1671	3034	1495	1530	3223	1335	1612	3312	1324	1399	3059	
Flt Permitted	0.72	1.00	1.00	0.72	1.00	1.00	0.09	1.00	1.00	0.23	1.00	
Satd. Flow (perm)	1258	3034	1495	1159	3223	1335	156	3312	1324	346	3059	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	80	54	253	256	61	147	234	999	132	120	1236	24
RTOR Reduction (vph)	0	0	131	0	0	107	0	0	69	0	1	0
Lane Group Flow (vph)	80	54	122	256	61	40	234	999	63	120	1259	0
Heavy Vehicles (%)	8%	19%	8%	18%	12%	21%	12%	9%	22%	29%	18%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	27.4	27.4	27.4	27.4	27.4	27.4	59.9	47.5	47.5	47.8	39.4	
Effective Green, g (s)	27.4	27.4	27.4	27.4	27.4	27.4	59.9	47.5	47.5	47.8	39.4	
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.60	0.48	0.48	0.48	0.39	
Clearance Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4	6.4	4.0	6.4	
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	
Lane Grp Cap (vph)	344	831	409	317	883	365	333	1573	628	253	1205	
v/s Ratio Prot		0.02			0.02		c0.12	0.30		0.04	c0.41	
v/s Ratio Perm	0.06		0.08	c0.22		0.03	0.30		0.05	0.19		
v/c Ratio	0.23	0.06	0.30	0.81	0.07	0.11	0.70	0.64	0.10	0.47	1.04	
Uniform Delay, d1	28.1	26.8	28.7	33.8	26.9	27.2	24.2	19.7	14.5	15.3	30.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	2.11	0.97	2.14	0.74	0.90	
Incremental Delay, d2	0.3	0.0	0.4	14.0	0.0	0.1	4.9	1.4	0.2	1.3	37.6	
Delay (s)	28.5	26.9	29.1	47.8	26.9	27.3	56.0	20.7	31.2	12.6	64.9	
Level of Service	C	C	C	D	C	C	E	C	C	B	E	
Approach Delay (s)		28.7			38.6			27.8			60.4	
Approach LOS		C			D			C			E	

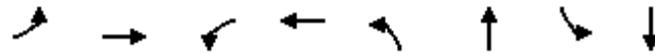
Intersection Summary

HCM 2000 Control Delay	41.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues

104: Regional Road 25 & Driveway/High Point Drive

09/07/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	32	641	61	18	1498	43	1757
v/c Ratio	0.05	0.06	1.22	0.09	0.32	0.71	0.60	1.24
Control Delay	17.8	15.3	145.3	12.8	43.1	32.0	34.1	127.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	15.3	145.3	12.8	43.1	32.0	34.1	127.6
Queue Length 50th (m)	2.6	3.1	~161.7	4.6	2.8	111.3	2.8	~229.1
Queue Length 95th (m)	7.5	9.0	#230.4	12.7	m9.1	128.0	m4.0 m	#232.3
Internal Link Dist (m)		98.3		127.8		439.1		258.8
Turn Bay Length (m)	15.0		30.0		70.0		30.0	
Base Capacity (vph)	443	529	524	653	56	2116	72	1422
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.06	1.22	0.09	0.32	0.71	0.60	1.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

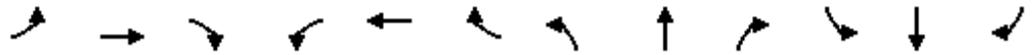
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 104: Regional Road 25 & Driveway/High Point Drive

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑↑		↖	↗	
Traffic Volume (vph)	20	2	27	583	5	51	16	1205	158	39	1595	4
Future Volume (vph)	20	2	27	583	5	51	16	1205	158	39	1595	4
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	0.86		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1399	1253		1612	1526		1327	4552		1492	3085	
Flt Permitted	0.72	1.00		0.74	1.00		0.09	1.00		0.10	1.00	
Satd. Flow (perm)	1056	1253		1249	1526		121	4552		157	3085	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	22	2	30	641	5	56	18	1324	174	43	1753	4
RTOR Reduction (vph)	0	3	0	0	13	0	0	17	0	0	0	0
Lane Group Flow (vph)	22	29	0	641	48	0	18	1481	0	43	1757	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	29%	50%	29%	12%	0%	8%	36%	10%	27%	21%	17%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.0	42.0		42.0	42.0		46.1	46.1		46.1	46.1	
Effective Green, g (s)	42.0	42.0		42.0	42.0		46.1	46.1		46.1	46.1	
Actuated g/C Ratio	0.42	0.42		0.42	0.42		0.46	0.46		0.46	0.46	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	443	526		524	640		55	2098		72	1422	
v/s Ratio Prot		0.02			0.03			0.33			c0.57	
v/s Ratio Perm	0.02			c0.51			0.15			0.27		
v/c Ratio	0.05	0.05		1.22	0.08		0.33	0.71		0.60	1.24	
Uniform Delay, d1	17.2	17.2		29.0	17.4		17.1	21.5		20.0	26.9	
Progression Factor	1.00	1.00		1.00	1.00		1.38	1.41		0.55	0.52	
Incremental Delay, d2	0.0	0.0		116.7	0.1		14.1	1.9		16.7	109.2	
Delay (s)	17.2	17.3		145.7	17.4		37.6	32.3		27.7	123.1	
Level of Service	B	B		F	B		D	C		C	F	
Approach Delay (s)		17.2			134.5			32.3			120.8	
Approach LOS		B			F			C			F	

Intersection Summary

HCM 2000 Control Delay	88.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

09/07/2017



Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	722	497	992	874	1853
v/c Ratio	0.90	0.33	0.47	0.55	0.86
Control Delay	51.5	0.6	13.6	3.8	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	0.6	13.6	3.8	10.3
Queue Length 50th (m)	72.6	0.0	54.3	0.5	105.2
Queue Length 95th (m)	#103.6	0.0	m56.9	m13.8	m39.5
Internal Link Dist (m)	112.5		321.2		439.1
Turn Bay Length (m)				75.0	
Base Capacity (vph)	834	1495	2131	1580	2151
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.87	0.33	0.47	0.55	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

09/07/2017



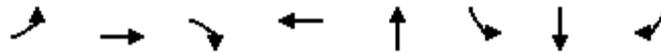
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	722	497	992	874	0	1853
Future Volume (vph)	722	497	992	874	0	1853
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	5.5	4.0		5.5
Lane Util. Factor	0.97	1.00	0.95	1.00		0.95
Frpb, ped/bikes	1.00	1.00	1.00	0.98		1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	3273	1495	3312	1580		3343
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	3273	1495	3312	1580		3343
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	722	497	992	874	0	1853
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	722	497	992	874	0	1853
Confl. Peds. (#/hr)				4	4	
Heavy Vehicles (%)	7%	8%	9%	0%	0%	8%
Turn Type	Prot	Free	NA	Free		NA
Protected Phases	8		2			6
Permitted Phases		Free		Free		
Actuated Green, G (s)	24.6	100.0	64.4	100.0		64.4
Effective Green, g (s)	24.6	100.0	64.4	100.0		64.4
Actuated g/C Ratio	0.25	1.00	0.64	1.00		0.64
Clearance Time (s)	5.5		5.5			5.5
Vehicle Extension (s)	3.0		3.0			3.0
Lane Grp Cap (vph)	805	1495	2132	1580		2152
v/s Ratio Prot	c0.22		0.30			c0.55
v/s Ratio Perm		0.33		0.55		
v/c Ratio	0.90	0.33	0.47	0.55		0.86
Uniform Delay, d1	36.5	0.0	9.0	0.0		14.2
Progression Factor	1.00	1.00	1.44	1.00		0.64
Incremental Delay, d2	12.6	0.6	0.1	0.1		0.5
Delay (s)	49.1	0.6	13.1	0.1		9.6
Level of Service	D	A	B	A		A
Approach Delay (s)	29.3		7.0			9.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool L~~0~~ 09/07/2017



Lane Group	EBL	EBT	EBR	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	159	291	293	98	2019	65	1705	540
v/c Ratio	0.59	0.80	0.81	0.51	1.12	1.02	0.93	0.33
Control Delay	43.2	40.3	41.4	19.5	73.2	118.5	28.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	40.3	41.4	19.5	73.2	118.5	28.1	0.3
Queue Length 50th (m)	29.2	40.5	40.7	0.4	~275.3	~14.8	153.5	0.0
Queue Length 95th (m)	45.4	66.3	67.1	16.4m	#176.7	m#21.5	#267.7	m0.0
Internal Link Dist (m)		109.5		75.3	224.9		321.2	
Turn Bay Length (m)	30.0		30.0			30.0		75.0
Base Capacity (vph)	381	479	474	191	1799	64	1837	1615
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.61	0.62	0.51	1.12	1.02	0.93	0.33

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool Lane 09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘		↔			↕		↖	↗	↘
Traffic Volume (vph)	156	21	552	63	0	33	0	1936	42	64	1671	529
Future Volume (vph)	156	21	552	63	0	33	0	1936	42	64	1671	529
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	5.8		5.8			6.0		6.0	6.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00			0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00			1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.86	0.85		0.95			1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.97			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1271	1379	1358		1610			3301		1492	3374	1615
Flt Permitted	0.95	1.00	1.00		0.63			1.00		0.08	1.00	1.00
Satd. Flow (perm)	1271	1379	1358		1050			3301		118	3374	1615
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	159	21	563	64	0	34	0	1976	43	65	1705	540
RTOR Reduction (vph)	0	74	76	0	88	0	0	1	0	0	0	0
Lane Group Flow (vph)	159	217	217	0	10	0	0	2018	0	65	1705	540
Confl. Peds. (#/hr)									6	6		
Heavy Vehicles (%)	42%	8%	13%	3%	0%	20%	0%	9%	6%	21%	7%	0%
Turn Type	Split	NA	Perm	Perm	NA			NA		Perm	NA	Free
Protected Phases	4	4			8			2			6	
Permitted Phases			4	8						6		Free
Actuated Green, G (s)	21.1	21.1	21.1		8.0			53.3		53.3	53.3	100.0
Effective Green, g (s)	21.1	21.1	21.1		8.0			53.3		53.3	53.3	100.0
Actuated g/C Ratio	0.21	0.21	0.21		0.08			0.53		0.53	0.53	1.00
Clearance Time (s)	5.8	5.8	5.8		5.8			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	268	290	286		84			1759		62	1798	1615
v/s Ratio Prot	0.13	0.16						c0.61			0.51	
v/s Ratio Perm			c0.16		0.01					0.55		c0.33
v/c Ratio	0.59	0.75	0.76		0.12			1.15		1.05	0.95	0.33
Uniform Delay, d1	35.6	37.0	37.1		42.7			23.4		23.4	22.0	0.0
Progression Factor	1.00	1.00	1.00		1.00			0.45		0.93	0.89	1.00
Incremental Delay, d2	3.5	10.1	11.0		0.6			66.9		92.5	6.8	0.3
Delay (s)	39.1	47.0	48.1		43.3			77.3		114.3	26.4	0.3
Level of Service	D	D	D		D			E		F	C	A
Approach Delay (s)		45.7			43.3			77.3			22.8	
Approach LOS		D			D			E			C	

Intersection Summary

HCM 2000 Control Delay	47.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.6
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

09/07/2017



Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	291	115	168	93	2499	65	2243	153
v/c Ratio	0.92	0.23	0.49	0.52	1.51	0.35	1.34	0.23
Control Delay	68.2	11.0	23.5	17.7	249.7	19.8	187.9	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	11.0	23.5	17.7	249.7	19.8	187.9	17.3
Queue Length 50th (m)	54.7	5.4	17.6	6.7	~393.7	8.7	~333.3	12.5
Queue Length 95th (m)	#103.0	18.2	38.0	m6.4	m#362.5	m13.2	m#389.5	m23.2
Internal Link Dist (m)	193.9		43.6		225.6		224.9	
Turn Bay Length (m)		15.0		45.0		30.0		85.0
Base Capacity (vph)	343	538	365	179	1660	186	1669	657
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.21	0.46	0.52	1.51	0.35	1.34	0.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

09/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕↗		↗	↕↗	↗
Traffic Volume (vph)	268	6	108	73	5	80	87	2259	90	61	2108	144
Future Volume (vph)	268	6	108	73	5	80	87	2259	90	61	2108	144
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00	0.99		0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1619	1476		1656		1583	3414		1641	3438	1252
Flt Permitted		0.61	1.00		0.59		0.08	1.00		0.08	1.00	1.00
Satd. Flow (perm)		1041	1476		995		139	3414		145	3438	1252
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	285	6	115	78	5	85	93	2403	96	65	2243	153
RTOR Reduction (vph)	0	0	53	0	38	0	0	3	0	0	0	50
Lane Group Flow (vph)	0	291	62	0	130	0	93	2496	0	65	2243	103
Confl. Peds. (#/hr)	2		1	1		2	3		1	1		3
Heavy Vehicles (%)	12%	0%	8%	8%	0%	0%	14%	5%	6%	10%	5%	27%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		30.4	30.4		30.4		53.4	47.8		53.4	47.8	47.8
Effective Green, g (s)		30.4	30.4		30.4		53.4	47.8		53.4	47.8	47.8
Actuated g/C Ratio		0.30	0.30		0.30		0.53	0.48		0.53	0.48	0.48
Clearance Time (s)		6.2	6.2		6.2		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		316	448		302		155	1631		161	1643	598
v/s Ratio Prot							c0.03	c0.73		0.02	0.65	
v/s Ratio Perm		c0.28	0.04		0.13		0.29			0.19		0.08
v/c Ratio		0.92	0.14		0.43		0.60	1.53		0.40	1.37	0.17
Uniform Delay, d1		33.6	25.3		27.9		21.7	26.1		21.3	26.1	14.8
Progression Factor		1.00	1.00		1.00		1.26	0.77		1.67	1.38	2.28
Incremental Delay, d2		30.9	0.1		1.0		0.6	239.1		1.0	166.7	0.4
Delay (s)		64.6	25.4		28.8		27.9	259.1		36.5	202.7	34.3
Level of Service		E	C		C		C	F		D	F	C
Approach Delay (s)		53.5			28.8			250.8			187.8	
Approach LOS		D			C			F			F	

Intersection Summary		
HCM 2000 Control Delay	202.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.25	F
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	104.5%	16.2
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

Queues

108: Regional Road 25 & Market Drive

09/07/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	559	151	291	2054	2093	278
v/c Ratio	1.10	0.26	1.46	1.05	1.32	0.38
Control Delay	104.3	6.1	255.7	57.1	170.2	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.3	6.1	255.7	57.1	170.2	12.8
Queue Length 50th (m)	~130.1	0.7	~65.3	~241.3	~284.2	20.4
Queue Length 95th (m)	#195.8	14.8	#118.5	#285.6	m#96.5	m13.7
Internal Link Dist (m)	338.3			274.0	225.6	
Turn Bay Length (m)			55.0			55.0
Base Capacity (vph)	508	573	199	1959	1581	730
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.26	1.46	1.05	1.32	0.38

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

108: Regional Road 25 & Market Drive

09/07/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	531	143	276	1951	1988	264
Future Volume (vph)	531	143	276	1951	1988	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1641	1524	1752	3438	3438	1434
Flt Permitted	0.95	1.00	0.08	1.00	1.00	1.00
Satd. Flow (perm)	1641	1524	148	3438	3438	1434
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	559	151	291	2054	2093	278
RTOR Reduction (vph)	0	101	0	0	0	71
Lane Group Flow (vph)	559	50	291	2054	2093	207
Confl. Peds. (#/hr)			7			7
Heavy Vehicles (%)	10%	6%	3%	5%	5%	9%
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	31.0	31.0	57.0	57.0	46.0	46.0
Effective Green, g (s)	31.0	31.0	57.0	57.0	46.0	46.0
Actuated g/C Ratio	0.31	0.31	0.57	0.57	0.46	0.46
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	508	472	196	1959	1581	659
v/s Ratio Prot	c0.34		c0.10	0.60	0.61	
v/s Ratio Perm		0.03	c0.74			0.14
v/c Ratio	1.10	0.11	1.48	1.05	1.32	0.31
Uniform Delay, d1	34.5	24.6	28.2	21.5	27.0	17.0
Progression Factor	1.00	1.00	1.00	1.00	0.84	1.40
Incremental Delay, d2	70.2	0.1	243.3	34.4	146.1	0.1
Delay (s)	104.7	24.7	271.6	55.9	168.8	23.9
Level of Service	F	C	F	E	F	C
Approach Delay (s)	87.7			82.7	151.8	
Approach LOS	F			F	F	

Intersection Summary

HCM 2000 Control Delay	113.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	113.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

110: Martin Street/Regional Road 25 & Steeles Ave

09/07/2017



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	524	422	161	1585	125	746	740	655	884
v/c Ratio	1.11	0.20	0.59	1.69dr	0.75	0.75	1.12	0.75	0.94
Control Delay	103.0	19.0	46.6	70.9	68.0	43.6	99.1	32.7	35.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.0	19.0	46.6	70.9	68.0	43.6	99.1	32.7	35.8
Queue Length 50th (m)	~60.0	20.7	34.1	~134.2	28.2	86.5	~84.7	129.5	132.6
Queue Length 95th (m)	#95.9	28.3	59.2	#165.9	#61.7	110.0	#124.5	178.3	#237.0
Internal Link Dist (m)		121.2		239.5		126.4		231.3	
Turn Bay Length (m)	40.0		50.0		50.0		160.0		
Base Capacity (vph)	474	2164	273	1507	166	998	662	877	937
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.20	0.59	1.05	0.75	0.75	1.12	0.75	0.94

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

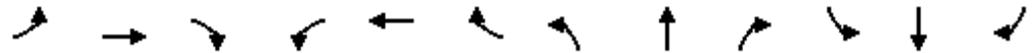
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

HCM Signalized Intersection Capacity Analysis
 110: Martin Street/Regional Road 25 & Steeles Ave

09/07/2017



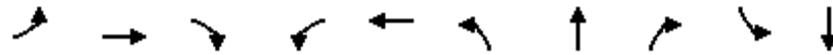
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↔		↔	↕↕↔		↔	↕↔		↔↔	↕	↔
Traffic Volume (vph)	498	336	65	153	415	1091	119	595	114	703	622	840
Future Volume (vph)	498	336	65	153	415	1091	119	595	114	703	622	840
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	0.95		0.97	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.89		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	4920		1785	4339		1799	3480		3242	1881	1550
Flt Permitted	0.10	1.00		0.50	1.00		0.31	1.00		0.16	1.00	1.00
Satd. Flow (perm)	352	4920		933	4339		588	3480		530	1881	1550
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	524	354	68	161	437	1148	125	626	120	740	655	884
RTOR Reduction (vph)	0	24	0	0	235	0	0	13	0	0	0	214
Lane Group Flow (vph)	524	398	0	161	1350	0	125	733	0	740	655	670
Confl. Peds. (#/hr)	5		1	1		5	8		2	2		8
Heavy Vehicles (%)	7%	3%	0%	1%	5%	5%	0%	1%	1%	8%	1%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	52.2	52.2		35.2	35.2		34.0	34.0		56.0	56.0	56.0
Effective Green, g (s)	52.2	52.2		35.2	35.2		34.0	34.0		56.0	56.0	56.0
Actuated g/C Ratio	0.44	0.44		0.29	0.29		0.28	0.28		0.47	0.47	0.47
Clearance Time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	469	2140		273	1272		166	986		654	877	723
v/s Ratio Prot	c0.12	0.08			0.31			0.21		c0.17	0.35	
v/s Ratio Perm	c0.37			0.17			0.21			c0.36		0.43
v/c Ratio	1.12	0.19		0.59	1.69dr		0.75	0.74		1.13	0.75	0.93
Uniform Delay, d1	34.8	20.8		36.2	42.4		39.2	39.0		30.2	26.2	30.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	77.6	0.0		3.2	43.1		26.7	5.1		77.3	5.8	19.7
Delay (s)	112.4	20.9		39.5	85.5		65.8	44.1		107.5	32.0	49.8
Level of Service	F	C		D	F		E	D		F	C	D
Approach Delay (s)		71.6			81.3			47.2			63.4	
Approach LOS		E			F			D			E	

Intersection Summary		
HCM 2000 Control Delay	67.7	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	1.18	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 19.8
Intersection Capacity Utilization	117.4%	ICU Level of Service H
Analysis Period (min)	15	
dr Defacto Right Lane. Recode with 1 though lane as a right lane.		
c Critical Lane Group		

Queues

101: Regional Road 25 & 5 Side Road

09/13/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	113	96	369	163	251	288	906	128	35	819
v/c Ratio	0.70	0.40	0.76	0.59	0.56	0.66	0.40	0.13	0.14	0.51
Control Delay	68.7	48.7	15.2	45.3	40.8	15.5	8.0	1.9	25.0	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	48.7	15.2	45.3	40.8	15.5	8.0	1.9	25.0	24.2
Queue Length 50th (m)	27.0	21.8	0.0	33.7	51.2	25.4	42.6	1.5	4.5	66.2
Queue Length 95th (m)	44.1	35.8	31.9	49.1	71.0	45.1	77.6	5.5	15.3	115.1
Internal Link Dist (m)		361.7			299.6		351.5			238.1
Turn Bay Length (m)	75.0		75.0	70.0		75.0			30.0	
Base Capacity (vph)	266	394	559	275	616	502	2267	953	249	1607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.24	0.66	0.59	0.41	0.57	0.40	0.13	0.14	0.51

Intersection Summary

HCM Signalized Intersection Capacity Analysis
101: Regional Road 25 & 5 Side Road

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	89	343	152	170	63	268	843	119	33	608	153
Future Volume (vph)	105	89	343	152	170	63	268	843	119	33	608	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	5.6	4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1656	1557	1122	1543	1756		1570	3438	1380	1543	3266	
Flt Permitted	0.60	1.00	1.00	0.57	1.00		0.25	1.00	1.00	0.31	1.00	
Satd. Flow (perm)	1052	1557	1122	923	1756		406	3438	1380	511	3266	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	113	96	369	163	183	68	288	906	128	35	654	165
RTOR Reduction (vph)	0	0	312	0	13	0	0	0	44	0	14	0
Lane Group Flow (vph)	113	96	57	163	238	0	288	906	84	35	805	0
Heavy Vehicles (%)	9%	22%	44%	17%	3%	6%	15%	5%	17%	17%	7%	8%
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	18.6	18.6	18.6	29.6	29.6		79.1	79.1	79.1	58.5	58.5	
Effective Green, g (s)	18.6	18.6	18.6	29.6	29.6		79.1	79.1	79.1	58.5	58.5	
Actuated g/C Ratio	0.16	0.16	0.16	0.25	0.25		0.66	0.66	0.66	0.49	0.49	
Clearance Time (s)	5.6	5.6	5.6	4.0	5.6		4.0	5.7	5.7	5.7	5.7	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	163	241	173	263	433		428	2266	909	249	1592	
v/s Ratio Prot		0.06		c0.04	0.14		c0.09	0.26			0.25	
v/s Ratio Perm	0.11		0.05	c0.12			c0.35		0.06	0.07		
v/c Ratio	0.69	0.40	0.33	0.62	0.55		0.67	0.40	0.09	0.14	0.51	
Uniform Delay, d1	48.0	45.7	45.2	39.6	39.4		11.2	9.5	7.4	16.9	20.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.88	0.72	0.92	1.00	1.00	
Incremental Delay, d2	12.0	1.1	1.1	4.3	1.5		4.0	0.5	0.2	1.2	1.1	
Delay (s)	60.0	46.7	46.3	43.9	40.9		13.8	7.3	7.0	18.1	22.1	
Level of Service	E	D	D	D	D		B	A	A	B	C	
Approach Delay (s)		49.0			42.1			8.7			21.9	
Approach LOS		D			D			A			C	

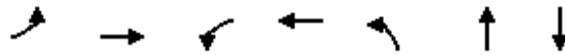
Intersection Summary

HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Queues

102: Regional Road 25 & Escarpment Way/Peddie Road

09/13/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	166	115	99	14	18	1206	1090
v/c Ratio	0.72	0.40	0.61	0.06	0.07	0.34	0.32
Control Delay	63.8	20.5	61.5	30.0	3.4	2.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.8	20.5	61.5	30.0	3.4	2.6	7.6
Queue Length 50th (m)	39.4	8.6	23.1	1.9	0.4	11.2	54.9
Queue Length 95th (m)	59.4	24.6	39.4	7.5	m1.4	17.2	39.4
Internal Link Dist (m)		165.7		110.1		512.8	351.5
Turn Bay Length (m)	25.0		55.0		75.0		
Base Capacity (vph)	532	570	372	554	244	3525	3392
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.20	0.27	0.03	0.07	0.34	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 102: Regional Road 25 & Escarpment Way/Peddie Road

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	159	6	105	95	9	5	17	1107	51	0	998	48
Future Volume (vph)	159	6	105	95	9	5	17	1107	51	0	998	48
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		6.0	6.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91			0.91	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.86		1.00	0.95		1.00	0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1752	1359		1421	1430		1308	4793			4611	
Flt Permitted	0.75	1.00		0.64	1.00		0.24	1.00			1.00	
Satd. Flow (perm)	1380	1359		965	1430		332	4793			4611	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	166	6	109	99	9	5	18	1153	53	0	1040	50
RTOR Reduction (vph)	0	62	0	0	4	0	0	2	0	0	2	0
Lane Group Flow (vph)	166	53	0	99	10	0	18	1204	0	0	1088	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	3%	0%	21%	27%	40%	0%	38%	6%	38%	0%	12%	6%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.1	20.1		20.1	20.1		88.2	88.2			88.2	
Effective Green, g (s)	20.1	20.1		20.1	20.1		88.2	88.2			88.2	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.74	0.74			0.74	
Clearance Time (s)	5.7	5.7		5.7	5.7		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	231	227		161	239		244	3522			3389	
v/s Ratio Prot		0.04			0.01			c0.25			0.24	
v/s Ratio Perm	c0.12			0.10			0.05					
v/c Ratio	0.72	0.23		0.61	0.04		0.07	0.34			0.32	
Uniform Delay, d1	47.3	43.3		46.4	41.9		4.5	5.6			5.5	
Progression Factor	1.00	1.00		1.00	1.00		0.46	0.39			1.23	
Incremental Delay, d2	10.2	0.5		6.8	0.1		0.5	0.2			0.2	
Delay (s)	57.5	43.8		53.2	41.9		2.6	2.4			7.0	
Level of Service	E	D		D	D		A	A			A	
Approach Delay (s)		51.9			51.8			2.4			7.0	
Approach LOS		D			D			A			A	

Intersection Summary

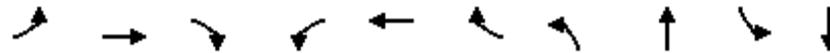
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

103: Regional Road 25 & James Snow Pkwy

09/13/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	80	54	253	256	61	147	234	1131	120	1260
v/c Ratio	0.25	0.07	0.44	0.85	0.07	0.32	0.72	0.47	0.45	0.60
Control Delay	34.7	30.7	6.2	66.4	30.9	6.7	50.8	9.7	17.7	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	30.7	6.2	66.4	30.9	6.7	50.8	9.7	17.7	17.4
Queue Length 50th (m)	15.6	5.2	0.0	59.9	5.9	0.0	38.3	14.6	7.5	50.4
Queue Length 95th (m)	27.1	9.7	18.3	86.2	10.6	14.6	65.3	37.5	24.3	66.2
Internal Link Dist (m)		134.9			153.9			258.8		512.8
Turn Bay Length (m)	55.0		80.0	85.0		40.0	30.0		75.0	
Base Capacity (vph)	416	1003	663	383	1066	540	387	2417	298	2099
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.05	0.38	0.67	0.06	0.27	0.60	0.47	0.40	0.60

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 103: Regional Road 25 & James Snow Pkwy

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑↗		↘	↑↑↗	
Traffic Volume (vph)	76	51	240	243	58	140	222	949	125	114	1174	23
Future Volume (vph)	76	51	240	243	58	140	222	949	125	114	1174	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4		4.0	6.4	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91		1.00	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	3034	1495	1530	3223	1335	1612	4611		1399	4396	
Flt Permitted	0.72	1.00	1.00	0.72	1.00	1.00	0.14	1.00		0.22	1.00	
Satd. Flow (perm)	1258	3034	1495	1159	3223	1335	243	4611		319	4396	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	80	54	253	256	61	147	234	999	132	120	1236	24
RTOR Reduction (vph)	0	0	187	0	0	109	0	12	0	0	2	0
Lane Group Flow (vph)	80	54	66	256	61	38	234	1119	0	120	1258	0
Heavy Vehicles (%)	8%	19%	8%	18%	12%	21%	12%	9%	22%	29%	18%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	31.2	31.2	31.2	31.2	31.2	31.2	76.1	62.6		66.7	57.2	
Effective Green, g (s)	31.2	31.2	31.2	31.2	31.2	31.2	76.1	62.6		66.7	57.2	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.63	0.52		0.56	0.48	
Clearance Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	4.0	6.4		4.0	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	327	788	388	301	837	347	324	2405		262	2095	
v/s Ratio Prot		0.02			0.02		c0.09	0.24		0.04	0.29	
v/s Ratio Perm	0.06		0.04	c0.22		0.03	c0.37			0.22		
v/c Ratio	0.24	0.07	0.17	0.85	0.07	0.11	0.72	0.47		0.46	0.60	
Uniform Delay, d1	35.1	33.5	34.4	42.2	33.5	33.8	13.9	18.1		13.1	23.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	2.94	0.48		1.21	0.64	
Incremental Delay, d2	0.4	0.0	0.2	19.9	0.0	0.1	5.8	0.5		1.2	1.3	
Delay (s)	35.5	33.5	34.6	62.1	33.5	34.0	46.7	9.2		17.1	15.9	
Level of Service	D	C	C	E	C	C	D	A		B	B	
Approach Delay (s)		34.6			49.4			15.6			16.0	
Approach LOS		C			D			B			B	

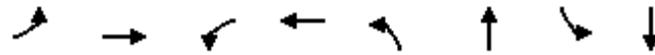
Intersection Summary

HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

104: Regional Road 25 & Driveway/High Point Drive

09/13/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	32	641	61	18	1498	43	1757
v/c Ratio	0.24	0.24	0.97	0.09	0.38	0.70	0.62	0.85
Control Delay	57.9	22.9	56.9	14.9	47.2	26.2	55.8	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	22.9	56.9	14.9	47.2	26.2	55.8	22.9
Queue Length 50th (m)	5.2	0.5	132.6	6.5	2.9	106.4	3.6	55.0
Queue Length 95th (m)	14.0	10.6	#187.3	14.4	m8.5	109.8	m#20.7	#94.1
Internal Link Dist (m)		98.3		127.8		439.1		258.8
Turn Bay Length (m)	15.0		30.0		70.0		30.0	
Base Capacity (vph)	123	172	664	756	47	2137	69	2068
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.19	0.97	0.08	0.38	0.70	0.62	0.85

Intersection Summary

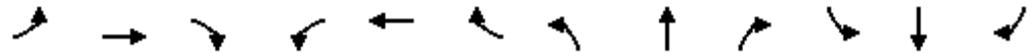
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 104: Regional Road 25 & Driveway/High Point Drive

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	20	2	27	583	5	51	16	1205	158	39	1595	4
Future Volume (vph)	20	2	27	583	5	51	16	1205	158	39	1595	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		5.9	5.9		5.9	5.9	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.86		1.00	0.86		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1399	1253		1612	1526		1327	4552		1492	4433	
Flt Permitted	0.72	1.00		0.54	1.00		0.07	1.00		0.10	1.00	
Satd. Flow (perm)	1056	1253		917	1526		102	4552		149	4433	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	22	2	30	641	5	56	18	1324	174	43	1753	4
RTOR Reduction (vph)	0	28	0	0	7	0	0	13	0	0	0	0
Lane Group Flow (vph)	22	4	0	641	54	0	18	1485	0	43	1757	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	29%	50%	29%	12%	0%	8%	36%	10%	27%	21%	17%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.3	8.3		53.3	53.3		54.8	54.8		54.8	54.8	
Effective Green, g (s)	8.3	8.3		53.3	53.3		54.8	54.8		54.8	54.8	
Actuated g/C Ratio	0.07	0.07		0.44	0.44		0.46	0.46		0.46	0.46	
Clearance Time (s)	6.0	6.0		3.0	6.0		5.9	5.9		5.9	5.9	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	73	86		650	677		46	2078		68	2024	
v/s Ratio Prot		0.00		c0.34	0.04			0.33			c0.40	
v/s Ratio Perm	0.02			c0.09			0.18			0.29		
v/c Ratio	0.30	0.05		0.99	0.08		0.39	0.71		0.63	0.87	
Uniform Delay, d1	53.1	52.2		31.0	19.2		21.6	26.3		24.9	29.3	
Progression Factor	1.00	1.00		1.00	1.00		0.91	0.93		0.66	0.63	
Incremental Delay, d2	2.3	0.2		31.5	0.1		21.2	1.9		31.9	4.5	
Delay (s)	55.4	52.4		62.5	19.3		40.7	26.5		48.3	23.0	
Level of Service	E	D		E	B		D	C		D	C	
Approach Delay (s)		53.6			58.8			26.7			23.6	
Approach LOS		D			E			C			C	

Intersection Summary

HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

09/13/2018



Lane Group	WBL	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	836	383	992	874	1853
v/c Ratio	0.82	0.79	0.35	0.55	0.65
Control Delay	44.7	40.2	13.8	5.2	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	40.2	13.8	5.2	9.1
Queue Length 50th (m)	96.4	73.6	34.2	10.2	52.9
Queue Length 95th (m)	111.0	108.5	51.8	135.2	m64.2
Internal Link Dist (m)	112.5		321.2		439.1
Turn Bay Length (m)				75.0	
Base Capacity (vph)	1209	562	2845	1580	2871
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.69	0.68	0.35	0.55	0.65

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 105: Regional Road 25 & Highway 401 Westbound Off-Ramp (N. Term)

09/13/2018



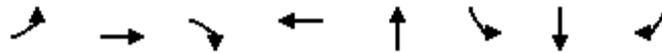
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	722	497	992	874	0	1853
Future Volume (vph)	722	497	992	874	0	1853
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	4.0		5.5
Lane Util. Factor	0.97	0.91	0.91	1.00		0.91
Frbp, ped/bikes	1.00	1.00	1.00	0.98		1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00
Frt	0.98	0.85	1.00	0.85		1.00
Flt Protected	0.96	1.00	1.00	1.00		1.00
Satd. Flow (prot)	3231	1361	4759	1580		4803
Flt Permitted	0.96	1.00	1.00	1.00		1.00
Satd. Flow (perm)	3231	1361	4759	1580		4803
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	722	497	992	874	0	1853
RTOR Reduction (vph)	12	63	0	0	0	0
Lane Group Flow (vph)	824	320	992	874	0	1853
Confl. Peds. (#/hr)				4	4	
Heavy Vehicles (%)	7%	8%	9%	0%	0%	8%
Turn Type	Prot	Perm	NA	Free		NA
Protected Phases	8		2			6
Permitted Phases		8		Free		
Actuated Green, G (s)	37.2	37.2	71.8	120.0		71.8
Effective Green, g (s)	37.2	37.2	71.8	120.0		71.8
Actuated g/C Ratio	0.31	0.31	0.60	1.00		0.60
Clearance Time (s)	5.5	5.5	5.5			5.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	1001	421	2847	1580		2873
v/s Ratio Prot	c0.26		0.21			c0.39
v/s Ratio Perm		0.23		0.55		
v/c Ratio	0.82	0.76	0.35	0.55		0.64
Uniform Delay, d1	38.4	37.4	12.2	0.0		15.8
Progression Factor	1.00	1.00	1.04	1.00		0.51
Incremental Delay, d2	5.6	7.7	0.2	0.9		0.5
Delay (s)	43.9	45.0	13.0	0.9		8.6
Level of Service	D	D	B	A		A
Approach Delay (s)	44.3		7.3			8.6
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool L09/13/2018



Lane Group	EBL	EBT	EBR	WBT	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	159	291	293	98	2019	65	1705	540
v/c Ratio	0.51	0.72	0.67	0.50	0.80	0.43	0.57	0.33
Control Delay	39.7	46.7	36.5	15.3	10.3	25.6	15.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	46.7	36.5	15.4	10.3	25.6	15.1	0.4
Queue Length 50th (m)	32.2	65.6	53.3	0.0	25.6	5.9	90.9	0.0
Queue Length 95th (m)	48.4	91.3	78.8	12.4m	214.9m	14.4	101.4	0.0
Internal Link Dist (m)		109.5		75.3	224.9		321.2	
Turn Bay Length (m)	30.0		30.0			30.0		75.0
Base Capacity (vph)	355	536	560	197	2525	167	2977	1615
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	1	0	0	65	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.54	0.52	0.50	0.80	0.39	0.59	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

106: Regional Road 25 & Highway 401 Eastbound Off-Ramp (S. Term)/MTO Carpool Lanes 09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘		↔			↑↑↑		↖	↑↑↑	↗
Traffic Volume (vph)	156	21	552	63	0	33	0	1936	42	64	1671	529
Future Volume (vph)	156	21	552	63	0	33	0	1936	42	64	1671	529
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	5.8		5.8			6.0		4.0	6.0	4.0
Lane Util. Factor	1.00	0.95	0.95		1.00			0.91		1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00			1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frt	1.00	0.86	0.85		0.95			1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.97			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1271	1379	1358		1610			4743		1492	4848	1615
Flt Permitted	0.67	1.00	1.00		0.63			1.00		0.06	1.00	1.00
Satd. Flow (perm)	893	1379	1358		1050			4743		94	4848	1615
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	159	21	563	64	0	34	0	1976	43	65	1705	540
RTOR Reduction (vph)	0	9	46	0	90	0	0	1	0	0	0	0
Lane Group Flow (vph)	159	282	247	0	8	0	0	2018	0	65	1705	540
Confl. Peds. (#/hr)									6	6		
Heavy Vehicles (%)	42%	8%	13%	3%	0%	20%	0%	9%	6%	21%	7%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA			NA		pm+pt	NA	Free
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4		4	8						6		Free
Actuated Green, G (s)	34.5	34.5	34.5		10.4			63.1		73.7	73.7	120.0
Effective Green, g (s)	34.5	34.5	34.5		10.4			63.1		73.7	73.7	120.0
Actuated g/C Ratio	0.29	0.29	0.29		0.09			0.53		0.61	0.61	1.00
Clearance Time (s)	5.8	5.8	5.8		5.8			6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	314	396	390		91			2494		134	2977	1615
v/s Ratio Prot	0.08	c0.20						c0.43		0.03	c0.35	
v/s Ratio Perm	0.07		0.18		0.01					0.27		0.33
v/c Ratio	0.51	0.71	0.63		0.09			0.81		0.49	0.57	0.33
Uniform Delay, d1	35.4	38.3	37.3		50.5			23.5		17.8	13.8	0.0
Progression Factor	1.00	1.00	1.00		1.00			0.31		1.41	0.99	1.00
Incremental Delay, d2	1.3	6.0	3.4		0.4			1.2		2.1	0.6	0.4
Delay (s)	36.6	44.3	40.6		50.9			8.6		27.2	14.2	0.4
Level of Service	D	D	D		D			A		C	B	A
Approach Delay (s)		41.2			50.9			8.6			11.4	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

09/13/2018



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	291	115	168	93	2403	96	65	2243	153
v/c Ratio	0.97	0.24	0.56	0.62	0.92	0.12	0.42	0.89	0.22
Control Delay	88.0	16.5	34.1	37.4	22.9	3.4	23.0	25.6	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.0	16.5	34.1	37.4	22.9	3.4	23.0	25.6	3.8
Queue Length 50th (m)	70.8	9.2	25.7	8.8	232.9	2.1	4.3	104.2	1.3
Queue Length 95th (m)	#128.4	24.4	50.6	m#23.2	#177.3	m4.6	m16.0	132.0	9.1
Internal Link Dist (m)	193.9		43.6		225.6			224.9	
Turn Bay Length (m)		15.0		45.0		45.0	30.0		85.0
Base Capacity (vph)	304	485	304	149	2623	821	154	2532	705
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.24	0.55	0.62	0.92	0.12	0.42	0.89	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 107: Regional Road 25 & Chisholm Drive/Maplehurst C.C.

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↔		↖	↑↑↑	↗	↖	↑↑↑	↗
Traffic Volume (vph)	268	6	108	73	5	80	87	2259	90	61	2108	144
Future Volume (vph)	268	6	108	73	5	80	87	2259	90	61	2108	144
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.2	6.2		6.2		4.0	6.0	6.0	4.0	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	0.91	1.00	1.00	0.91	1.00
Frbp, ped/bikes		1.00	0.99		0.99		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85		0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1618	1476		1656		1583	4940	1490	1641	4940	1251
Flt Permitted		0.60	1.00		0.54		0.06	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)		1019	1476		917		106	4940	1490	112	4940	1251
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	285	6	115	78	5	85	93	2403	96	65	2243	153
RTOR Reduction (vph)	0	0	45	0	31	0	0	0	31	0	0	64
Lane Group Flow (vph)	0	291	70	0	137	0	93	2403	65	65	2243	89
Confl. Peds. (#/hr)	2		1	1		2	3		1	1		3
Heavy Vehicles (%)	12%	0%	8%	8%	0%	0%	14%	5%	6%	10%	5%	27%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)		35.3	35.3		35.3		69.9	62.9	62.9	67.1	61.5	61.5
Effective Green, g (s)		35.3	35.3		35.3		69.9	62.9	62.9	67.1	61.5	61.5
Actuated g/C Ratio		0.29	0.29		0.29		0.58	0.52	0.52	0.56	0.51	0.51
Clearance Time (s)		6.2	6.2		6.2		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		299	434		269		147	2589	781	133	2531	641
v/s Ratio Prot							c0.04	c0.49		0.02	0.45	
v/s Ratio Perm		c0.29	0.05		0.15		0.33		0.04	0.25		0.07
v/c Ratio		0.97	0.16		0.51		0.63	0.93	0.08	0.49	0.89	0.14
Uniform Delay, d1		41.9	31.4		35.2		22.2	26.5	14.2	22.9	26.1	15.3
Progression Factor		1.00	1.00		1.00		1.28	0.64	0.52	1.31	0.80	0.85
Incremental Delay, d2		44.4	0.2		1.5		6.8	5.9	0.2	2.4	4.4	0.4
Delay (s)		86.3	31.6		36.7		35.3	22.9	7.5	32.4	25.1	13.4
Level of Service		F	C		D		D	C	A	C	C	B
Approach Delay (s)		70.8			36.7			22.8			24.6	
Approach LOS		E			D			C			C	

Intersection Summary

HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.2
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

108: Regional Road 25 & Market Drive

09/13/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	559	151	291	2054	2093	278
v/c Ratio	0.81	0.34	0.87	0.61	0.86	0.35
Control Delay	54.0	7.7	34.2	12.4	8.8	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	7.7	34.2	12.4	8.8	0.9
Queue Length 50th (m)	68.1	0.0	44.0	127.5	95.7	0.0
Queue Length 95th (m)	84.5	16.6	m55.7	m149.0	93.5	m0.1
Internal Link Dist (m)	338.3			274.0	225.6	
Turn Bay Length (m)	75.0		55.0			55.0
Base Capacity (vph)	822	505	345	3371	2444	787
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	111	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.30	0.84	0.63	0.86	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
108: Regional Road 25 & Market Drive

09/13/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	531	143	276	1951	1988	264
Future Volume (vph)	531	143	276	1951	1988	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3183	1524	1752	4940	4940	1430
Flt Permitted	0.95	1.00	0.06	1.00	1.00	1.00
Satd. Flow (perm)	3183	1524	116	4940	4940	1430
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	559	151	291	2054	2093	278
RTOR Reduction (vph)	0	118	0	0	0	80
Lane Group Flow (vph)	559	33	291	2054	2093	198
Confl. Peds. (#/hr)			7			7
Heavy Vehicles (%)	10%	6%	3%	5%	5%	9%
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	26.1	26.1	81.9	81.9	59.4	59.4
Effective Green, g (s)	26.1	26.1	81.9	81.9	59.4	59.4
Actuated g/C Ratio	0.22	0.22	0.68	0.68	0.49	0.49
Clearance Time (s)	6.0	6.0	4.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	692	331	331	3371	2445	707
v/s Ratio Prot	c0.18		c0.14	0.42	0.42	
v/s Ratio Perm		0.02	c0.46			0.14
v/c Ratio	0.81	0.10	0.88	0.61	0.86	0.28
Uniform Delay, d1	44.6	37.5	37.5	10.4	26.6	17.8
Progression Factor	1.00	1.00	0.71	1.11	0.21	0.03
Incremental Delay, d2	6.9	0.1	8.2	0.3	2.1	0.5
Delay (s)	51.5	37.7	34.8	11.7	7.8	1.1
Level of Service	D	D	C	B	A	A
Approach Delay (s)	48.5			14.6	7.0	
Approach LOS	D			B	A	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues

110: Martin Street/Regional Road 25 & Steeles Ave

09/13/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	524	422	161	1585	125	746	740	655	884
v/c Ratio	1.11	0.20	0.59	1.69dr	0.75	0.75	1.12	0.75	0.94
Control Delay	103.0	19.0	46.6	70.9	68.0	43.6	102.9	48.7	51.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.0	19.0	46.6	70.9	68.0	43.6	102.9	48.7	51.6
Queue Length 50th (m)	~60.0	20.7	34.1	~134.2	28.2	86.5	~109.8	172.1	191.3
Queue Length 95th (m)	#95.9	28.3	59.2	#165.9	#61.7	110.0 m#	121.4 m	203.5 m#	243.9
Internal Link Dist (m)		121.2		239.5		126.4		231.3	
Turn Bay Length (m)	40.0		50.0		50.0		160.0		
Base Capacity (vph)	474	2164	273	1507	166	998	662	877	937
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.20	0.59	1.05	0.75	0.75	1.12	0.75	0.94

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

HCM Signalized Intersection Capacity Analysis
 110: Martin Street/Regional Road 25 & Steeles Ave

09/13/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↔		↔	↕↕↔		↔	↕↔		↔↔	↕	↔
Traffic Volume (vph)	498	336	65	153	415	1091	119	595	114	703	622	840
Future Volume (vph)	498	336	65	153	415	1091	119	595	114	703	622	840
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91		1.00	0.91		1.00	0.95		0.97	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.89		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	4920		1785	4339		1799	3480		3242	1881	1550
Flt Permitted	0.10	1.00		0.50	1.00		0.31	1.00		0.16	1.00	1.00
Satd. Flow (perm)	352	4920		933	4339		588	3480		530	1881	1550
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	524	354	68	161	437	1148	125	626	120	740	655	884
RTOR Reduction (vph)	0	24	0	0	235	0	0	13	0	0	0	214
Lane Group Flow (vph)	524	398	0	161	1350	0	125	733	0	740	655	670
Confl. Peds. (#/hr)	5		1	1		5	8		2	2		8
Heavy Vehicles (%)	7%	3%	0%	1%	5%	5%	0%	1%	1%	8%	1%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	52.2	52.2		35.2	35.2		34.0	34.0		56.0	56.0	56.0
Effective Green, g (s)	52.2	52.2		35.2	35.2		34.0	34.0		56.0	56.0	56.0
Actuated g/C Ratio	0.44	0.44		0.29	0.29		0.28	0.28		0.47	0.47	0.47
Clearance Time (s)	4.0	5.8		5.8	5.8		6.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	469	2140		273	1272		166	986		654	877	723
v/s Ratio Prot	c0.12	0.08			0.31			0.21		c0.17	0.35	
v/s Ratio Perm	c0.37			0.17			0.21			c0.36		0.43
v/c Ratio	1.12	0.19		0.59	1.69dr		0.75	0.74		1.13	0.75	0.93
Uniform Delay, d1	34.8	20.8		36.2	42.4		39.2	39.0		30.2	26.2	30.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.55	1.68	2.50
Incremental Delay, d2	77.6	0.0		3.2	43.1		26.7	5.1		70.4	3.3	12.8
Delay (s)	112.4	20.9		39.5	85.5		65.8	44.1		117.2	47.4	88.1
Level of Service	F	C		D	F		E	D		F	D	F
Approach Delay (s)		71.6			81.3			47.2			85.9	
Approach LOS		E			F			D			F	

Intersection Summary

HCM 2000 Control Delay	76.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	117.4%	ICU Level of Service	H
Analysis Period (min)	15		
dr Defacto Right Lane. Recode with 1 though lane as a right lane.			
c Critical Lane Group			

**REGIONAL ROAD 25 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT TRANSPORTATION
PLANNING REPORT**

Appendix D – Roundabout Feasibility Study
January 2, 2019

Appendix D – ROUNDABOUT FEASIBILITY STUDY

To: Jeffrey Reid
Halton Region
File: 165010586

From: Gord Murray
Stantec Consulting Ltd.
Date: December 24, 2018

Reference: Regional Road 25 Roundabout Feasibility Study

This memo has been prepared to provide a summary of the Roundabout Feasibility Study conducted within the Regional Road 25 Municipal Class Environmental Assessment (MCEA) study area, between Steeles Avenue and 5 Side Road within the Town of Milton/Town of Halton Hills. The study was completed in accordance with the Regional Municipality of Halton's roundabout suitability guidelines, highlighted in the *Guidelines for the use of Modern Roundabouts on Regional Arterial Roadways* (the Guidelines).

The purpose of this Roundabout Feasibility Study is to determine whether the signalized intersections within the road corridor are candidates for conversion to roundabout intersection control types. A feasibility study was completed at six (6) intersections within the Regional Road 25 study boundaries.

The *Regional Road 25 Municipal Class Environmental Assessment Transportation Planning Report* (The Transportation Planning Report) was used to obtain traffic and collision data at each candidate intersection. The forecasted 2031 AM and PM weekday peak hour volume traffic conditions for the intersections are summarized in the Transportation Report, assuming that Regional Road 25 is widened from 2 to 3 lanes (each direction), from Steeles Avenue to 5 Side Road.

As per the Guidelines, a roundabout should be considered under the following criteria:

1. A new intersection on a Regional Road;
2. An existing intersection on a Regional Road where traffic signals are warranted;
3. An existing intersection on a Regional Road which is programmed for modifications to address an identified capacity or safety problem; and
4. Any other location as determined by staff or Regional Council.

If a location meets one or more of these criteria, a Roundabout Screening Assessment should be completed. This process will screen out possible locations for roundabouts based on proposed locations and estimated cost. Several economic and non-economic criteria are used to evaluate each intersection. The results of this study have been summarized below:

SUMMARY OF RESULTS

The Proposed Suitability Factors for Roundabouts have been highlighted in **Table 1**, below. The Guidelines suggest that if two or more of the suitability factors are satisfied, roundabouts should be further considered for possible implementation.

Reference: Regional Road 25 Roundabout Feasibility Study

Table 1: Proposed Suitability Factors for Roundabouts

No.	Suitability Factor	Outcome					
		5 Side Road	Peddie Road	James Snow Parkway	High Point Drive	Chisholm Drive	Market Drive
1	Is there a historical safety problem at the intersection for motorists or pedestrians?	N	N	N	N	N	N
2	Are capacity problems currently being experienced or expected in the future?	Y	N	N	Y	Y	Y
3	Is there a high proportion of turning movements at the intersection?	Y	N	Y	Y	N	N
4	Are traffic signals warranted, or expected to be warranted in the future?	Y	Y	Y	Y	Y	Y
5	Does the intersection experience high side-street delays under stop control (but not enough to warrant traffic signals)?	N	N	N	N	N	N
6	Is there sufficient property at the intersection (i.e. over 50 metres clear diameter if considering a single-lane roundabout, and over 65 meters clear diameter if considering a 2-lane roundabout)?	Y	N	N	N	N	N
7	Does the intersection have more than 4 legs, or unusual geometry?	N	N	N	N	N	N
8	Will planned modifications to the intersection require that nearby structures be widened (i.e. to accommodate turn lanes)?	N	N	N	N	N	Y
9	Is the intersection located at a transition between rural and urban environments (i.e. an urban boundary) such that a roundabout could act as a means of speed transition?	Y	N	N	N	N	N
10	Is the intersection located at a neighborhood or commercial entry such that a roundabout could act as a gateway feature?	Y	N	N	Y	Y	N

Y = Yes, N = No

Consideration and notes for each of the suitability factors is as follows:

1. The Potential for Safety Improvement (PSI) rankings, collision history and collision rates were all considered. The highest collision rate experienced was 0.58 per Million Vehicles Entering (MVE) at 5 Side Road.
2. Evaluations of possible level of service issues at each intersection were conducted under both existing and future conditions based on the results from the *Transportation Planning Report*. Overall Intersections operating at LOS 'F', or with a V/C ratio of 0.85 or higher, were indicated as 'Yes'.

Reference: Regional Road 25 Roundabout Feasibility Study

3. Turning movement data obtained from the *Transportation Planning Report* were used when evaluating this factor. When turning movements from both the major and minor approaches comprised a significant portion of the total traffic moving throughout the intersection, the intersection was marked as 'Yes'.
4. All candidate intersections within the study area are currently signalized.
5. All candidate intersections within the study area are currently signalized. Therefore, this measure is not relevant.
6. Property availability was assessed at each intersection to determine if sufficient property could be made available to construct a two-lane roundabout. Additional factors were considered due to the nature and locations of the proposed roundabouts:
7. No intersections exceed 4 legs or have unusual geometry.
9. A roundabout located at the intersection of Regional Road 25 and 5 Side Road could act as a rural to urban transition zone and serve to slow operating speeds from approximately 80-85 km/hr north of 5 Side Road to a posted speed of 60 km/hr south of 5 Side Road. A roundabout could also serve as a gateway feature for entry to the Town of Milton and the Regional Road 25 business area.

Contra-Indications for Roundabouts have been highlighted in **Table 2**, below. As per the Guidelines, if one or more of the contra-indication factors are satisfied, a roundabout may pose design or economic difficulties at the proposed location. A single contra-indication should not dismiss the consideration of a roundabout at a specific location, but it should warrant extra caution.

Reference: Regional Road 25 Roundabout Feasibility Study

Table 2: Proposed Contra-Indications for Roundabouts

No.	Contra- Indication	Outcome					
		5 Side Road	Peddie Road	James Snow Parkway	High Point Drive	Chisholm Drive	Market Drive
1	Are there any approaches where stopping sight distance (SSD) of a roundabout yield line may not be attainable (i.e. the intersection is on a crest vertical line)?	N	N	N	N	N	N
2	Is there an existing uncontrolled approach with a grade in excess of 4 percent?	N	N	N	N	N	N
3	Is there a closely-spaced traffic signal or railway crossing that would not be controlled with a nearby roundabout?	N	N	N	N	N	N
4	Is the intersection part of a coordinated arterial signal system, such that a roundabout would disrupt traffic platoons?	N	N	Y	N	N	N
5	Does the intersection experience a heavy flow of through traffic on the major street opposed by relatively light traffic on the minor street?	Y	Y	N	Y	Y	Y
6	Are there one-way streets or reversible traffic lanes approaching the intersection?	N	N	N	N	N	N
a	Are there significant impacts to adjacent properties?	N	N	N	N	Y	Y
b	Are there significant impacts to existing infrastructure?	N	N	N	N	Y	Y
c	Are there significant impacts to existing entrances?	N	N	N	N	Y	N
7	Are there known visually impaired pedestrians that cross the intersection?	N	N	N	N	N	N
8	Lane drop required NB and SB in order to implement two-lane roundabout?	N	N	Y	Y	Y	Y

Y = Yes, N = No

 = not included in Guidelines for the use of Modern Roundabouts on Regional Arterial Roadways

Notes and considerations for each of the contra-indication factors is as follows:

1. There are no significant obstructions to sightlines under the existing conditions at each intersection (with the exception of the southbound approach at the 5 Side Road intersection, which could be easily addressed by vegetation removal).
2. No intersection within the study area has an uncontrolled approach.

Reference: Regional Road 25 Roundabout Feasibility Study

- 4 The intersection of James Snow Parkway and Regional Road 25 is currently part of two coordinated signal systems. Roundabout implementation could result in impacts to traffic platoons on both streets.
- 5 Traffic volumes obtained from the *Regional Road 25 Municipal Class Environmental Assessment Transportation Planning Report* show that traffic volumes along Regional Road 25 are typically larger than on the opposing side street. This criterion is not satisfied for the intersection of Regional Road 25 and James Snow Parkway, where the traffic volumes on each street do not vary significantly.
- 6 There are no one-way streets or reversible traffic lanes approaching any intersection within the study area.
 - a) Potential impacts to adjacent property were identified at each location. Any significant impacts which would affect the daily operations on a property were marked as 'Yes'.
 - b) Potential impacts to existing structures were identified. Locations where a proposed roundabout would intersect or be in close proximity to structures on the property were marked as 'Yes'.
 - c) Potential impacts to existing property entrances were determined. Locations where a proposed roundabout would intersect or be in close proximity to a property entrance were marked as 'Yes'.
- 7 There are no known visually-impaired pedestrians crossing any intersection within the study area.
- 8 With a planned three lanes in each direction on Regional Road 25, it would be necessary to drop a lane in advance of each roundabout, unless a three-lane roundabout is contemplated. While three-lane roundabouts are feasible, in practice they can be confusing and intimidating to many motorists and pedestrians and, for all practical purposes, it is suggested that three-lane roundabouts not be considered within the Regional Road 25 study area.
- 9 The industrial nature of this area means that there are a relatively large number of large trucks using the intersections. While roundabouts can be designed to accommodate vehicles with wide, large radius turning movements, these vehicles may tend to set the design parameters for the roundabout, resulting in a non-optimal design for smaller vehicles.

Regional Road 25 & 5 Side Road Intersection

- Under existing conditions, the intersection experiences high delay and volume to capacity ratios on the eastbound through/right movement. A contributing factor is the No Right-Turn on Red (NRTOR) restriction for the eastbound direction. Under future conditions, the intersection is expected to experience high delay and volume to capacity ratios on both the eastbound left and northbound left turn movements.
- There are no significant safety concerns experienced at the signalized intersection, although a collision rate of 0.58 per MVE is the highest of all the intersections within the study area.
- Six (6) suitability factors are in favour of a roundabout (see **Table 1**).
- There is one (1) contra-indication factor against the implementation of a roundabout (see **Table 2**).
- No significant impacts are anticipated to adjacent properties, existing infrastructure or existing entrances based on the implementation of a two-lane roundabout.
- The significant number of large trucks (e.g. – gravel haulers) using this intersection would require consideration in the geometric design, however, there is no reason to believe, based on the concept design, that both large and small vehicles could not be accommodated at this intersection.

A Roundabout Feasibility Assessment and preliminary design for this intersection have verified that a two-lane roundabout is the recommended configuration. The recommendation is to proceed with implementing a roundabout design at this location, and to confirm that the physical impacts of a roundabout are manageable (e.g. – property, utilities).

Regional Road 25 & Peddie Road Intersection

- There are no capacity or volume to capacity issues identified under existing conditions. Under future conditions, the intersection is expected to experience high capacity on all movements.

Reference: Regional Road 25 Roundabout Feasibility Study

- There are no significant safety concerns experienced at the signalized intersection.
- There is one (1) suitability factor for the implementation of a roundabout (see **Table 1**).
- There is one (1) contra-indication factor against the implementation of a roundabout (see **Table 2**).
- No significant impacts are anticipated to adjacent properties, existing infrastructure or existing entrances based on the implementation of a two-lane roundabout.

The recommendation is to not proceed with implementing a roundabout at this location, as there does not appear to be a significant benefit over a signalized intersection. The satisfaction of one criterion in **Table 1** does not fulfill the minimum requirement to warrant further consideration for a roundabout.

Regional Road 25 & James Snow Parkway Intersection

- There are no capacity or volume to capacity issues identified under existing conditions. Under future conditions, the intersection is expected to experience adequate capacity for most movements, with the proposed improvements (i.e. – widening Reg. Rd. 25 to six lanes).
- There are no significant safety concerns identified at the signalized intersection.
- Two (2) suitability factors are satisfied for the implementation of a roundabout (see **Table 1**).
- One (1) contra-indication factor against the implementation of a roundabout (see **Table 2**).

The recommendation is not to proceed with the assessment of a roundabout at this location. There appear to be no significant advantages over the signalized intersection alternative.

Regional Road 25 & High Point Drive Intersection

- There are no capacity or volume to capacity issues identified under existing conditions. Under future conditions, the intersection is expected to experience level of service 'E' on the eastbound left and through/right movements.
- There are no significant safety concerns identified at the signalized intersection.
- Four (4) suitability factors are satisfied for the implementation of a roundabout (see **Table 1**).
- One (1) contra-indication factor against the implementation of a roundabout (see **Table 2**).
- Potential impacts to adjacent properties, existing infrastructure and existing entrances have been identified. The northwest and northeast properties would experience significant property impacts with the implementation of a two-lane roundabout, however, by shifting the roundabout to the south, these effects can mostly be eliminated, without significantly impacting the property on the southeast or southwest corners of the intersection.

The recommendation is to not proceed with the assessment of implementing a roundabout at this intersection location, due to the property impacts.

Regional Road 25 & Chisholm Drive Intersection

- Under future conditions, the eastbound through/left movement experiences level of service 'F' in the AM peak and LOS 'E' in the AM peak.
- There are no significant safety concerns identified at the signalized intersection.
- Three (3) suitability factors are satisfied for the implementation of a roundabout (see **Table 1**).
- One (1) contra-indication factor against the implementation of a roundabout (see **Table 2**).

December 24, 2018

Jeffrey Reid

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Reference: Regional Road 25 Roundabout Feasibility Study

- Potential impacts to adjacent properties, existing infrastructure and existing entrances have been identified with the implementation of a two-lane (or three-lane) roundabout. The proximity to the Highway 401 interchange, particularly the eastbound on-ramp, could also create operational challenges, and would require modifications to the on-ramp geometry at the bullnose. The culvert located on the southwest property would need to be replaced, and the entrance to the southwest corner would likely need to be closed.

The recommendation is to not proceed with implementing a roundabout at this intersection location due to the identified property and infrastructure impacts.

Regional Road 25 & Market Drive Intersection

- There are no capacity or volume to capacity issues identified under existing or future conditions.
- There are no significant safety concerns identified at the signalized intersection.
- Three (3) suitability factors are satisfied for the implementation of a roundabout (see **Table 1**).
- One (1) contra-indication factor against the implementation of a roundabout (see **Table 2**).
- The northwest and southwest corner properties will experience significant impacts if a roundabout were installed. The stream located on the east side of Regional Road 25 would need to be realigned. Utility impacts would also be substantial

The recommendation is to not proceed implement a roundabout at this intersection location due to the identified property, utility and watercourse impacts.

CONCLUSION

Stantec recommends that only the 5 Side Road intersection should be further considered for implementation of a two-lane roundabout. Other intersections would experience substantial negative impacts, with little to no operational benefits over a signalized intersection.

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