600 March Road

Transportation Impact Assessment Report

June 7, 2022

Prepared for:

Nokia Canada Inc.

Prepared by:

Stantec Consulting Ltd.

Sign-off Sheet

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1.0 SCREENING

1.1 SUMMARY OF DEVELOPMENT

Municipal Address	600 March Road
Description of Location	Southeast quadrant of the March Road at Terry Fox Drive intersection
Land Use Classification	Mixed-Use Development (Residential High-Rise, Retail, Office)
Development Size (units)	Residential units = 1,900
Development Size (m^2)	Office/Lab: 46,000 m^2 Retail: 11,350 m^2
Number of Accesses and Locations	Four (4) accesses from March Road, One (1) access from Terry Fox Drive, Three (3) accesses from Legget Drive.
Phase of Development	Unknown
Buildout Year	2032 (10 year build out)

If available, please attach a sketch of the development or site plan to this form.

1.2 TRIP GENERATION TRIGGER

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size	Triggered
Single-family homes	40 units	✘
Townhomes or apartments	90 units	✓
Office	3,500 m^2	✓
Industrial	5,000 m^2	✘
Fast-food restaurant or coffee shop	100 m^2	✘
Destination retail	1,000 m^2	✓
Gas station or convenience market	75 m^2	✘

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

1.3 LOCATION TRIGGERS

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?	✓	
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone? *		✗

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

1.4 SAFETY TRIGGERS

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?	✓	
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	✓	
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	✓	
Is the proposed driveway within auxiliary lanes of an intersection?		✗
Does the proposed driveway make use of an existing median break that serves an existing site?		✗
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		✗
Does the development include a drive-thru facility?		✗

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

1.5 SUMMARY

	Yes	No
Does the development satisfy the Trip Generation Trigger?	✓	
Does the development satisfy the Location Trigger?	✓	
Does the development satisfy the Safety Trigger?	✓	

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

2.0 SCOPING

2.1 EXISTING AND PLANNED CONDITIONS

2.1.1 Proposed Development

Nokia Canada Inc. is proceeding with a Zoning By-Law Amendment application for a proposed mixed-use development. The proposed development is located at 600 March Road (southeast quadrant of the March Road at Terry Fox Drive intersection) in the Brookside-Briarbrook-Morgan's Grant community in Kanata, Ontario. The current development concept consists of eleven residential buildings, six of which have a commercial component, as well as two office buildings, which both have a commercial component. It should be noted that this concept plan is subject to change as the development proceeds through the approvals process. The site is bound by an existing office building to the south, March Road to the west, Legget Drive to the east, and Terry Fox Drive to the north.

Figure 1 illustrates the site location. The subject site currently carries two different zoning designations. The northern portion of the proposed site is zoned IP6 H (44) and as outlined in the City of Ottawa's Zoning By-Law, the purpose of the IP- Business Park Industrial Zone is to:

- accommodate mixed office, office-type uses and low impact, light industrial uses in a business park setting, in accordance with the Enterprise Area designations of the Official Plan or, the Employment Area or the General Urban Area designation where applicable;
- allow in certain Enterprise or General Urban Areas, a variety of complementary uses such as recreational, health and fitness uses and service commercial (e.g., convenience store, personal service business, restaurant, automobile service station and gas bar), occupying small sites as individual occupancies or in groupings as part of a small plaza, to serve the employees of the Enterprise, Employment or General Urban Area, the general public in the immediate vicinity, and passing traffic;
- prohibit retail uses in areas designated as Enterprise Area but allow limited sample and showroom space that is secondary and subordinate to the primary use of buildings for the manufacturing or warehousing of the product;
- prohibit uses which are likely to generate noise, fumes, odors, or other similar obnoxious impacts, or are hazardous; and
- provide development standards that would ensure compatibility between uses and would minimize the negative impact of the uses on adjacent non-industrial areas.

The southern portion of the proposed site is zoned IG6 and as outlined in the City of Ottawa's Zoning By-Law, the purpose of the IG- General Industrial Zone is to:

- permit a wide range of low to moderate impact, light industrial uses in accordance with the Employment Area designation of the Official Plan or, the General Urban Area designation where applicable;

- allow in certain Employment Areas or General Urban Areas, a variety of complementary uses such as recreational, health and fitness uses and service commercial (e.g. convenience store, personal service business, restaurant, automobile service station and gas bar), occupying small sites as individual occupancies or in groupings as part of a small plaza, to serve the employees of the Employment or General Urban Area, the general public in the immediate vicinity, and passing traffic;
- prohibit retail uses in areas designated as Employment Area but allow limited sample and showroom space that is secondary and subordinate to the primary use of buildings for the manufacturing or warehousing of the product; and
- provide development standards that would ensure that the industrial uses would not impact on the adjacent non-industrial areas

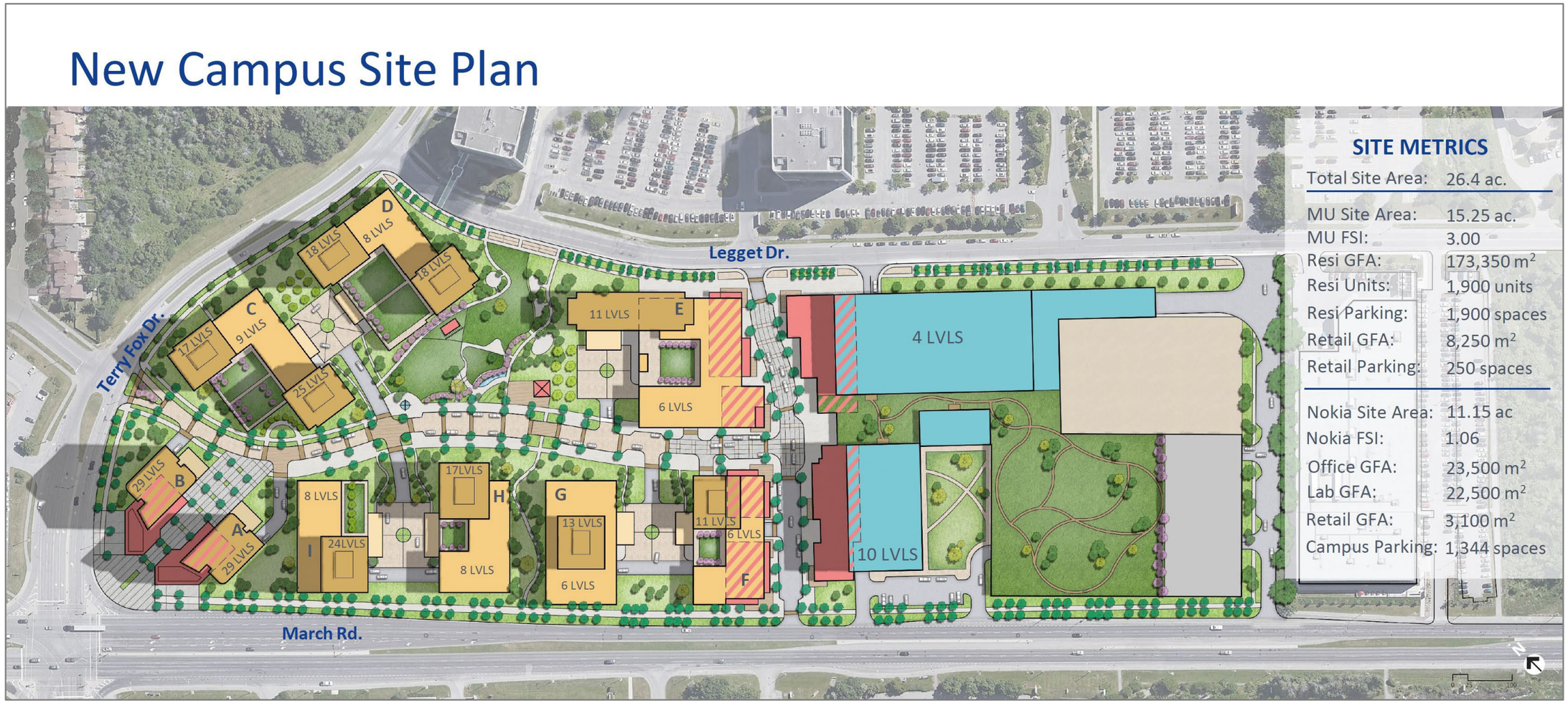
A full build-out and occupancy of the proposed development is anticipated to occur by 2032, with an unknown number of phases. There are four proposed site accesses to March Road, one proposed site access to Terry Fox Road, and three proposed site accesses to Legget Drive. The number and location of proposed site accesses is subject to change as the development proceeds through the approvals process. Underground vehicle parking spaces will be provided on-site as part of the development; however, the exact layout of the proposed parking garages is not yet known.

As the subject application is for Zoning By-Law Amendment, detailed information regarding the current concept is not yet known. The current concept includes 1,900 residential units 46,000 m^2 of office space, and 11,350 m^2 of retail space.

Figure 2 illustrates the current development concept plan.

Figure 1 - Site Location

Figure 2 - Proposed Development Concept Plan



2.1.2 Existing Conditions

2.1.2.1 Roads and Traffic Control

The roadways and intersections under consideration in the study area are described as follows:

March Road

March Road is a four-lane arterial roadway with a posted speed limit of 80 km/h. Across the frontage of the subject site, there are buffered on-street cycle lanes in both directions. In addition, sidewalks are provided along both sides of March Road. The roadway is designated as a Spine route as per the City of Ottawa's Ultimate Cycling Plan and is also designated as a truck route. On-street parking on March Road in the vicinity of the subject site is prohibited at all times. The intersection with Terry Fox Drive is signalized with dual left turn lanes in the northbound, westbound, and eastbound directions. In addition, there are channelized right turn lanes in all directions. The intersection with Solandt Road is signalized with dual left turn lanes in the westbound direction. In addition, the March Road at Solandt Road intersection has channelized right turn lanes in all directions.

Terry Fox Drive

Across the frontage of the subject development, Terry Fox Drive is a two-lane major collector roadway with a posted speed limit of 60 km/h. This portion of Terry Fox Drive has on-street cycling lanes. Continuous sidewalks are provided along the south side of Terry Fox Drive. A sidewalk is provided along the north side of Terry Fox Drive between March Road and McKinnley Drive. West of March Road, Terry Fox Drive is designated as a truck route, Cross Town Bikeway, and a cycling spine route. East of March Road, Terry Fox Drive is designated as cycling spine route. On-street parking along Terry Fox Drive in the vicinity of the study area is prohibited at all times. The intersection with Legget Drive is a full movements intersection that is stop-controlled along Legget Drive.

Legget Drive

Across the frontage of the subject site, Legget Drive is a two-lane collector roadway with a posted speed limit of 50 km/h. There is an existing sidewalk along the east side of Legget Drive and an on-street cycle lane along the west side. The roadway is designated as a Local Route per the City of Ottawa's Ultimate Cycling Plan. On-street parking on Legget Drive in the vicinity of the subject site is prohibited at all times. The intersection with Solandt Road is signalized with auxiliary left turn lanes in all directions.

Solandt Road

Solandt Road is a two-lane collector road with a default speed limit of 50 km/h. West of Legget Drive, there are sidewalks along both sides of Solandt Road. Currently, the roadway is classified as a suggested cycling route per the City's Existing Cycling Network. The roadway is also designated as a Local Route and Major Pathway per the City of Ottawa's Ultimate Cycling Plan. On-street parking on Solandt Road in the vicinity of the subject site is prohibited at all times.

Morgan's Grant Way / Shirley's Brook Drive

Morgan's Grant Way is a two-lane collector roadway with a posted speed limit of 40 km/h. Sidewalks are provided along the south of Morgan's Grant Way / Shirley's Brook Drive. On-street cycle lanes are provided on both sides of the roadway. Currently, Morgan's Grant Way / Shirley's Brook Drive are designed as suggested cycling routes per the City of Ottawa's Existing Cycling Network. They are both designated as local routes per the City's Ultimate Cycling Network. The intersection with March Road is signalized with channelized right turn lanes in all directions.

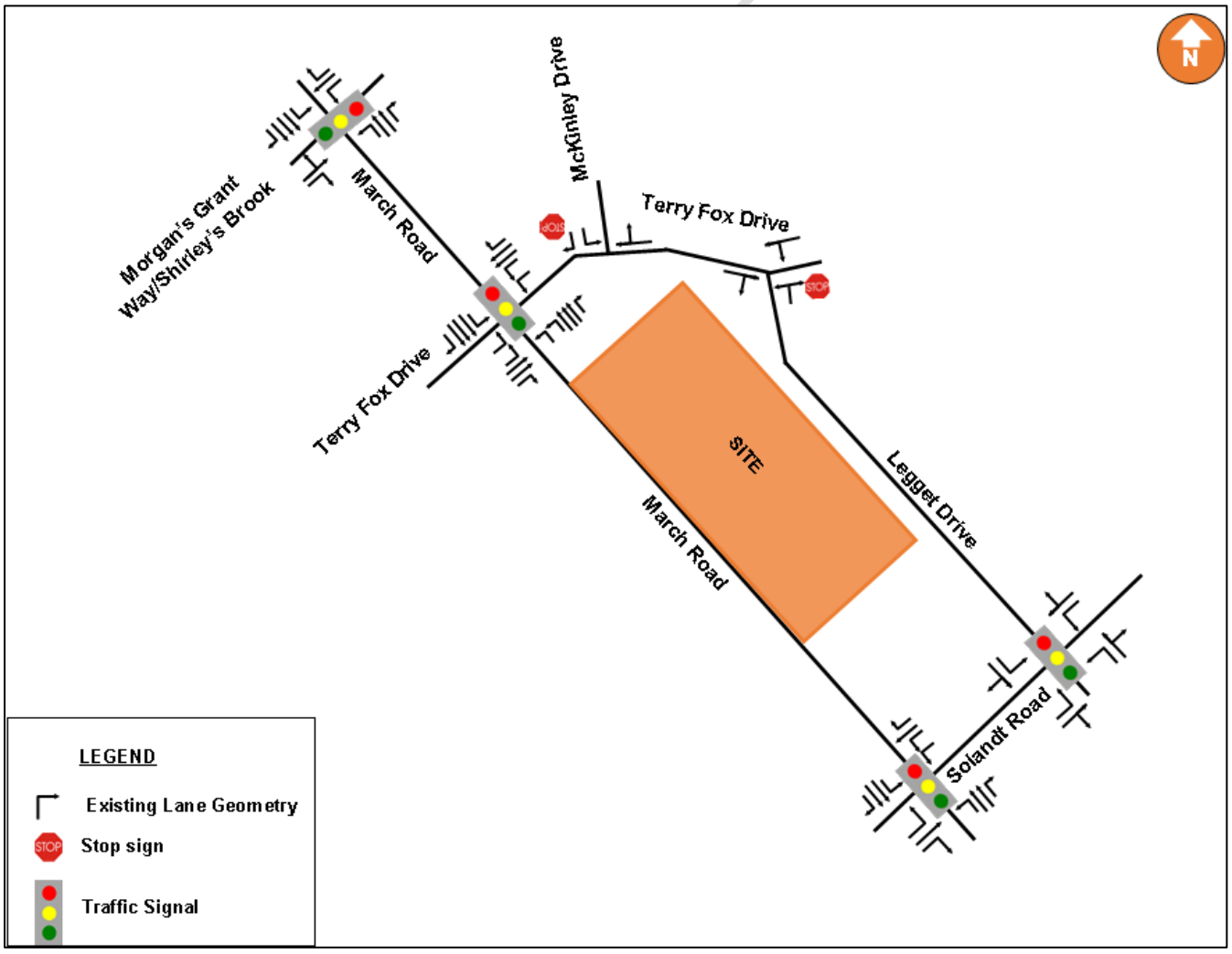
McKinley Drive

McKinley Drive is a two-lane collector road with a speed limit of 40 km/h. There are sidewalks along both sides of McKinley Drive within the vicinity of the development. On-street parking on McKinley Drive in the vicinity of the subject site is prohibited at all times.

Figure 3 illustrates the existing lane configuration and traffic control.

Currently, there are several driveways along March Road, within the vicinity of the subject development. There is also one commercial access along the north side of Terry Fox Drive, just east of March Road. Along Legget Drive, there are also several driveways that access the existing office buildings in the Kanata North Business Park.

Figure 3 - Existing Lane Configuration and Traffic Control



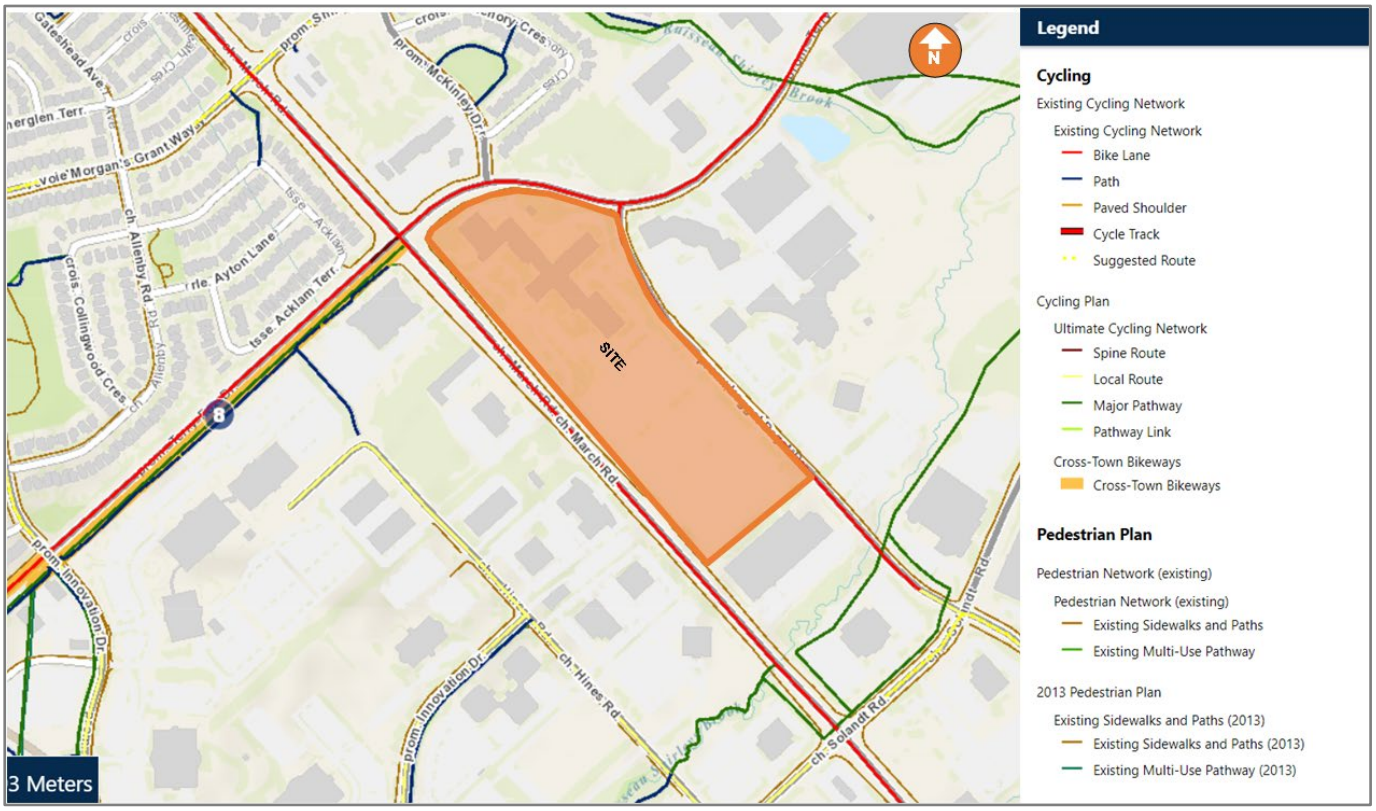
2.1.2.2 Walking and Cycling

The study area is currently well-serviced by pedestrian facilities with sidewalks along all study area roadways.

Currently, March Road and Terry Fox Drive are designated as Spine Routes as outlined in the City of Ottawa's Ultimate Cycling Plan. Terry Fox Drive is also designated as a Cross-Town Bikeway west of March Road. The City's Ultimate Cycling Plan also identifies Legget Drive, Solandt Road, and Morgan's Grant Way / Shirley's Brook Drive as Local Cycling Routes. The Ultimate Cycling Network also includes a Major Pathway link along Solandt Road, that connects the Kanata North Business Park to the South March Highlands Conservation Forest.

Figure 4 illustrates the existing pedestrian and cycling facilities within the vicinity of the subject site.

Figure 4 - Existing Pedestrian and Cycling Network



Source: geoOttawa, accessed January 2022

2.1.2.3 Transit

OC Transpo service is currently provided in the vicinity of the subject site via routes 63, 66, 110, and 166.

Route 63 is a Rapid Route that runs 7 days per week between Innovation Station and Tunney's Pasture. It runs with 20-minute headways during the weekday peak periods and 30-minute headways during the weekend peak periods.

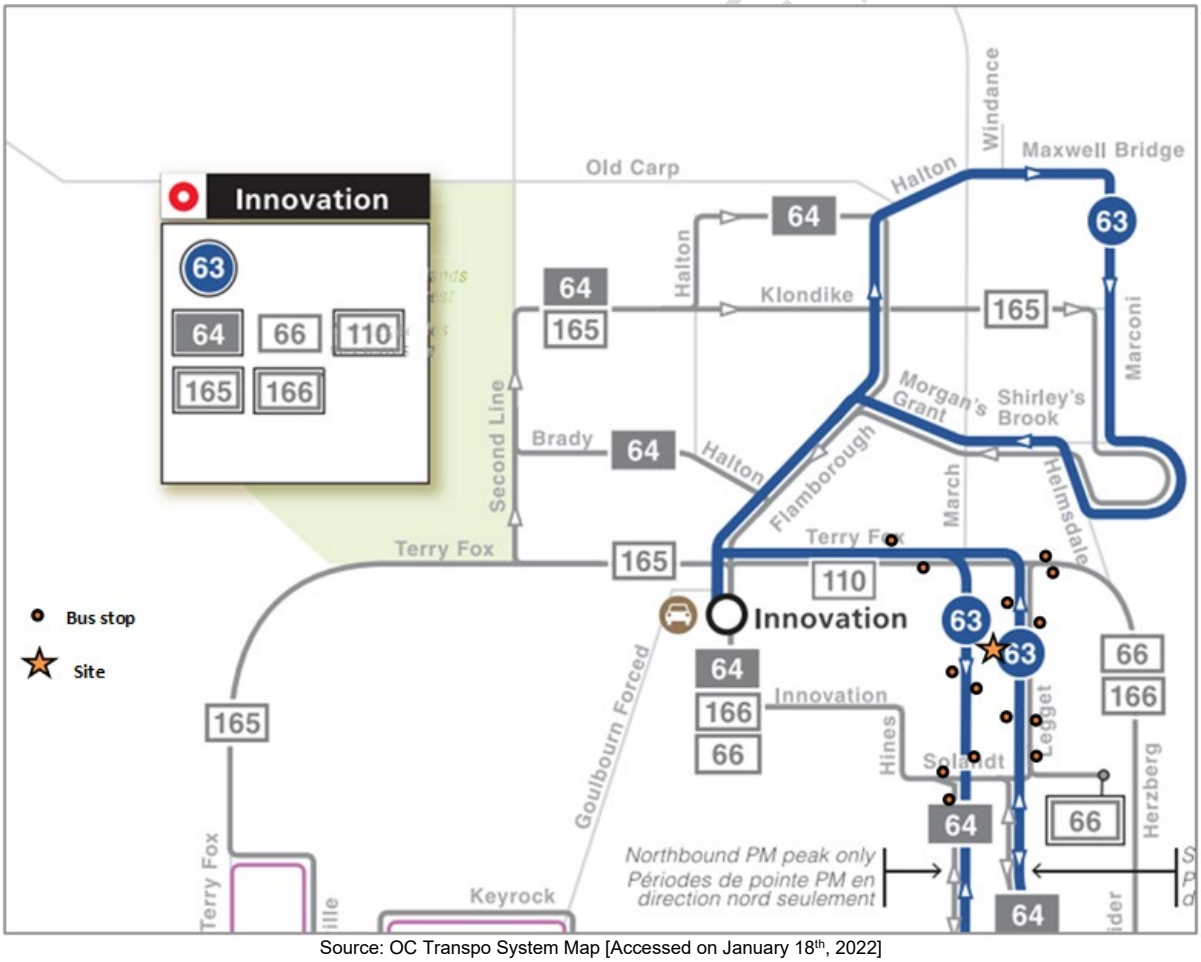
Route 66 is a Local Route that runs Monday to Friday between Kanata and Gatineau. It runs with 15-minute headways during both peak periods.

Route 110 is a Local Route that runs Monday to Friday between Innovation and Fallowfield. It runs with 30-minute headways during both peak periods.

Route 166 is a Local Route that runs Monday to Friday between Innovation and Eagleson. It runs only one bus in each direction during the morning peak hour.

Figure 5 illustrates the transit routes and stops.

Figure 5 - Study Area Transit Routes and Stops



Source: OC Transpo System Map [Accessed on January 18th, 2022]

2.1.2.4 Traffic Management Measures

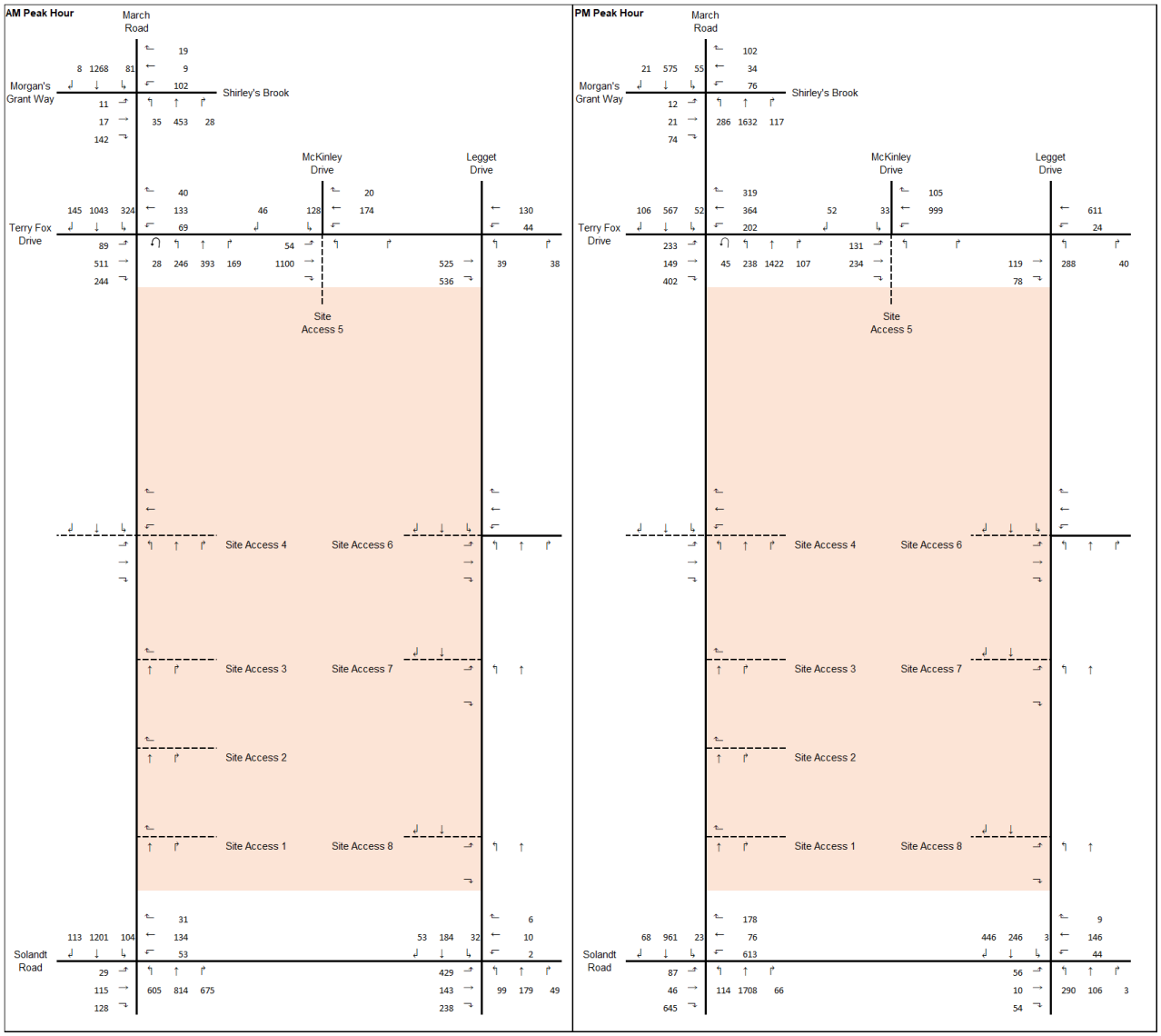
There are currently no traffic management measures in the vicinity of the subject development.

2.1.2.5 Traffic Volumes

Traffic volumes at the study area intersections were collected in the fall of 2016-2019. Using the City of Ottawa's long-range model (exhibit 2.11 of the 2013 TMP), the weighted forecasted trip growth was calculated to / from the inner area (from 2011 to 2031), and it was found that the growth rate is approximately 1.9% per year. This annual growth rate was applied to the traffic counts to represent the 2022 existing traffic volumes.

The 2022 existing traffic volumes can be seen in **Figure 6** for the AM and PM peak hours.

Figure 6 - 2022 Existing Traffic Volumes



2.1.2.6 Collision History

Collision data was provided by the City of Ottawa and included collisions from 2015 to 2019 in the vicinity of the subject site.

Overall, there were a total 186 reported collisions between 2015 to 2019. It was found that 144 collisions (77%) resulted in property damage only, suggesting that they occurred at low speeds, thereby circumventing bodily harm. The analysis also found that 42 collisions (23%) resulted in non-fatal injuries, and 0 collision (0%) resulted in a fatal injury. The collision statistics are shown in **Table 1** below.

At the intersection of Terry Fox Drive at March Road, a total of 56 collisions were reported, which accounts for 30% of the total collisions in the identified intersections and segments. Of these 56 collisions, 43 of them (77%) resulted in property damage only and 13 of them (23%) resulted in non-fatal injuries. Of these 56 collisions, the vast majority of them were rear end collisions (64%). These rear end collisions were analyzed further to determine if there are any significant patterns in the rear end collisions at this intersection, which can be seen in **Table 2** below. It was found that 50% of the rear end collisions occurred between vehicles traveling in the northbound direction. As there does not appear to be any geometric issues that could explain the frequency of the northbound rear end collisions at this location, the combination of the high volume of vehicles coupled with the high posted speed limit could have been factors.

At the intersection of March Road at Solandt Road, a total of 53 collisions were reported, accounting for 29% of the total collisions. Of the 53 collisions, 47 collisions (89%) resulted in property damage only and 6 collisions (11%) resulted in non-fatal injuries. Of these 53 collisions, a significant portion of them were rear end collisions (45%) and angle / turning collisions (45%). These collisions were reviewed further to determine if there are any significant patterns, which can be seen in **Table 3** below.

The rear end collision analysis at this intersection found that 9 collisions (25%) occurred along the southbound approach and 7 collisions (19%) occurred along the northbound approach. The angle / turning movement analysis at this intersection found that 11 collisions (31%) occurred in the southbound approach and 10 collisions (28%) occurred in the northbound approach. Similar to the findings of the Terry Fox Drive at March Road intersection, as there are no geometric issues that could contribute to these rear end and angle collisions, they are likely due to the combination of the high volume of traffic with the high posted speed limit.

Table 1 - Collision Statistics

		Terry Fox @ March	March @ Morgan Grant	March @ Solandt	Solandt @ Legget	Terry Fox @ Legget	Terry Fox between March & Legget	March between Terry Fox & Solandt	Legget between Solandt & Terry Fox	Solandt between March and Legget	Terry Fox Drive & McKinley Drive
Classification	Property Damage Only	43	27	47	4	6	1	13	1	1	1
	Non-Fatal Injury	13	10	6	--	1	2	7	2	--	1
	Fatal Injury	--	--	--	--	--	--	--	--	--	--
Collision Type	Sideswipe	7	2	4	--	--	--	3	--	--	
	Angle / Turning	6	20	24	1	4	--	1	2	1	2
	Rear End	36	13	24	2	3	1	7	--	--	--
	Single Motor Vehicle	5	2	1	1	--	2	9	1	--	--
	Other	2	--	--	--	--	--	--	--	--	--
Environmental Condition	Clear	41	31	39	2	3	3	16	3	--	2
	Rain	10	2	6	1	2	--	2	--	1	--
	Snow	4	4	7	1	2	--	2	--	--	--
	Freezing Rain	1	--	1	--	--	--	--	--	--	--

Table 2 - Terry Fox at March Rear-End Collisions

Vehicle Direction	Number of Collisions
North	18
South	8
East	5
West	5

Table 3 - March at Solandt Rear-End and Angle/Turning movement and Sideswipe Collisions

March at Solandt Rear-End and Angle/Turning movement Collisions			
Rear End Collision Statistics	Vehicle 1 Direction	North	7
		South	9
		East	4
		West	4
Angle/Turning movements Collision Statistics	Vehicle 1 Direction	North	10
		South	11
		East	2
		West	1

2.1.3 Planned Conditions

2.1.3.1 Road Network Modifications

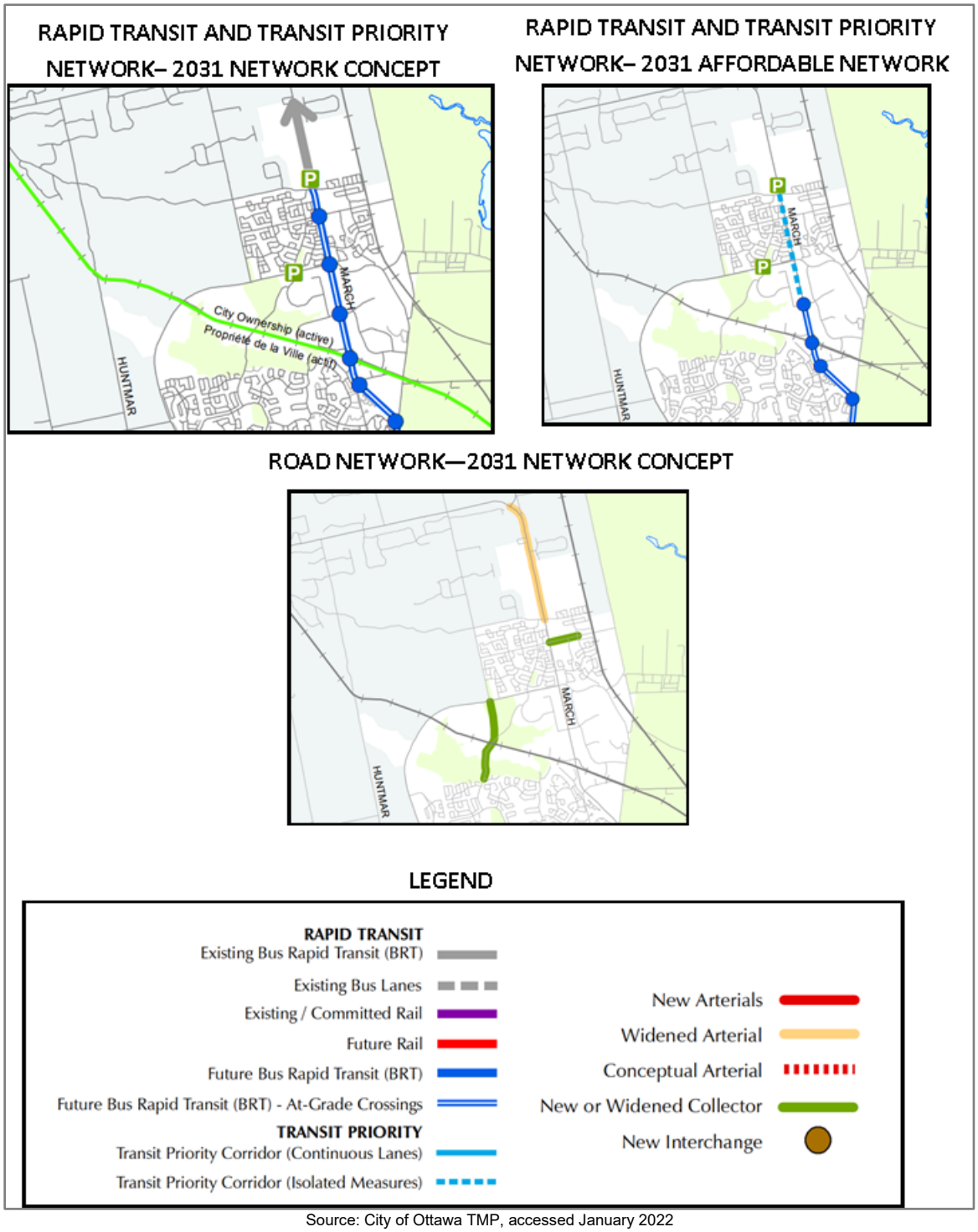
Table 4 identifies the City of Ottawa's Transportation Master Plan (TMP) projects located in the vicinity of the subject site, as well as projects that are anticipated to influence modal share characteristics in the future.

Figure 7 illustrates planned network modifications near the proposed development.

Table 4 - City of Ottawa Transportation Master Plan Projects

Project	Description	TMP Phase
Kanata North Transitway	Affordable: At-grade BRT between Solandt Road and Hwy. 417 Concept: At-grade BRT between Maxwell Bridge Road and Highway 417	Affordable Network Network Concept
March Road	Transit signal priority and queue jump lanes between Maxwell Bridge Road and Carling Avenue. Allows for future conversion to BRT at a later time to connect with planned BRT south of Carling Avenue	Affordable Network
March Road	Widen from two to four lanes between Old Carp Road and Dunrobin Road	Network Concept
Klondike Road	Urbanize existing two-lane rural cross section between March Road and Sandhill Road	Affordable Network and Network Concept
Goulbourn Forced Road Realignment	Re-aligned and new two-lane road between Terry Fox Drive and Kanata Avenue	Network Concept

Figure 7 - Planned Network Modifications



Source: City of Ottawa TMP, accessed January 2022

2.1.3.2 Future Background Developments

There are numerous developments scheduled to occur in the vicinity of the subject site as illustrated in **Figure 8** and described in **Table 5.**

Figure 8 - Background Developments Key Plan

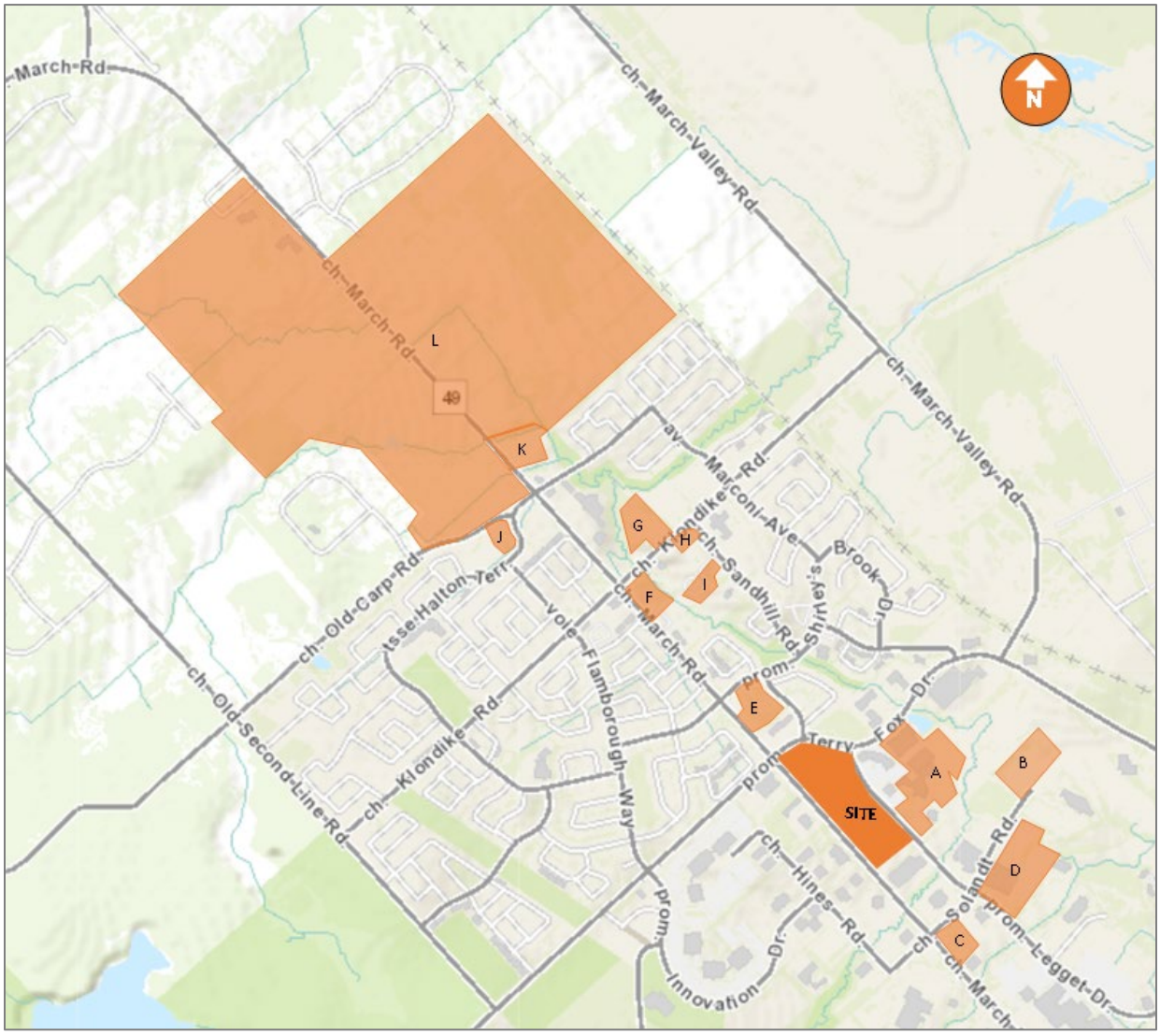


Table 5 - Background Developments

Key Plan Reference	Development	Location	Description
A	359 Terry Fox Drive & 525 Legget Drive	Southeast corner of the Terry Fox Drive and Legget Drive	30-storey high-rise residential building with 256 rental dwellings and approx. 3,850 ft^2 GFA of rooftop restaurant space
B	2707 Solandt Road	At the eastern limits of Solandt Road	8-storey, 198,615ft^2 office building
C	3026 Solandt Road	Southeast corner of the March Road and Solandt Road intersection	5 storey building, 100,000ft^2 office building
D	415 Legget Drive & 2700 Solandt Road	Northeast corner of Legget Drive and Solandt Road intersection	2-storey warehousing, GFA 14,350m^2 and 2 warehouse buildings, GFA 18,580m^2
E	706,710, and 714 March Road	Bound by Shirley's Brook Drive to the north, McKinley Drive to the east, March Road to the west, and Terry Fox Drive to the south	4,165 m^2 supermarket, 350m^2 fast-food restaurant with drive-through, and multi-unit commercial space 1500m^2, 237 parking stalls
F	788 March Road	Southeast corner of the Klondike and March Road	111 residential units
G	1055 Klondike Road	Northeast corner of the Klondike Road and March Road intersection	12 Semi-detached & 46 townhomes dwellings, 56 apartment dwellings
H	1050 Klondike Road**	Southwest corner of the Klondike Road and Sandhill Road	Seven 3- storey townhomes and a 2-storey stacked dwelling with 9 dwellings
I	100 Attwell Private**	Southwest corner of the Sandhill Road and Attwell Private	14 blocks of townhomes, 60 units on private street.
J	1104 Halton Terrace	Northeast corner of the Halton Terrace and Flamborough Way intersection	86 apartment dwellings
K	910 March Road	Northeast corner of the March Road and Maxwell Bridge Road intersection	1,835m^2 hardware store, 234m^2 restaurant with drive-through, 191m^2 coffee shop with drive-through, 416m^2 retail store, and 249m^2 gas bar.
L	KNUEA***	North of the established urban area of Kanata	960 single-detached homes, 1282 townhomes, 2,170 multi-unit residential units, and 145,600 ft2 GFA of commercial space

**TIA not yet submitted and thus traffic for these developments have not been explicitly added
***This KNUEA (Kanata North Urban Expansion Area_ development includes 927 March Road, 936 March Road, 1020 and 1070 March Road, 1053,1075 and 1145 March Road

2.2 STUDY AREA AND TIME PERIODS

2.2.1 Study Area

The study area was limited to the following intersections:

1. Terry Fox Drive at March Road;
2. Terry Fox Drive at Legget Drive;
3. March Road at Solandt Road;
4. March Road at Morgan's Grant Way / Shirley's Brook Drive;
5. Solandt Road at Legget Drive;
6. Terry Fox Drive at McKinley Drive
7. All site access intersections (as shown on the Concept Plan in **Figure 2**)

2.2.2 Time Periods

The scope of the transportation assessment includes the following analysis time periods:

- Weekday AM peak hour of roadway; and
- Weekday PM peak hour of roadway.

2.2.3 Horizon Years

The scope of the transportation assessment includes the following horizon years:

- 2022 existing conditions;
- 2032 future background conditions;
- 2032 total future conditions (site build-out); and
- 2037 total future conditions (5 years beyond build-out).

2.3 EXEMPTIONS REVIEW

Table 6 summarizes the Exemptions Review table from the City of Ottawa's *2017 Transportation Impact Assessment Guidelines*.

As the subject TIA is in support of a Zoning By-Law Amendment application, Modules 4.1 to 4.4 have been omitted from the study.

Table 6 - Exemptions Review

Module	Element	Exemption Considerations	Exempted?
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Yes
	4.1.3 New Street Networks	Only required for plans of subdivision	Yes
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Yes
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Yes
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	No
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Yes
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	Yes
4.9 Intersection Design	All Elements	Not required if site generation trigger is not met	No

3.0 FORECASTING

3.1 DEVELOPMENT GENERATED TRAVEL DEMAND

3.1.1 Existing Trip Generation

As the subject site currently includes office space, the trip generation for the existing office building was calculated and subsequently removed from the transportation network. This is to avoid double counting the future trips associated with this development parcel.

The *Institute of Transportation (ITE) Trip Generation Manual (11th Edition)* was used to forecast the auto trip generation for the existing office land use. Land use 710 – General Office Building was thought to be the most representative of the existing land use. The size of the future campus is smaller in terms of overall gross floor area as compared to the existing campus while the number of employees will be higher for the future campus. Therefore, if the GFA is used as the independent variable, it will incorrectly show a decrease in site trips for the future campus as compared to the existing campus. As such, the number of employees was used as the independent variable which more accurately represents the increase in employees between the existing and future Nokia campus.

Table 7 outlines the assumed land uses and the trip generation rates for each land use.

Table 7 – Existing Trip Generation Rates

LUC	Land Use	Employees	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
710	General Office Building	2,000	88%	12%	0.42	17%	83%	0.34

Table 8 outlines development-generated person trips for each land use.

Table 8 – Existing Person Trips Generated

LUC	Land Use	Trip Conversion	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
710	General Office Building	Auto Trips	743	101	844	115	560	675
		Person Trip Factor	1.28					
		Person Trips	951	129	1080	147	717	864

To reflect local travel characteristics, the person trips were assigned to the four primary modal shares (i.e., auto, passenger, transit, and active moves). The modal shares were obtained from the TRANS Committee's 2011 Origin-Destination (O-D) Survey for the Kanata / Stittsville District. **Table 9** below outlines the existing trips generated by modal share. These trips were removed from the transportation network.

Table 9 – Existing Trip Generation by Travel Mode

LUC	Land Use	Trip Conversion		Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
710	General Office Building	Auto Driver	48%	694	94	788	107	523	631
		Auto Passenger	23%	209	28	238	32	158	190
		Transit	25%	10	1	11	1	7	9
		Cycling	0%	0	0	0	0	0	0
		Walking	5%	38	5	43	6	29	35

Comparing the vehicle trips associated with the existing Nokia campus, as outlined in **Table 9** above, to the existing traffic volumes along Legget Drive, it is clear that the volumes outlined in **Table 9** are an overestimation of the actual volumes the existing Nokia campus is generating. As the main entrances to the existing Nokia campus are on Legget Drive, the vehicle trips outlined in **Table 9** above are not realistic and thus were decreased to more accurately match the existing volumes along Legget Drive. This reduction was done in conjunction with assessing the existing volumes on Legget Drive along with the surrounding land uses. **Table 10** below outlines the existing Nokia volumes after the reductions were applied, which are more in line with the turning movement counts collected in the area.

Table 10 – Adjusted Existing Trips

LUC	Land Use	Trip Conversion		Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
710	General Office Building	Reduction	30%	486	66	552	75	366	442

3.1.2 Future Trip Generation and Mode Shares

The *Institute of Transportation (ITE) Trip Generation Manual (11th Edition)* was used to forecast the auto trip generation for the retail and office land uses and the *Trans Trip Generation Study* was used to forecast the auto trip generation for the residential land use. Land use codes 222 – Multi-Unit High Rise Building, 821 – Shopping Plaza, and 710 – General Office Building were thought to be the most representative of the proposed land uses.

Table 11 outlines the assumed land uses and the trip generation rates for each land use.

Table 11 – Future Land Uses and Trip Generation Rates

LUC	Land Use	Units/Employees/ GFA (1000's SF)	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
222	Multi - Unit (High-Rise)	1900 Units	31%	69%	0.80	58%	42%	0.90
710	General Office Building	2400	88%	12%	0.42	17%	83%	0.32
821	Shopping Plaza	122 GFA	62%	38%	1.73	48%	52%	5.19

It is noted that as per direction from Nokia, the office land use is anticipated to generate an additional 25 inbound and 25 outbound delivery trips during each of the AM and PM peak hours. Of the net 25 deliveries, 3 are anticipated to be tractor trailers (entering the site from Legget Drive), and 22 are anticipated to be box trucks / vans (entering the site from March Road). The delivery trips are not included in the trip generation tables and were accounted for as part of the total office land use trips shown in **Figure 12**.

Table 12 outlines development-generated person trips for each land use.

Table 12 – Future Person Trips Generated by Land Use

LUC	Land Use	Trip Conversion	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
222	Multi - Unit (High-Rise)	Person Trips (Peak Period	471	1049	1520	992	718	1710
		Person Trips (Peak Hour) 0.50 for AM & 0.40 for PM	236	525	761	436	316	752
710	General Office	Auto Trips	880	120	1000	131	641	772
		Person Trip Factor	1.28					
		Person Trips	1126	154	1280	168	820	988
821	Shopping Plaza	Auto Trips	131	80	211	304	330	634
		Person Trip Factor	1.28					
		Person Trips	168	102	270	389	422	812
Total Development		**Total Person Trips**	**1530**	**781**	**2311**	**993**	**1558**	**2552**

To reflect local travel characteristics, the person trips were assigned to the four primary modal shares (i.e., auto, passenger, transit, and active moves). As per the City of Ottawa's TMP, the March Road Bus Rapid Transit (BRT) is scheduled to be implemented by 2031, between Solandt Road and Highway 417. The subject development is planned to be built and occupied by 2032. The office portion of the subject development is anticipated to be within 400m of the planned BRT station at Solandt Road. Per direction from the City of Ottawa, the March Road BRT, north of Solandt Road, is scheduled to occur beyond the horizons of this subject study (i.e., post 2037). The residential / retail portion of the subject development (north half) are not anticipated to be within 400m of a rapid transit station during the study horizons. As such, the modal shares for the northern and southern portions of the subject development will differ as a direct result of the implementation plan of the March Road BRT.

Residential Trips – Mode Shares

Section 4.2 (Table 8) of the *TRANS Trip Generation Summary Report* was utilized to determine the residential mode share for high rise multi-family housing for the Kanata / Stittsville district. The average mode shares for the district include a 49% auto mode share and a 25% transit mode share. As the existing transit mode share is notably high for the general area, it is not anticipated to see increase as a result of the planned March Road BRT (between Highway 417 and Solandt Road) as the distance between the transit station and the residential component of the proposed development is anticipated to be greater than 400m.

Office Trips – Mode Shares

Section 6.2 (Table 12) of the *TRANS Trip Generation Summary Report* was utilized to determine the employment generator mode share by district. The report exclusively cites AM mode shares, however, it is expected that the PM mode shares would be identical as the commute from employment generators during the PM peak hour is very unlikely to differ from the commute to employment generators during the AM peak hour. For the Kanata / Stittsville district, the aforementioned report cites an 8% transit mode share and an 84% auto mode share. To account for the planned March Road BRT (between Highway 417 and Solandt Road), the transit mode share for the office land use was increased from 8% to 20% (a 12% net increase) while subsequently reducing the auto mode share by 12% to a total of 72%.

Commercial Trips – Mode Shares

Section 6.3 (Table 13) of the *TRANS Trip Generation Summary Report* was utilized to determine the commercial generator mode share for the Kanata / Stittsville district. The report exclusively cites that the sample size for shopping

trips during the AM peak tends to be low. As such, more emphasis was placed on the mode shares during the PM peak period to better represent the activity in the district. During the PM peak, the mode shares for the district include a 73% auto mode share and a 1% transit mode share. To account for the enhanced overall transit service as a result of the planned March Road BRT (between Highway 417 and Solandt Road), the transit mode share for the commercial land use was increased from 1% to 10% (a 9% net increase) while subsequently reducing the 73% auto mode share by 9% for a total of 64%.

Table 13 outlines the modal shares that were used for the proposed development.

Table 13 – Future Trip Generation by Travel Mode

LUC	Land Use	Trip Conversion		Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
222	Multi - Unit (High-Rise)	Auto Driver	49%	116	257	373	214	155	369
		Auto Passenger	22%	52	116	168	96	70	166
		Transit	25%	58	129	187	107	77	184
		Cycling	0%	0	0	0	0	0	0
		Walking	4%	9	21	30	17	13	30
710	General Office Building	Auto Driver	72%	811	111	922	121	590	712
		Auto Passenger	4%	45	6	51	7	33	39
		Transit	20%	225	31	256	34	164	198
		Cycling	1%	11	2	12	2	8	11
		Walking	3%	34	5	37	5	25	31
821	Shopping Plaza	Auto Driver	64%	108	65	173	249	270	519
		Auto Passenger	22%	37	22	59	86	93	179
		Transit	10%	17	10	27	39	42	81
		Cycling	0%	0	0	0	0	0	0
		Walking	4%	7	4	11	16	17	33
Total Development		**Auto Driver**		**1035**	**433**	**1468**	**584**	**1015**	**1600**
		Auto Passenger		**134**	**144**	**278**	**189**	**196**	**384**
		Transit		**300**	**170**	**470**	**180**	**283**	**463**
		Cycling		**11**	**2**	**12**	**2**	**8**	**11**
		Walking		**50**	**30**	**78**	**38**	**55**	**94**

3.1.3 Internal Capture and Pass-By

When predicting trips that are associated with different land use types the interaction between those land use types must be accounted for by applying the principals of internal capture adjustments. Internal capture trips are trips which are shared between two or more uses on the same site. A portion of the generated trips for each individual land use is therefore drawn from the adjacent land uses. Internal capture adjustments were made to account for vehicles that visit more than one land use within the subject development. Since these trips are contained within the subject site, accounting for each trip separately on the roadway network would result in “double-counting”. For this reason, land uses that may have associated internal capture trips between one another ultimately had their net new trips adjusted consistent with typical industry standards. In the subject development, the land uses that are subject to internal capture reductions are the retail and office land uses.

In addition, a portion of the auto trips generated by the proposed retail land uses will be ‘pass-by’ in nature. Pass-by trips are considered intermediate stops between an origin and a destination. They are site trips that are drawn from existing traffic volumes on the road network that are “passing-by” the site. While the total number of trips generated by

a given development remains the same, the turning movements at study area intersections and site accesses require adjustments to reflect pass-by traffic. The rate of pass-by traffic is based on the specific land use which was obtained from the *ITE Trip Generation Manual*. A pass-by rate of 34% was used for the retail land use.

Table 14 outlines the pass-by, internal capture, and net new trips anticipated for the proposed development.

Table 14 – Future Pass-By and Internal Capture Trips

LUC	Land Use	Trip Conversion			Weekday AM Peak Hour			Weekday PM Peak Hour		
					In	Out	Total	In	Out	Total
710	General Office Building	Auto Trips			811	111	922	121	590	712
		Internal Capture	AM	PM						
		Inbound	4%	10%	-32	-31	-63	-12	-30	-42
		Outbound	28%	5%						
		Net New Auto Trips			779	80	859	109	560	670
821	Shopping Plaza	Auto Trips			108	65	173	249	270	519
		Internal Capture	AM	PM						
		Inbound	24%	16%	-26	-21	-47	-40	-76	-116
		Outbound	33%	28%						
		Net New Auto Trips			82	44	126	209	194	403
821 – Shopping Plaza		Auto Trips			82	44	126	209	194	403
		Pass-By		34%				71	66	137
		Net Auto Trips			82	44	126	138	128	266
Net New Auto Trips										
		222 – Multi Unit (High Rise)			116	257	373	214	155	369
		710 – Office Building/ Lab			779	80	859	109	560	670
		821 – Shopping Plaza			82	44	126	138	128	266
Total Development										
		Net New Auto Trips			**977**	**381**	**1358**	**461**	**843**	**1305**

3.1.4 Trip Distribution

The distribution of traffic to / from the proposed development was developed using the relative traffic flows and volumes at the study area inlets / outlets. To account for the significant Kanata North Urban Expansion Area (KNUEA) development north of the study area (anticipated to be fully built by the 2032 horizon year and is projected to add 800 vehicles to / from the north during the peak hours), the 2032 future background horizon volumes were utilized for this exercise.

Overall, for the office land use, the following trip distribution is anticipated:

- 35% to / from the North (via March Road)
- 50% to / from the South (via March Road)
- 15% to / from the West (via Terry Fox Drive)
- Note: Terry Fox Road (E) and Legget Drive (S) are anticipated to carry negligible development traffic due to the limited connectivity to the adjacent transportation network. Traffic to / from the south of the proposed development is projected to be predominantly on March Road due to the higher speeds and superior connectivity to Highway 417 and the district to the south.

For the commercial and residential components, the anticipated trips to / from the north were reduced to better reflect the area characteristics, resulting in the following trip distribution:

- 20% to / from the North (via March Road)
- 60% to / from the South (via March Road)
- 20% to / from the West (via Terry Fox Drive)

The trip distribution was done separately for each land use to account for the specific access arrangements.

Figure 9 through **Figure 11** illustrates the site traffic distribution for the proposed land uses.

Figure 9 - Trip Distribution – Office Land Use (excluding truck deliveries)

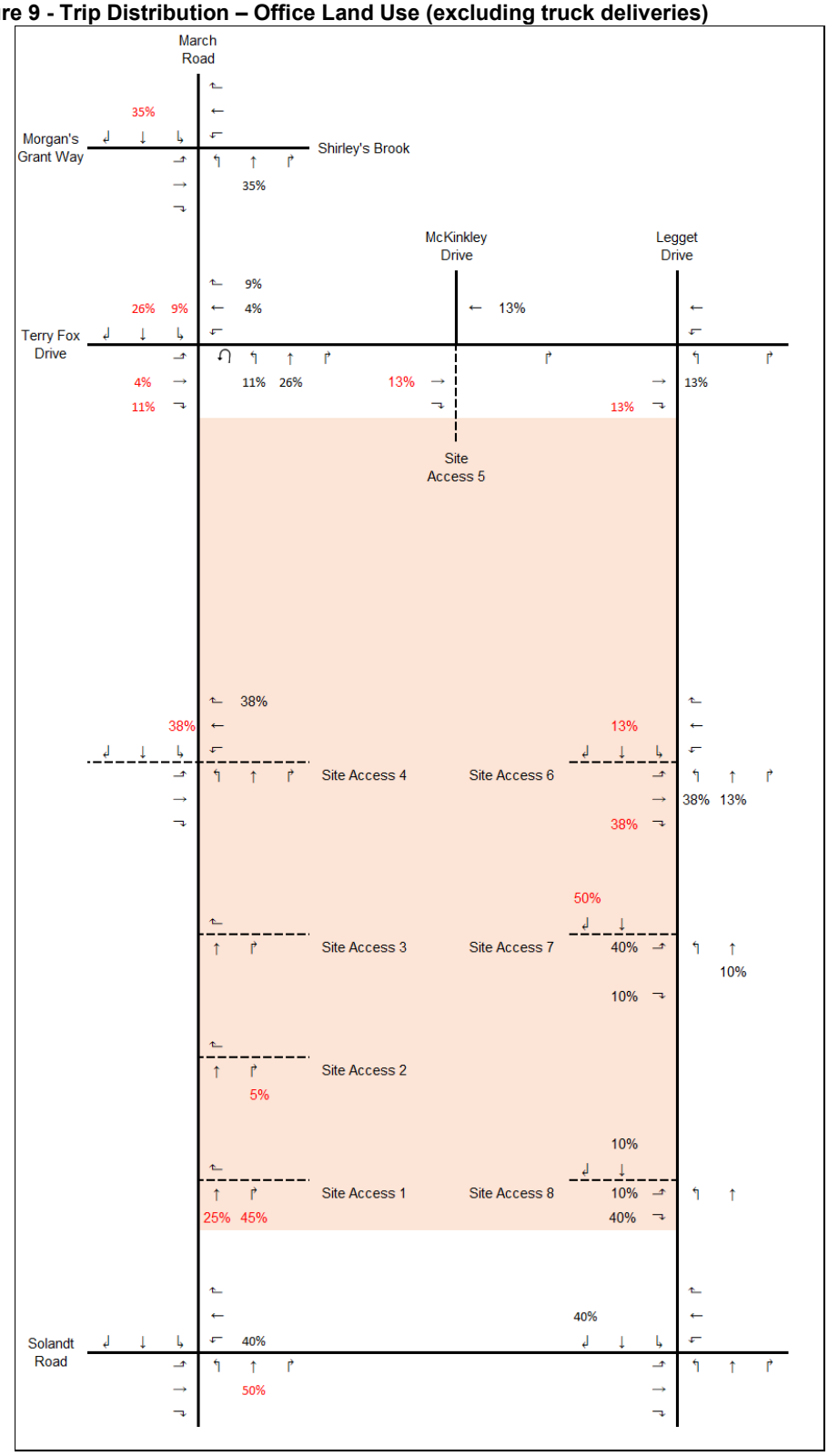


Figure 10 - Trip Distribution - Residential Land Use

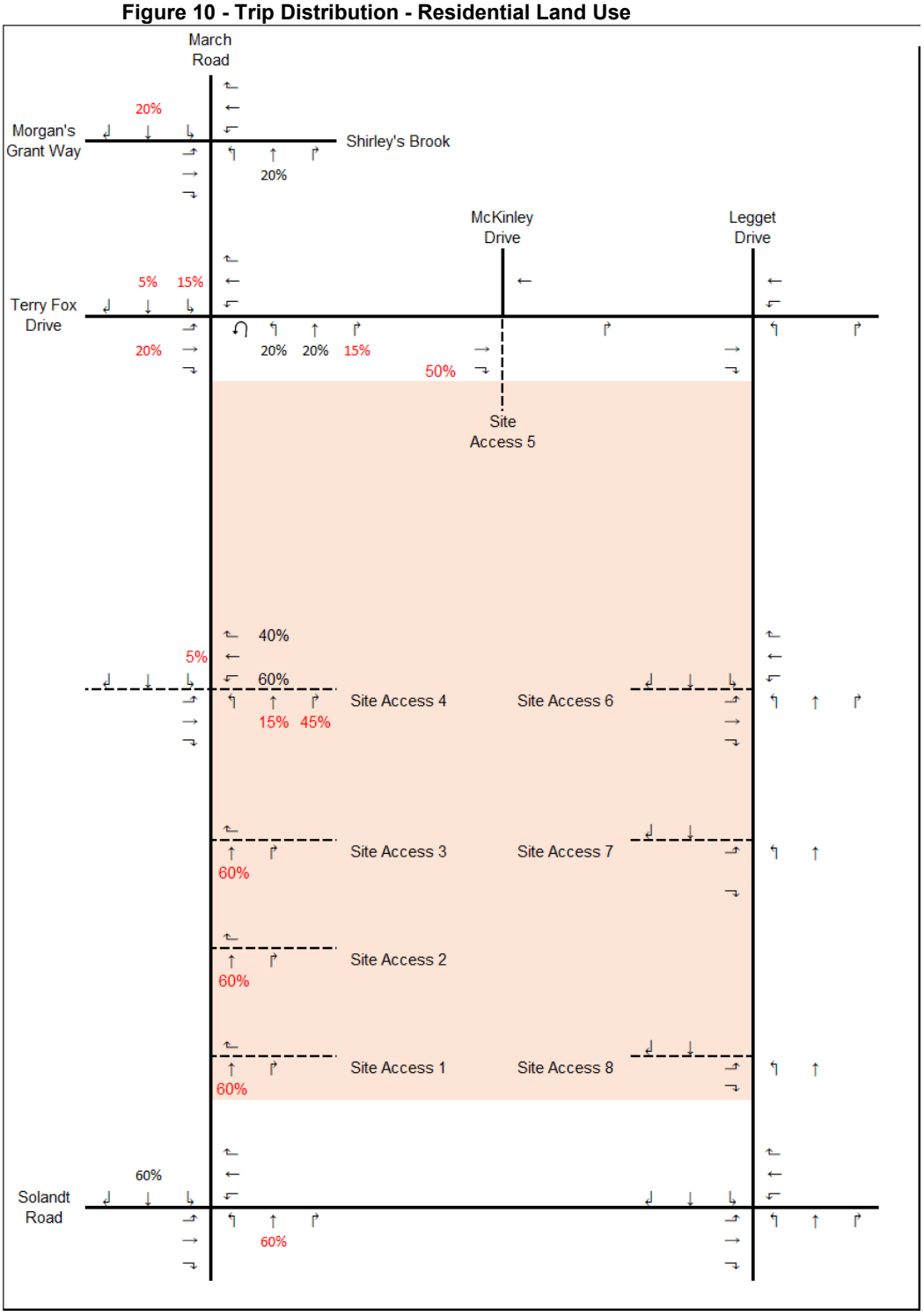
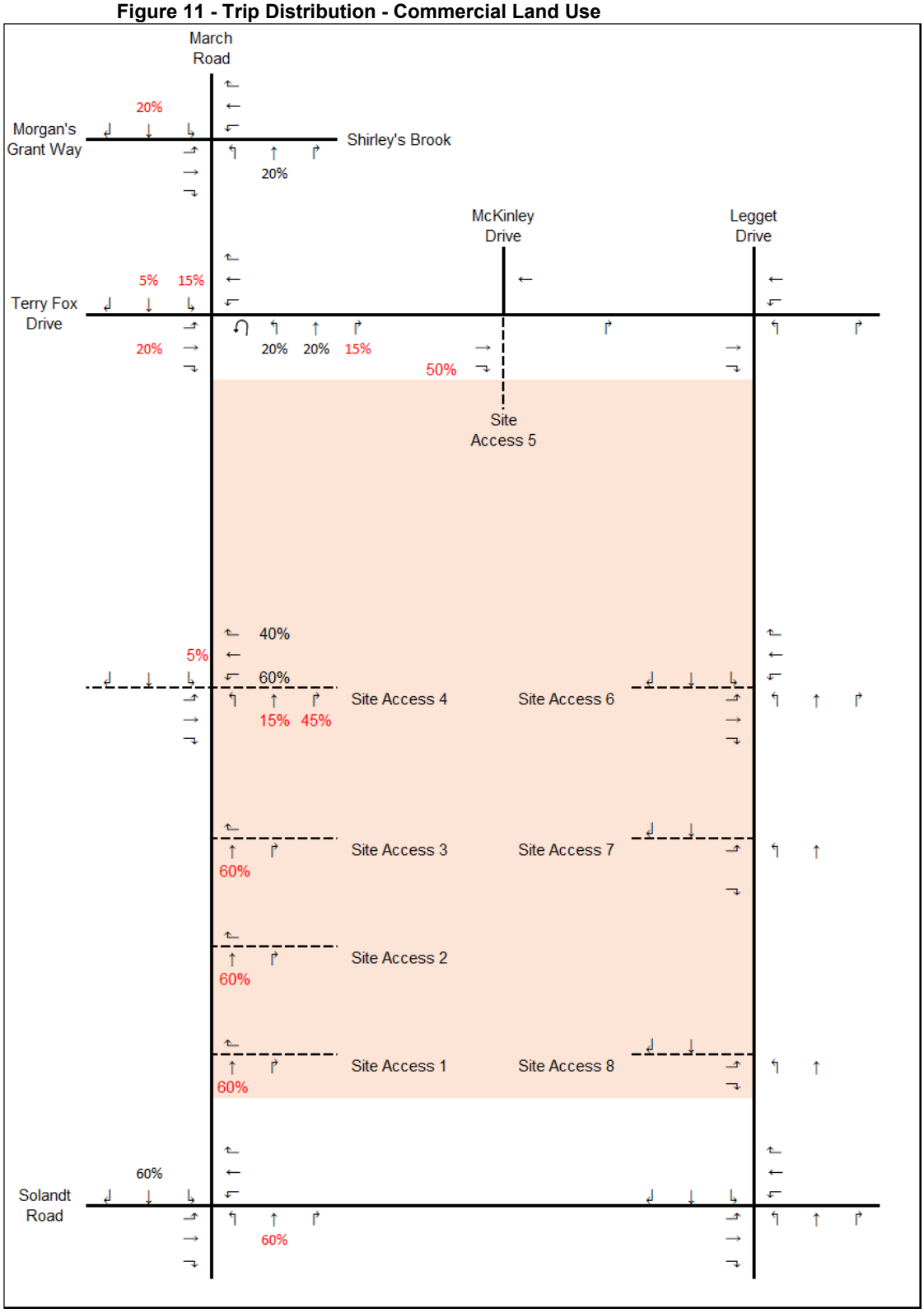


Figure 11 - Trip Distribution - Commercial Land Use



3.1.5 Trip Assignment

Site generated trips were assigned to the study area road network based on the trip distribution assumptions outlined above in **Section 3.1.4. Figure 12** through **Figure 15** illustrates the new site generated trips.

Figure 12 - Site Generated Traffic Volumes – Office Land Use (including truck deliveries)

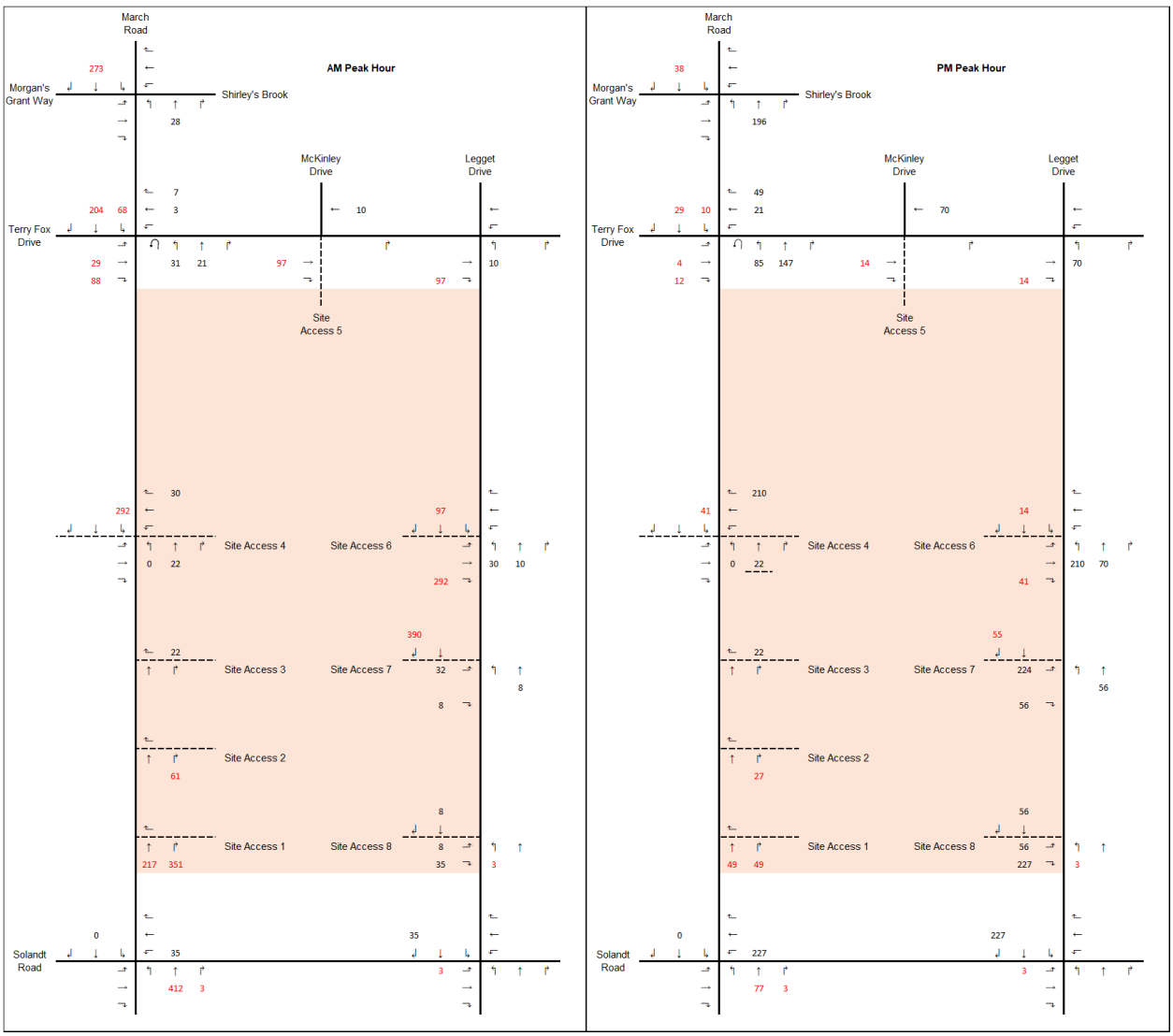


Figure 13 - Site Generated Traffic Volumes – Residential Land Use

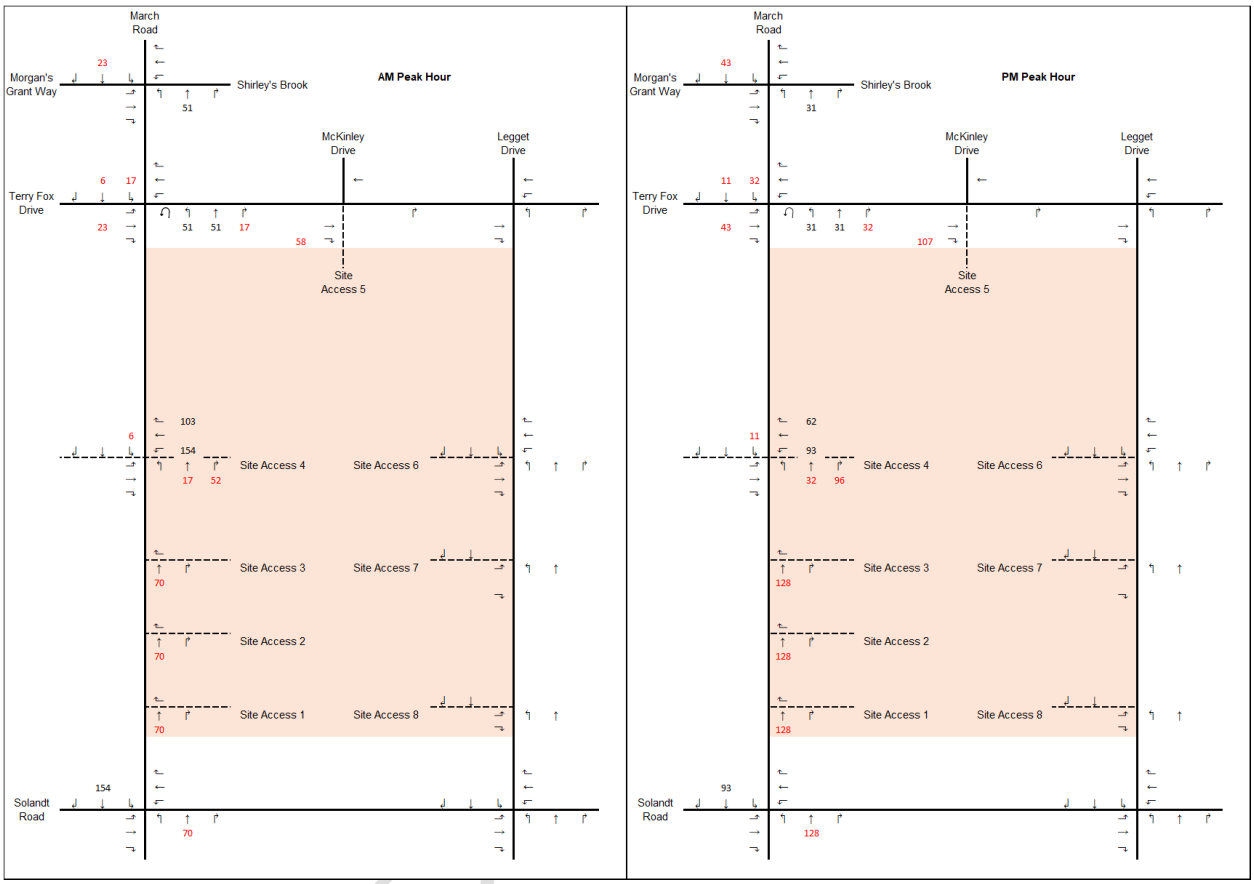


Figure 14 - Site Generated Traffic Volumes – Commercial Land Use

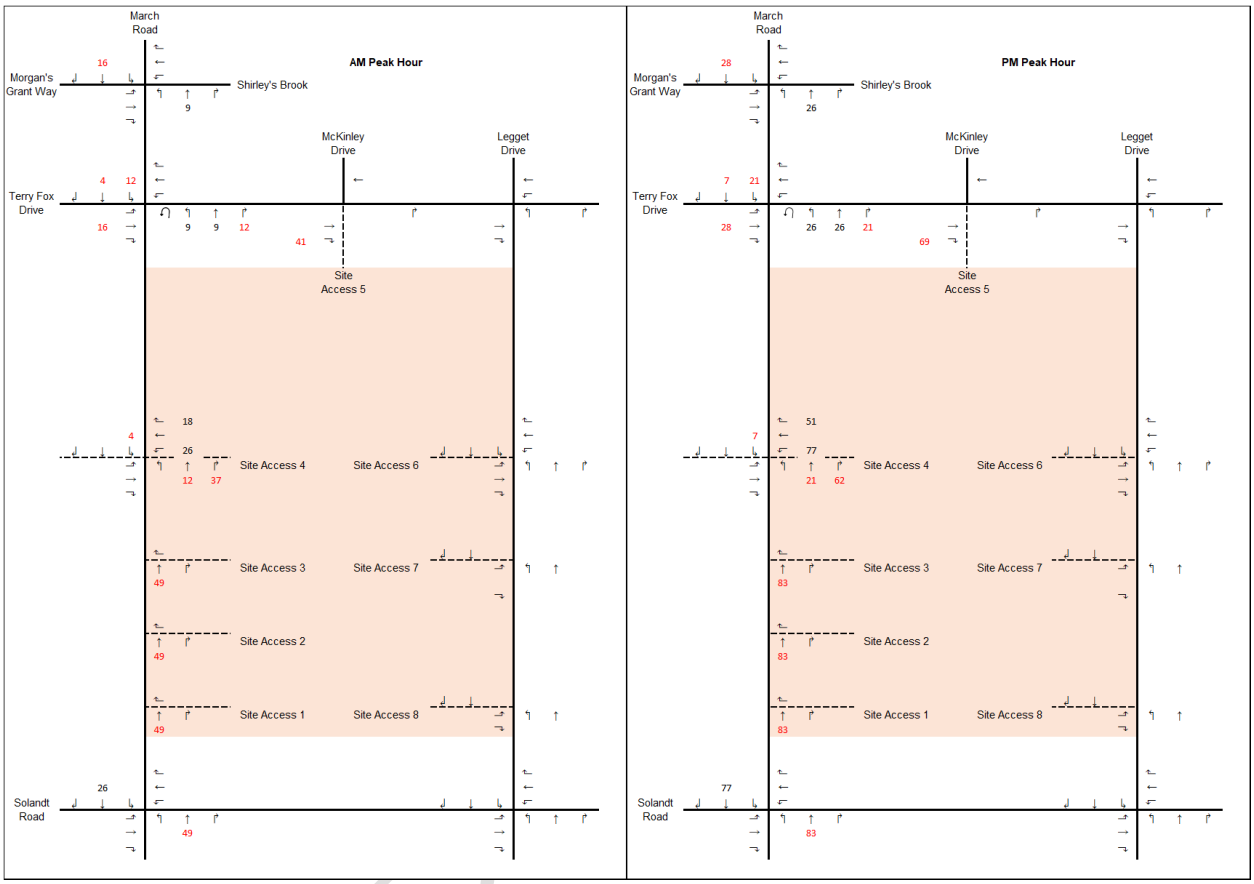
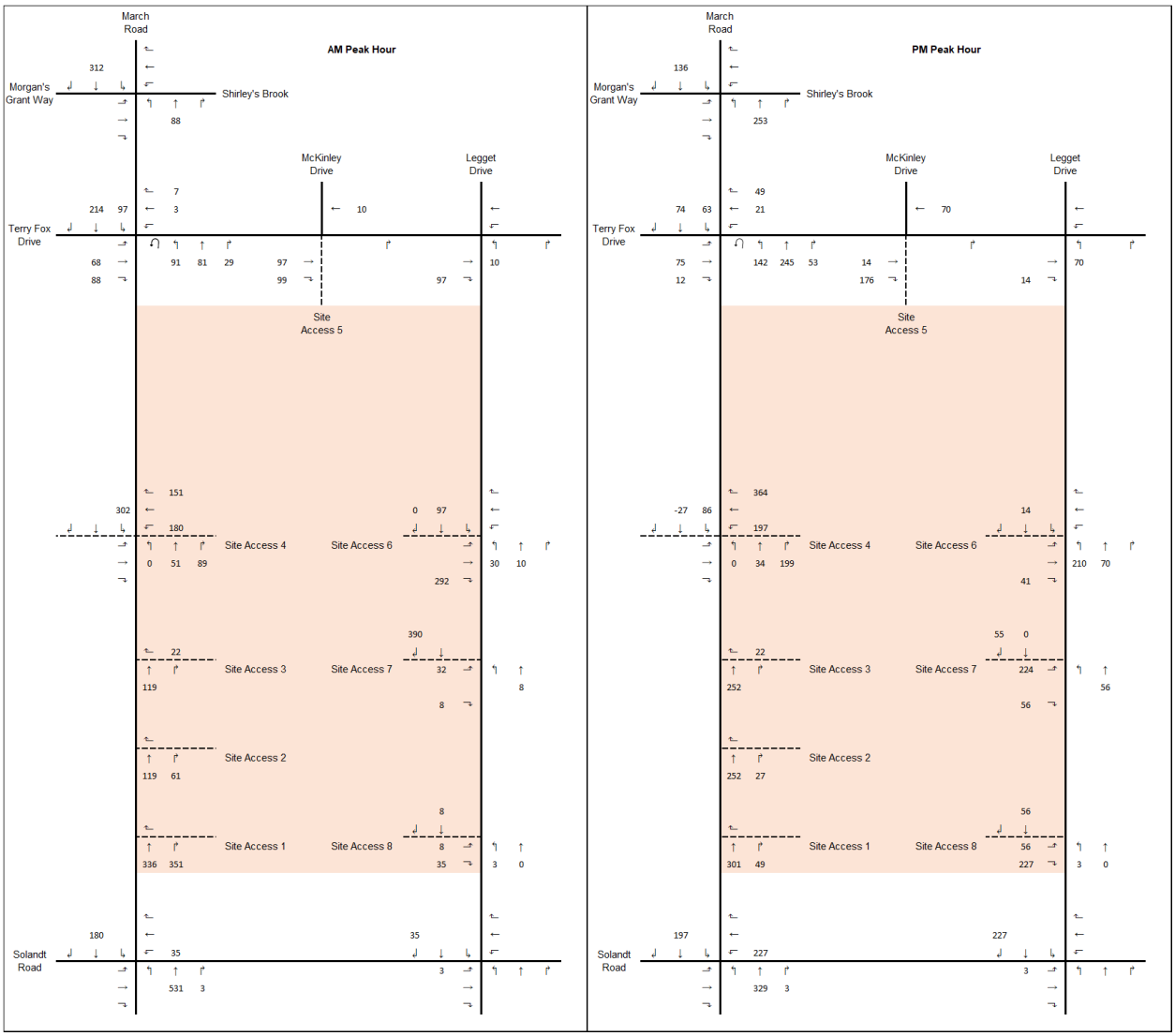


Figure 15 - Site Generated Traffic Volumes - All Land Uses & Pass-by Trips



3.2 BACKGROUND NETWORK TRAVEL DEMAND

3.2.1 Transportation Network Plans

Table 4 includes the transportation network plans in the vicinity of the subject site.

3.2.2 Background Growth

As outlined in **Section 2.1.2.5**, a 1.9% per annum growth rate was applied to the traffic volumes at the study area intersections to represent 2022 existing traffic volumes. This growth rate was calculated based on the long-range model in the City of Ottawa's 2013 TMP.

Due to the limited connections from Solandt Road, Legget Drive, and Terry Fox Drive (E), the established land uses in the vicinity of the proposed development, as well as the consideration of future planned background developments in the area, the calculated annual growth rate was not applied beyond existing conditions to represent future volumes. Any growth to the turning movements at the study area intersections is anticipated to be directly correlated with planned background developments as opposed to natural traffic growth when considering the factors above. Furthermore, analysis of existing conditions found that several study area intersections currently operate above their theoretical capacities, indicating that March Road (just south of Terry Fox) does not have the capacity to grow unconstrained.

3.2.3 Other Developments

As outlined in **Table 5** in **Section 2.1.3.2**, there are numerous developments in the study area that are scheduled to be constructed within the horizons of the subject study. The traffic volumes from these developments were obtained from their respective traffic studies, where available, and added to the transportation network as background traffic.

3.3 DEMAND RATIONALIZATION

Recognizing that the future traffic volumes in the study area are projected to be extremely high, particularly along March Road, it is feasible to assume some demand rationalization will inevitably occur. The two-way peak hour traffic volumes along March Road are projected to be in the range of 3,300 – 4,300 during the 2032 future background horizon. A large portion of these traffic volumes are attributed to the Kanata North Urban Expansion Area.

While a portion of the forecasted future volume is envisioned to be accommodated by the planned March Road BRT (between Highway 417 and Solandt Road), the overall future volumes are still anticipated to drive March Road, Terry Fox Drive, Solandt Road, and Legget Drive beyond their respective theoretical capacities, effectively placing a limitation on background traffic growth in the area.

In light of the projected future congestion in the area, motorists may begin to alter their travel times to travel outside of the peak period, thereby reducing demand on the network during the peak hour and subsequently increasing demand on the network just before and just after the peak hour, which is referred to as peak spreading. This is often realized with flexible work schedules, a now common arrangement borne of the COVID-19 pandemic.

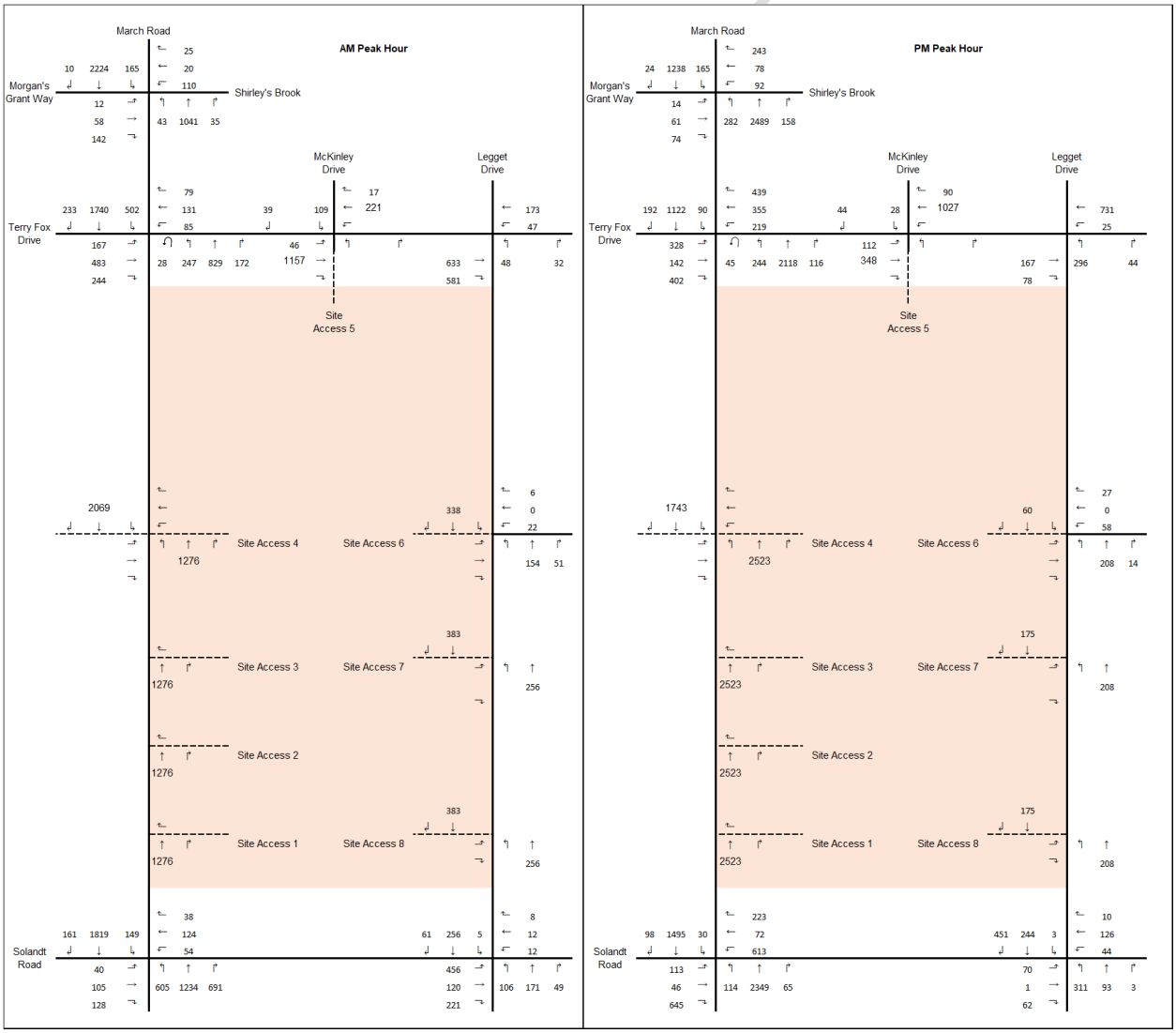
As a high-level observation, it is also noted that a significant proportion of the existing land uses in the vicinity of the proposed development are Information Technology (IT) based companies. As such, it is also expected that a portion of the employees would elect to "work-from-home" or telecommute to eliminate all travel during the peak hours.

Overall, it was assumed that peak hour traffic in the study area would be reduced by 15% due to the combination of peak spreading (flexible work schedules) and telecommuting. This reduction may need to be adjusted as part of the Step 4 – Forecasting Report once the intersection operations are analyzed and the capacities at each intersection are determined.

3.3.1 2032 Future Background Traffic Volumes

Figure 16 illustrates the 2032 future background traffic volumes at the study area intersections.

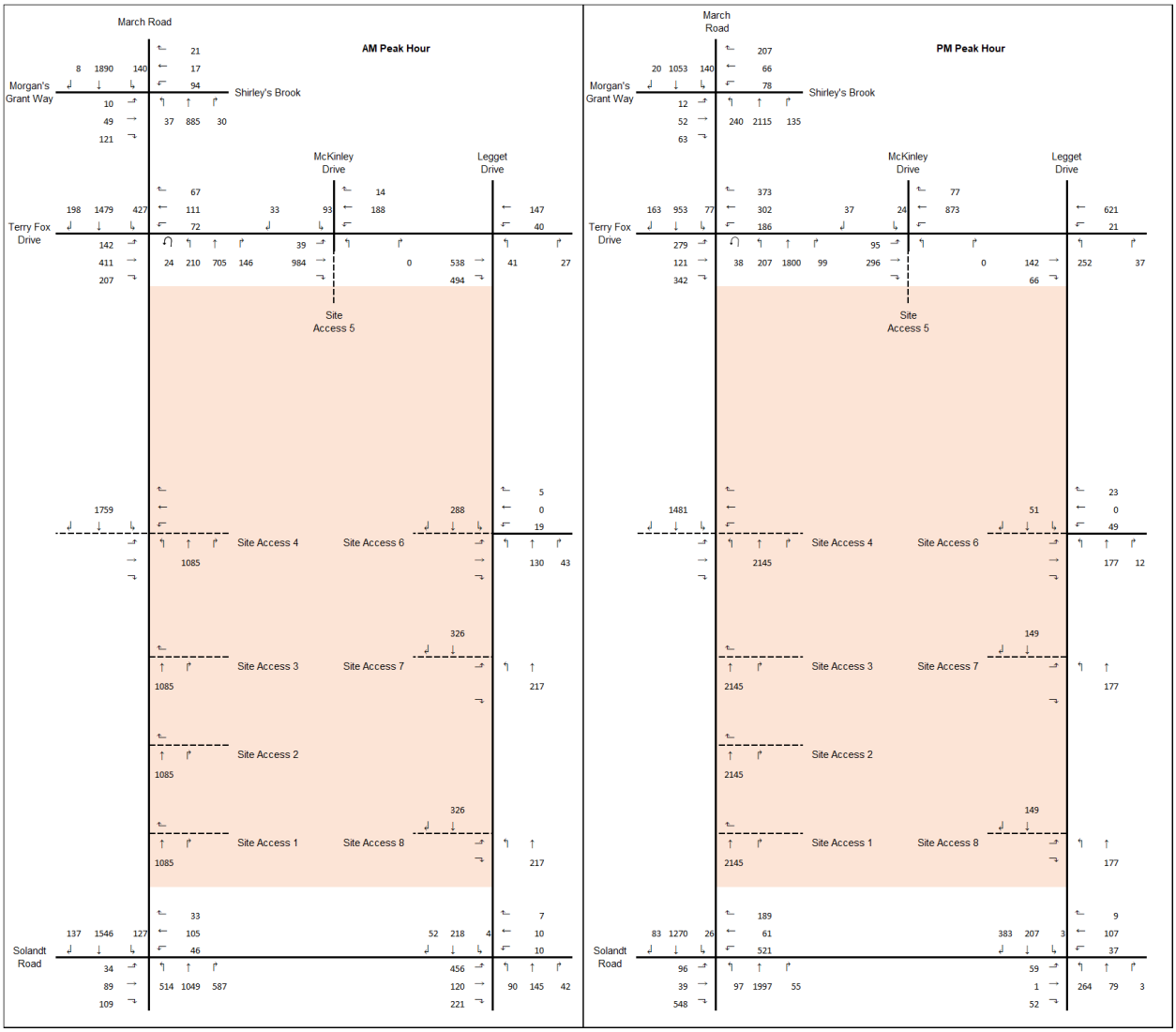
Figure 16 - 2032 Future Background Traffic Volumes



3.3.2 2032 Future Background Traffic Volumes - Rationalized

Figure 17 illustrates the 2032 rationalized future background traffic volumes at the study area intersections.

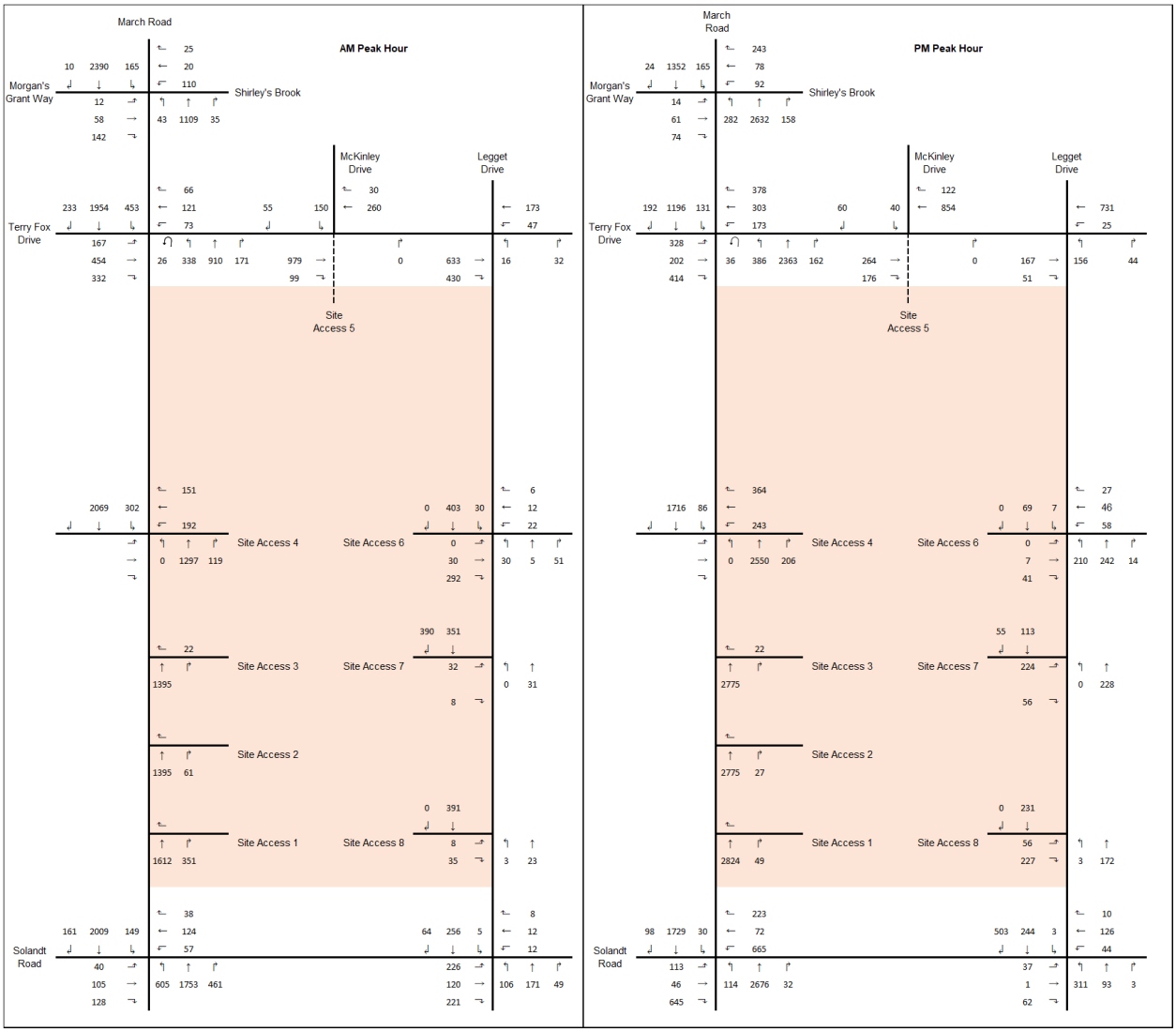
Figure 17 - 2032 Future Background Traffic Volumes - Rationalized



3.3.3 2032 Total Future Traffic Volumes

Figure 18 illustrates the 2032 total future traffic volumes at the study area intersections.

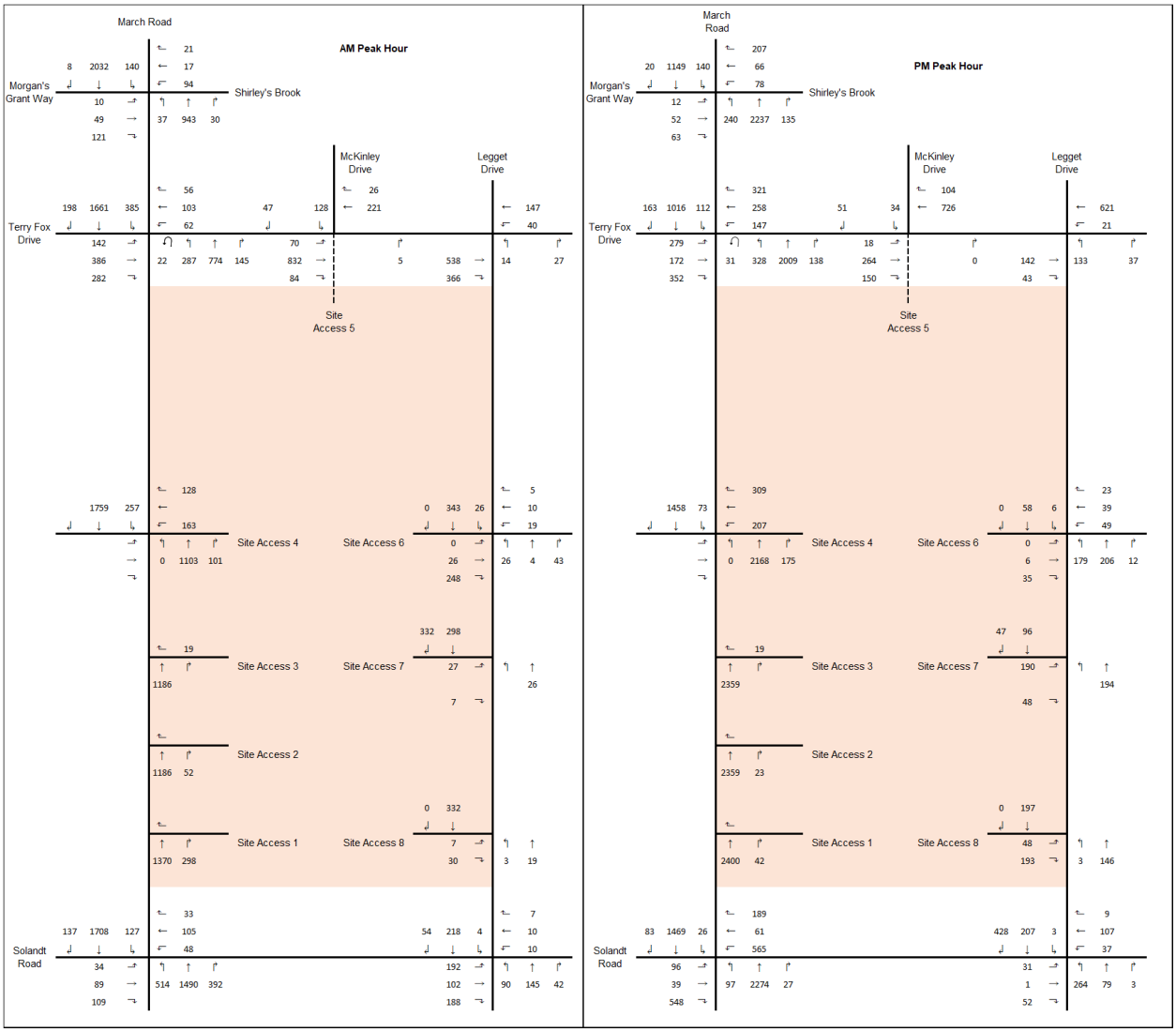
Figure 18 - 2032 Total Future Traffic Volumes



3.3.4 2032 Total Future Traffic Volumes - Rationalized

Figure 19 illustrates the 2032 rationalized total future traffic volumes at the study area intersections.

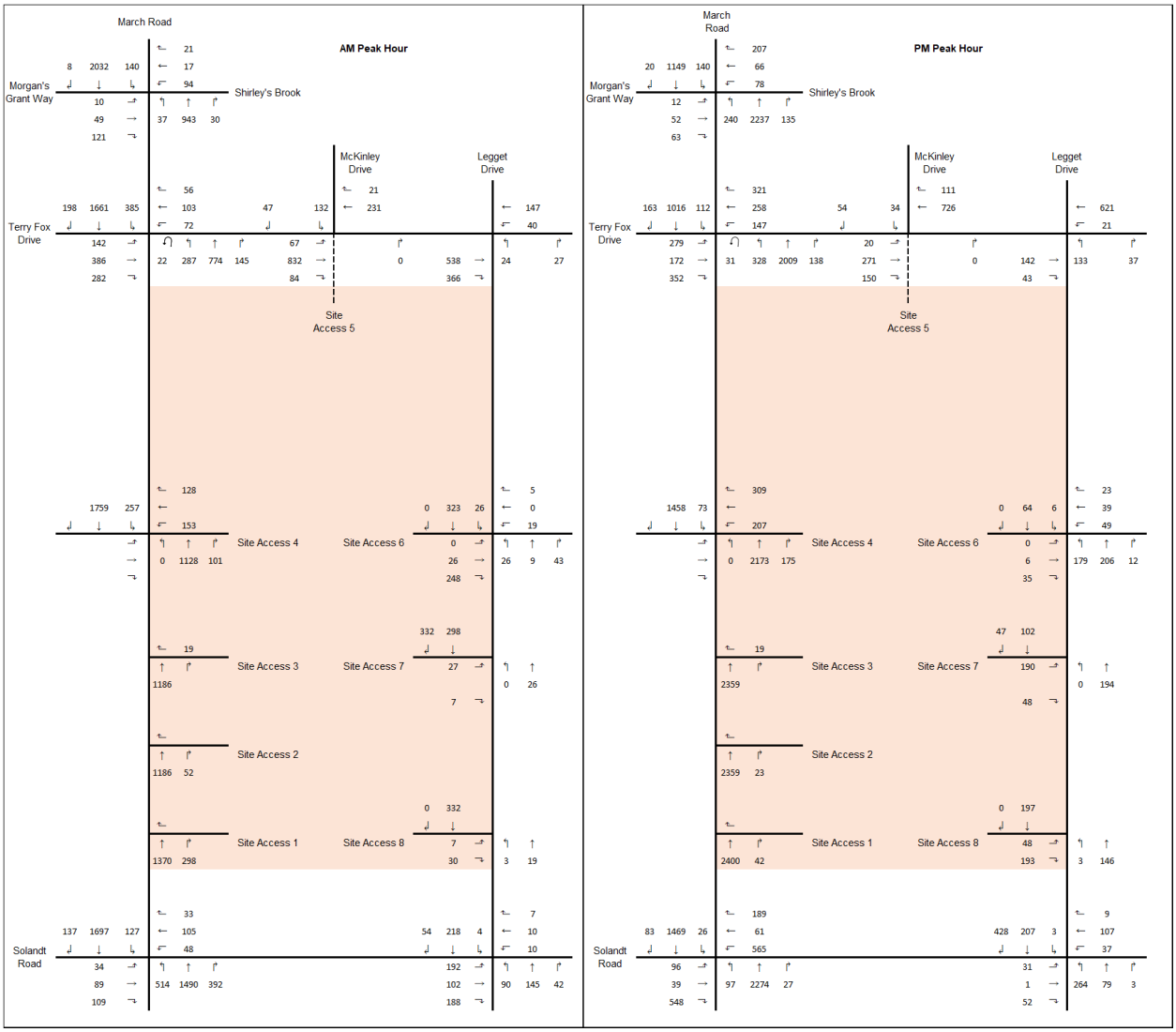
Figure 19 - 2032 Total Future Traffic Volumes - Rationalized



3.3.5 2037 Total Future Traffic Volumes - Rationalized

Figure 20 illustrates the 2037 rationalized total future traffic volumes at the study area intersections.

Figure 20 - 2037 Total Future Traffic Volumes - Rationalized



4.0 STRATEGY REPORT

4.1 DEVELOPMENT DESIGN

4.1.1 Design for Sustainable Modes

Not applicable; exempted during screening and scoping.

4.1.2 Circulation and Access

Not applicable; exempted during screening and scoping.

4.1.3 New Street Networks

Not applicable; exempted during screening and scoping.

4.2 PARKING

4.2.1 Parking Supply

Not applicable; exempted during screening and scoping.

4.2.2 Spillover Parking

Not applicable; exempted during screening and scoping.

4.3 BOUNDARY STREET DESIGN

4.3.1 Multi Modal Level of Service

Not applicable; exempted during screening and scoping.

4.4 ACCESS INTERSECTION DESIGN

4.4.1 Access Location

Not applicable; exempted during screening and scoping.

4.4.2 Intersection Control

Not applicable; exempted during screening and scoping.

4.5 TRANSPORTATION DEMAND MANAGEMENT

4.5.1 Context for TDM Measures

The proposed development includes 1,900 residential units, 495,000ft^2 of office space, and 122,000 ft^2 of retail space. As the current development application is for Zoning, the exact unit breakdown of the residential buildings (i.e., studios, one-bedroom, two-bedrooms, etc.) is not known at this time.

The majority of the proposed development is located within 600m of a future Bus Rapid Transit station (stations at March Road and Solandt Road). However, per direction from the City of Ottawa, the March Road BRT is currently planned to terminate at Solandt Road by the horizons of the subject study. As such, only the southern portion of the subject site (i.e., the office component and the southern retail component) will be within 600m of a Bus Rapid Transit station at Solandt Road for the subject horizons. Due to the proximity of the proposed land uses to the future BRT station at Solandt, and the nature of the land uses themselves, the Transportation Demand Management (TDM) measures are different for the various proposed land uses.

4.5.2 Need and Opportunity

The mode shares for the residential portion of the proposed development were taken from the *TRANS Trip Generation Summary Report*, which states that the transit modal share for this district is 25%. As this transit mode share is notably high for the general area, it is not anticipated to see increase as a result of the planned March Road BRT (between Highway 417 and Solandt Road) as the distance between the transit station and the residential component of the proposed development is anticipated to be greater than 400m.

The modal shares for the office portion of the proposed development were also taken from the *TRANS Trip Generation Summary Report*, which states that the transit modal share for this district is 8%. To account for the planned March Road BRT (between Highway 417 and Solandt Road), the transit mode share for the office land use was increased from 8% to 20% (a 12% net increase) while subsequently reducing the auto mode share by 12% to a total of 72%.

The modal shares for the commercial portion of the proposed development were also taken from the *TRANS Trip Generation Summary Report*, which states that the transit modal share for this district is 1%. To account for the enhanced overall transit service as a result of the planned March Road BRT (between Highway 417 and Solandt Road), the transit mode share for the commercial land use was increased from 1% to 10% (a 9% net increase) while subsequently reducing the 73% auto mode share by 9% for a total of 64%.

Should the aforementioned transit modal share targets not be fully realized at the buildout of the subject development for the office and commercial land uses, the increase in two-way traffic volumes would equate to:

- AM Peak Hour: an additional 124 number of vehicle trips (increasing from 1,146 to 1,270)
- PM Peak Hour: an additional 142 number of vehicle trips (increasing from 1,255 to 1,397)

This represents roughly an 11% increase in vehicle trips should the desired transit modal share targets not be realized for the office and commercial land uses. As outlined in Section 4.9, there are existing congestion issues at the majority of the study area intersections, which will be exacerbated by the future growth, particularly in relation to the Kanata North Urban Expansion Area. Should the development not reach their transit modal share targets for the office and

commercial land uses, it is not expected to substantially impact the future operations at the study area intersections as it is a relatively small increase to future traffic. However, given the low assumed transit modal share targets for these two land uses, it is anticipated that these targets will be able to be met, particularly with the TDM measures, as described in the following subsection. According to the *March BRT Environmental Project Report (Final)* states that; to reflect Ottawa's growth transportation vision, the TMP aims for the highest level of future transit usage that can reasonably be achieved during commuter peak hours. The set target is 30% which means that 30% of all person-trips made using motorized modes (transit/auto) during peak hours would be by transit and 70% by automobile.

The TMP notes that while a 30% peak hour transit modal split represents a real challenge, it can be achieved if the required service strategies, transit priority measure and a variety of essential supporting actions are implemented in a coordinated and comprehensive fashion. One of the four TMP recommendations of response to this major transportation challenge, both in terms of encouraging desirable shifts in travel and in serving the resulting transit and traffic volumes in Transportation Demand Management discussed below for this development.

4.5.3 TDM Program

The City of Ottawa's TDM-supportive design and infrastructure elements checklist was consulted to identify and incorporate TDM supportive measures into the design stage. The various land uses within the proposed development are planned to include specific TDM measures, as described below.

RESIDENTIAL

The following is a list of the TDM measures that apply to the residential land uses within the proposed development:

Walking and Cycling routes

- Locate building close to the street, and do not locate parking areas between the street and building entrances
- Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations
- Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort
- Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort
- Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances
- Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks
- Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps
- Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation.

- Provide safe, direct and attractive walking routes from building entrances to nearby transit stops
- Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible
- Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility
- Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails
- Provide wayfinding signage for site access (where required,

Walking and cycling: end-of-trip facilities

- Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible
- Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas
- Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored
- Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists
- Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers

Transit

- Provide shelters, lighting and benches at any on-site transit stops
- Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter

Ridesharing

- Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones

Parking

- Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for
- Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking

- Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly

TDM Program Management

- Designate an internal coordinator, or contract with an external coordinator

Walking and Cycling

- Display local area maps with walking/cycling access routes and key destinations at major entrances;

Transit

- Display relevant transit schedules and route maps at entrances;
- Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit

Parking

- Unbundle parking cost from the purchase/lease price; and

TDM Marketing and Communications

- Provide a multimodal travel option information package to new residents. The package would be redistributed to residents once transit projects in the vicinity of the area are completed, i.e., post the year 2026.

OFFICE

In addition to the TDM measures listed above, the following is a list of the TDM measures that apply to the office and retail land uses within the proposed development.

Walking and cycling: end-of-trip facilities

- Provide shower and change facilities for the use of active commuters

Transit

- Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools
- Provide online links to OC Transpo and STO information

Ride sharing

- Provide a dedicated ride matching portal at OttawaRideMatch.com

Parking

- Charge for long-term parking (daily, weekly, monthly)

- Unbundle parking cost from lease rates at multi-tenant sites

TDM Marketing & Communications

- Provide a multimodal travel option information package to new/relocating employees and students

Other incentives & amenities

- Encourage flexible work hours
- Provide local business travel options that minimize the need for employees to bring a personal car to work

The TDM checklists are contained in **Appendix B**.

4.6 NEIGHBHOURHOOD TRAFFIC MANAGEMENT

Not applicable; exempted during screening and scoping.

4.7 TRANSIT

4.7.1 Route Capacity

Due to the limits of the future March Road BRT (i.e., terminating at Solandt Road), the transit users for the specific proposed land uses will utilize different transit facilities based on their proximity (i.e., office employees will be within 400m of the BRT station at Solandt, whereas the residents of the residential buildings and the users of the retail components will not).

The March Road BRT will support growth along March Road, by providing fast, reliable, comfortable service which is an attractive alternative to the automobile; and supplying increased transportation network capacity necessary to support increased development densities in designated areas including this proposed development. It provides reliable and high-quality transit service and provides the best multimodal and TOD opportunities.

Residential and Commercial

Per the distribution of the future residential and commercial trips as outlined in **Section 3.1.4**, 20% of the trips associated with the residential and commercial components will be destined to / from the north (via March Road north), 20% will be destined to / from the west (via Terry Fox Drive west), and 60% will be destined to / from the south (via March Road south). The residential and commercial components of the proposed development is anticipated to generate the following transit trips:

- 214 transit trips during the AM peak hour (75 inbound and 139 outbound); and
- 265 transit trips during the PM peak hour (146 inbound and 119 outbound).

Those traveling to / from the north equates to roughly 43 and 53 transit trips during the AM and PM peak hours, respectively. Based on the current transit schedule, there is only one transit route (Route 63- Innovation Station and Tunney's Pasture) that these transit users can take that head north, which operates with three buses per hour during

the peak hours. This provides a total transit capacity of 294 based on a total individual bus capacity of 98 people (the average between standard and articulated buses). As such, the transit users destined to / from the north are anticipated to occupy roughly 15%-18% of transit capacity, based on the current transit schedules.

Those traveling to / from the west equates to roughly 43 and 53 transit trips during the AM and PM peak hours, respectively. Based on the current transit schedule, there are three transit routes (Routes 66,110,166 - refer to **Section 2.1.2.3**) that these transit users can take that head west, which operate with six buses per hour during the peak hours. This provides a total transit capacity of 588 based on a total individual bus capacity of 98 people (the average between standard and articulated buses). As such, the transit users destined to / from the west are anticipated to occupy roughly 7%-9% of transit capacity, based on the current transit schedules.

Those traveling to / from the south equates to roughly 128 and 159 transit trips during the AM and PM peak hours, respectively. Based on the current transit schedule, there are four transit routes (Routes, 63,66,110,166- refer to **Section 2.1.2.3**) that these transit users can take that head south, which operate with 10 buses per hour during the peak hours. This provides a total transit capacity of 980 based on a total individual bus capacity of 98 people (the average between standard and articulated uses). As such, the transit users destined to / from the south are anticipated to occupy roughly 13%-16% of transit capacity, based on the current transit schedules.

The area to the east is all an employment area of offices, considering this, we do not anticipate trips being generated.

Office

Per the distribution of the future office trips as outlined in **Section 3.1.4**, 50% of the office employees will be coming from the north and west (i.e., March Road north and Terry Fox Drive west) and 50% will be coming from the south (i.e., March Road south). The office component of the proposed development is anticipated to generate the following transit trips:

- 193 transit trips during the AM peak hour (170 inbound and 23 outbound); and
- 183 transit trips during the PM peak hour (31 inbound and 152 outbound).

The employees that are arriving to the proposed site via transit from the west and north are all assumed to take local transit routes. This equates to approximately 97 and 92 two-way transit trips during the AM and PM peak hours, respectively. Based on the current transit schedule, there are three transit routes (Routes, 63, 110,166) that these transit users can take that head north and west, which operate with six buses per hour during the peak hours. This provides a total transit capacity of 588 based on a total individual bus capacity of 98 people (the average between standard and articulated buses). As such, the office transit users destined to / from the north and west are anticipated to occupy roughly 15%-17% of transit capacity, based on the current transit schedules.

The employees that will be arriving to the proposed site via transit from the south are all assumed to take the future March Road BRT. This equates to approximately 97 and 92 two-way transit trips during the AM and PM peak hours, respectively. Per the *West Transitway Connection – Highway 417 / Eagleson Road to North of Maxwell Bridge Road Environmental Project Report (Final)* (Delcan 2013), the future March Road BRT is anticipated to operate with 25 buses during the peak hours in the peak directions. As no indication was given as to how many buses will operate in the off-peak directions, it was assumed that 15 buses will do so, for a total of 40 two-way buses during the peak hours. OC Transpo buses have total capacities of approximately 98 (the average between the standard and articulated buses),

which equates to a total two-way March Road BRT capacity of 3,920 people during the peak hours. As such, the future office component of the proposed development is projected to occupy approximately 2% of the future March Road BRT.

The area to the east is all an employment area of offices, considering this, we do not anticipate trips being generated

4.8 REVIEW OF NETWORK CONCEPT

The current zoning permits a total GFA of appx 2,275,000 ft^2. As there are numerous land uses permitted under the existing zoning, it was assumed that the worst-case scenario in terms of traffic generation would be to construct an office of this size. This would result in appx 4,426 and 4,193 person trips during the AM and PM peak hours, respectively.

The proposed concept plan is reflection of the maximum allowable GFA of the proposed zoning. Therefore, the person trips associated with the proposed zoning is outlined in **Table 12**, which outlines there are 2311 and 2552 projected person trips during the AM and PM peak hours, respectively.

As such, the proposed zoning is not anticipated to generate more than 200 peak hour person-trips over the existing zoning, and thus, **Section 4.8** is exempt from the subject TIA.

4.9 INTERSECTION DESIGN

4.9.1 Intersection Control

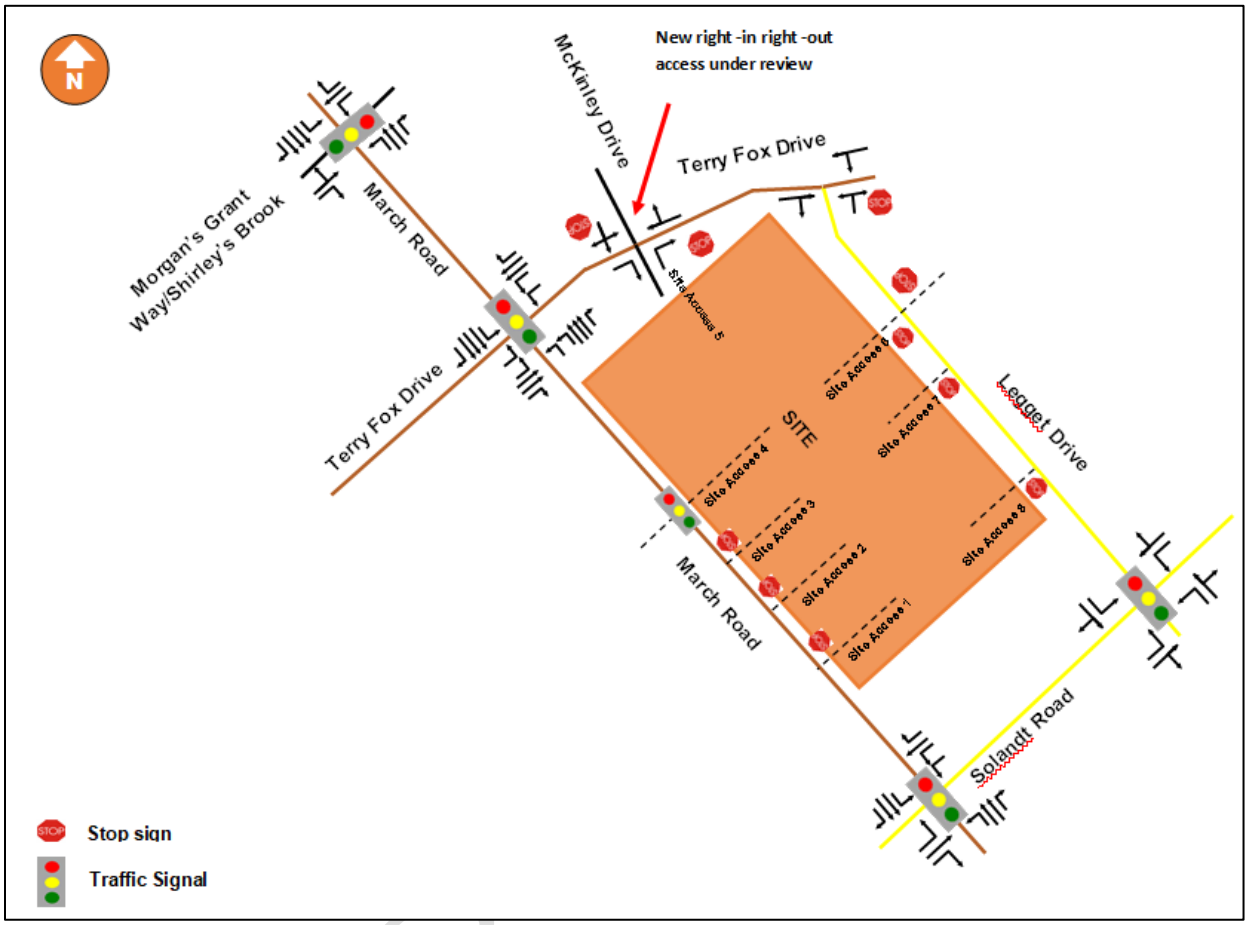
The concept plan is proposing to include a total of eight site accesses to the subject development, seven of which will be stop controlled at the accesses and one signalized intersection at the proposed 'lifestyle' street. Access to Terry Fox Drive will be a right-in / right-out on the south side of Terry Fox Drive opposite the existing unsignalized intersection of Terry Fox Drive and McKinley Drive. This site access will be reinforced with a right-in/right-out island that will prevent motorists from turning left onto Terry Fox Drive as well as vehicles turning left from Terry Fox into the site.

There are three accesses proposed on Legget Drive, which will all be stop-controlled at the entrances to Legget Drive. Legget Drive users will be free flowing.

Four accesses to the site are proposed on March Road, three are stop controlled, right-in right-out due to a median island along March Road, and one signalized all movement intersection. This signalized intersection is proposed to be located approximately 350m south of Terry Fox Drive. It should be noted that the exact location of this intersection may change slightly as the development proceeds through the approvals process.

Figure 6 summarizes the accesses and traffic control proposed for the subject site.

Figure 6 - Future Intersection Control



4.9.2 Intersection Design

An assessment of the study area intersections was undertaken to determine the operational characteristics under the various horizons identified in the Screening and Scoping report. Intersection operational analysis was performed with Synchro 10.0™ software package and the MMLOS analysis was completed for all modes and compared against the City of Ottawa's MMLOS targets.

4.9.2.1 2022 Existing Conditions

Existing traffic volumes were used to determine the base year 2022 for analysis at the study area intersections. Using the City of Ottawa's long-range model (exhibit 2.11 of the 2013 TMP), the weighted forecasted trip growth was calculated to / from the inner area (from 2011 to 2031), and it was found that the growth rate is approximately 1.9% per year. This annual growth rate was applied to the traffic counts to represent the 2022 existing traffic volumes.

Figure 6 illustrates 2022 existing traffic volumes at the study area intersection during the AM and PM peak hours, respectively.

Intersection Capacity Analysis

Table 15 summarizes the results of the Synchro analysis for the 2022 existing intersection operations.

March Road at Morgan's Grant

During the 2022 horizon year, the intersection of March Road and Morgan's Grant will operate at very good levels of service of A and B during the AM and PM peak hours, respectively.

The March Road BRT will support growth along March Road, by providing fast, reliable, comfortable service which is an attractive alternative to the automobile; and supplying increased transportation network capacity necessary to support increased development densities in designated areas including this proposed development.

March Road at Terry Fox Drive

The intersection of March Road at Terry Fox Drive currently has several individual movements operating with delays exceeding 50 seconds. In addition, the southbound left turn movement is operating at the theoretical capacity during the AM peak hour. This suggests there is little residual capacity for any future growth at this intersection. This signal timing plan at this intersection will be optimized in subsequent horizons to determine if the operations can be improved.

The March Road BRT will support growth along March Road, by providing fast, reliable, comfortable service which is an attractive alternative to the automobile; and supplying increased transportation network capacity necessary to support increased development densities in designated areas including this proposed development.

March Road at Solandt Road

The intersection of March Road at Solandt Road currently has several individual movements operating at or above theoretical capacity with excessive delays during both the AM and PM peak hours. Of particular note are the eastbound right turn movement during the PM peak hour (9 minutes of delay), the northbound through movement during the PM peak hour (2.5 minutes of delay), and the northbound left turn movement during the AM peak hour (4 minutes of delay). Overall, this intersection is exceeding capacity and motorists are currently having to wait for several cycles to clear the intersection. The signal timing plan of this intersection will be optimized in subsequent horizons to determine if the operations can be improved.

The March Road BRT will support growth along March Road, by providing fast, reliable, comfortable service which is an attractive alternative to the automobile; and supplying increased transportation network capacity necessary to support increased development densities in designated areas including this proposed development.

Solandt Road at Legget Drive

The southbound through movement at the intersection of Solandt Road at Legget Drive currently operates at or above theoretical capacity during the PM peak hour with delays exceeding 1.5 minutes. The signal timing plan will be optimized in subsequent horizons to determine if the operations can be improved.

Terry Fox Drive at Legget Drive

The intersection of Terry Fox Drive at Legget Drive currently operates at or above theoretical capacity with delays exceeding two minutes in the northbound direction during the PM peak hour. This intersection will be further reviewed

in subsequent horizons to determine if geometric changes or traffic control upgrades are required to improve the operations of this intersection.

Terry Fox Drive and McKinley Drive

The intersection of Terry Fox Drive and McKinley Drive will operate at satisfactory levels of service of C and D during both the AM and PM peak hours, respectively, in 2022.

All other study area intersections were found to operate acceptably.

Synchro analysis results can be found in **Appendix C**.

Table 15 - 2022 Existing Conditions - Intersection Operations

Intersection	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95th (m)
March Road and Morgan's Grant Way	Signalized	EB	Through	A (A)	0.15 (0.23)	50.9 (53.7)	16 (18)
			Right	A (A)	0.10 (0.05)	50.5 (52.1)	18 (14)
		WB	Left	B (A)	0.68 (0.59)	64.6 (61.2)	46 (37)
			Through	A (A)	0.05 (0.19)	49.9 (53.3)	7 (19)
			Right	A (A)	0.01 (0.07)	49.7 (52.3)	0 (17)
		NB	Left	A (C)	0.41 (0.75)	54.6 (73.9)	23 (m#119)
			Through	A (A)	0.17 (0.55)	10.4 (3.0)	15 (23)
			Right	A (A)	0.02 (0.10)	9.2 (0.2)	0 (m0)
		SB	Left	A (A)	0.56 (0.53)	60.9 (63.3)	39 (29)
			Through	A (A)	0.43 (0.27)	10.8 (19.6)	86 (43)
			Right	A (A)	0.01 (0.02)	7.5 (17.0)	0 (0)
		Overall Intersection		**A (B)**	**0.49 (0.62)**	**19.4 (19.5)**	**-- (--)**
March Road and Terry Fox Drive	Signalized	EB	Left	A (B)	0.46 (0.68)	60.0 (60.1)	22 (47)
			Through	C (A)	0.74 (0.20)	50.8 (38.6)	86 (27)
			Right	A (D)	0.19 (0.90)	41.3 (71.2)	22 (#136)
		WB	Left	A (B)	0.46 (0.63)	61.8 (59.1)	18 (41)
			Through	A (A)	0.21 (0.48)	42.6 (42.7)	24 (61)
			Right	A (A)	0.03 (0.40)	40.9 (42.0)	0 (46)
		NB	Left	B (C)	0.69 (0.79)	54.6 (66.1)	51 (m31)
			Through	A (D)	0.31 (0.87)	48.7 (19.4)	52 (m132)
			Right	A (A)	0.13 (0.08)	136.4 (28.0)	37 (m3)
		SB	Left	E (A)	0.97 (0.52)	85.2 (65.7)	#183 (31)
			Through	A (A)	0.60 (0.41)	26.0 (29.5)	118 (42)
			Right	A (A)	0.12 (0.08)	17.7 (22.5)	16 (5)
		Overall Intersection		**C (D)**	**0.75 (0.89)**	**48.7 (38.3)**	**-- (--)**
March Road and Solandt Road	Signalized	EB	Left	A (A)	0.60 (0.59)	79.9 (61.5)	19 (41)
			Through	A (A)	0.49 (0.15)	52.4 (43.3)	48 (23)
			Right	A (F)	0.10 (2.08)	48.2 (548.3)	17 (#324)
		WB	Left	A (E)	0.41 (0.95)	62.4 (71.7)	15 (#124)
			Through / Right	B (A)	0.66 (0.45)	57.1 (36.5)	65 (73)
		NB	Left	F (F)	1.38 (1.01)	226.3 (112.6)	#292 (#60)
			Through	A (F)	0.41 (1.25)	10.6 (154.1)	77 (#361)
			Right	A (A)	0.56 (0.05)	13.9 (20.7)	57 (8)
		SB	Left	A (A)	0.57 (0.47)	48.3 (45.9)	#51 (m10)
			Through	F (D)	1.09 (0.90)	96.6 (37.5)	#263 (#151)
			Right	A (A)	0.09 (0.05)	86.4 (26.0)	24 (m0)
		Overall Intersection		**F (F)**	**1.24 (1.45)**	**78.2 (159.3)**	**-- (--)**

Solandt Road and Legget Drive	Signalized	EB	Left	C (A)	0.71 (0.33)	14.4 (36.4)	86 (23)
			Through / Right	A (A)	0.45 (0.08)	9.6 (33.8)	49 (13)
		WB	Left	A (A)	0.0 (0.21)	7.1 (34.9)	1 (19)
			Through / Right	A (B)	0.02 (0.66)	7.2 (43.8)	4 (53)
		NB	Left	A (C)	0.41 (0.75)	17.7 (34.3)	30 (#87)
			Through / Right	A (A)	0.50 (0.10)	18.0 (5.2)	56 (15)
		SB	Left	A (A)	0.13 (0.01)	15.5 (17.9)	12 (2)
			Through / Right	A (F)	0.52 (1.10)	18.1 (96.2)	58 (#258)
		Overall Intersection		**B (E)**	**0.64 (0.91)**	**14.5 (63.5)**	**-- (--)**
Terry Fox Drive and Legget Drive	Minor Stop	EB	Through / Right	B (A)	0.69 (0.13)	0.0 (0.0)	0 (0)
		WB	Left / Through	A (A)	0.11 (0.02)	4.7 (0.5)	3 (1)
		NB	Left / Right	D (F)	0.38 (1.15)	30.4 (133.2)	13 (114)
		Overall Intersection		**C (C)**	**0.77 (0.77)**	**2.4 (37.9)**	**-- (--)**
Terry Fox Drive and McKinley Drive	Minor Stop	EB	Left	A (A)	0.04 (0.26)	7.8 (13.5)	1.1 (7.7)
			Through	C (A)	0.72 (0.15)	0.0 (0.0)	0.0 (0.0)
		WB	Left/Through	A (C)	0.13 (0.72)	0.0 (0.0)	0.0 (0.0)
		SB	Left/Right	F (A)	1.14 (0.53)	167.6 (45.4)	77.0 (20.4)
		Overall Intersection		**C (D)**	**0.78 (0.85)**	**19.4 (3.6)**	**--(--)**

Notes:
1. Table format: AM (PM)
2. v/c – represents the anticipated volume divided by the predicted capacity
3. # 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles
4. Level of Service (LOS) calculation is based on volume-to-capacity (v/c) ratios for signalized intersections and delays for unsignalized intersections

Intersection Multi-Modal Level of Service (MMLOS)

A multi-modal level of service (MMLOS) assessment was completed for the signalized intersection within the study area under 2022 existing conditions. The results of this analyses can be found in **Table 16** below.

Table 16 – 2022 Existing - Multi-Modal Level of Service Assessment

Intersection		PLOS	BLOS	TLOS	TkLOS	VLOS
March Road at Morgan's Grant Way	Existing	F	F	F	C	B
	Target	C	B	D	D	D
March Road at Terry Fox Drive	Existing	F	F	F	A	D
	Target	C	B	D	B	D
March Road at Solandt Road	Existing	F	F	F	A	F
	Target	C	C	D	B	D
Solandt Road at Legget Drive	Existing	F	C	F	C	E
	Target	C	C	D	D	D

March Road and Morgan's Grant Way

The intersection of March Road and Morgan's Grant is situated in a General Urban Area. March Road is classified as an Arterial roadway and Morgan's Grant Way is classified as a collector roadway. The Pedestrian Level of Service (PLOS) at this intersection is operating at PLOS F, which does not meet the desired target of C for both the Arterial and Collector Roadway. Reducing the number of lanes at the intersection is not feasible. However, incorporating pedestrian refuge areas by means of wide medians (ie >2.4m) is not expected to improve the PLOS.

The Bicycle Level of Service (BLOS) is currently operating at a BLOS of F at the intersection of March Road at Morgan's Grant Way, which does not meet the desired target of B. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds. Introducing dedicated bike lanes as well as reducing the speed limit to 50 km/h is expected to result in meeting the desired BLOS target of E. As the March Road BRT plans include cycling infrastructure (i.e. cycle tracks), it is not recommended to implement any improvements as an interim mitigation measure. The Ultimate Cycling Network from the City of Ottawa's Cycling Plan (2013) designates March Road as a spine cycling route. The intersection is therefore subject to a Bicycle Level of Service (BLOS) target of B.

March Road and Terry Fox Drive

The intersection of March Road and Terry Fox Drive is situated in an Urban Employment Area with March Road being classified as an arterial roadway and Terry Fox Drive classified as a major collector roadway across the frontage of the subject site. Based on these classifications, the governing Pedestrian Level of Service (PLOS) target is C (for a Urban Employment Area). The Ultimate Cycling Network from the City of Ottawa's Cycling Plan (2013) designates both March Road and Terry Fox Drive as a spine cycling route. The intersection is therefore subject to a Bicycle Level of Service (BLOS) target of C. March Road is designated as a transit route with isolated transit priority measures in 2021 in the vicinity of the intersection, equating to a Transit Level of Service (TLOS) target of D. The Truck Level of Service (TkLOS) is D.

The intersection of March Road and Terry Fox Drive currently operates with a Pedestrian Level of Service (PLOS) of F, which does not meet the target of C. This is attributed to the 130s cycle length during the PM peak period coupled with the short effective walk times in the east-west direction due to the 28s phase length. Another contributing factor is the high number of lanes that have to be crossed by pedestrians (10+ lanes) along all the legs of the intersection. Reducing the cycle length and the number of lanes on March Road and Terry Fox Drive and incorporating raised crosswalks at this intersection would improve the PLOS based on the PETSI score. To improve the PLOS based on the pedestrian delay, the cycle length would need to be greatly reduced. Although these methods would improve the PLOS at this intersection, they are not feasible options as they would be to the detriment of the vehicles. It is noted that the future March Road cross section (2031 and beyond) will see different infrastructure and lane arrangements.

The Bicycle Level of Service (BLOS) at the intersection of March Road and Terry Fox Drive currently operates with a BLOS of F, which does not meet the target of B. Methods for improving the BLOS at this intersection include reducing the speed limit and number of lanes along March Road and Terry Fox Drive, but this approach is not feasible as it would be to the detriment of the vehicles on the roadway. Another method for improving the BLOS operations would be to install multi-use pathways with two-stage left turns. It is noted that the future March Road cross section (2031 and beyond) will see different infrastructure and lane arrangements.

The Transit Level of Service (TLOS) at the intersection of March Road and Terry Fox Drive currently operates with a TLOS of F, which does not meet the target of D. Based on the MMLOS guidelines, intersection TLOS is governed by

the delay at the intersection. It is noted that transit measures including transit priority and queue jump lanes signaling along March Road will be constructed by 2031 and coupled with the March Road BRT between Maxwell Bridge and Highway 417 (by 2031), is anticipated to result in reductions in vehicular traffic that would allow for shorter bus travel times and signal timing optimizations.

The Truck Level of Service (TkLOS) at the intersection of March Road and Terry Fox Drive currently operates with a TkLOS of A, which meets the desired target of B.

Once the aforementioned transit priority measures and BRT are completed, the operations and lane geometry at this intersection will change. It is therefore not recommended to address the MMLOS at this time.

March Road at Solandt Road

The PLOS, BLOS and TLOS current operations are similar to those at March Road at Terry Fox Drive, the aforementioned solutions apply to this intersection to meet their respective targets.

The Vehicular Level of Service (VLOS) at the intersection of March Road at Terry Fox Drive is currently operating at VLOS of F, which does not meet the desired target of D. With the implementation of BRT along this intersection, transit ridership is expected to increase hence reducing auto passenger trips.

Solandt at Legget Drive

The intersection of Solandt at Legget Drive is situated in the Employment Area. Both Solandt Road and Legget Drive are classified as collector roadways. The Pedestrian Level of Service (PLOS) is projected to operate at F, which does not meet the desired target C. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross. Due to the nature of arterial roads, reducing the number of lanes at the intersection is not a feasible option especially with the implementation of the March Road BRT.

The intersection meets the Bicycle Level of Service (BLOS) target of C.

The Transit Level of Service (TLOS) is projected to operate with a TLOS of F, which does not meet the targeted value of C. Based on the MMLOS guidelines, intersection TLOS is governed by the delay at the intersection. Buses are expected to operate with less than 40 seconds of delay, which is significantly high compared to general traffic. Implementing intersection modifications or operating aggressive forms of TSP operations (i.e. skipping and rotating traffic phases) could improve transit service but can severely impact other modes of transportation.

The Vehicular Level of Service (VLOS) is projected to operate with a VLOS of E, which does not meet the desired target of D. Increasing the number of lanes at this intersection would increase capacity and thus improve the VLOS, however, it would be to the detriment of the other modes of transportation and is therefore not recommended.

Intersection MMLOS results can be found in **Appendix D**.

4.9.2.2 2032 Future Background Conditions

The 2032 future background traffic volumes represent traffic volumes adjacent to the site before adding in trips generated by the site. **Figure 17** illustrates 2032 Future Background traffic volumes at the study area intersection during the AM and PM peak hours, respectively.

Intersection Capacity Analysis

Table 17 summarizes the results of the Synchro analysis for the 2032 Future Background intersection operations.

March Road at Morgan's Grant

During the 2032 horizon year, the intersection of March Road and Morgan's Grant will begin to experience at capacity operations at several movements during both the AM and PM peak hours. More specifically, the westbound and southbound left turn movements during the AM peak hour, and the westbound, northbound, and southbound left turn movements during the PM peak hour.

March Road at Terry Fox Drive

The intersection of March Road at Terry Fox Drive will operate with several individual movements operating with delays exceeding 60 seconds. In addition, the eastbound and westbound left turn movements are operating at capacity during the AM and PM peak hours. This suggests there is little residual capacity for any future growth at this intersection. This signal timing plan at this intersection will be optimized in subsequent horizons to determine if the operations can be improved.

March Road at Solandt Road

The intersection of March Road at Solandt Road will continue to operate with several individual movements operating at or above theoretical capacity with excessive delays during both the AM and PM peak hours. Of particular note are the westbound and northbound left turn movements which will operate with excessive delays. Overall, this intersection is expected to continue experiencing major capacity issues with motorists having to wait for significant periods of time. The signal timing plan of this intersection will be optimized in subsequent horizons to determine if the operations can be improved.

Solandt Road at Legget Drive

This intersection will operate under capacity during background conditions as a result of signal timing optimization.

Terry Fox Drive at Legget Drive

The intersection of Terry Fox Drive at Legget Drive will generally operate at acceptable levels.

Terry Fox Drive and McKinley Drive

The intersection of Terry Fox Drive and McKinley Drive will operate at satisfactory levels of service in 2032 during background traffic conditions.

All other study area intersections were found to operate acceptably.

Synchro analysis results can be found in **Appendix C**.

Table 17 - 2032 Future Background Intersection Operations

Intersection	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95th (m)
March Road and Morgan's Grant Way	Signalized	EB	Through	A (A)	0.31 (0.36)	52.7 (54.1)	28 (30)
			Right	A (A)	0.09 (0.05)	50.7 (51.1)	17 (11)
		WB	Left	B (A)	0.66 (0.58)	63.8 (60.1)	43 (37)
			Through	A (A)	0.09 (0.38)	50.7 (54.3)	11 (31)
			Right	A (A)	0.02 (0.29)	50.0 (53.5)	0 (30)
		NB	Left	A (B)	0.43 (0.67)	53.6 (66.7)	m19 (m71)
			Through	A (D)	0.36 (0.85)	8.5 (10.2)	35 (m206)
			Right	A (A)	0.02 (0.13)	11.3 (0.2)	m0 (m0)
		SB	Left	B (B)	0.66 (0.66)	60.2 (60.2)	59 (59)
			Through	B (A)	0.64 (0.48)	13.6 (22.7)	175 (93)
			Right	A (A)	0.01 (0.01)	7.4 (17.0)	0 (0)
		Overall Intersection		**B (D)**	**0.66 (0.81)**	**18.5 (23.0)**	**-- (--)**
March Road and Terry Fox Drive	Signalized	EB	Left	B (C)	0.70 (0.77)	68.1 (63.7)	#34 (55)
			Through	B (A)	0.68 (0.20)	51.4 (43.8)	72 (22)
			Right	A (A)	0.16 (0.49)	43.8 (47.7)	21 (50)
		WB	Left	A (A)	0.47 (0.62)	61.8 (59.3)	18 (38)
			Through	A (A)	0.20 (0.55)	45.6 (49.7)	22 (51)
			Right	A (C)	0.05 (0.73)	44.3 (59.9)	0 (71)
		NB	Left	B (B)	0.64 (0.66)	39.1 (60.1)	45 (41)
			Through	A (F)	0.56 (1.08)	64.1 (70.0)	90 (#299)
			Right	A (A)	0.11 (0.07)	154.1 (32.5)	37 (m5.2)
		SB	Left	F (A)	1.14 (0.55)	136.0 (60.6)	#234 (41)
			Through	C (A)	0.79 (0.57)	24.0 (41.7)	#187 (86)
			Right	A (A)	0.17 (0.13)	6.2 (79.7)	8 (25)
		Overall Intersection		**E (E)**	**0.89 (0.91)**	**53.4 (58.5)**	**-- (--)**
March Road and Solandt Road	Signalized	EB	Left	A (A)	0.55 (0.59)	70.1 (76.3)	21 (#54)
			Through	A (A)	0.44 (0.15)	54.1 (38.3)	39 (19)
			Right	A (F)	0.08 (2.08)	50.5 (290.6)	6 (#257)
		WB	Left	A (E)	0.36 (0.95)	62.2 (407.9)	13 (#149)
			Through / Right	B (A)	0.68 (0.45)	63.0 (42.4)	56 (67)
		NB	Left	F (F)	1.83 (1.01)	439.0 (320.4)	#307 (#479)
			Through/Right	F (F)	1.08 (1.25)	77.5 (268.8)	#83 (#19)
		SB	Left	B (A)	0.62 (0.47)	57.9 (117.4)	#83 (#19)
			Through/Right	F (E)	1.23 (0.90)	146.5 (84.1)	#383 (#268)
		Overall Intersection		**F (F)**	**1.25 (1.59)**	**144.1 (218.9)**	**-- (--)**
Solandt Road and Legget Drive	Signalized	EB	Left	A (A)	0.73 (0.32)	15.8 (35.9)	97 (24)
			Through / Right	A (A)	0.39 (0.04)	9.5 (33.4)	40 (11)
		WB	Left	A (A)	0.02 (0.19)	7.5 (34.6)	3 (16)
			Through / Right	A (A)	0.02 (0.53)	7.4 (38.8)	4 (41)
		NB	Left	A (B)	0.42 (0.64)	19.2 (21.7)	31 (58)
			Through / Right	A (A)	0.40 (0.07)	18.4 (4.5)	49 (10)
		SB	Left	A (A)	0.01 (0.01)	15.9 (16.4)	3 (2)
			Through / Right	A (E)	0.58 (0.90)	20.7 (40.5)	72 (#191)
		Overall Intersection		**A (C)**	**0.68 (0.75)**	**15.6 (33.0)**	**-- (--)**
Terry Fox Drive and Legget Drive	Minor Stop	EB	Through / Right	B (A)	0.67 (0.02)	0.0 (0.5)	0 (0)
		WB	Left / Through	A (A)	0.09 (1.06)	3.8 (0.5)	2 (92)
		NB	Left / Right	A (A)	0.35 (0.14)	29.9 (133.2)	11 (0)
		Overall Intersection		**C(F)**	**0.74 (1.06)**	**2.1 (27.0)**	**-- (--)**

Terry Fox and McKinley Drive	Minor Stop	EB	Left	A (A)	0.03 (0.16)	7.8 (11.5)	1 (4)
			Through	B (A)	0.64 (0.19)	0.0 (0.0)	0 (0)
		WB	Through/Right	A (B)	0.13 (0.62)	0.0 (0.0)	0 (0)
		SB	Left/Through/Right	F (A)	1.07 (0.28)	164.8 (8.5)	60 (9)
		Overall Intersection			**0.69 (0.73)**	**15.6 (1.9)**	**--(--)**

Notes:
1. **Table format: AM (PM)**
2. **v/c – represents the anticipated volume divided by the predicted capacity**
3. **# 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles**
4. **Level of Service (LOS) calculation is based on volume-to-capacity (v/c) ratios for signalized intersections and delays for unsignalized intersections**

Multi-Modal Level of Service Assessment

The intersection operations remain similar to existing conditions; therefore, the intersection MMLOS discussion in **Section 4.9.2.1** applies to the 2022 future background analysis.

Appendix D contains the detailed MMLOS analysis and is provided for reference

4.9.2.3 2032 Future Total Traffic Conditions

The 2032 future total traffic volumes represent traffic volumes at the site after adding the trips generated by the site to the 2032 background traffic network. **Figure 19** illustrates 2032 Total Future traffic volumes at the study area intersection during the AM and PM peak hours, respectively.

Intersection Capacity Analysis

Table 18 summarizes the results of the Synchro analysis for the 2032 Future Total Traffic intersection operations.

March Road at Morgan's Grant

During the 2032 horizon year, the intersection of March Road and Morgan's Grant will operate at similar levels of service as the 2032 background traffic volume scenario with the westbound and southbound left turn movements during the AM peak hour, and the westbound, northbound, and southbound left turn movements during the PM peak hour experiencing delays in excess of 1 minute.

March Road at Terry Fox Drive

The intersection of March Road at Terry Fox Drive will operate with a few individual movements operating at or above theoretical capacity with excessive delays during both the AM and PM peak hours. Of particular note is the northbound through movement with almost two minutes of delay, and the southbound right turn movement with slightly over 90 seconds of delay per vehicle. Overall, this intersection is not experiencing major capacity issues and motorists will not have to wait for significant periods of time.

March Road at Solandt Road

The intersection of March Road at Solandt Road will operate with several individual movements operating at or above theoretical capacity with excessive delays during both the AM and PM peak hours. Of particular note are the northbound

and southbound approaches during both peak hours and the eastbound and westbound approaches during the PM peak hour. Overall, this intersection will experience major capacity issues and motorists will have to wait for significant periods of time. The completion of the BRT to Maxwell Bridge is anticipated to reduce the number of vehicle trips as people transition to transit. The current shift to telecommuting may also contribute to improved operations at this intersection.

Solandt Road at Legget Drive

The southbound through movement at the intersection of Solandt Road at Legget Drive will operate slightly below theoretical capacity during the PM peak hour with a v/c ratio of 0.96 and a delay of 53 seconds per vehicle. Therefore, the delays at this intersection are not significant.

Terry Fox Drive at Legget Drive

The intersection of Terry Fox Drive at Legget Drive will generally operate at acceptable levels.

Terry Fox Drive and McKinley Drive

The intersection of Terry Fox Drive and McKinley Drive will operate at satisfactory levels of service with the addition of site traffic opposite McKinley Drive.

Site Accesses

The northbound through movement at site accesses 1-4 currently operate at or above theoretical capacity during the PM peak hour with delay of 2 minutes at the unsignalized access (March Road and site access 4).

The other study area intersections were found to operate at acceptable levels of service.

Synchro analysis results can be found in **Appendix C**.

Table 18 - 2032 Future Total Traffic Intersection Operations

Intersection	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95th (m)
March Road and Morgan's Grant Way	Signalized	EB	Through	A (A)	0.31 (0.36)	52.7 (54.1)	28 (30)
			Right	A (A)	0.09 (0.05)	50.7 (51.1)	17 (11)
		WB	Left	B (A)	0.66 (0.58)	63.8 (60.1)	43 (37)
			Through	A (A)	0.09 (0.38)	50.7 (54.3)	11 (31)
			Right	A (A)	0.02 (0.29)	50.0 (53.5)	0 (30)
		NB	Left	A (B)	0.43 (0.67)	51.6 (67.2)	m19 (m71)
			Through	A (D)	0.38 (0.90)	10.3 (9.1)	31 (m206)
			Right	A (A)	0.02 (0.13)	11.3 (0.0)	m0 (m0)
		SB	Left	B (B)	0.66 (0.66)	60.2 (60.2)	59 (59)
			Through	B (A)	0.68 (0.52)	14.6 (23.4)	175 (93)
			Right	A (A)	0.01 (0.01)	7.4 (17.0)	0 (0)
		Overall Intersection		**B (D)**	**0.70 (0.84)**	**19.2 (22.3)**	**-- (--)**
March Road and Terry Fox Drive	Signalized	EB	Left	B (C)	0.70 (0.77)	68.1 (63.7)	#34 (55)
			Through	B (A)	0.65 (0.31)	50.9 (46.5)	68 (31)
			Right	A (A)	0.21 (0.50)	44.8 (49.5)	24 (50)
		WB	Left	A (A)	0.42 (0.56)	61.4 (58.8)	17 (32)
			Through	A (A)	0.19 (0.56)	46.1 (52.8)	20 (46)

			Right	A (A)	0.04 (0.57)	44.8 (54.9)	0 (52)
		NB	Left	C (C)	0.71 (0.74)	47.0 (49.5)	59 (m42)
			Through	B (F)	0.61 (1.18)	58.6 (117.6)	90.3 (m#299)
			Right	A (A)	0.11 (0.11)	148.9 (35.9)	m35 (m6)
		SB	Left	E (B)	1.00 (0.64)	94.3 (58.6)	#207 (54)
			Through	E (B)	0.93 (0.63)	32.3 (46.6)	#235 (94)
			Right	A (A)	0.20 (0.13)	7.5 (93.0)	11 (27)
		Overall Intersection		**E (E)**	**0.92 (0.97)**	**50.2 (77.4)**	**-- (--)**
March Road and Solandt Road	Signalized	EB	Left	A (C)	0.55 (0.74)	70.1 (76.3)	21 (#54)
			Through	A (A)	0.44 (0.10)	54.1 (38.3)	39 (19)
			Right	A (F)	0.08 (1.50)	50.5 (290.6)	6 (#257)
		WB	Left	A (E)	0.38 (1.90)	62.2 (473.4)	14 (#163)
			Through / Right	B (A)	0.68 (0.49)	63.0 (42.4)	56 (67)
		NB	Left	F (F)	1.83 (1.44)	439.0 (320.4)	#290 (#75)
			Through/Right	F (F)	1.24 (1.69)	145.4 (349.6)	#390 (#556)
		SB	Left	B (C)	0.62 (0.74)	57.9 (117.4)	#83 (#19)
			Through/Right	F (F)	1.35 (1.23)	197.9 (147.7)	#434 (#330)
		Overall Intersection		**F (F)**	**1.31 (1.71)**	**187.2 (276.6)**	**-- (--)**
Solandt Road and Legget Drive	Signalized	EB	Left	A (A)	0.40 (0.17)	9.5 (34.5)	27 (14)
			Through / Right	A (A)	0.39 (0.04)	9.3 (33.5)	27 (11)
		WB	Left	A (A)	0.03 (0.19)	7.7 (34.7)	3 (16)
			Through / Right	A (A)	0.03 (0.53)	7.7 (38.5)	3 (40)
		NB	Left	A (B)	0.34 (0.69)	11.8 (29.0)	16 (66)
			Through / Right	A (A)	0.38 (0.07)	11.7 (4.5)	26 (10)
		SB	Left	A (A)	0.01 (0.01)	10.0 (16.4)	2 (2)
			Through / Right	A (E)	0.55 (0.96)	13.2 (53.0)	38 (#211)
		Overall Intersection		**A (C)**	**0.47 (0.80)**	**10.9 (41.3)**	**-- (--)**
Terry Fox Drive and Legget Drive	Minor Stop	EB	Through / Right	B (A)	0.59 (0.02)	0.0 (0.5)	0 (0)
		WB	Left / Through	A (A)	0.08 (0.57)	3.3 (29.5)	2 (26)
		NB	Left / Right	A (A)	0.16 (0.12)	19.9 (0.0)	4 (0)
		Overall Intersection		**B (A)**	**0.65 (0.57)**	**1.3 (5.3)**	**-- (--)**
March Road & Site Access 1	Minor stop	WB	Right	**A (A)**	**0.01 (0.01)**	**11.8 (11.4)**	**0 (0)**
		NB	Through	**A (F)**	**0.60 (1.05)**	**0.0 (0.0)**	**0 (0)**
			Right	**A (A)**	**0.49 (0.55)**	**0.0 (0.0)**	**0 (0)**
		SB	**Through**	**A (A)**	**0.0 (0.00)**	**0.0 (0.0)**	**0 (0)**
		Overall Intersection		**A (D)**	**0.60 (0.81)**	**0.0 (0.0)**	**--(--)**
March and Site Access 2	Minor Stop	WB	Right	A (A)	0.01 (0.01)	11.0 (0.0)	0 (0)
		NB	Through	A (F)	0.52 (1.03)	0.0 (0.0)	0 (0)
			Right	A (A)	0.29 (0.53)	0.0 (0.0)	0 (0)
		SB	Left	A (A)	0.00 (0.00)	0.0 (0.0)	0 (0)
			Through	A (A)	0.00 (0.00)	0.0 (0.0)	0 (0)
		Overall Intersection		**A (C)**	**0.46 (0.80)**	**0.0 (0.0)**	**-- (--)**
March Road and Site Access 3	Minor Stop	WB	Right	A (A)	0.03 (0.03)	11.1 (11.1)	1 (1)
		NB	Through	A (F)	0.52 (1.03)	0.0 (0.0)	0 (1)
			Right	A (A)	0.26 (0.52)	0.0 (0.0)	0 (0)
		SB	Left	A (A)	0.0 (0.00)	0.0 (0.0)	0 (0)
			Through	A (A)	0.0 (0.00)	0.0 (0.0)	0 (0)
		Overall Intersection		**A (C)**	**0.45 (0.79)**	**0.2 (0.1)**	**-- (--)**
March Road and Site Access 4	Minor Stop	EB	Left	A (A)	0.09 (0.11)	60.6 (46.1)	5 (6)
			Through/Right	A (A)	0.13 (0.02)	62.7 (44.5)	8 (7)
		WB	Left	B (E)	0.68 (0.99)	55.0 (108.3)	63 (#111)
			Through/Right	A (F)	0.12 (1.11)	48.8 (142.2)	20 (#146)
		NB	Left	A (A)	0.33 (0.04)	62.3 (1.7)	m2 (m0)
			Through	C (F)	0.77 (1.04)	19.6 (34.4)	m61 (m18)

			Right	A (A)	0.00 (0.14)	65.0 (0.0)	m3 (m0)
		SB	Left	C (B)	0.71 (0.68)	71.3 (86.1)	m90 (m#23)
			Through	D (B)	0.83 (0.63)	23.2 (11.5)	#144 (66)
		Overall Intersection		**D (F)**	**0.83 (1.05)**	**29.4 (37.5)**	**-- (--)**
Site Access 5 and Terry Fox Drive and McKinley Drive	Minor Stop	EB	Left	A (A)	0.06 (0.03)	8.0 (9.8)	1.5 (0.6)
			Through/Right	A (A)	0.56 (0.27)	0.0 (0.0)	0.0 (0.0)
		WB	Right/Through	A (A)	0.16 (0.52)	0.0 (0.0)	0.0 (0.0)
		NB	Right	A (A)	0.02 (0.01)	16.2 (10.2)	0.4 (0.2)
		SB	Left/Right	C (A)	0.75 (0.29)	50.9 (20.1)	40.8 (8.8)
		Overall Intersection		**A (A)**	**0.72 (0.57)**	**7.1 (1.5)**	**-- (--)**
Site Access 6	Signalized	EB	Left/Through/ Right	A (A)	0.50 (0.09)	16.4 (11.5)	21 (2)
		WB	Left/Through/ Right	A (A)	0.16 (0.37)	23.6 (22.0)	4 (13)
		NB	Right	A (A)	0.02 (0.13)	3.1 (4.1)	1 (3)
		SB	Left/Right	A (A)	0.02 (0.01)	0.7 (0.7)	0 (0)
		Overall Intersection		**A (A)**	**0.46 (0.49)**	**7.7 (7.5)**	**-- (--)**
Legget Drive and Site Access 7	Minor Stop	EB		A (A)	0.10 (0.39)	12.6 (13.7)	3 (14)
		NB		A (A)	0.01 (0.00)	1.6 (0.0)	0 (0)
		SB		A (A)	0.41 (0.09)	0.0 (0.0)	0 (0)
		Overall Intersection		**A (A)**	**0.48 (0.36)**	**0.9 (5.7)**	**--(--)**
Legget Drive and Site Access 8	Minor Stop	EB	Left / Right	A (A)	0.06 (0.35)	10.8 (12.2)	2 (12)
		NB	Left/ Through	A (A)	0.00 (0.00)	1.2 (0.2)	0 (0)
		SB	Through/Right	A (A)	0.22 (0.13)	0.0 (0.0)	0 (0)
		Overall Intersection		**A (A)**	**0.28 (0.33)**	**1.1 (5.0)**	**--(--)**

Notes:
1. **Table format: AM (PM)**
2. **v/c – represents the anticipated volume divided by the predicted capacity**
3. **# 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles**
4. **Level of Service (LOS) calculation is based on volume-to-capacity (v/c) ratios for signalized intersections and delays for unsignalized intersections**

Multi-Modal Level of Service Assessment – 2032 Total future background

The intersection operating conditions remain similar to existing conditions; therefore, the intersection MMLOS discussion in **Section 4.9.2.1** applies to the 2032 total future background analysis.

Appendix D contains the detailed MMLOS analysis and is provided for reference.

4.9.2.4 2037 Ultimate Conditions

The 2037 ultimate total future traffic volumes represent traffic volumes at the site 5 years after full build-out of the site. **Figure 20** illustrates 2037 Ultimate traffic volumes at the study area intersection during the AM and PM peak hours, respectively.

Intersection Capacity Analysis

March Road at Morgan's Grant

During the 2032 ultimate horizon year, the intersection of March Road and Morgan's Grant will operate at similar levels of service as the 2032 total traffic volume scenario with the westbound and southbound left turn movements during the AM peak hour, and the westbound, northbound, and southbound left turn movements during the PM peak hour experiencing delays in excess of 1 minute.

March Road at Terry Fox Drive

The intersection of March Road at Terry Fox Drive will operate at satisfactory levels of service in the ultimate scenario with only one movement operating at capacity. The northbound through movement during the PM peak hour will experience 2.1 minutes of delay during the PM peak hour, Overall, this intersection is not experiencing major capacity issues and motorists will not have to wait for significant periods of time. The City could advance the timing of the March Road BRT to Maxwell Bridge in order to increase transit capacity and thus decrease the reliance of auto vehicles which will improve intersection operations and increase telecommuting.

March Road at Solandt Road

The intersection of March Road at Solandt Road will have several individual movements operating at or above theoretical capacity with excessive delays during both the AM and PM peak hours. Of particular note is the westbound left turn movement (5 minutes of delay) during the PM peak hour. During the AM peak hour, the northbound left turn movement experiences 6.7 minutes of delay, and the southbound through movement experiences 3.4 minutes of delay. Overall, this intersection will experience major capacity issues and motorists will have to wait for significant periods of time. The completion of the BRT to Maxwell Bridge is anticipated to reduce the number of vehicle trips as people transition to transit. The current shift to telecommuting may also contribute to improved operations at this intersection.

Solandt Road at Legget Drive

The southbound through movement at the intersection of Solandt Road at Legget Drive will operate at or above theoretical capacity during the PM peak hour with delay of 0.9 minutes. Therefore, the delays at this intersection are not significant. All other movements operate at acceptable delay levels.

Terry Fox Drive at Legget Drive

The intersection of Terry Fox Drive at Legget Drive will generally operate at acceptable levels.

Terry Fox Drive and McKinley Drive

The intersection of Terry Fox Drive and McKinley Drive will operate at satisfactory levels of service five years after the site has been built-out.

Site Accesses

The northbound through movements at site accesses 1-4 currently (Figure 21) operate at or above theoretical capacity during the PM peak hour with delay of 1.2 minutes at the signalized access (March Road and Site Access 4).

The other study area intersections were found to operate at acceptable levels of service. The proposed development is not anticipated to have a substantial effect on the study area intersections

Table 19 summarizes the results of the Synchro analysis for the 2037 Ultimate intersection operations.

Table 19: 2037 Ultimate Intersection Operations

Intersection	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95th (m)
March Road and Morgan's Grant Way	Signalized	EB	Through	A (A)	0.31 (0.36)	52.7 (54.1)	28 (30)
			Right	A (A)	0.09 (0.05)	50.7 (51.1)	17 (11)
		WB	Left	B (A)	0.66 (0.58)	63.8 (60.1)	43 (37)
			Through	A (A)	0.09 (0.38)	50.7 (54.3)	11 (31)
			Right	A (A)	0.02 (0.29)	50.0 (53.5)	0 (30)
		NB	Left	A (B)	0.43 (0.67)	55.1 (67.3)	m16 (m71)
			Through	A (D)	0.38 (0.90)	8.0 (9.2)	m22 (m206)
			Right	A (A)	0.02 (0.13)	11.3 (0.1)	m0 (m0)
		SB	Left	B (B)	0.66 (0.66)	60.2 (60.2)	59 (59)
			Through	B (A)	0.68 (0.52)	14.6 (23.4)	175 (93)
			Right	A (A)	0.01 (0.01)	7.4 (17.0)	0 (0)
		Overall Intersection		**B (D)**	**0.70 (0.84)**	**18.6 (22.4)**	**-- (--)**
March Road and Terry Fox Drive	Signalized	EB	Left	D (C)	0.89 (0.77)	99.8 (63.7)	#42 (55)
			Through	B (A)	0.63 (0.29)	49.9 (46.3)	67 (29)
			Right	A (A)	0.42 (0.50)	46.7 (49.5)	44 (50)
		WB	Left	A (A)	0.59 (0.56)	67.4 (58.8)	19 (32)
			Through	A (A)	0.18 (0.56)	44.8 (52.8)	20 (46)
			Right	A (A)	0.04 (0.57)	43.5 (54.9)	0 (52)
		NB	Left	B (C)	0.67 (0.73)	56.1 (44.3)	#62 (m39)
			Through	C (F)	0.74 (1.18)	49.0 (124.1)	94 (m#276)
			Right	A (A)	0.14 (0.10)	14.3 (14.1)	14 (m4)
		SB	Left	D (B)	0.82 (0.64)	59.2 (58.6)	#163 (54)
			Through	E (B)	0.94 (0.63)	35.3 (46.4)	#209 (94)
			Right	A (A)	0.18 (0.13)	12.5 (92.7)	13 (27)
		Overall Intersection		**D (E)**	**0.89 (0.97)**	**44.2 (79.0)**	**-- (--)**
March Road and Solandt Road	Signalized	EB	Left	A (C)	0.55 (0.74)	70.1 (75.3)	21 (#53)
			Through	A (A)	0.44 (0.18)	54.1 (50.2)	39 (20)
			Right	A (A)	0.08 (0.53)	8.8 (11.8)	2 (34)
		WB	Left	A (F)	0.38 (1.54)	62.2 (313.3)	14 (#153)
			Through / Right	B (C)	0.68 (0.72)	63.0 (60.6)	56 (71)
		NB	Left	F (B)	1.76 (0.63)	405.7 (36.8)	#286 (#51)
			Through/Right	F (F)	1.24 (1.45)	145.4 (237.8)	#390 (#543)
		SB	Left	B (A)	0.62 (0.52)	57.9 (69.7)	#83 (#19)
			Through/Right	F (F)	1.37 (1.07)	204.9 (79.1)	#434 (#315)
		Overall Intersection		**F (F)**	**1.31 (1.36)**	**185.4 (161.3)**	**-- (--)**
Solandt Road and Legget Drive	Signalized	EB	Left	A (A)	0.40 (0.17)	9.5 (34.5)	27 (14)
			Through / Right	A (A)	0.39 (0.04)	9.3 (33.4)	27 (11)
		WB	Left	A (A)	0.03 (0.19)	7.7 (34.6)	3 (16)
			Through / Right	A (A)	0.03 (0.53)	7.7 (38.8)	3 (41)
		NB	Left	A (B)	0.34 (0.69)	11.8 (29.1)	16 (67)
			Through / Right	A (A)	0.38 (0.07)	11.7 (4.5)	26 (10)
		SB	Left	A (A)	0.01 (0.01)	10.0 (16.4)	2 (2)
			Through / Right	A (E)	0.55 (0.97)	13.2 (53.4)	38 (#211)
		Overall Intersection		**A (C)**	**0.47 (0.80)**	**10.9 (41.5)**	**-- (--)**
Terry Fox Drive and Legget Drive	Minor Stop	EB	Through / Right	A (A)	0.59 (0.02)	0.0 (0.5)	0 (0)
		WB	Left / Through	A (A)	0.08 (0.57)	3.3 (29.5)	2 (25.6)
		NB	Left / Right	A (A)	0.21 (0.12)	22.0 (0.0)	6 (0)
		Overall Intersection		**B (A)**	**0.65 (0.57)**	**1.5 (5.3)**	**-- (--)**
	Minor stop	WB	Right	A (A)	0.01 (0.01)	12.0 (0.0)	0 (0)
		NB	Through	A (F)	0.60 (1.05)	0.0 (0.0)	0 (0)

March Road & Site Access 1			Right	A (A)	0.49 (0.55)	0.0 (0.0)	0 (0)
		SB	**Through**	A (A)	0.0 (0.00)	0.0 (0.0)	0 (0)
		Overall Intersection		**A (D)**	**0.60 (0.81)**	**0.0 (0.0)**	**--(--)**
March and Site Access 2	Minor Stop	WB	Right	A (A)	0.01 (0.01)	11.2 (11.9)	0 (0)
		NB	Through	A (F)	0.52 (1.03)	0.0 (0.0)	0 (0)
			Right	A (A)	0.29 (0.53)	0.0 (0.0)	0 (0)
		SB	Left	A (A)	0.00 (0.00)	0.0 (0.0)	0 (0)
			Through	A (A)	0.00 (0.00)	0.0 (0.0)	0 (0)
		Overall Intersection		**A (C)**	**0.46 (0.80)**	**0.0 (0.0)**	**-- ()**
March Road and Site Access 3	Minor Stop	WB	Right	A (A)	0.03 (0.04)	11.1 (12.1)	1 (1)
		NB	Through	A (F)	0.52 (1.03)	0.0 (0.0)	0 (1)
			Right	A (A)	0.26 (0.52)	0.0 (0.0)	0 (0)
		SB	Left	A (A)	0.0 (0.00)	0.0 (0.0)	0 (0)
			Through	A (A)	0.0 (0.00)	0.0 (0.0)	0 (0)
		Overall Intersection		**A (C)**	**0.45 (0.79)**	**0.2 (0.1)**	**-- (--)**
March Road and Site Access 4	Signalized	EB	Left	A (A)	0.04 (0.09)	39.3 (40.5)	5 (5)
			Through	A (A)	0.03 (0.02)	39.2 (39.4)	6 (6)
		WB	Left	D (C)	0.81 (0.77)	64.3 (58.6)	#65 (82)
			Through	A (D)	0.12 (0.87)	39.9 (68.6)	18 (#113)
		NB	Left	A (A)	0.07 (0.05)	14.7 (3.6)	3 (m0)
			Through	C (F)	0.72 (1.14)	23.0 (73.8)	144 (m41)
			Right	A (A)	0.07 (0.16)	13.6 (0.4)	9 (m0)
		SB	Left	D (A)	0.83 (0.60)	57.9 (69.4)	#89 (m#24)
			Through	C (B)	0.76 (0.68)	9.7 (11.6)	145 (221)
		Overall Intersection		**C (F)**	**0.80 (1.06)**	**21.1 (48.6)**	**-- (--)**
Terry Fox Drive and McKinley Drive (Site Access 5)	Stop & Right in right out	EB	Left	A (A)	0.06 (0.03)	8.0 (9.8)	1.4 (0.7)
			Through/Right	A (A)	0.56 (0.27)	0.0 (0.0)	0.0 (0.0)
		WB	Right/Through	A (A)	0.16 (0.52)	0.0 (0.0)	0.0 (0.0)
		NB	Right	A (A)	0.02 (0.01)	16.2 (10.2)	0.4 (0.2)
		SB	Left/Right	C (A)	0.76 (0.32)	52.8 (21.1)	42.7 (10.2)
		Overall Intersection		C (B)	0.72 (0.58)	7.4 (1.7)	--(--)
Site Access 6	Signalized	EB	Left/Through/ Right	A (A)	0.48 (0.09)	15.8 (11.6)	20 (2)
		WB	Left/Through/ Right	A (A)	0.15 (0.37)	23.7 (22.3)	4 (13)
		NB	Left/Through/ Right	A (A)	0.02 (0.13)	2.8 (4.1)	1 (3)
		SB	Left/Through/ Right	A (A)	0.02 (0.01)	0.7 (0.7)	0 (0)
		Overall Intersection		**A (A)**	**0.45 (0.49)**	**7.5 (7.5)**	**-- (--)**
Legget Drive and Site Access 7	Minor Stop	EB		A (A)	0.08 (0.39)	12.8 (13.5)	2 (14)
		NB		A (A)	0.01 (0.00)	1.6 (0.0)	0 (0)
		SB		A (A)	0.41 (0.10)	0.0 (0.0)	0 (0)
		Overall Intersection		**A (A)**	**0.48 (0.32)**	**0.7 (5.5)**	**--(--)**
Legget Drive and Site Access 8	Minor Stop	EB	Left / Right	A (A)	0.06 (0.35)	10.8 (12.1)	2 (12)
		NB	Left/ Through	A (A)	0.00 (0.00)	1.0 (0.2)	0 (0)
		SB	Through/Right	A (A)	0.22 (0.13)	0.0 (0.0)	0 (0)
		Overall Intersection		**A (A)**	**0.29 (0.33)**	**1.1 (5.0)**	**--(--)**

Notes:

1. **Table format: AM (PM)**
2. **v/c – represents the anticipated volume divided by the predicted capacity**
3. **# 95th percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles**
4. **Level of Service (LOS) calculation is based on volume-to-capacity (v/c) ratios for signalized intersections and delays for unsignalized intersections**

Multi-Modal Level of Service Assessment- 2037 Ultimate MMLOS

A multi-modal level of service (MMLOS) assessment was completed for the signalized intersection within the study area under 2037 existing conditions. The results of this analyses can be found in **Table 20** below.

Table 20 - 2037 Ultimate – Multi- Modal Level of Service Assessment

Intersection		PLOS	BLOS	TLOS	TkLOS	VLOS
March Road at Morgan's Grant Way	Ultimate	F	F	C	C	F
	Target	C	B	D	D	D
March Road at Terry Fox Drive	Ultimate	F	F	C	A	F
	Target	C	B	D	B	D
March Road at Solandt Road	Ultimate	F	F	C	C	F
	Target	C	C	D	B	D
Solandt Road at Legget Drive	Ultimate	F	E	C	C	C
	Target	C	C	D	D	D

As per the City of Ottawa's TMP, the March Road Bus Rapid Transit (BRT) is scheduled to be implemented by 2031, between Solandt Road and Highway 417. The subject development is planned to be built and occupied by 2032. The office portion of the subject development is anticipated to be within 400m of the planned BRT station at Solandt Road. Per direction from the City of Ottawa, the March Road BRT, north of Solandt Road, is scheduled to occur beyond the horizons of this subject study (i.e., post 2037). The residential / retail portion of the subject development (north half) are not anticipated to be within 400m of a rapid transit station during the study horizons. As such, the modal shares for the northern and southern portions of the subject development will differ as a direct result of the implementation plan of the March Road BRT.

The multi-modal level of service (MMLOS) targets at intersections are determined by taking the most stringent of the MMLOS targets for each individual roadway segment.

<u>March Road and Morgan's Grant Way</u>

The Pedestrian Level of Service (PLOS) is projected to operate with a PLOS of F, which does not meet the desired target of C for both the Arterial and Collector Roadway. PLOS is largely influenced by the number of lanes pedestrians cross. Due to the nature of arterial roads, reducing the number of lanes at the intersection is not a feasible option. Incorporating other improvements such as pedestrian leading intervals or reducing the corner radii are not expected to highly improve the PLOS to the desired targets and will have minimal impacts to the PLOS.

The Ultimate Cycling Network from the City of Ottawa's Cycling Plan (2013) designates March Road as a spine cycling route. The intersection is therefore subject to a Bicycle Level of Service (BLOS) target of D.

The Vehicular Level of Service (VLOS) is projected to operate with a VLOS of F, which does not meet the desired target of D. Increasing the number of lanes at this intersection would increase capacity and thus improve the VLOS, however, it would be to the detriment of the other modes of transportation and is therefore not recommended.

Once the aforementioned transit priority measures and BRT are completed, the operations and lane geometry at this intersection will change. It is therefore not recommended to address the MMLOS at this time.

The March Road BRT will support growth along March Road, by providing fast, reliable, comfortable service which is an attractive alternative to the automobile; and supplying increased transportation network capacity necessary to support increased development densities in designated areas including this proposed development.

March Road and Terry Fox Drive

The intersection of March Road and Terry Fox Drive is situated in an Urban Employment Area with March Road being classified as an arterial roadway and Terry Fox Drive classified as a major collector roadway across the frontage of the subject site. Based on these classifications, the governing Pedestrian Level of Service (PLOS) target is C (for a Urban Employment Area). The intersection of March Road and Terry Fox Drive is projected to operate with a Pedestrian Level of Service (PLOS) of F, which does not meet the target of C. This is attributed to the 130s cycle length during the PM peak period coupled with the short effective walk times in the east-west direction due to the 28s phase length. Another contributing factor is the high number of lanes that have to be crossed by pedestrians (10+ lanes) along all the legs of the intersection. Reducing the cycle length and the number of lanes on March Road and Terry Fox Drive and incorporating raised crosswalks at this intersection would improve the PLOS based on the PETSI score. To improve the PLOS based on the pedestrian delay, the cycle length would need to be greatly reduced. Although these methods would improve the PLOS at this intersection, they are not feasible options as they would be to the detriment of the vehicles. It is noted that the future March Road cross section (2031 and beyond) will see different infrastructure and lane arrangements.

The Bicycle Level of Service (BLOS) at the intersection of March Road and Terry Fox Drive is projected to operate with a BLOS of F, which does not meet the target of B. Methods for improving the BLOS at this intersection include reducing the speed limit and number of lanes along March Road and Terry Fox Drive, but this approach is not feasible as it would be to the detriment of the vehicles on the roadway. Another method for improving the BLOS operations would be to install multi-use pathways with two-stage left turns. It is noted that the future March Road cross section (2031 and beyond) will see different infrastructure and lane arrangements.

Once the aforementioned transit priority measures and BRT are completed, the operations and lane geometry at this intersection will change. It is therefore not recommended to address the MMLOS at this time.

March Road at Solandt Road

The Pedestrian Level of Service (PLOS) is projected to operate with a PLOS of F, which does not meet the desired target of C. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross. Due to the nature of arterial roads, reducing the number of lanes at the intersection is not a feasible

option. Incorporating other improvements such as pedestrian leading intervals or reducing the corner radii are not expected to highly improve the PLOS to the desired targets and will have minimal impacts to the PLOS.

The Bicycle Level of Service (BLOS) at the intersection of March Road and Solandt Road is projected to operate with a BLOS of F, which does not meet the target of C. Methods for improving the BLOS at this intersection include reducing the speed limit and number of lanes along March Road and Solandt Road, but this approach is not feasible as it would be to the detriment of the vehicles on the roadway. Another method for improving the BLOS operations would be to install multi-use pathways with two-stage left turns. It is noted that the future March Road cross section (2031 and beyond) will see different infrastructure and lane arrangements.

The Transit Level of Service (TLOS) at the intersection of March Road and Solandt Road is projected to operate with a TLOS of C, which meets the target of D.

The Truck Level of Service (TkLOS) at the intersection of March Road and Solandt Road is projected to operate with a TkLOS of C, which meets the desired target of D.

The Vehicular Level of Service (VLOS) is projected to operate with a VLOS of F, which does not meet the desired target of D. Increasing the number of lanes at this intersection would increase capacity and thus improve the VLOS, however, would not be possible with the implementation of the March Road BRT. It is anticipated that as transit ridership increases the VLOS will improve.

Solandt Road at Legget Drive

The PLOS is projected to operate with a PLOS of F, which does not meet the desired target of C. No conceptual measures will reduce the pedestrian crossing delay and no geometric changes will improve the PETSE scores.

Solandt at Legget Drive is projected to be a local route by the City of Ottawa's Ultimate Cycling Plan which is likely to improve the level of service to meet the target of C for the Bicycle Level of Service (BLOS) at the intersection of Solandt Road and Legget Drive

The Transit Level of Service (TLOS), Truck Level of Service (TkLOS) and Vehicular Level of Service (VLOS) all meet the required targets for their respective roadways.

4.9.3 Summary of Required Road Improvements

According to *Appendix E of the March Road BRT* study, the implementation of the March Road BRT will significantly assist in buses encountering less delays when operating in a dedicated transit facility compared to a mixed-use roadway. The queue length transit priority measure up-stream of March/Solandt intersection was found to have limited benefit because of the residual northbound left- turning queues at March and Terry Fox Drive intersection. There is also an opportunity to minimize the impact of auto delays/queues by providing a two-stage pedestrian crossing associated with a median in place. Reducing the east/west pedestrian clearance times to facilitate the two-stage pedestrian crossing, green time can be provided to the major northbound and south bound movements in form of additional capacity.

The construction of the March Road BRT improves the modal splits from Section 4.2 (Table 8) of the *TRANS Trip Generation Summary Report* reducing the auto driver split for the area by 12% and increasing the transit split by 12%

for the office trips and 9% increase in transit split percentage for retail trips. The supplemental transportation demand management measures discussed in **Section 4.5** are expected to reduce the auto trips generated by the proposed development in the future.

5.0 SUMMARY AND CONCLUSIONS

This Transportation Impact Assessment (TIA) was prepared in support of a Zoning By-Law Amendment application for a proposed mixed-use development to be build out by 2032. The proposed development is located at 600 March Road (southeast quadrant of the March Road at Terry Fox Drive intersection) in the Brookside-Briarbrook-Morgan's Grant community in Kanata, Ontario. The current development concept consists of eleven residential buildings, six of which have a commercial component, as well as two office buildings, which both have a commercial component. It should be noted that this concept plan is subject to change as the development proceeds through the approvals process. The site is bound by an existing office building to the south, March Road to the west, Legget Drive to the east, and Terry Fox Drive to the north.

Bicycle lanes will be provided along the March Road corridor to encourage active mode of transportation within the area. Bicycle lanes will be designed as a segregated facility during detail design stage of the project.

The March Road BRT will support growth along March Road, by providing fast, reliable, comfortable service which is an attractive alternative to the automobile; and supplying increased transportation network capacity necessary to support increased development densities in designated areas including this proposed development.

The proposed development is anticipated to generate 1358 and 1305 net new auto trips (two-way) during the AM and PM peak hours, respectively. As the subject site currently includes office space, the trip generation for the existing office building was calculated to be 552 during the am peak hour and 442 during the pm peak hour and subsequently removed from the transportation network. This is to avoid double counting the future trips associated with this development parcel.

The trip generation accounted for transit modal shares observed in the TRANS 2011 O-D Survey, and as such, resulted in a slightly conservative analysis of total and ultimate future conditions, however due to the construction of the March Road BRT, the targets were adjusted accordingly reducing the auto driver split by 12% and increasing the transit split by 12% for the office trips and 9% increase in transit split percentage for retail trips. The supplemental transportation demand management measures discussed in **Section 4.5** are expected to reduce the auto trips generated by the proposed development in the future.

Applying the concept of demand rationalization, the traffic was reduced by 15% during the year 2032 due to peak spreading (flexible work schedules), telecommuting, and the expansion of the BRT line to the west.

The analysis of the study area intersections under the base year (2032 background traffic) conditions found that the signalized intersection of March Road and Terry Fox Drive has a number of movements that are expected to operate at capacity with an overall LOS of E during both the AM and PM peak hours. The southbound left movement was found to operate with a v/c ratio of 1.14 and a delay of 136s. At the signalized intersection of March Road and Solandt Road,

the analysis found that the overall intersection LOS is F during both the AM and PM peak hours. The westbound and northbound left turn movements will operate over capacity with excessive delays during both AM and PM peak hours. All remaining study area intersections were found to operate satisfactorily.

Under the 2032 total future conditions, carrying forward the demand rationalization and signal timing plan improvements from the future background conditions, the analysis found that the operations in the study area are not projected to significantly change as a result of the addition of the site traffic. The signalized intersection of March Road and Terry Fox Drive has a number of movements that are expected to operate at capacity with an overall intersection LOS of E during both the AM and PM peak hours. The signalized intersection of March Road and Solandt Drive will continue to operate with several movements over capacity and overall intersection LOS of F during both the AM and PM Peak hours. The newly signalized intersection of March Road and Ste Access #4 along with the remaining study area intersections are anticipated to operate satisfactorily.

Under the 2037 ultimate future conditions, March Road in the vicinity of the subject site is expected to see numerous cross-sectional changes. By this horizon, the median BRT system is anticipated to be finalized.

Traffic operations under the 2037 ultimate horizon are similar to that of the 2032 total traffic horizon. The intersection operations of March Road and Terry Fox Drive will slightly improve with an overall intersection LOS D during the AM peak hour and E during the PM peak hour. The intersection of March Road and Solandt Drive will continue to operate at LOS F during both the AM and PM peak hours with slight improvements to the delays at the intersection in both the northbound and southbound directions.

The TMP sets the objective of increasing the walking modal share across the city from 9.5% in 2011 to 10% in 2031 for the morning peak period. This increase reflects the City's strategic direction to build compact, mixed-use developments. In 2009, the City released the final Ottawa Pedestrian Plan. The goals and objectives of the plan include recommendations to:

- Increase the pedestrian modal share across the city.
- Develop and integrated network of pedestrian facilities that includes sidewalks, pathways and pedestrian friendly spaces throughout the city, providing connections to important destinations and transit facilities.

Considering this and the future BRT Sidewalks will be widened and enhanced ladder style crosswalks at intersections installed that will encourage pedestrian activity. Achieving target PLOS is difficult along the corridor due to the crossing distances. This development will benefit from these enhancements.

The future plans for March Road by the city is for bicycle lanes to be provided along the corridor to encourage active mode of transportation within the area. Bicycle lanes are planned to be designed as a segregated facility during detail design stage of the project. Separating the cycling facility from the general purpose lanes will help increase the BLOS. This development will benefit from these enhancements.

The March Road BRT will support growth along March Road, by providing fast, reliable, comfortable service which is an attractive alternative to the automobile; and supplying increased transportation network capacity necessary to support increased development densities in designated areas including this proposed development.

In conclusion, the analysis found that the background traffic in the area is a major factor behind the deteriorated operations at the intersections Terry Fox and March Road, and March Road and Solandt Road. The development generated site traffic was found to result in some impact to the overall traffic operations in the area. The analysis found that with signal timing and offset optimizations, the signalized study area intersections are projected to operate acceptably. From a transportation standpoint, the proposed development at 600 March Road can be accommodated by the future transportation network without requiring geometric improvements. Signal timing plan improvements are anticipated to be required by the years 2032 and 2037.

Appendix A TRAFFIC DATA

Transportation Services - Traffic Services

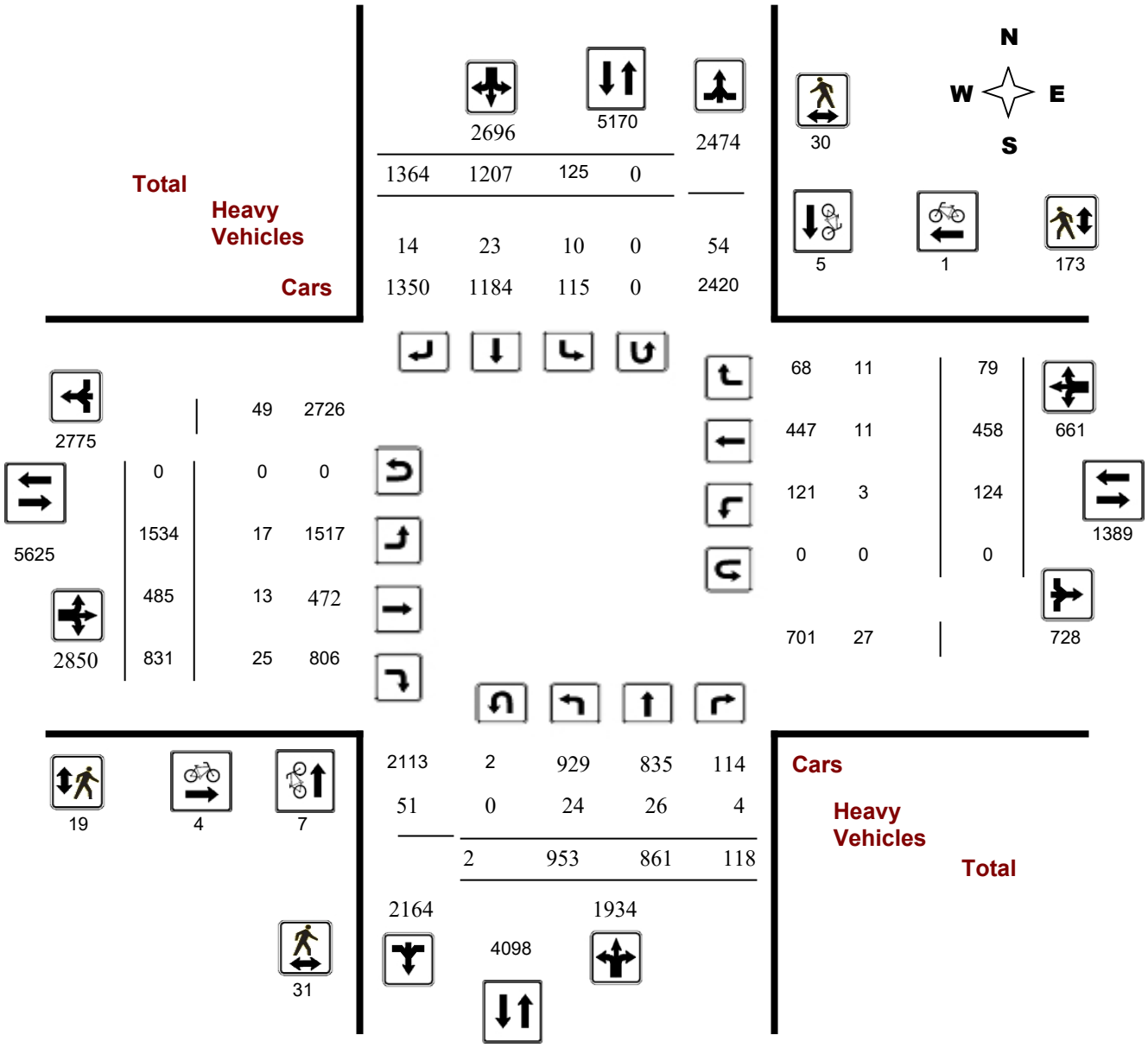
Turning Movement Count - Study Results

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017
Start Time: 07:00

WO No: 36905
Device: Miovision

Full Study Diagram



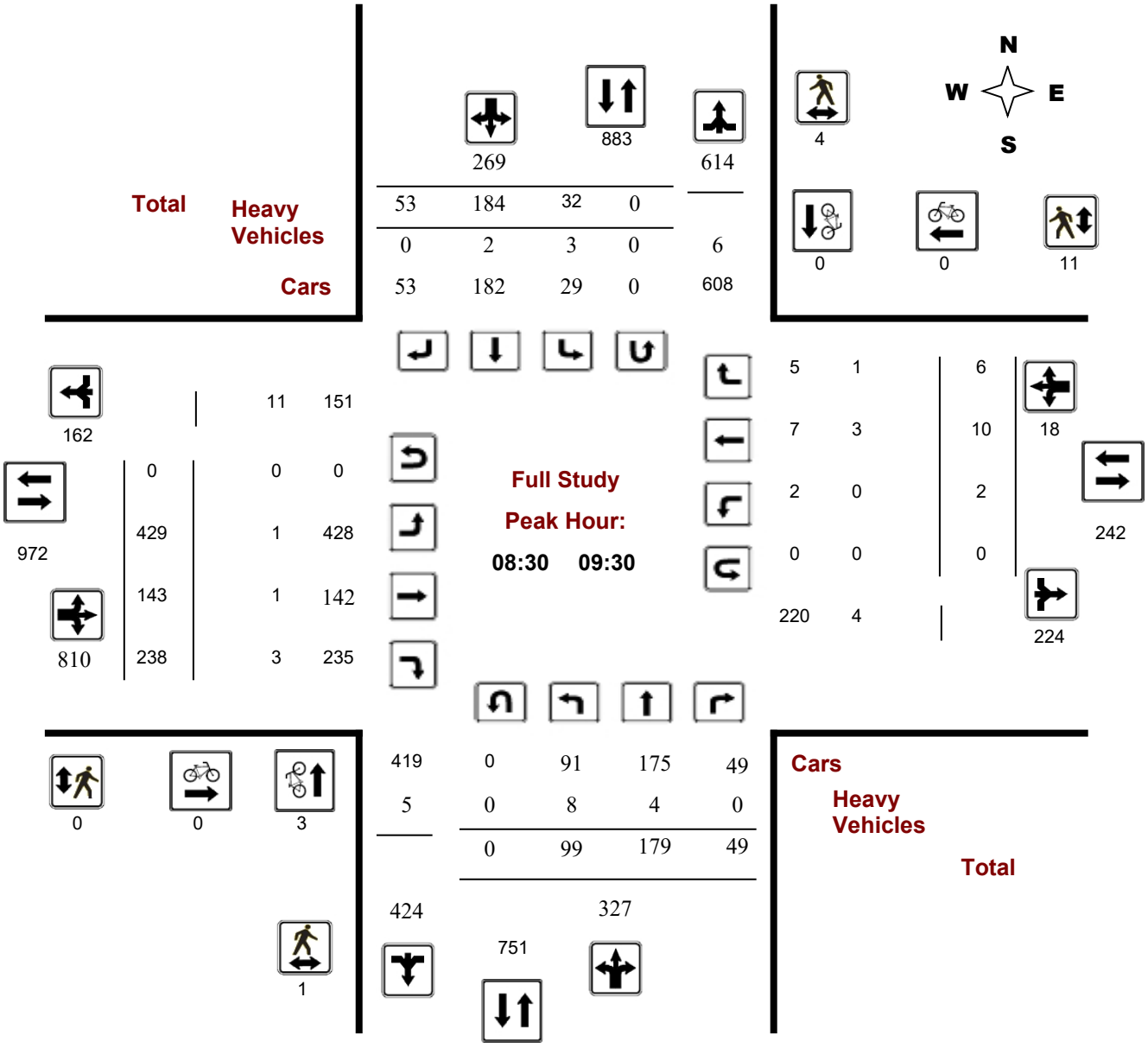
Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017
Start Time: 07:00
WO No: 36905
Device: Miovision

Full Study Peak Hour Diagram



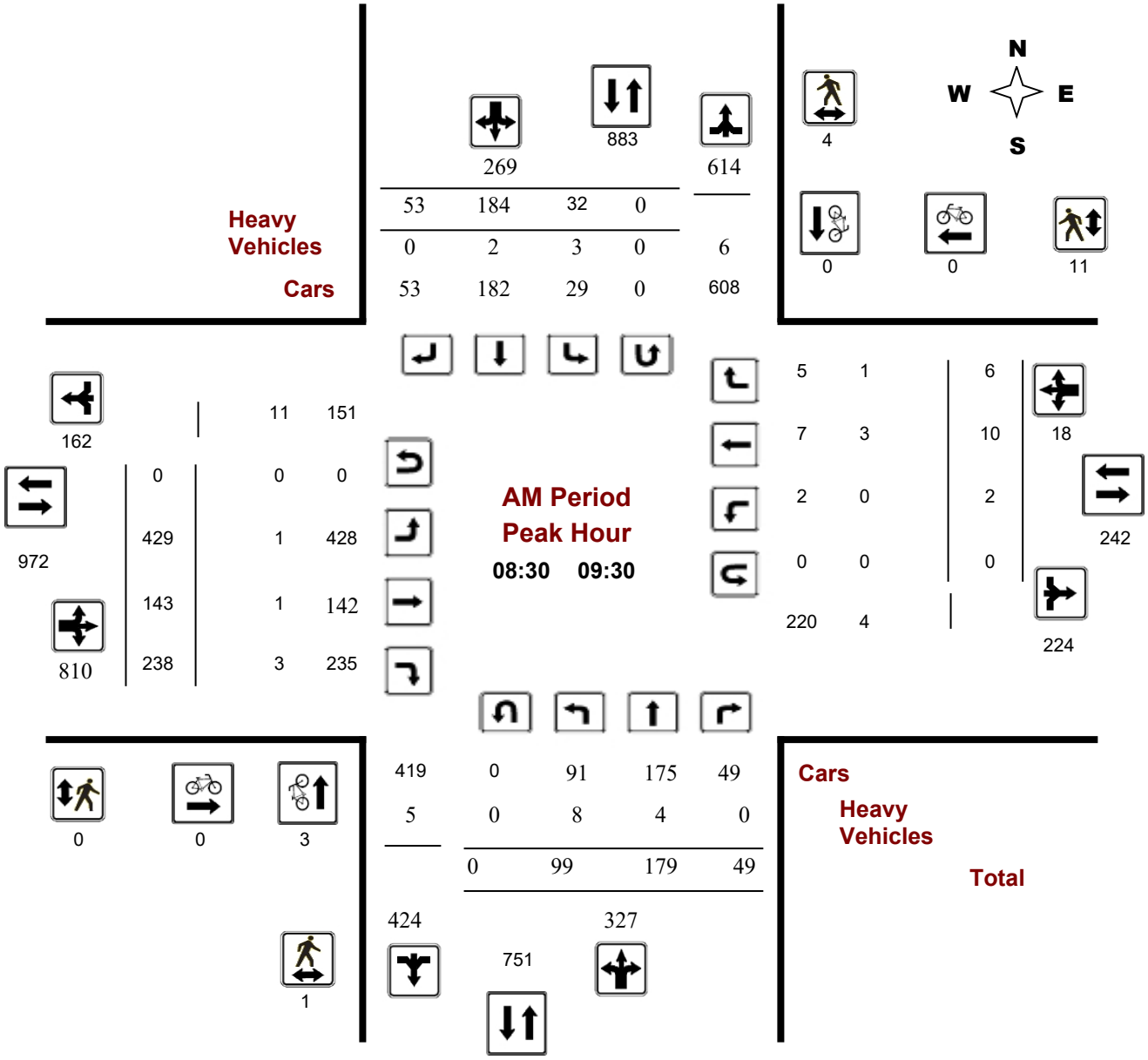
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017
Start Time: 07:00

WO No: 36905
Device: Miovision



Comments

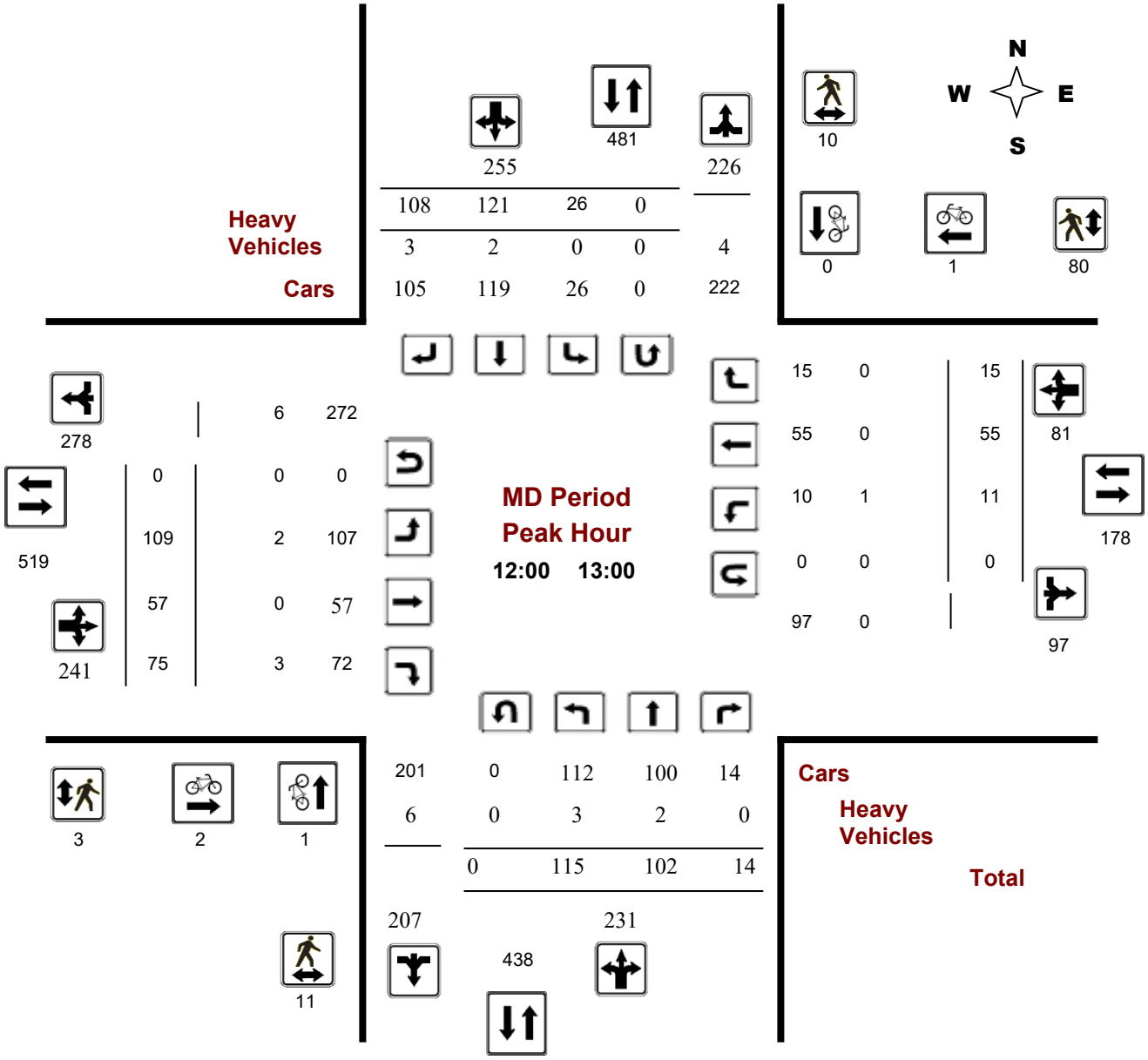
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017
Start Time: 07:00

WO No: 36905
Device: Miovision



Comments

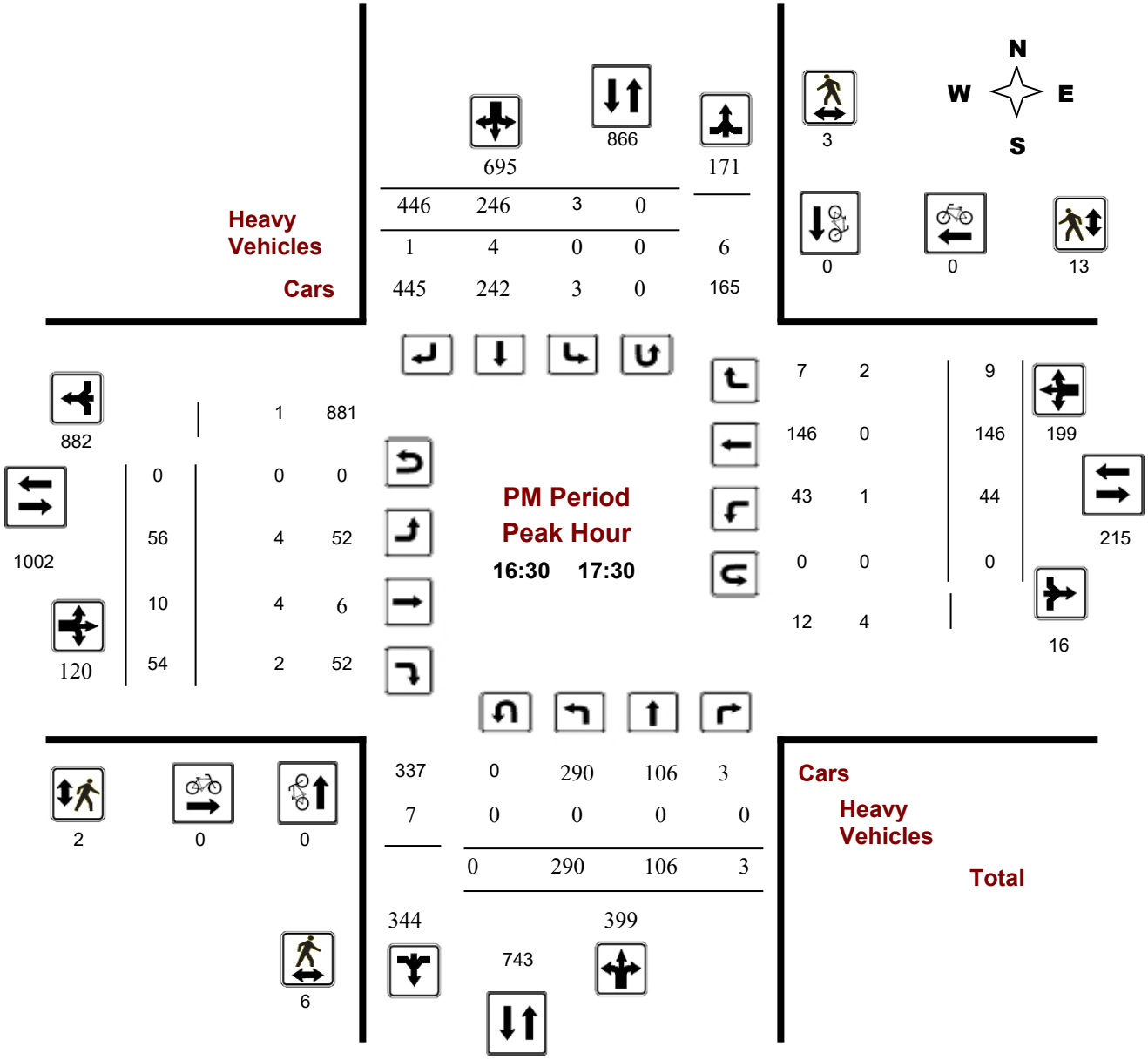
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017 **WO No:** 36905

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017 **WO No:** 36905

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, April 11, 2017

Total Observed U-Turns

Northbound: 2 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor

.90

	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	25	100	12	**137**	11	98	36	**145**	**282**	309	86	137	**532**	3	6	3	**12**	**544**	**826**
08:00 09:00	84	161	36	**281**	37	207	59	**303**	**584**	427	147	213	**787**	5	8	3	**16**	**803**	**1387**
09:00 10:00	69	147	37	**253**	29	132	49	**210**	**463**	372	113	173	**658**	1	17	6	**24**	**682**	**1145**
11:30 12:30	129	116	13	**258**	14	89	131	**234**	**492**	91	37	47	**175**	13	68	25	**106**	**281**	**773**
12:30 13:30	68	68	12	**148**	23	117	94	**234**	**382**	131	67	110	**308**	7	35	8	**50**	**358**	**740**
15:00 16:00	96	67	4	**167**	5	110	201	**316**	**483**	90	12	52	**154**	23	54	12	**89**	**243**	**726**
16:00 17:00	212	96	3	**311**	5	238	419	**662**	**973**	74	12	43	**129**	35	124	17	**176**	**305**	**1278**
17:00 18:00	270	106	1	**377**	1	216	375	**592**	**969**	40	11	56	**107**	37	146	5	**188**	**295**	**1264**
Sub Total	953	861	118	**1932**	125	1207	1364	**2696**	**4628**	1534	485	831	**2850**	124	458	79	**661**	**3511**	**8139**
U Turns	2			**2**	0			**0**	**2**	**0**			**0**	0			**0**	**0**	**2**
Total	955	861	118	**1934**	125	1207	1364	**2696**	**4630**	1534	485	831	**2850**	124	458	79	**661**	**3511**	**8141**
EQ 12Hr	1327	1197	164	**2688**	174	1678	1896	**3748**	**6436**	2132	674	1155	**3961**	172	637	110	**919**	**4880**	**11316**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	1194	1077	148	**2419**	157	1510	1706	**3373**	**5792**	1919	607	1040	**3566**	155	573	99	**827**	**4393**	**10185**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	1564	1411	194	**3169**	206	1978	2235	**4419**	**7588**	2514	795	1362	**4671**	203	751	130	**1084**	**5755**	**13343**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017 **WO No:** 36905

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

Time Period		Northbound				Southbound					Eastbound				Westbound					
		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	9	19	3	31	2	16	7	25	**56**	40	11	27	78	1	3	0	4	**82**	**138**
07:15	07:30	5	17	6	28	4	23	4	31	**59**	72	16	22	110	1	2	1	4	**114**	**173**
07:30	07:45	7	32	2	41	3	29	8	40	**81**	77	29	31	137	1	1	1	3	**140**	**221**
07:45	08:00	5	32	1	38	2	30	17	49	**87**	120	30	57	207	0	0	1	1	**208**	**295**
08:00	08:15	13	32	13	58	3	45	12	60	**118**	116	39	43	198	2	3	0	5	**203**	**321**
08:15	08:30	17	35	5	57	16	61	15	92	**149**	104	42	50	196	1	0	1	2	**198**	**347**
08:30	08:45	27	47	10	84	10	59	14	83	**167**	105	35	62	202	1	1	1	3	**205**	**372**
08:45	09:00	27	47	8	82	8	42	18	68	**150**	102	31	58	191	1	4	1	6	**197**	**347**
09:00	09:15	23	35	18	76	6	38	11	55	**131**	108	49	59	216	0	1	0	1	**217**	**348**
09:15	09:30	22	50	13	85	8	45	10	63	**148**	114	28	59	201	0	4	4	8	**209**	**357**
09:30	09:45	13	34	4	51	10	27	16	53	**104**	81	20	35	136	0	8	1	9	**145**	**249**
09:45	10:00	11	28	2	41	5	22	12	39	**80**	69	16	20	105	1	4	1	6	**111**	**191**
11:30	11:45	34	19	5	58	0	18	34	52	**110**	24	5	11	40	4	17	6	27	**67**	**177**
11:45	12:00	28	30	1	59	2	17	37	56	**115**	23	7	16	46	2	18	7	27	**73**	**188**
12:00	12:15	39	39	1	79	7	23	38	68	**147**	22	8	10	40	3	25	4	32	**72**	**219**
12:15	12:30	29	28	6	63	5	31	22	58	**121**	22	17	10	49	4	8	8	20	**69**	**190**
12:30	12:45	27	16	1	44	6	30	28	64	**108**	32	17	25	74	3	17	1	21	**95**	**203**
12:45	13:00	20	19	6	45	8	37	20	65	**110**	33	15	30	78	1	5	2	8	**86**	**196**
13:00	13:15	14	15	2	31	4	26	25	55	**86**	38	24	32	94	2	4	4	10	**104**	**190**
13:15	13:30	7	18	3	28	5	24	21	50	**78**	28	11	23	62	1	9	1	11	**73**	**151**
15:00	15:15	23	15	3	41	1	13	32	46	**87**	13	4	14	31	5	7	3	15	**46**	**133**
15:15	15:30	15	17	0	32	3	24	45	72	**104**	16	1	13	30	2	13	3	18	**48**	**152**
15:30	15:45	26	17	0	43	1	31	70	102	**145**	35	5	10	50	11	24	2	37	**87**	**232**
15:45	16:00	32	18	1	51	0	42	54	96	**147**	26	2	15	43	5	10	4	19	**62**	**209**
16:00	16:15	40	26	1	67	1	68	115	184	**251**	22	5	11	38	7	33	8	48	**86**	**337**
16:15	16:30	52	22	0	74	2	49	83	134	**208**	16	3	11	30	5	28	1	34	**64**	**272**
16:30	16:45	52	25	2	79	2	56	104	162	**241**	21	1	7	29	13	34	4	51	**80**	**321**
16:45	17:00	68	23	0	91	0	65	117	182	**273**	15	3	14	32	10	29	4	43	**75**	**348**
17:00	17:15	94	31	1	126	0	66	121	187	**313**	12	3	13	28	9	46	0	55	**83**	**396**
17:15	17:30	76	27	0	103	1	59	104	164	**267**	8	3	20	31	12	37	1	50	**81**	**348**
17:30	17:45	56	26	0	82	0	54	83	137	**219**	10	3	12	25	10	38	2	50	**75**	**294**
17:45	18:00	44	22	0	66	0	37	67	104	**170**	10	2	11	23	6	25	2	33	**56**	**226**
Total:		955	861	118	1934	125	1207	1364	2696	**4630**	1534	485	831	2850	124	458	79	661	**4630**	**8,141**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017 **WO No:** 36905

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	1	0	**1**	0	0	**0**	**1**
07:15	07:30	0	0	**0**	0	0	**0**	**0**
07:30	07:45	0	1	**1**	0	0	**0**	**1**
07:45	08:00	1	0	**1**	0	0	**0**	**1**
08:00	08:15	0	0	**0**	0	0	**0**	**0**
08:15	08:30	0	0	**0**	1	0	**1**	**1**
08:30	08:45	0	0	**0**	0	0	**0**	**0**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	3	0	**3**	0	0	**0**	**3**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	1	0	**1**	1	0	**1**	**2**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	0	0	**0**	**0**
12:00	12:15	1	0	**1**	0	1	**1**	**2**
12:15	12:30	0	0	**0**	0	0	**0**	**0**
12:30	12:45	0	0	**0**	1	0	**1**	**1**
12:45	13:00	0	0	**0**	1	0	**1**	**1**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	0	**0**	0	0	**0**	**0**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	0	0	**0**	0	0	**0**	**0**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	0	0	**0**	0	0	**0**	**0**
17:00	17:15	0	0	**0**	0	0	**0**	**0**
17:15	17:30	0	0	**0**	0	0	**0**	**0**
17:30	17:45	0	3	**3**	0	0	**0**	**3**
17:45	18:00	0	1	**1**	0	0	**0**	**1**
Total		7	5	**12**	4	1	**5**	**17**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017 **WO No:** 36905

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	**0**	0	0	**0**	**0**
07:15 07:30	0	0	**0**	0	1	**1**	**1**
07:30 07:45	0	1	**1**	1	2	**3**	**4**
07:45 08:00	0	0	**0**	0	0	**0**	**0**
08:00 08:15	3	3	**6**	0	7	**7**	**13**
08:15 08:30	2	2	**4**	2	2	**4**	**8**
08:30 08:45	0	1	**1**	0	1	**1**	**2**
08:45 09:00	0	2	**2**	0	1	**1**	**3**
09:00 09:15	1	1	**2**	0	2	**2**	**4**
09:15 09:30	0	0	**0**	0	7	**7**	**7**
09:30 09:45	0	0	**0**	0	0	**0**	**0**
09:45 10:00	0	0	**0**	0	2	**2**	**2**
11:30 11:45	1	2	**3**	0	5	**5**	**8**
11:45 12:00	1	1	**2**	2	10	**12**	**14**
12:00 12:15	0	1	**1**	1	14	**15**	**16**
12:15 12:30	4	0	**4**	1	23	**24**	**28**
12:30 12:45	3	5	**8**	0	23	**23**	**31**
12:45 13:00	4	4	**8**	1	20	**21**	**29**
13:00 13:15	0	2	**2**	1	11	**12**	**14**
13:15 13:30	1	0	**1**	0	5	**5**	**6**
15:00 15:15	2	2	**4**	0	5	**5**	**9**
15:15 15:30	0	0	**0**	0	4	**4**	**4**
15:30 15:45	0	0	**0**	5	0	**5**	**5**
15:45 16:00	0	0	**0**	0	3	**3**	**3**
16:00 16:15	1	0	**1**	0	1	**1**	**2**
16:15 16:30	0	0	**0**	0	3	**3**	**3**
16:30 16:45	1	0	**1**	0	2	**2**	**3**
16:45 17:00	1	1	**2**	0	3	**3**	**5**
17:00 17:15	2	0	**2**	0	3	**3**	**5**
17:15 17:30	2	2	**4**	2	5	**7**	**11**
17:30 17:45	2	0	**2**	2	7	**9**	**11**
17:45 18:00	0	0	**0**	1	1	**2**	**2**
Total	31	30	**61**	19	173	**192**	**253**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017 **WO No:** 36905

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

Time Period		Northbound				Southbound					Eastbound				Westbound					
		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	1	2	1	**4**	0	1	2	**3**	**7**	0	0	1	**1**	0	0	0	**0**	**1**	**8**
07:15	07:30	1	2	0	**3**	0	0	1	**1**	**4**	0	1	1	**2**	1	0	0	**1**	**3**	**7**
07:30	07:45	0	3	0	**3**	1	0	0	**1**	**4**	0	0	0	**0**	0	1	1	**2**	**2**	**6**
07:45	08:00	1	1	0	**2**	0	0	1	**1**	**3**	0	0	1	**1**	0	0	0	**0**	**1**	**4**
08:00	08:15	0	1	0	**1**	1	0	0	**1**	**2**	1	0	0	**1**	0	1	0	**1**	**2**	**4**
08:15	08:30	0	0	0	**0**	1	0	0	**1**	**1**	1	0	1	**2**	0	0	0	**0**	**2**	**3**
08:30	08:45	2	3	0	**5**	0	0	0	**0**	**5**	1	0	0	**1**	0	1	0	**1**	**2**	**7**
08:45	09:00	3	0	0	**3**	1	0	0	**1**	**4**	0	1	1	**2**	0	1	0	**1**	**3**	**7**
09:00	09:15	1	1	0	**2**	0	1	0	**1**	**3**	0	0	2	**2**	0	0	0	**0**	**2**	**5**
09:15	09:30	2	0	0	**2**	2	1	0	**3**	**5**	0	0	0	**0**	0	1	1	**2**	**2**	**7**
09:30	09:45	0	2	0	**2**	0	1	1	**2**	**4**	0	0	1	**1**	0	1	0	**1**	**2**	**6**
09:45	10:00	1	2	0	**3**	1	1	1	**3**	**6**	1	0	1	**2**	0	1	0	**1**	**3**	**9**
11:30	11:45	2	1	2	**5**	0	2	1	**3**	**8**	0	1	1	**2**	0	2	0	**2**	**4**	**12**
11:45	12:00	1	1	0	**2**	0	2	0	**2**	**4**	0	0	1	**1**	0	0	0	**0**	**1**	**5**
12:00	12:15	1	0	0	**1**	0	0	2	**2**	**3**	1	0	1	**2**	1	0	0	**1**	**3**	**6**
12:15	12:30	0	1	0	**1**	0	1	0	**1**	**2**	1	0	0	**1**	0	0	0	**0**	**1**	**3**
12:30	12:45	1	0	0	**1**	0	0	1	**1**	**2**	0	0	2	**2**	0	0	0	**0**	**2**	**4**
12:45	13:00	1	1	0	**2**	0	1	0	**1**	**3**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
13:00	13:15	1	0	0	**1**	0	0	0	**0**	**1**	1	0	1	**2**	0	0	1	**1**	**3**	**4**
13:15	13:30	0	1	1	**2**	0	1	0	**1**	**3**	0	0	1	**1**	0	0	0	**0**	**1**	**4**
15:00	15:15	1	0	0	**1**	0	0	0	**0**	**1**	1	1	1	**3**	0	0	1	**1**	**4**	**5**
15:15	15:30	1	2	0	**3**	1	2	0	**3**	**6**	0	0	0	**0**	0	1	1	**2**	**2**	**8**
15:30	15:45	2	1	0	**3**	1	1	1	**3**	**6**	1	1	3	**5**	0	0	0	**0**	**5**	**11**
15:45	16:00	0	0	0	**0**	0	1	0	**1**	**1**	2	0	1	**3**	0	0	1	**1**	**4**	**5**
16:00	16:15	1	0	0	**1**	1	1	0	**2**	**3**	2	1	0	**3**	0	1	2	**3**	**6**	**9**
16:15	16:30	0	0	0	**0**	0	1	2	**3**	**3**	0	1	1	**2**	0	0	0	**0**	**2**	**5**
16:30	16:45	0	0	0	**0**	0	1	0	**1**	**1**	2	0	0	**2**	0	0	0	**0**	**2**	**3**
16:45	17:00	0	0	0	**0**	0	1	1	**2**	**2**	1	2	1	**4**	0	0	1	**1**	**5**	**7**
17:00	17:15	0	0	0	**0**	0	1	0	**1**	**1**	1	1	1	**3**	0	0	0	**0**	**3**	**4**
17:15	17:30	0	0	0	**0**	0	1	0	**1**	**1**	0	1	0	**1**	1	0	1	**2**	**3**	**4**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	1	**2**	0	0	0	**0**	**2**	**2**
17:45	18:00	0	1	0	**1**	0	1	0	**1**	**2**	0	1	0	**1**	0	0	1	**1**	**2**	**4**
Total:	None	24	26	4	**54**	10	23	14	**47**	**101**	17	13	25	**55**	3	11	11	**25**	**80**	**181**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ SOLANDT RD

Survey Date: Tuesday, April 11, 2017 **WO No:** 36905

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	1	0	0	0	**1**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	1	0	0	0	**1**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		2	0	0	0	**2**

Transportation Services - Traffic Services

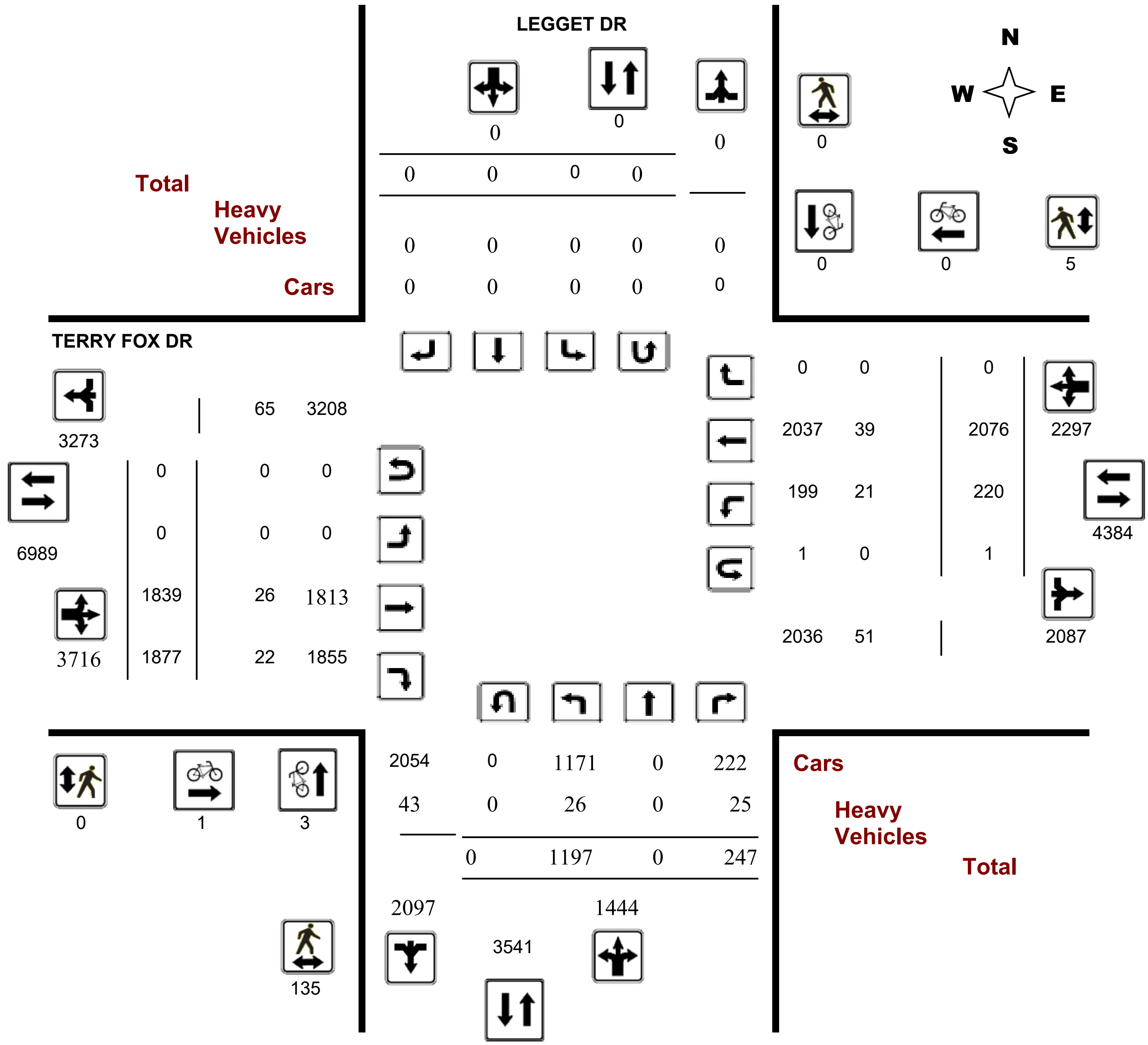
Turning Movement Count - Study Results

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019 **WO No:** 38360

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



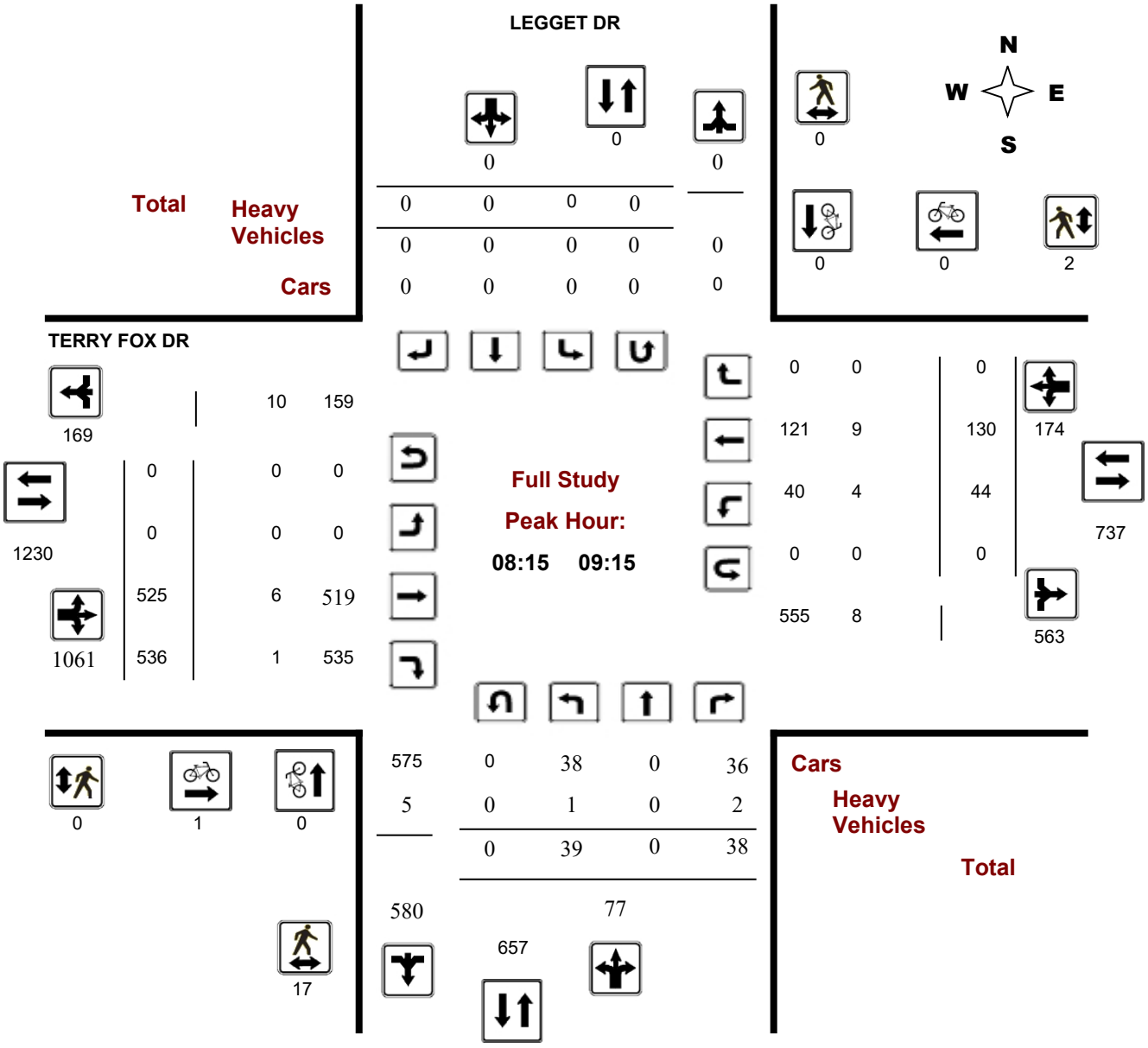
Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019
Start Time: 07:00
WO No: 38360
Device: Miovision

Full Study Peak Hour Diagram



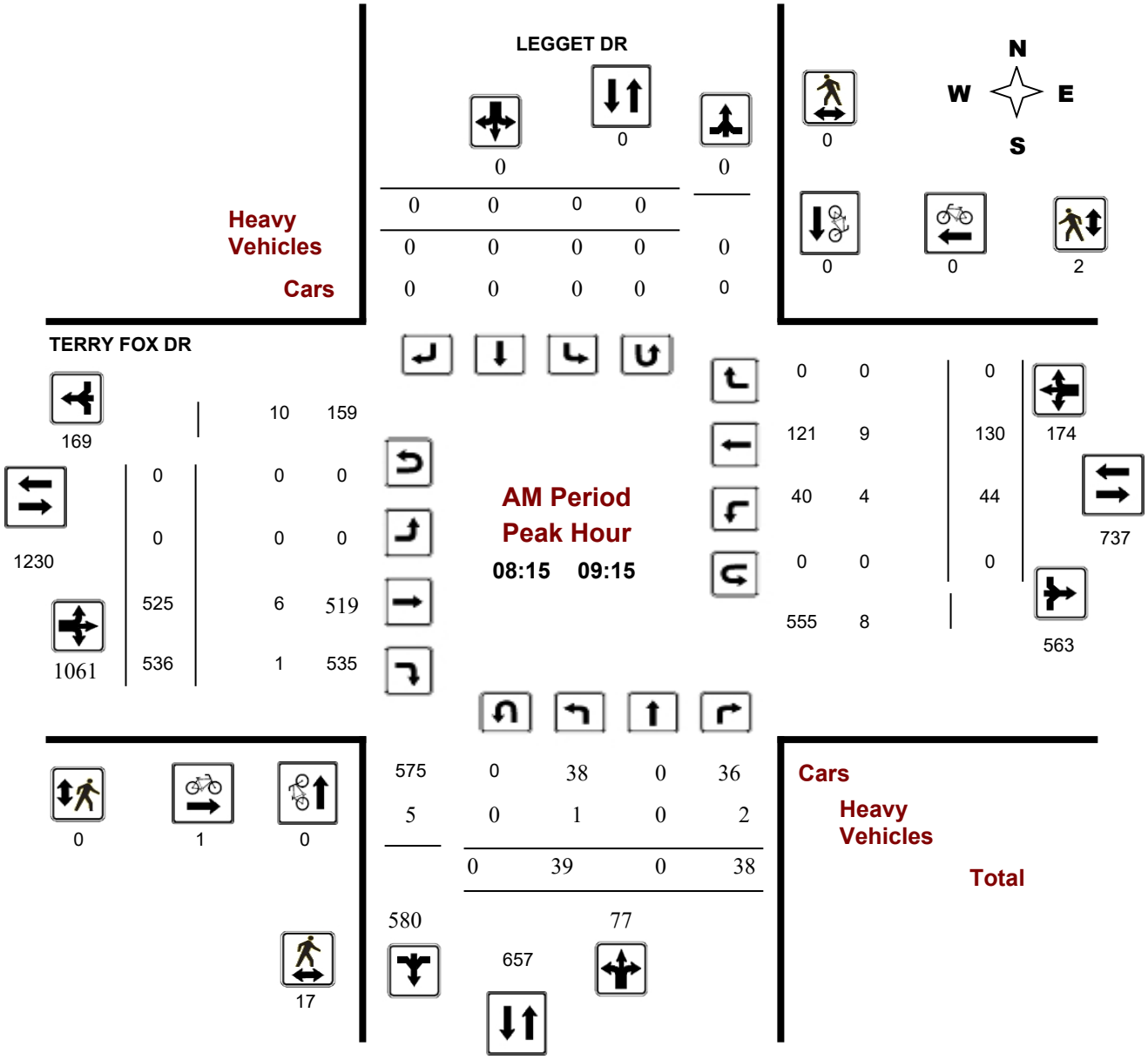
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019 **WO No:** 38360

Start Time: 07:00 **Device:** Miovision



Comments

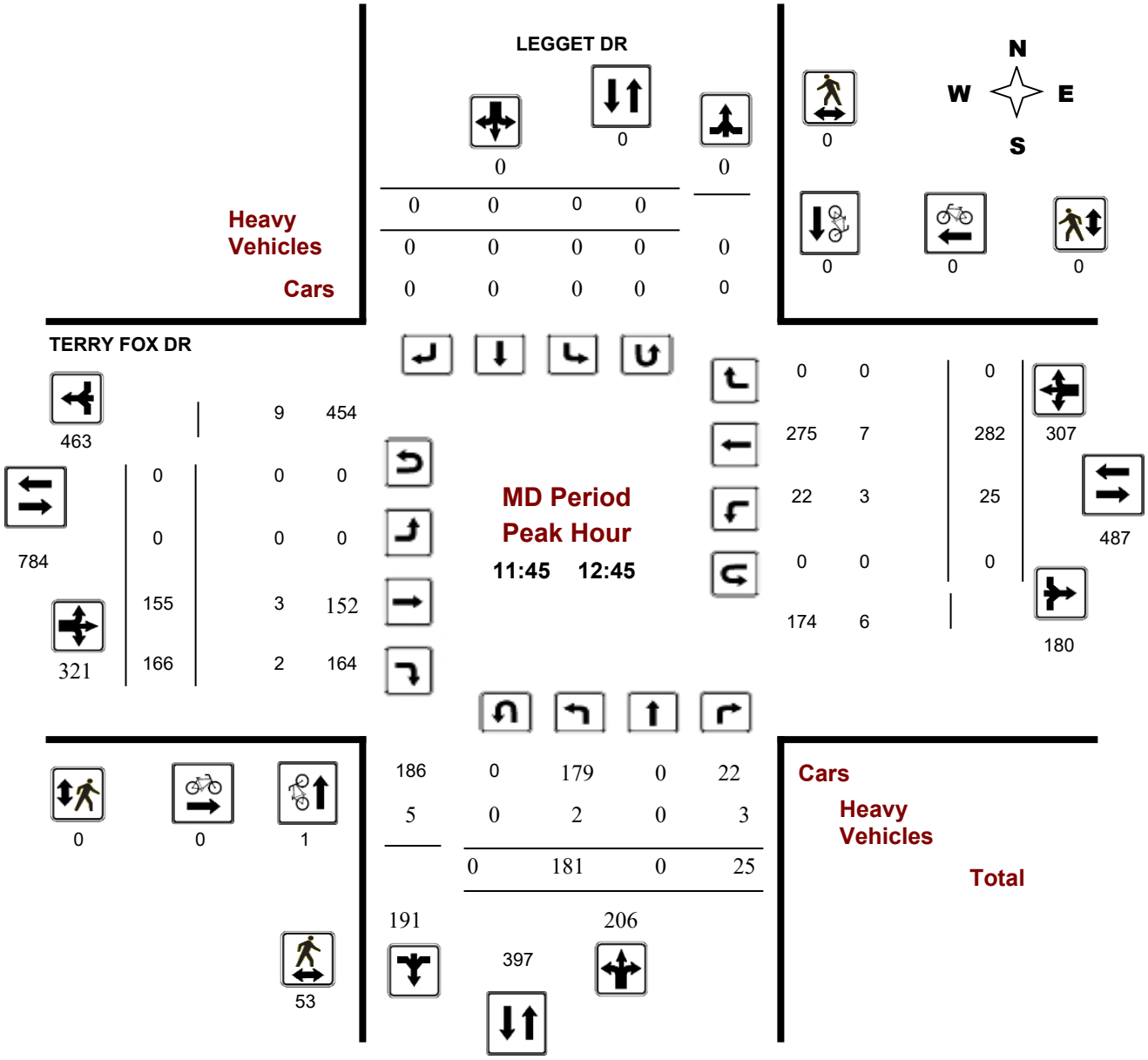
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019 **WO No:** 38360

Start Time: 07:00 **Device:** Miovision



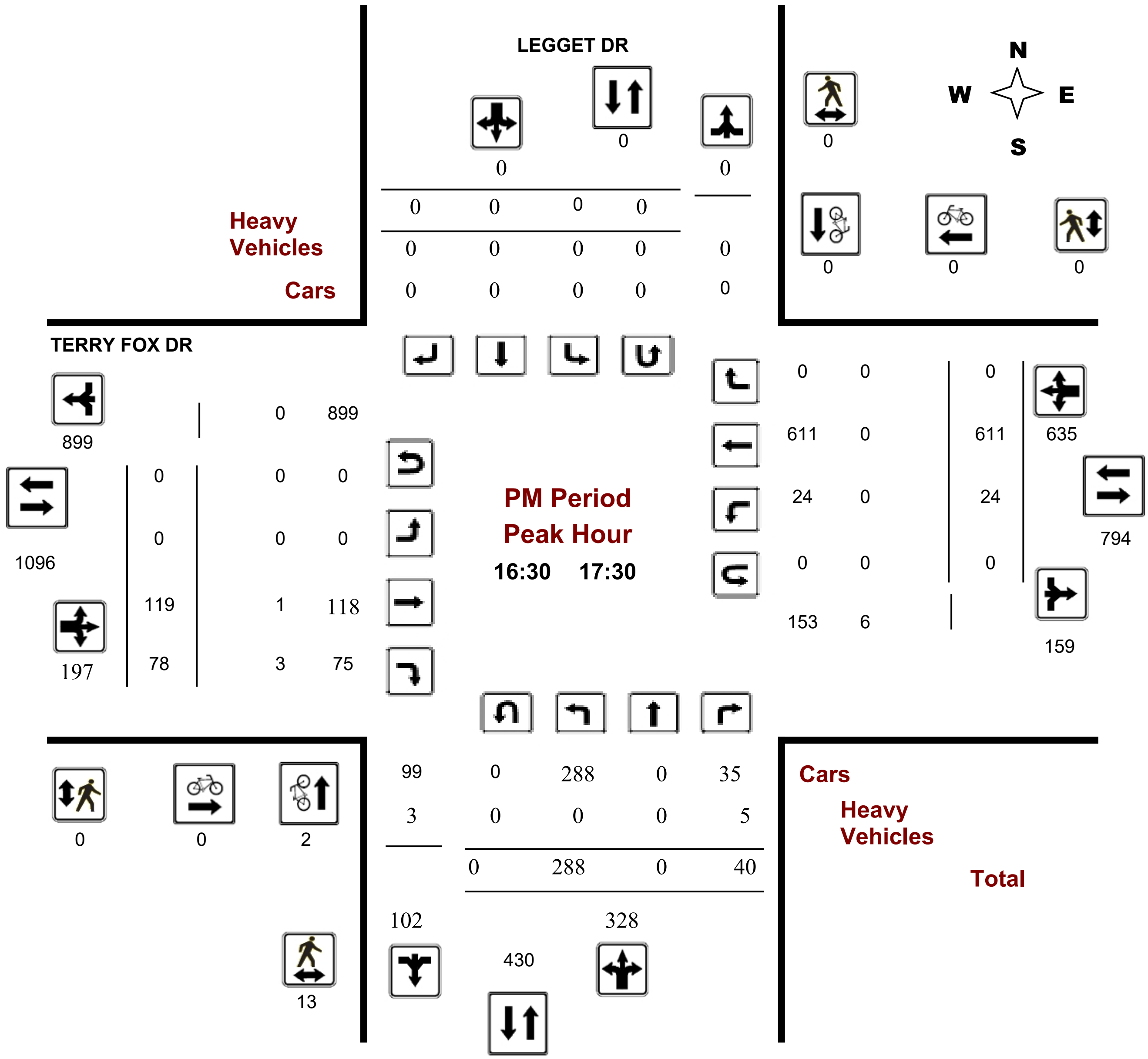
Comments

Turning Movement Count - Peak Hour Diagram

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019 **WO No:** 38360

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019 **WO No:** 38360

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, February 20, 2019

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 1

AADT Factor

1.00

	LEGGET DR									TERRY FOX DR									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	27	0	21	**48**	0	0	0	**0**	**48**	0	324	365	**689**	38	82	0	**120**	**809**	**857**
08:00 09:00	41	0	39	**80**	0	0	0	**0**	**80**	0	476	553	**1029**	37	122	0	**159**	**1188**	**1268**
09:00 10:00	61	0	28	**89**	0	0	0	**0**	**89**	0	390	370	**760**	37	105	0	**142**	**902**	**991**
11:30 12:30	208	0	29	**237**	0	0	0	**0**	**237**	0	125	144	**269**	22	288	0	**310**	**579**	**816**
12:30 13:30	115	0	21	**136**	0	0	0	**0**	**136**	0	228	206	**434**	21	147	0	**168**	**602**	**738**
15:00 16:00	188	0	27	**215**	0	0	0	**0**	**215**	0	84	89	**173**	21	239	0	**260**	**433**	**648**
16:00 17:00	301	0	45	**346**	0	0	0	**0**	**346**	0	107	81	**188**	18	540	0	**558**	**746**	**1092**
17:00 18:00	256	0	37	**293**	0	0	0	**0**	**293**	0	105	69	**174**	26	553	0	**579**	**753**	**1046**
Sub Total	1197	0	247	**1444**	0	0	0	**0**	**1444**	0	1839	1877	**3716**	220	2076	0	**2296**	**6012**	**7456**
U Turns	0			**0**	0			**0**	**0**	**0**			**0**	1			**1**	**1**	**1**
Total	1197	0	247	**1444**	0	0	0	**0**	**1444**	0	1839	1877	**3716**	221	2076	0	**2297**	**6013**	**7457**
EQ 12Hr	1664	0	343	**2007**	0	0	0	**0**	**2007**	0	2556	2609	**5165**	307	2886	0	**3193**	**8358**	**10365**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	1664	0	343	**2007**	0	0	0	**0**	**2007**	0	2556	2609	**5165**	307	2886	0	**3193**	**8358**	**10365**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	2180	0	449	**2629**	0	0	0	**0**	**2629**	0	3348	3418	**6766**	402	3781	0	**4183**	**10949**	**13578**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019 **WO No:** 38360

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		LEGGET DR									TERRY FOX DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	6	0	3	9	0	0	0	0	**9**	0	65	54	119	2	17	0	19	**138**	**147**
07:15	07:30	7	0	4	11	0	0	0	0	**11**	0	99	91	190	7	18	0	25	**215**	**226**
07:30	07:45	8	0	7	15	0	0	0	0	**15**	0	74	89	163	14	18	0	32	**195**	**210**
07:45	08:00	6	0	7	13	0	0	0	0	**13**	0	86	131	217	15	29	0	44	**261**	**274**
08:00	08:15	12	0	6	18	0	0	0	0	**18**	0	83	137	220	6	24	0	30	**250**	**268**
08:15	08:30	8	0	11	19	0	0	0	0	**19**	0	110	141	251	16	31	0	47	**298**	**317**
08:30	08:45	12	0	12	24	0	0	0	0	**24**	0	145	147	292	7	35	0	42	**334**	**358**
08:45	09:00	9	0	10	19	0	0	0	0	**19**	0	138	128	266	8	32	0	40	**306**	**325**
09:00	09:15	10	0	5	15	0	0	0	0	**15**	0	132	120	252	13	32	0	45	**297**	**312**
09:15	09:30	25	0	10	35	0	0	0	0	**35**	0	111	116	227	10	31	0	41	**268**	**303**
09:30	09:45	15	0	6	21	0	0	0	0	**21**	0	79	72	151	5	20	0	25	**176**	**197**
09:45	10:00	11	0	7	18	0	0	0	0	**18**	0	68	62	130	9	22	0	31	**161**	**179**
11:30	11:45	57	0	6	63	0	0	0	0	**63**	0	23	24	47	5	55	0	60	**107**	**170**
11:45	12:00	44	0	7	51	0	0	0	0	**51**	0	22	40	62	6	86	0	92	**154**	**205**
12:00	12:15	63	0	10	73	0	0	0	0	**73**	0	33	34	67	7	87	0	94	**161**	**234**
12:15	12:30	44	0	6	50	0	0	0	0	**50**	0	47	46	93	4	60	0	64	**157**	**207**
12:30	12:45	30	0	2	32	0	0	0	0	**32**	0	53	46	99	8	49	0	57	**156**	**188**
12:45	13:00	28	0	5	33	0	0	0	0	**33**	0	58	57	115	2	43	0	45	**160**	**193**
13:00	13:15	30	0	5	35	0	0	0	0	**35**	0	61	52	113	7	29	0	36	**149**	**184**
13:15	13:30	27	0	9	36	0	0	0	0	**36**	0	56	51	107	4	26	0	30	**137**	**173**
15:00	15:15	40	0	0	40	0	0	0	0	**40**	0	20	17	37	6	50	0	56	**93**	**133**
15:15	15:30	38	0	5	43	0	0	0	0	**43**	0	16	21	37	4	56	0	60	**97**	**140**
15:30	15:45	56	0	9	65	0	0	0	0	**65**	0	24	20	44	7	61	0	68	**112**	**177**
15:45	16:00	54	0	13	67	0	0	0	0	**67**	0	24	31	55	5	72	0	77	**132**	**199**
16:00	16:15	87	0	12	99	0	0	0	0	**99**	0	20	23	43	2	129	0	131	**174**	**273**
16:15	16:30	63	0	13	76	0	0	0	0	**76**	0	34	20	54	5	130	0	135	**189**	**265**
16:30	16:45	75	0	13	88	0	0	0	0	**88**	0	21	18	39	5	142	0	147	**186**	**274**
16:45	17:00	76	0	7	83	0	0	0	0	**83**	0	32	20	52	6	139	0	145	**197**	**280**
17:00	17:15	70	0	8	78	0	0	0	0	**78**	0	35	23	58	5	168	0	173	**231**	**309**
17:15	17:30	67	0	12	79	0	0	0	0	**79**	0	31	17	48	8	162	0	170	**218**	**297**
17:30	17:45	72	0	10	82	0	0	0	0	**82**	0	21	17	38	5	134	0	139	**177**	**259**
17:45	18:00	47	0	7	54	0	0	0	0	**54**	0	18	12	30	8	89	0	97	**127**	**181**
Total:		1197	0	247	1444	0	0	0	0	**1444**	0	1839	1877	3716	221	2076	0	2297	**1444**	**7,457**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019 **WO No:** 38360

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		LEGGET DR			TERRY FOX DR			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	0	**0**	0	0	**0**	**0**
07:30	07:45	0	0	**0**	0	0	**0**	**0**
07:45	08:00	0	0	**0**	0	0	**0**	**0**
08:00	08:15	0	0	**0**	0	0	**0**	**0**
08:15	08:30	0	0	**0**	0	0	**0**	**0**
08:30	08:45	0	0	**0**	0	0	**0**	**0**
08:45	09:00	0	0	**0**	1	0	**1**	**1**
09:00	09:15	0	0	**0**	0	0	**0**	**0**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	0	0	**0**	**0**
12:00	12:15	0	0	**0**	0	0	**0**	**0**
12:15	12:30	0	0	**0**	0	0	**0**	**0**
12:30	12:45	1	0	**1**	0	0	**0**	**1**
12:45	13:00	0	0	**0**	0	0	**0**	**0**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	0	**0**	0	0	**0**	**0**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	0	0	**0**	0	0	**0**	**0**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	0	0	**0**	0	0	**0**	**0**
17:00	17:15	1	0	**1**	0	0	**0**	**1**
17:15	17:30	1	0	**1**	0	0	**0**	**1**
17:30	17:45	0	0	**0**	0	0	**0**	**0**
17:45	18:00	0	0	**0**	0	0	**0**	**0**
Total		3	0	**3**	1	0	**1**	**4**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019 **WO No:** 38360

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

		LEGGET DR			TERRY FOX DR			
Time Period		NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00	07:15	1	0	**1**	0	0	**0**	**1**
07:15	07:30	1	0	**1**	0	0	**0**	**1**
07:30	07:45	2	0	**2**	0	0	**0**	**2**
07:45	08:00	2	0	**2**	0	0	**0**	**2**
08:00	08:15	5	0	**5**	0	0	**0**	**5**
08:15	08:30	4	0	**4**	0	2	**2**	**6**
08:30	08:45	7	0	**7**	0	0	**0**	**7**
08:45	09:00	3	0	**3**	0	0	**0**	**3**
09:00	09:15	3	0	**3**	0	0	**0**	**3**
09:15	09:30	2	0	**2**	0	0	**0**	**2**
09:30	09:45	3	0	**3**	0	0	**0**	**3**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	2	0	**2**	0	0	**0**	**2**
11:45	12:00	12	0	**12**	0	0	**0**	**12**
12:00	12:15	11	0	**11**	0	0	**0**	**11**
12:15	12:30	19	0	**19**	0	0	**0**	**19**
12:30	12:45	11	0	**11**	0	0	**0**	**11**
12:45	13:00	6	0	**6**	0	0	**0**	**6**
13:00	13:15	4	0	**4**	0	0	**0**	**4**
13:15	13:30	2	0	**2**	0	0	**0**	**2**
15:00	15:15	4	0	**4**	0	0	**0**	**4**
15:15	15:30	1	0	**1**	0	0	**0**	**1**
15:30	15:45	3	0	**3**	0	0	**0**	**3**
15:45	16:00	1	0	**1**	0	2	**2**	**3**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	2	0	**2**	0	1	**1**	**3**
16:30	16:45	4	0	**4**	0	0	**0**	**4**
16:45	17:00	2	0	**2**	0	0	**0**	**2**
17:00	17:15	3	0	**3**	0	0	**0**	**3**
17:15	17:30	4	0	**4**	0	0	**0**	**4**
17:30	17:45	6	0	**6**	0	0	**0**	**6**
17:45	18:00	5	0	**5**	0	0	**0**	**5**
Total	.....	135	0	**135**	0	5	**5**	**140**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019 **WO No:** 38360

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		LEGGET DR									TERRY FOX DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	2	0	0	**2**	0	0	0	**0**	**2**	0	2	0	**2**	1	1	0	**2**	**4**	**6**
07:15	07:30	2	0	0	**2**	0	0	0	**0**	**2**	0	0	0	**0**	1	1	0	**2**	**2**	**4**
07:30	07:45	2	0	1	**3**	0	0	0	**0**	**3**	0	0	1	**1**	1	2	0	**3**	**4**	**7**
07:45	08:00	1	0	1	**2**	0	0	0	**0**	**2**	0	1	0	**1**	2	1	0	**3**	**4**	**6**
08:00	08:15	2	0	0	**2**	0	0	0	**0**	**2**	0	0	0	**0**	1	1	0	**2**	**2**	**4**
08:15	08:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	1	4	0	**5**	**6**	**6**
08:30	08:45	1	0	2	**3**	0	0	0	**0**	**3**	0	3	0	**3**	1	2	0	**3**	**6**	**9**
08:45	09:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	1	0	**1**	**2**	**2**
09:00	09:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	1	**2**	2	2	0	**4**	**6**	**6**
09:15	09:30	1	0	1	**2**	0	0	0	**0**	**2**	0	0	1	**1**	0	1	0	**1**	**2**	**4**
09:30	09:45	1	0	1	**2**	0	0	0	**0**	**2**	0	1	1	**2**	1	2	0	**3**	**5**	**7**
09:45	10:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
11:30	11:45	2	0	0	**2**	0	0	0	**0**	**2**	0	2	0	**2**	0	2	0	**2**	**4**	**6**
11:45	12:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	1	3	0	**4**	**5**	**5**
12:00	12:15	1	0	1	**2**	0	0	0	**0**	**2**	0	1	0	**1**	1	2	0	**3**	**4**	**6**
12:15	12:30	0	0	1	**1**	0	0	0	**0**	**1**	0	1	0	**1**	0	1	0	**1**	**2**	**3**
12:30	12:45	1	0	1	**2**	0	0	0	**0**	**2**	0	1	1	**2**	1	1	0	**2**	**4**	**6**
12:45	13:00	2	0	0	**2**	0	0	0	**0**	**2**	0	3	0	**3**	0	1	0	**1**	**4**	**6**
13:00	13:15	2	0	0	**2**	0	0	0	**0**	**2**	0	1	0	**1**	1	2	0	**3**	**4**	**6**
13:15	13:30	1	0	0	**1**	0	0	0	**0**	**1**	0	1	1	**2**	2	0	0	**2**	**4**	**5**
15:00	15:15	1	0	0	**1**	0	0	0	**0**	**1**	0	0	0	**0**	1	0	0	**1**	**1**	**2**
15:15	15:30	1	0	3	**4**	0	0	0	**0**	**4**	0	0	3	**3**	1	0	0	**1**	**4**	**8**
15:30	15:45	3	0	3	**6**	0	0	0	**0**	**6**	0	2	1	**3**	0	2	0	**2**	**5**	**11**
15:45	16:00	0	0	1	**1**	0	0	0	**0**	**1**	0	0	1	**1**	1	2	0	**3**	**4**	**5**
16:00	16:15	0	0	1	**1**	0	0	0	**0**	**1**	0	3	1	**4**	0	3	0	**3**	**7**	**8**
16:15	16:30	0	0	2	**2**	0	0	0	**0**	**2**	0	0	3	**3**	1	1	0	**2**	**5**	**7**
16:30	16:45	0	0	1	**1**	0	0	0	**0**	**1**	0	0	1	**1**	0	0	0	**0**	**1**	**2**
16:45	17:00	0	0	1	**1**	0	0	0	**0**	**1**	0	0	1	**1**	0	0	0	**0**	**1**	**2**
17:00	17:15	0	0	2	**2**	0	0	0	**0**	**2**	0	0	1	**1**	0	0	0	**0**	**1**	**3**
17:15	17:30	0	0	1	**1**	0	0	0	**0**	**1**	0	1	0	**1**	0	0	0	**0**	**1**	**2**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	0	3	**3**	0	1	0	**1**	**4**	**4**
17:45	18:00	0	0	1	**1**	0	0	0	**0**	**1**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
Total:	None	26	0	25	**51**	0	0	0	**0**	**51**	0	26	22	**48**	21	39	0	**60**	**108**	**159**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

LEGGET DR @ TERRY FOX DR

Survey Date: Wednesday, February 20, 2019 **WO No:** 38360

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		LEGGET DR Northbound U-Turn Total	LEGGET DR Southbound U-Turn Total	TERRY FOX DR Eastbound U-Turn Total	TERRY FOX DR Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	1	**1**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		0	0	0	1	**1**

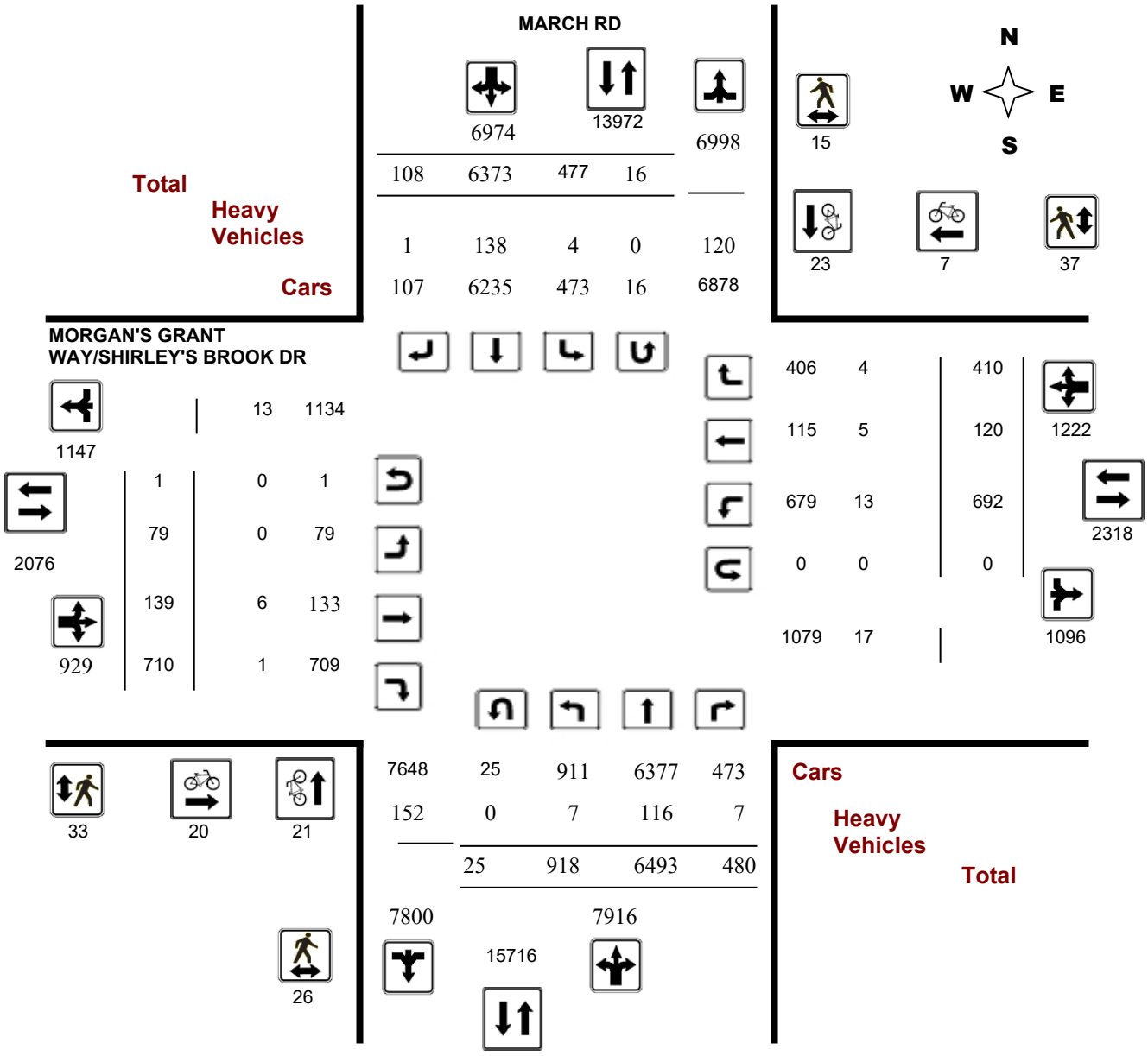
Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016
Start Time: 07:00
WO No: 36160
Device: Miovision

Full Study Diagram



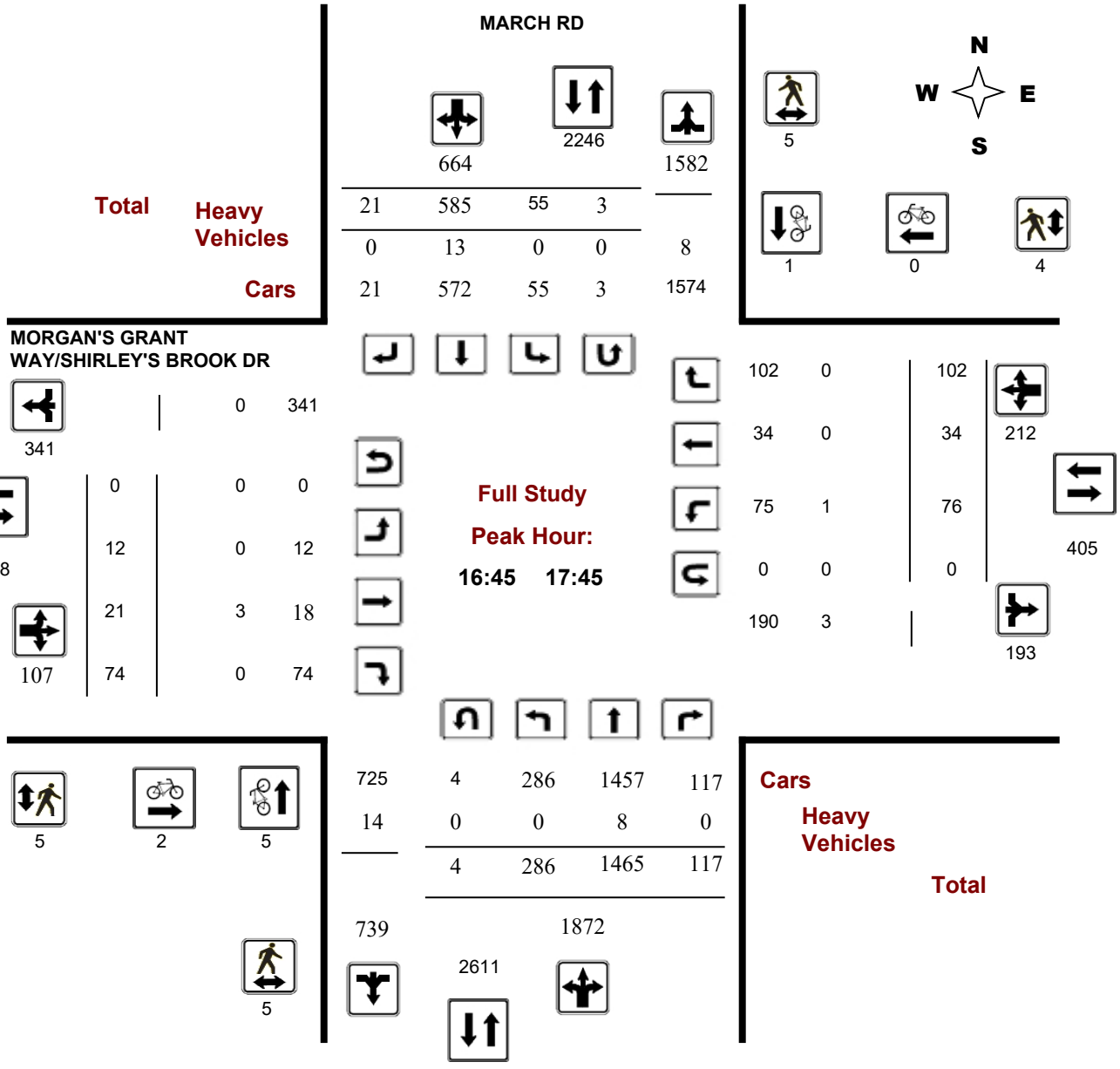
Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016
Start Time: 07:00
WO No: 36160
Device: Miovision

Full Study Peak Hour Diagram



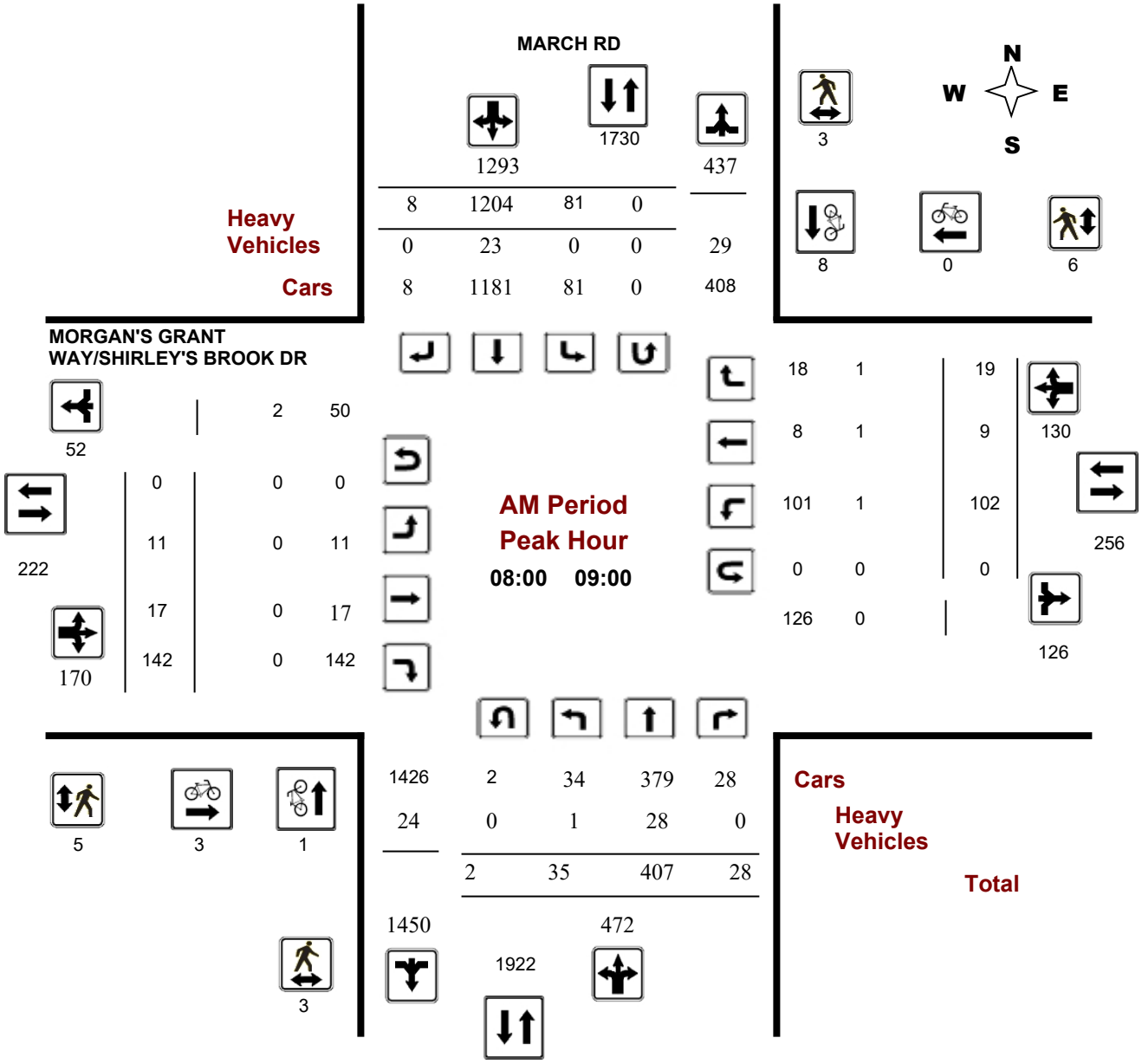
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016 **WO No:** 36160

Start Time: 07:00 **Device:** Miovision



Comments

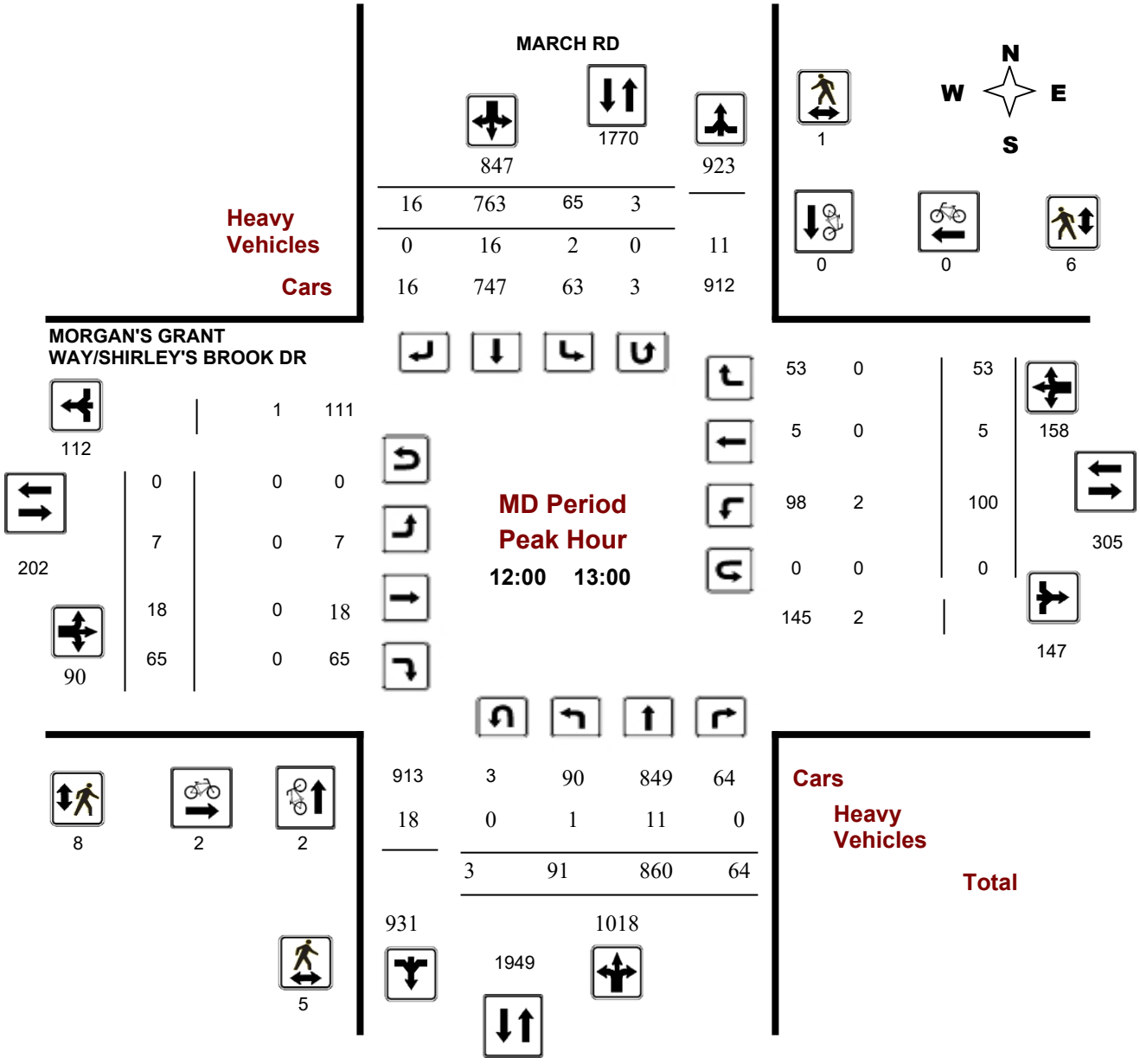
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016 **WO No:** 36160

Start Time: 07:00 **Device:** Miovision



Comments

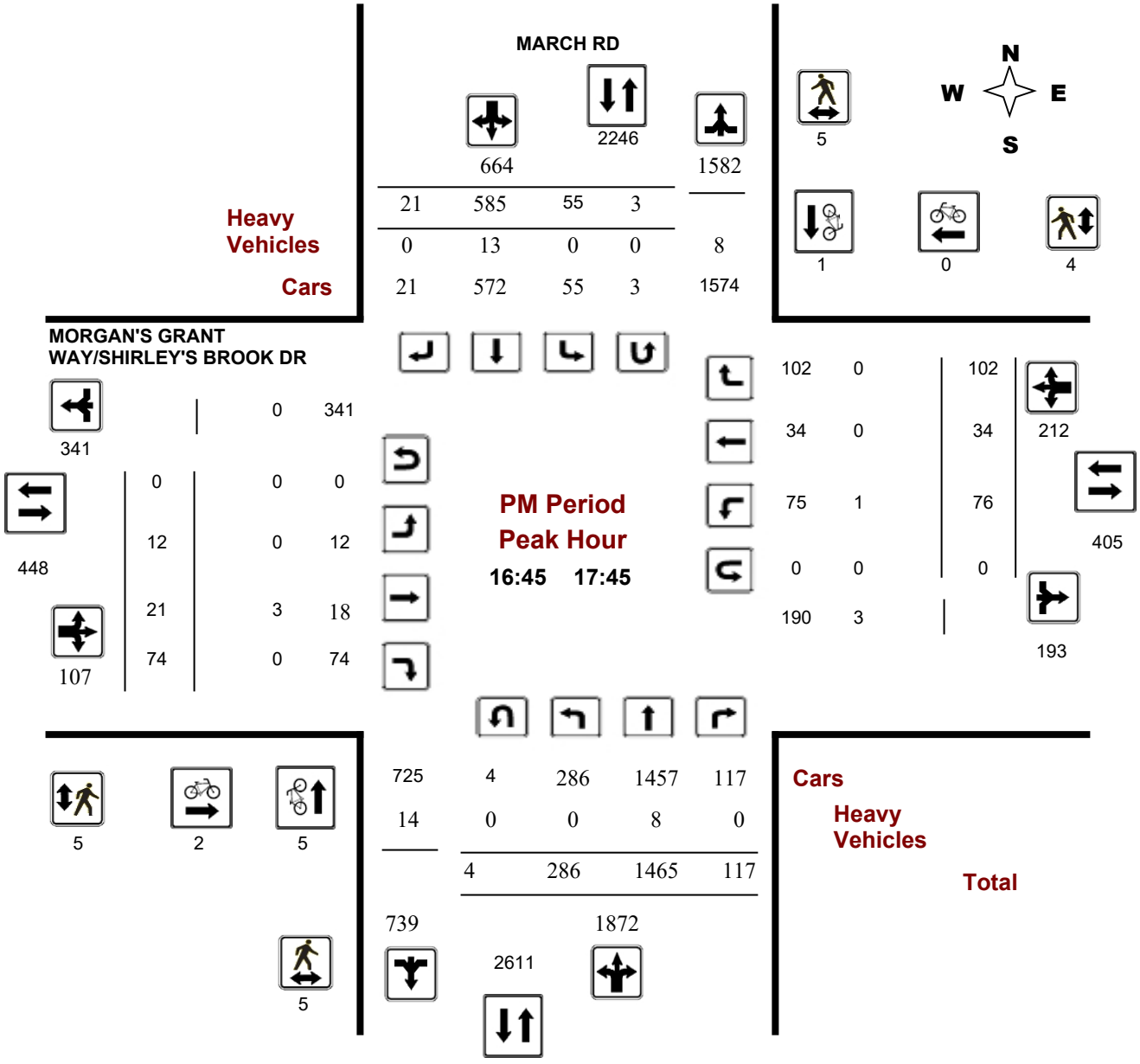
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016 **WO No:** 36160

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016 **WO No:** 36160

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, August 10, 2016

Total Observed U-Turns

Northbound: 25 Southbound: 16

Eastbound: 1 Westbound: 0

AADT Factor

.90

	MARCH RD									MORGAN'S GRANT WAY/SHIRLEY'S BROOK DR									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	19	283	25	**327**	95	1082	9	**1186**	**1513**	10	16	140	**166**	97	9	12	**118**	**284**	**1797**
08:00 09:00	35	407	28	**470**	81	1204	8	**1293**	**1763**	11	17	142	**170**	102	9	19	**130**	**300**	**2063**
09:00 10:00	55	445	31	**531**	61	873	12	**946**	**1477**	6	18	108	**132**	91	8	28	**127**	**259**	**1736**
11:30 12:30	86	863	59	**1008**	52	672	15	**739**	**1747**	10	14	46	**70**	93	3	50	**146**	**216**	**1963**
12:30 13:30	81	740	52	**873**	57	787	12	**856**	**1729**	9	19	72	**100**	95	12	50	**157**	**257**	**1986**
15:00 16:00	136	990	64	**1190**	29	600	14	**643**	**1833**	10	10	56	**76**	56	14	62	**132**	**208**	**2041**
16:00 17:00	235	1359	109	**1703**	46	579	15	**640**	**2343**	13	24	77	**114**	83	31	92	**206**	**320**	**2663**
17:00 18:00	271	1406	112	**1789**	56	576	23	**655**	**2444**	10	21	69	**100**	75	34	97	**206**	**306**	**2750**
Sub Total	918	6493	480	**7891**	477	6373	108	**6958**	**14849**	79	139	710	**928**	692	120	410	**1222**	**2150**	**16999**
U Turns	25			**25**	16			**16**	**41**	**1**			**1**	0			**0**	**1**	**42**
Total	943	6493	480	**7916**	493	6373	108	**6974**	**14890**	80	139	710	**929**	692	120	410	**1222**	**2151**	**17041**
EQ 12Hr	1311	9025	667	**11003**	685	8858	150	**9693**	**20696**	111	193	987	**1291**	962	167	570	**1699**	**2990**	**23686**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	1180	8122	600	**9902**	616	7972	135	**8723**	**18625**	100	174	888	**1162**	866	150	513	**1529**	**2691**	**21316**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	1546	10640	786	**12972**	807	10443	177	**11427**	**24399**	131	228	1163	**1522**	1134	196	672	**2002**	**3524**	**27923**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016 **WO No:** 36160

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		MARCH RD									MORGAN'S GRANT WAY/SHIRLEY'S BROOK DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	6	54	5	65	26	237	0	263	**328**	0	3	31	34	22	3	2	27	**61**	**389**
07:15	07:30	2	74	10	86	27	248	2	277	**363**	3	3	35	41	22	3	3	28	**69**	**432**
07:30	07:45	8	66	2	76	15	292	4	311	**387**	3	5	33	41	24	1	5	30	**71**	**458**
07:45	08:00	5	89	8	102	27	305	3	335	**437**	5	5	41	51	29	2	2	33	**84**	**521**
08:00	08:15	9	102	3	114	20	298	1	319	**433**	7	2	39	48	23	2	5	30	**78**	**511**
08:15	08:30	11	101	7	119	28	287	3	318	**437**	1	2	46	49	23	2	7	32	**81**	**518**
08:30	08:45	7	100	6	113	13	312	3	328	**441**	2	8	31	41	25	1	4	30	**71**	**512**
08:45	09:00	10	104	12	126	20	307	1	328	**454**	1	5	26	32	31	4	3	38	**70**	**524**
09:00	09:15	23	118	8	149	14	243	1	258	**407**	0	3	31	34	23	2	7	32	**66**	**473**
09:15	09:30	8	113	9	130	21	217	6	244	**374**	2	7	29	38	23	4	7	34	**72**	**446**
09:30	09:45	12	116	4	132	14	241	4	259	**391**	2	2	29	33	26	1	2	29	**62**	**453**
09:45	10:00	15	98	10	123	14	172	1	187	**310**	2	6	19	27	19	1	12	32	**59**	**369**
11:30	11:45	20	181	12	213	11	150	3	164	**377**	1	3	11	15	22	0	9	31	**46**	**423**
11:45	12:00	22	215	14	251	8	168	3	179	**430**	6	2	14	22	28	1	17	46	**68**	**498**
12:00	12:15	26	228	20	274	19	169	5	193	**467**	1	6	9	16	19	0	11	30	**46**	**513**
12:15	12:30	19	239	13	271	17	185	4	206	**477**	2	3	12	17	24	2	13	39	**56**	**533**
12:30	12:45	22	185	12	219	20	209	3	232	**451**	1	6	19	26	25	1	13	39	**65**	**516**
12:45	13:00	27	208	19	254	12	200	4	216	**470**	3	3	25	31	32	2	16	50	**81**	**551**
13:00	13:15	18	173	11	202	14	200	2	216	**418**	3	5	15	23	23	6	11	40	**63**	**481**
13:15	13:30	21	174	10	205	11	178	3	192	**397**	2	5	13	20	15	3	10	28	**48**	**445**
15:00	15:15	23	191	7	221	10	156	2	168	**389**	3	3	18	24	17	3	9	29	**53**	**442**
15:15	15:30	32	258	23	313	7	152	4	163	**476**	1	3	8	12	9	2	24	35	**47**	**523**
15:30	15:45	41	273	16	330	6	146	2	154	**484**	5	0	13	18	22	7	13	42	**60**	**544**
15:45	16:00	44	268	18	330	9	146	6	161	**491**	1	4	17	22	8	2	16	26	**48**	**539**
16:00	16:15	48	309	26	383	16	157	6	179	**562**	2	6	18	26	24	6	20	50	**76**	**638**
16:15	16:30	54	351	32	437	13	143	3	159	**596**	2	5	26	33	16	13	24	53	**86**	**682**
16:30	16:45	63	343	24	430	7	138	3	148	**578**	5	9	14	28	23	6	19	48	**76**	**654**
16:45	17:00	72	356	27	455	13	141	3	157	**612**	4	4	19	27	20	6	29	55	**82**	**694**
17:00	17:15	78	399	35	512	17	141	4	162	**674**	2	3	10	15	13	11	33	57	**72**	**746**
17:15	17:30	86	391	27	504	15	147	6	168	**672**	2	7	19	28	16	7	18	41	**69**	**741**
17:30	17:45	54	319	28	401	13	156	8	177	**578**	4	7	26	37	27	10	22	59	**96**	**674**
17:45	18:00	57	297	22	376	16	132	5	153	**529**	2	4	14	20	19	6	24	49	**69**	**598**
Total:		943	6493	480	7916	493	6373	108	6974	**14890**	80	139	710	929	692	120	410	1222	**14890**	**17,041**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016 **WO No:** 36160

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		MARCH RD			MORGAN'S GRANT WAY/SHIRLEY'S BROOK DR			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	1	**1**	0	0	**0**	**1**
07:30	07:45	2	1	**3**	0	0	**0**	**3**
07:45	08:00	0	0	**0**	0	0	**0**	**0**
08:00	08:15	0	2	**2**	0	0	**0**	**2**
08:15	08:30	0	2	**2**	1	0	**1**	**3**
08:30	08:45	1	2	**3**	1	0	**1**	**4**
08:45	09:00	0	2	**2**	1	0	**1**	**3**
09:00	09:15	0	1	**1**	1	0	**1**	**2**
09:15	09:30	1	0	**1**	4	0	**4**	**5**
09:30	09:45	0	1	**1**	2	0	**2**	**3**
09:45	10:00	1	1	**2**	2	0	**2**	**4**
11:30	11:45	1	1	**2**	0	0	**0**	**2**
11:45	12:00	1	0	**1**	3	0	**3**	**4**
12:00	12:15	1	0	**1**	0	0	**0**	**1**
12:15	12:30	0	0	**0**	0	0	**0**	**0**
12:30	12:45	1	0	**1**	1	0	**1**	**2**
12:45	13:00	0	0	**0**	1	0	**1**	**1**
13:00	13:15	1	1	**2**	0	0	**0**	**2**
13:15	13:30	2	3	**5**	0	0	**0**	**5**
15:00	15:15	0	1	**1**	0	0	**0**	**1**
15:15	15:30	0	0	**0**	0	2	**2**	**2**
15:30	15:45	0	0	**0**	0	1	**1**	**1**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	1	2	**3**	0	2	**2**	**5**
16:15	16:30	1	1	**2**	1	1	**2**	**4**
16:30	16:45	0	0	**0**	0	1	**1**	**1**
16:45	17:00	1	0	**1**	1	0	**1**	**2**
17:00	17:15	2	0	**2**	1	0	**1**	**3**
17:15	17:30	1	0	**1**	0	0	**0**	**1**
17:30	17:45	1	1	**2**	0	0	**0**	**2**
17:45	18:00	2	0	**2**	0	0	**0**	**2**
Total		21	23	**44**	20	7	**27**	**71**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016 **WO No:** 36160

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

	MARCH RD			MORGAN'S GRANT WAY/SHIRLEY'S BROOK DR			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	2	0	**2**	0	0	**0**	**2**
07:15 07:30	0	0	**0**	1	0	**1**	**1**
07:30 07:45	0	0	**0**	1	1	**2**	**2**
07:45 08:00	1	1	**2**	0	0	**0**	**2**
08:00 08:15	0	0	**0**	0	1	**1**	**1**
08:15 08:30	1	1	**2**	2	3	**5**	**7**
08:30 08:45	1	1	**2**	1	0	**1**	**3**
08:45 09:00	1	1	**2**	2	2	**4**	**6**
09:00 09:15	4	0	**4**	2	1	**3**	**7**
09:15 09:30	2	0	**2**	2	1	**3**	**5**
09:30 09:45	1	0	**1**	3	2	**5**	**6**
09:45 10:00	0	1	**1**	0	4	**4**	**5**
11:30 11:45	0	0	**0**	0	3	**3**	**3**
11:45 12:00	0	0	**0**	1	1	**2**	**2**
12:00 12:15	3	0	**3**	2	2	**4**	**7**
12:15 12:30	0	0	**0**	5	2	**7**	**7**
12:30 12:45	0	0	**0**	0	0	**0**	**0**
12:45 13:00	2	1	**3**	1	2	**3**	**6**
13:00 13:15	2	0	**2**	0	2	**2**	**4**
13:15 13:30	0	1	**1**	2	0	**2**	**3**
15:00 15:15	0	0	**0**	1	1	**2**	**2**
15:15 15:30	1	0	**1**	0	0	**0**	**1**
15:30 15:45	0	0	**0**	0	0	**0**	**0**
15:45 16:00	0	0	**0**	0	1	**1**	**1**
16:00 16:15	0	0	**0**	0	0	**0**	**0**
16:15 16:30	0	0	**0**	1	0	**1**	**1**
16:30 16:45	0	1	**1**	0	1	**1**	**2**
16:45 17:00	2	1	**3**	0	1	**1**	**4**
17:00 17:15	2	0	**2**	1	0	**1**	**3**
17:15 17:30	1	2	**3**	3	2	**5**	**8**
17:30 17:45	0	2	**2**	1	1	**2**	**4**
17:45 18:00	0	2	**2**	1	3	**4**	**6**
Total	26	15	**41**	33	37	**70**	**111**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016 **WO No:** 36160

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		MARCH RD									MORGAN'S GRANT WAY/SHIRLEY'S BROOK DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	2	0	**2**	1	5	0	**6**	**8**	0	0	0	**0**	0	1	0	**1**	**1**	**9**
07:15	07:30	1	8	1	**10**	0	2	0	**2**	**12**	0	0	0	**0**	1	0	0	**1**	**1**	**13**
07:30	07:45	1	4	0	**5**	0	6	0	**6**	**11**	0	0	0	**0**	1	1	0	**2**	**2**	**13**
07:45	08:00	0	7	0	**7**	0	3	0	**3**	**10**	0	0	0	**0**	0	1	0	**1**	**1**	**11**
08:00	08:15	1	9	0	**10**	0	4	0	**4**	**14**	0	0	0	**0**	0	0	1	**1**	**1**	**15**
08:15	08:30	0	10	0	**10**	0	6	0	**6**	**16**	0	0	0	**0**	0	1	0	**1**	**1**	**17**
08:30	08:45	0	3	0	**3**	0	7	0	**7**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**10**
08:45	09:00	0	6	0	**6**	0	6	0	**6**	**12**	0	0	0	**0**	1	0	0	**1**	**1**	**13**
09:00	09:15	0	5	0	**5**	0	10	0	**10**	**15**	0	0	0	**0**	0	0	0	**0**	**0**	**15**
09:15	09:30	0	3	0	**3**	0	4	0	**4**	**7**	0	0	0	**0**	1	1	2	**4**	**4**	**11**
09:30	09:45	0	2	1	**3**	0	2	0	**2**	**5**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
09:45	10:00	0	5	0	**5**	0	4	0	**4**	**9**	0	0	1	**1**	1	0	0	**1**	**2**	**11**
11:30	11:45	0	2	1	**3**	0	7	0	**7**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**10**
11:45	12:00	1	2	0	**3**	0	2	0	**2**	**5**	0	0	0	**0**	1	0	0	**1**	**1**	**6**
12:00	12:15	0	3	0	**3**	1	3	0	**4**	**7**	0	0	0	**0**	0	0	0	**0**	**0**	**7**
12:15	12:30	0	5	0	**5**	0	3	0	**3**	**8**	0	0	0	**0**	2	0	0	**2**	**2**	**10**
12:30	12:45	0	1	0	**1**	0	4	0	**4**	**5**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
12:45	13:00	1	2	0	**3**	1	6	0	**7**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**10**
13:00	13:15	0	6	0	**6**	0	2	0	**2**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**8**
13:15	13:30	0	1	0	**1**	0	7	0	**7**	**8**	0	0	0	**0**	0	0	0	**0**	**0**	**8**
15:00	15:15	0	3	0	**3**	0	3	0	**3**	**6**	0	0	0	**0**	1	0	0	**1**	**1**	**7**
15:15	15:30	0	4	2	**6**	0	3	1	**4**	**10**	0	0	0	**0**	0	0	1	**1**	**1**	**11**
15:30	15:45	0	2	0	**2**	0	5	0	**5**	**7**	0	0	0	**0**	2	0	0	**2**	**2**	**9**
15:45	16:00	0	2	0	**2**	1	7	0	**8**	**10**	0	1	0	**1**	0	0	0	**0**	**1**	**11**
16:00	16:15	1	4	1	**6**	0	5	0	**5**	**11**	0	0	0	**0**	0	0	0	**0**	**0**	**11**
16:15	16:30	0	4	0	**4**	0	5	0	**5**	**9**	0	0	0	**0**	0	0	0	**0**	**0**	**9**
16:30	16:45	1	2	1	**4**	0	3	0	**3**	**7**	0	1	0	**1**	1	0	0	**1**	**2**	**9**
16:45	17:00	0	5	0	**5**	0	2	0	**2**	**7**	0	0	0	**0**	0	0	0	**0**	**0**	**7**
17:00	17:15	0	3	0	**3**	0	4	0	**4**	**7**	0	1	0	**1**	1	0	0	**1**	**2**	**9**
17:15	17:30	0	0	0	**0**	0	4	0	**4**	**4**	0	1	0	**1**	0	0	0	**0**	**1**	**5**
17:30	17:45	0	0	0	**0**	0	3	0	**3**	**3**	0	1	0	**1**	0	0	0	**0**	**1**	**4**
17:45	18:00	0	1	0	**1**	0	1	0	**1**	**2**	0	1	0	**1**	0	0	0	**0**	**1**	**3**
Total:	None	7	116	7	**130**	4	138	1	**143**	**273**	0	6	1	**7**	13	5	4	**22**	**29**	**302**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ MORGAN'S GRANT WAY/SHIRLEY'S BROOK

Survey Date: Wednesday, August 10, 2016 **WO No:** 36160

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		MARCH RD		MORGAN'S GRANT WAY/SHIRLEY'S BROOK DR		Total
		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	
07:00	07:15	1	0	0	0	**1**
07:15	07:30	0	0	1	0	**1**
07:30	07:45	1	0	0	0	**1**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	2	0	0	0	**2**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	1	0	0	**1**
09:15	09:30	1	1	0	0	**2**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	2	0	0	0	**2**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	1	2	0	0	**3**
12:15	12:30	0	1	0	0	**1**
12:30	12:45	2	0	0	0	**2**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	3	0	0	0	**3**
13:15	13:30	2	0	0	0	**2**
15:00	15:15	1	0	0	0	**1**
15:15	15:30	1	1	0	0	**2**
15:30	15:45	1	0	0	0	**1**
15:45	16:00	1	2	0	0	**3**
16:00	16:15	0	2	0	0	**2**
16:15	16:30	1	1	0	0	**2**
16:30	16:45	1	0	0	0	**1**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	3	2	0	0	**5**
17:30	17:45	1	1	0	0	**2**
17:45	18:00	0	2	0	0	**2**
Total		25	16	1	0	**42**

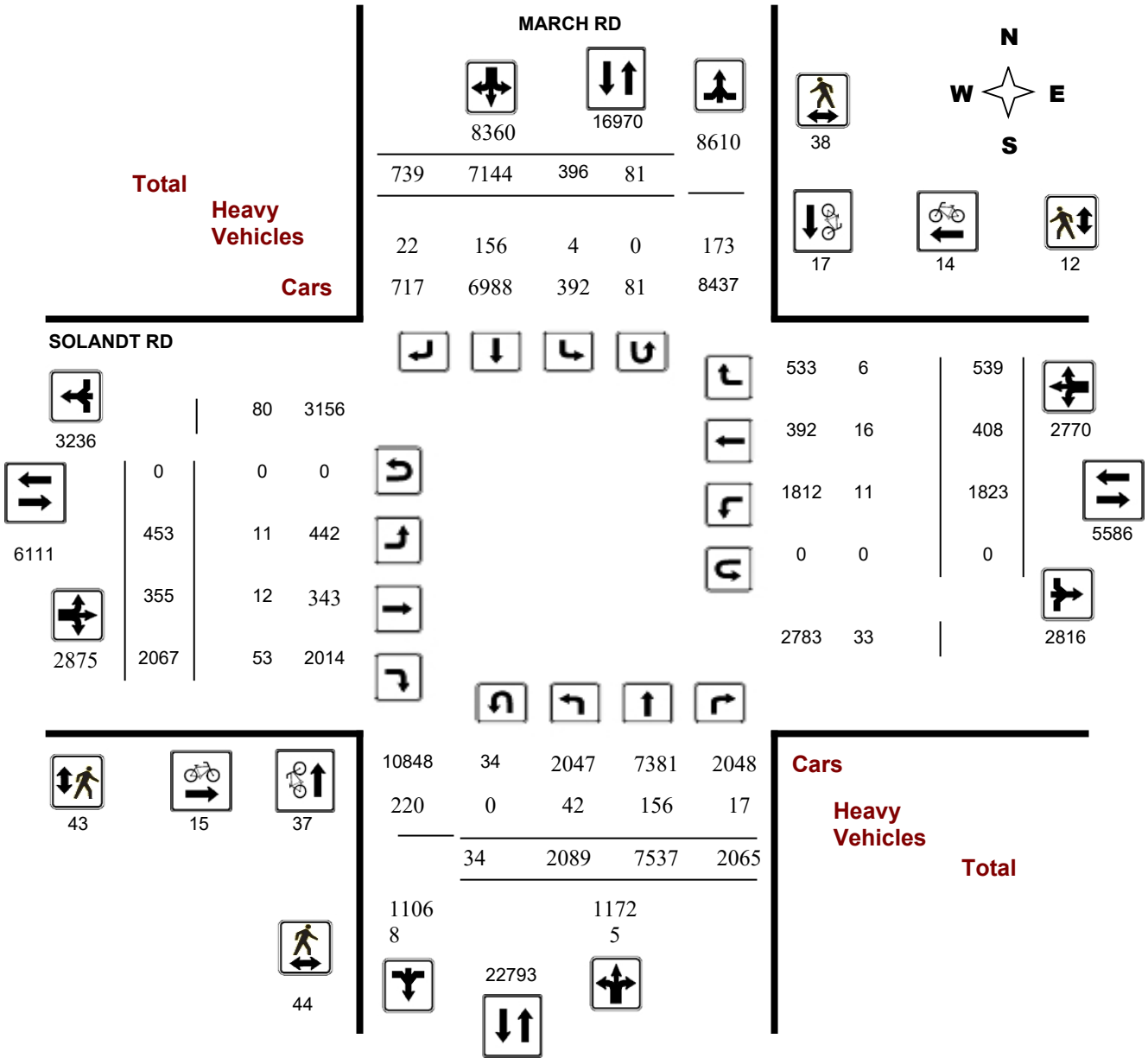
Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016
Start Time: 07:00
WO No: 36153
Device: Miovision

Full Study Diagram



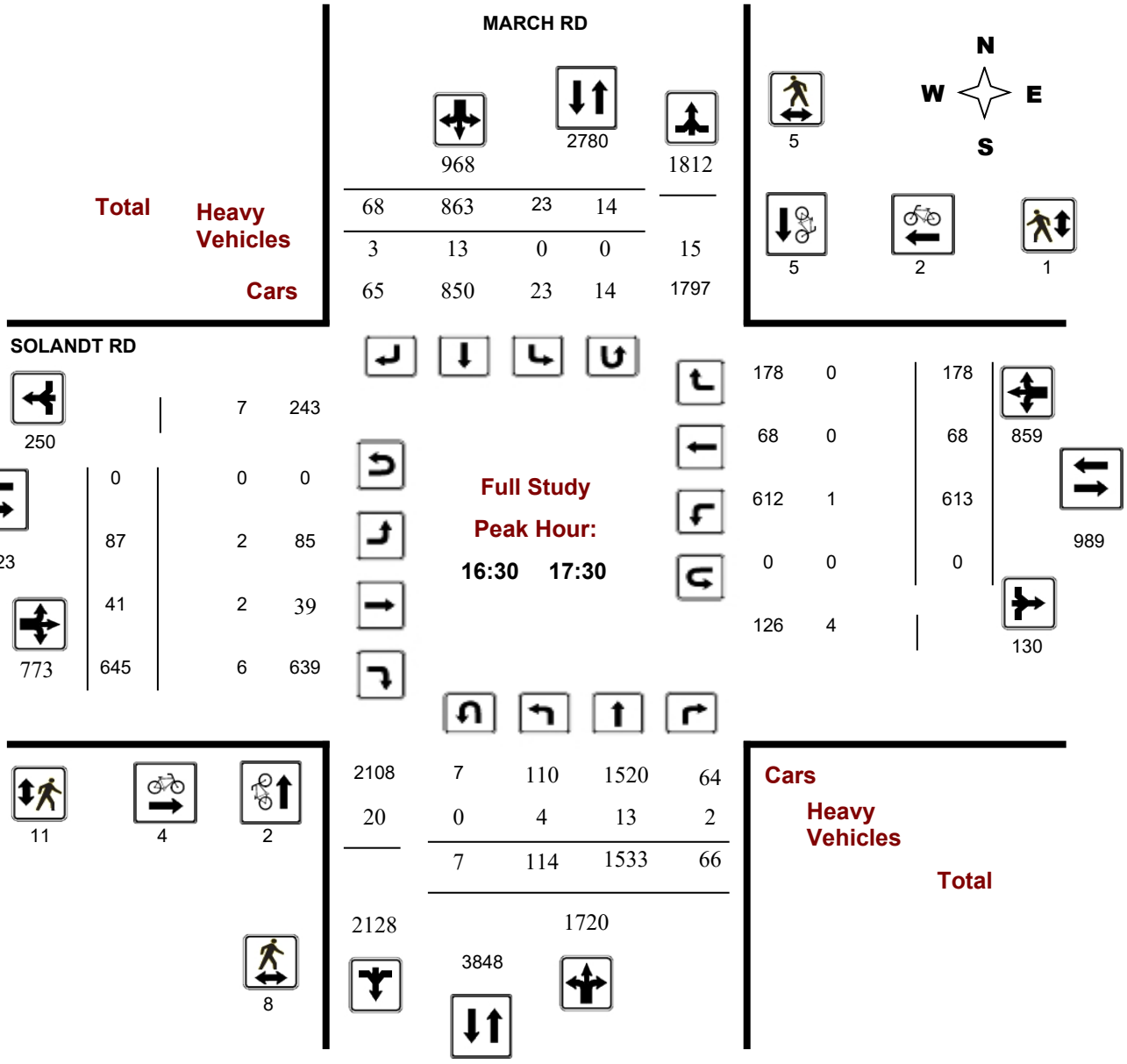
Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016
Start Time: 07:00
WO No: 36153
Device: Miovision

Full Study Peak Hour Diagram



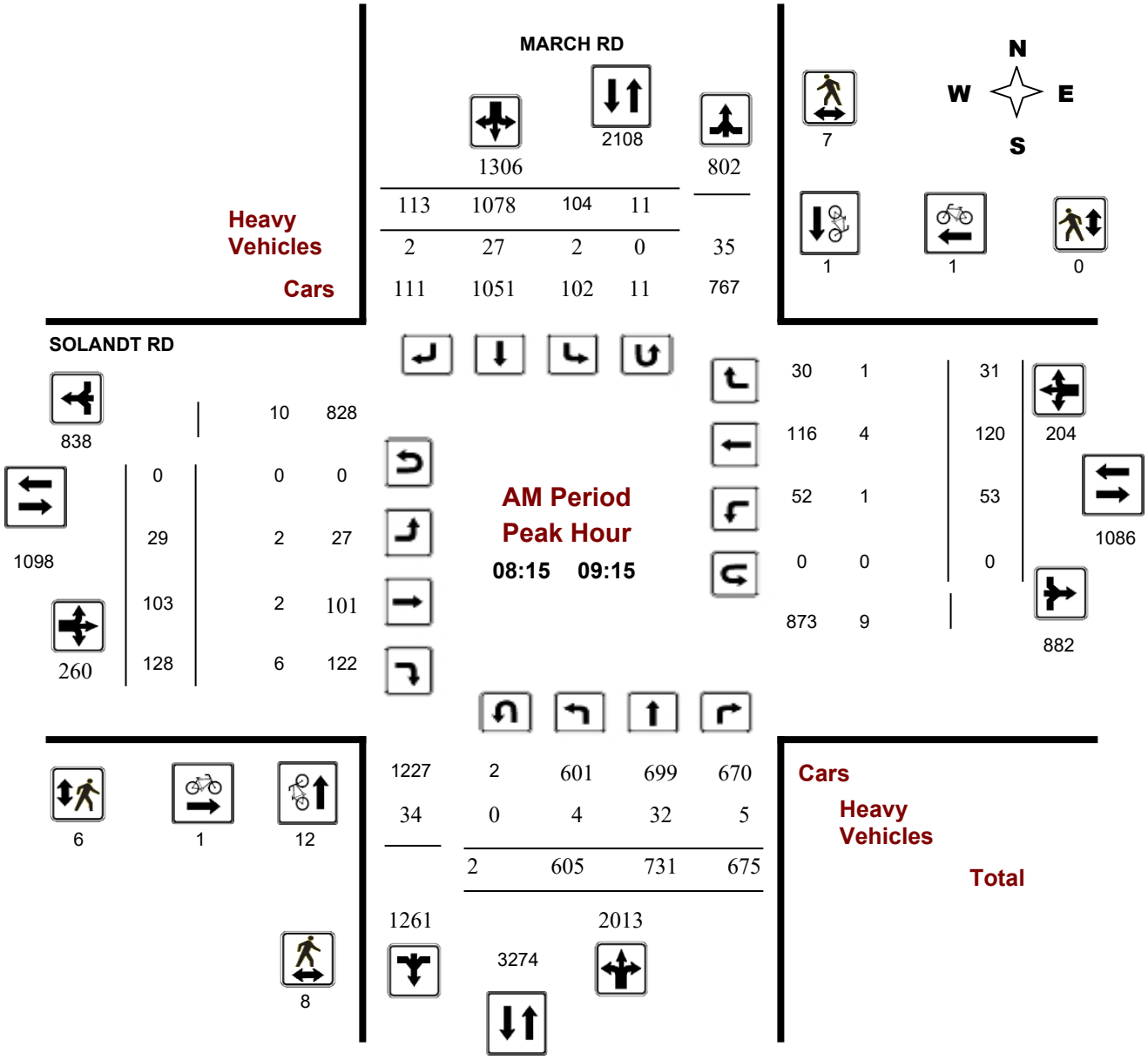
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36153

Start Time: 07:00 **Device:** Miovision



Comments

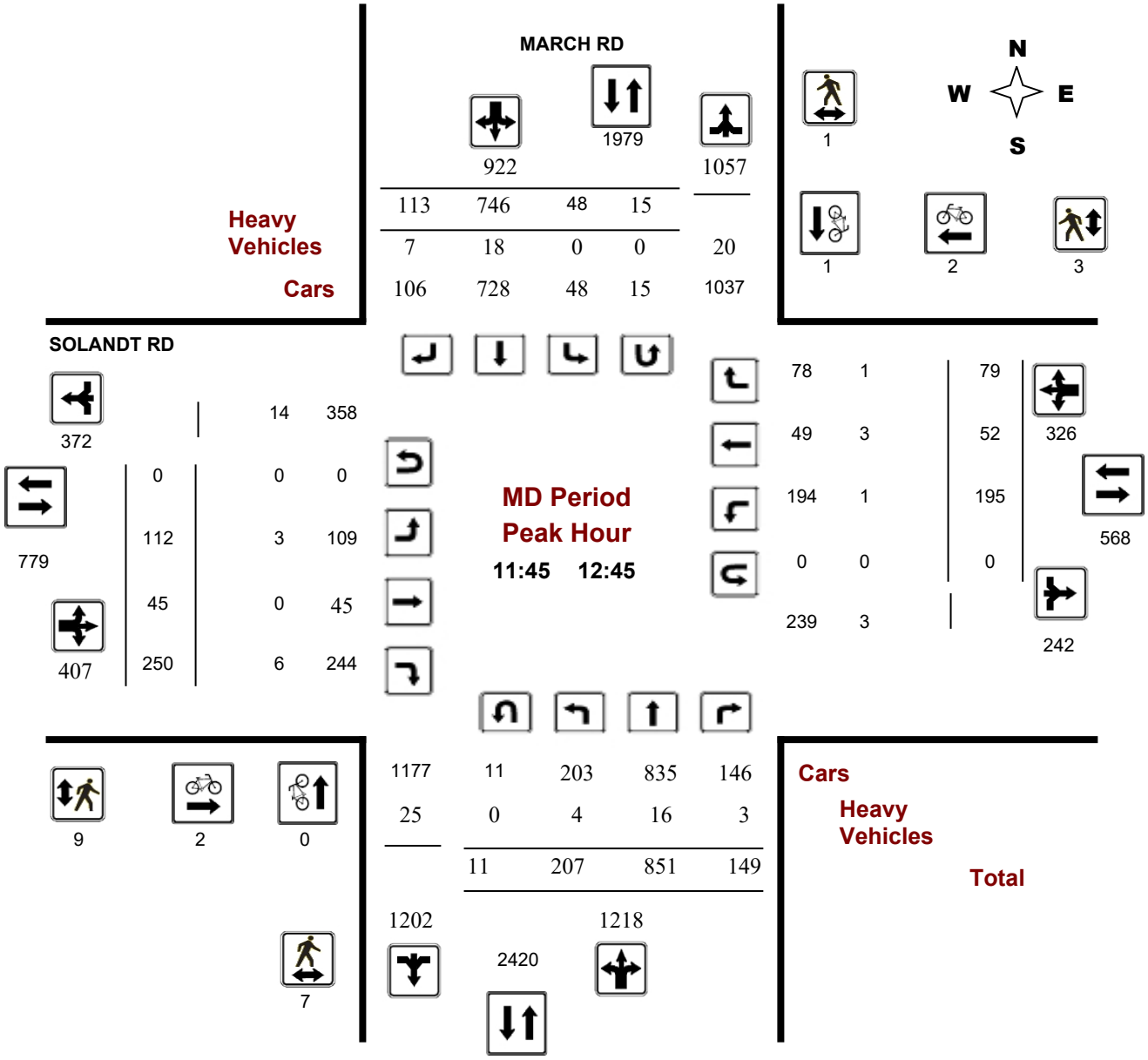
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36153

Start Time: 07:00 **Device:** Miovision



Comments

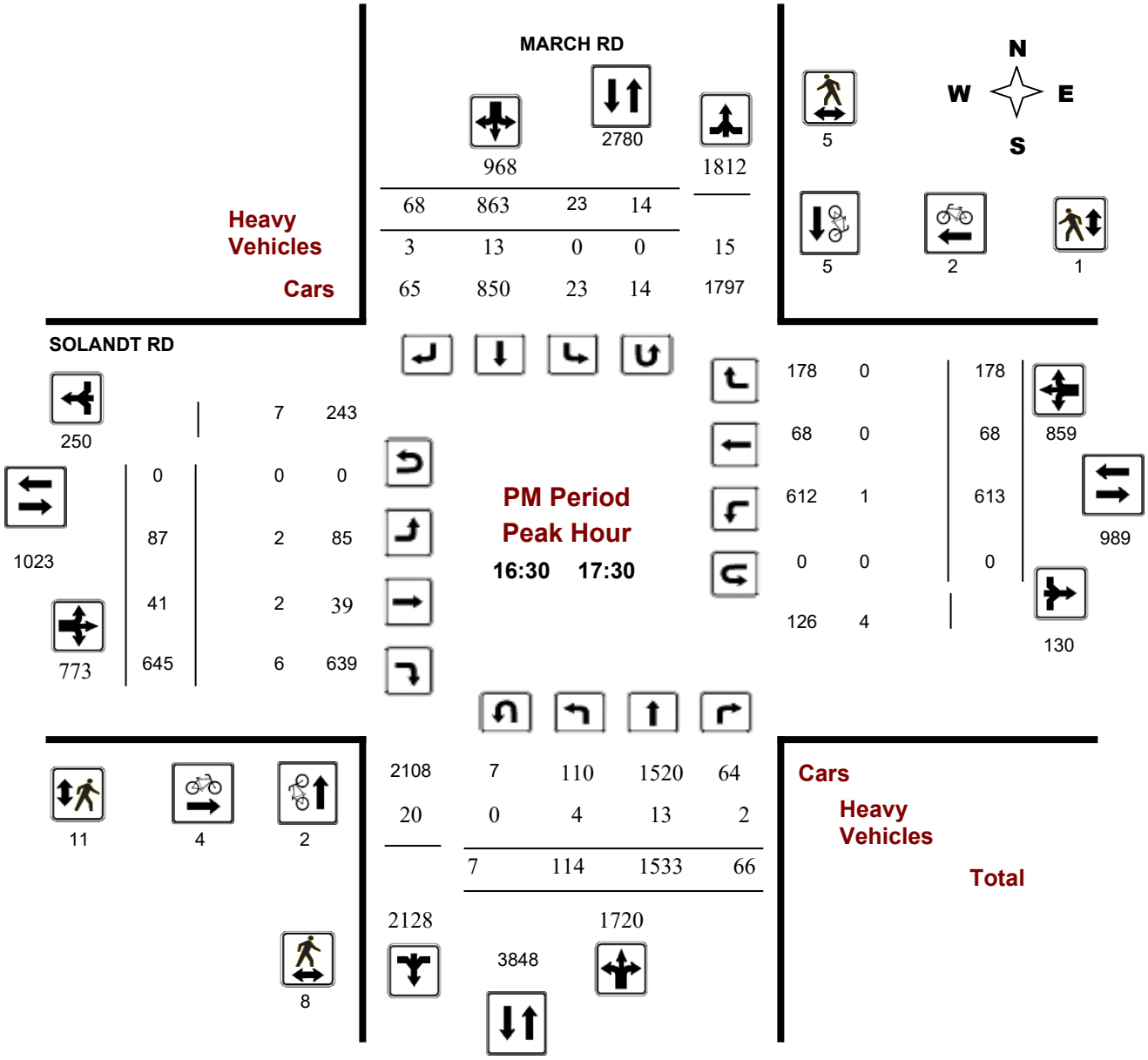
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36153

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36153

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, August 10, 2016

Total Observed U-Turns

Northbound: 34 Southbound: 81

Eastbound: 0 Westbound: 0

AADT Factor

.90

	MARCH RD									SOLANDT RD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	301	467	367	**1135**	65	1214	103	**1382**	**2517**	8	29	65	**102**	56	17	10	**83**	**185**	**2702**
08:00 09:00	560	685	645	**1890**	99	1147	125	**1371**	**3261**	27	93	132	**252**	45	91	29	**165**	**417**	**3678**
09:00 10:00	472	736	518	**1726**	67	891	83	**1041**	**2767**	22	52	111	**185**	67	71	23	**161**	**346**	**3113**
11:30 12:30	178	824	118	**1120**	35	728	102	**865**	**1985**	109	46	257	**412**	199	51	87	**337**	**749**	**2734**
12:30 13:30	231	776	182	**1189**	75	771	149	**995**	**2184**	70	40	162	**272**	122	36	49	**207**	**479**	**2663**
15:00 16:00	104	1098	118	**1320**	13	698	48	**759**	**2079**	57	26	280	**363**	273	18	53	**344**	**707**	**2786**
16:00 17:00	145	1439	71	**1655**	21	779	79	**879**	**2534**	88	46	573	**707**	541	65	134	**740**	**1447**	**3981**
17:00 18:00	98	1512	46	**1656**	21	916	50	**987**	**2643**	72	23	487	**582**	520	59	154	**733**	**1315**	**3958**
Sub Total	2089	7537	2065	**11691**	396	7144	739	**8279**	**19970**	453	355	2067	**2875**	1823	408	539	**2770**	**5645**	**25615**
U Turns	34			**34**	81			**81**	**115**	**0**			**0**	0			**0**	**0**	**115**
Total	2123	7537	2065	**11725**	477	7144	739	**8360**	**20085**	453	355	2067	**2875**	1823	408	539	**2770**	**5645**	**25730**
EQ 12Hr	2951	10476	2870	**16297**	663	9930	1027	**11620**	**27917**	630	493	2873	**3996**	2534	567	749	**3850**	**7846**	**35763**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	2656	9428	2583	**14667**	597	8937	924	**10458**	**25125**	567	444	2586	**3597**	2281	510	674	**3465**	**7062**	**32187**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	3479	12351	3384	**19214**	782	11707	1210	**13699**	**32913**	743	582	3388	**4713**	2988	668	883	**4539**	**9252**	**42165**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36153

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		MARCH RD									SOLANDT RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	47	89	48	184	16	268	27	311	**495**	4	3	13	20	13	1	2	16	**36**	**531**
07:15	07:30	51	126	77	254	10	307	28	345	**599**	3	5	17	25	11	2	1	14	**39**	**638**
07:30	07:45	66	110	96	272	24	333	24	381	**653**	1	4	20	25	19	4	2	25	**50**	**703**
07:45	08:00	138	142	146	426	19	306	24	349	**775**	0	17	15	32	13	10	5	28	**60**	**835**
08:00	08:15	107	152	152	411	24	292	37	353	**764**	7	16	31	54	14	3	9	26	**80**	**844**
08:15	08:30	158	154	152	464	29	273	29	331	**795**	10	25	31	66	14	17	8	39	**105**	**900**
08:30	08:45	139	181	171	491	18	312	30	360	**851**	7	28	35	70	6	19	4	29	**99**	**950**
08:45	09:00	157	198	170	525	39	270	29	338	**863**	3	24	35	62	11	52	8	71	**133**	**996**
09:00	09:15	153	198	182	533	29	223	25	277	**810**	9	26	27	62	22	32	11	65	**127**	**937**
09:15	09:30	138	190	154	482	18	222	20	260	**742**	3	14	24	41	14	23	7	44	**85**	**827**
09:30	09:45	97	171	113	381	8	253	25	286	**667**	3	5	35	43	17	10	3	30	**73**	**740**
09:45	10:00	86	177	69	332	13	193	13	219	**551**	7	7	25	39	14	6	2	22	**61**	**612**
11:30	11:45	32	169	27	228	11	189	19	219	**447**	15	8	58	81	45	9	21	75	**156**	**603**
11:45	12:00	59	208	29	296	14	173	18	205	**501**	33	15	85	133	54	15	20	89	**222**	**723**
12:00	12:15	48	228	29	305	14	173	27	214	**519**	38	11	61	110	50	12	29	91	**201**	**720**
12:15	12:30	52	219	33	304	10	193	38	241	**545**	23	12	53	88	50	15	17	82	**170**	**715**
12:30	12:45	59	196	58	313	25	207	30	262	**575**	18	7	51	76	41	10	13	64	**140**	**715**
12:45	13:00	72	192	49	313	24	206	49	279	**592**	19	15	34	68	30	11	10	51	**119**	**711**
13:00	13:15	61	196	43	300	22	192	37	251	**551**	16	12	49	77	27	12	15	54	**131**	**682**
13:15	13:30	41	192	32	265	22	166	33	221	**486**	17	6	28	51	24	3	11	38	**89**	**575**
15:00	15:15	20	207	18	245	9	167	16	192	**437**	12	7	102	121	51	7	13	71	**192**	**629**
15:15	15:30	19	291	29	339	6	178	8	192	**531**	15	11	49	75	52	2	12	66	**141**	**672**
15:30	15:45	33	295	40	368	2	197	10	209	**577**	13	3	49	65	98	5	15	118	**183**	**760**
15:45	16:00	34	305	31	370	4	156	14	174	**544**	17	5	80	102	72	4	13	89	**191**	**735**
16:00	16:15	38	355	17	410	6	192	18	216	**626**	23	10	122	155	143	20	27	190	**345**	**971**
16:15	16:30	40	372	17	429	7	200	22	229	**658**	27	7	113	147	98	13	30	141	**288**	**946**
16:30	16:45	47	328	15	390	14	173	25	212	**602**	19	19	183	221	164	19	43	226	**447**	**1049**
16:45	17:00	25	384	22	431	5	214	14	233	**664**	19	10	155	184	136	13	34	183	**367**	**1031**
17:00	17:15	25	418	16	459	7	219	6	232	**691**	31	7	185	223	192	19	53	264	**487**	**1178**
17:15	17:30	24	403	13	440	11	257	23	291	**731**	18	5	122	145	121	17	48	186	**331**	**1062**
17:30	17:45	25	337	4	366	9	241	10	260	**626**	16	8	95	119	124	14	29	167	**286**	**912**
17:45	18:00	32	354	13	399	8	199	11	218	**617**	7	3	85	95	83	9	24	116	**211**	**828**
Total:		2123	7537	2065	1172	477	7144	739	8360	**20085**	453	355	2067	2875	1823	408	539	2770	**20085**	**25,730**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36153

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		MARCH RD			SOLANDT RD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	1	0	**1**	2	0	**2**	**3**
07:15	07:30	2	0	**2**	1	0	**1**	**3**
07:30	07:45	0	0	**0**	0	0	**0**	**0**
07:45	08:00	4	0	**4**	0	0	**0**	**4**
08:00	08:15	3	0	**3**	0	1	**1**	**4**
08:15	08:30	2	1	**3**	0	0	**0**	**3**
08:30	08:45	3	0	**3**	0	1	**1**	**4**
08:45	09:00	5	0	**5**	1	0	**1**	**6**
09:00	09:15	2	0	**2**	0	0	**0**	**2**
09:15	09:30	4	0	**4**	0	0	**0**	**4**
09:30	09:45	2	0	**2**	0	0	**0**	**2**
09:45	10:00	1	4	**5**	0	0	**0**	**5**
11:30	11:45	1	0	**1**	0	0	**0**	**1**
11:45	12:00	0	1	**1**	2	1	**3**	**4**
12:00	12:15	0	0	**0**	0	0	**0**	**0**
12:15	12:30	0	0	**0**	0	1	**1**	**1**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	0	0	**0**	**0**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	1	0	**1**	0	0	**0**	**1**
15:00	15:15	1	1	**2**	0	1	**1**	**3**
15:15	15:30	2	1	**3**	2	0	**2**	**5**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	1	1	**2**	1	2	**3**	**5**
16:00	16:15	0	1	**1**	1	2	**3**	**4**
16:15	16:30	0	1	**1**	0	1	**1**	**2**
16:30	16:45	0	3	**3**	0	1	**1**	**4**
16:45	17:00	1	0	**1**	2	1	**3**	**4**
17:00	17:15	1	1	**2**	1	0	**1**	**3**
17:15	17:30	0	1	**1**	1	0	**1**	**2**
17:30	17:45	0	1	**1**	1	1	**2**	**3**
17:45	18:00	0	0	**0**	0	1	**1**	**1**
Total		37	17	**54**	15	14	**29**	**83**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36153

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

	MARCH RD			SOLANDT RD			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	0	0	**0**	0	0	**0**	**0**
07:15 07:30	0	0	**0**	0	1	**1**	**1**
07:30 07:45	0	0	**0**	0	0	**0**	**0**
07:45 08:00	1	2	**3**	0	0	**0**	**3**
08:00 08:15	0	3	**3**	0	0	**0**	**3**
08:15 08:30	0	0	**0**	1	0	**1**	**1**
08:30 08:45	7	2	**9**	2	0	**2**	**11**
08:45 09:00	1	0	**1**	2	0	**2**	**3**
09:00 09:15	0	5	**5**	1	0	**1**	**6**
09:15 09:30	0	3	**3**	2	0	**2**	**5**
09:30 09:45	0	1	**1**	0	0	**0**	**1**
09:45 10:00	0	1	**1**	0	0	**0**	**1**
11:30 11:45	1	0	**1**	3	0	**3**	**4**
11:45 12:00	0	0	**0**	1	0	**1**	**1**
12:00 12:15	2	0	**2**	5	1	**6**	**8**
12:15 12:30	3	0	**3**	1	0	**1**	**4**
12:30 12:45	2	1	**3**	2	2	**4**	**7**
12:45 13:00	0	2	**2**	1	4	**5**	**7**
13:00 13:15	6	2	**8**	3	0	**3**	**11**
13:15 13:30	1	5	**6**	1	2	**3**	**9**
15:00 15:15	5	2	**7**	1	0	**1**	**8**
15:15 15:30	0	0	**0**	1	0	**1**	**1**
15:30 15:45	2	0	**2**	2	0	**2**	**4**
15:45 16:00	2	2	**4**	2	1	**3**	**7**
16:00 16:15	1	0	**1**	0	0	**0**	**1**
16:15 16:30	0	0	**0**	0	0	**0**	**0**
16:30 16:45	1	2	**3**	1	0	**1**	**4**
16:45 17:00	7	1	**8**	4	1	**5**	**13**
17:00 17:15	0	2	**2**	3	0	**3**	**5**
17:15 17:30	0	0	**0**	3	0	**3**	**3**
17:30 17:45	2	0	**2**	1	0	**1**	**3**
17:45 18:00	0	2	**2**	0	0	**0**	**2**
Total	44	38	**82**	43	12	**55**	**137**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36153

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		MARCH RD									SOLANDT RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	1	7	0	**8**	0	5	1	**6**	**14**	1	0	5	**6**	0	0	0	**0**	**6**	**20**
07:15	07:30	0	9	0	**9**	0	4	1	**5**	**14**	1	0	2	**3**	0	0	0	**0**	**3**	**17**
07:30	07:45	2	4	0	**6**	0	7	0	**7**	**13**	0	0	1	**1**	0	2	0	**2**	**3**	**16**
07:45	08:00	1	4	0	**5**	0	5	1	**6**	**11**	0	1	0	**1**	0	0	0	**0**	**1**	**12**
08:00	08:15	2	10	0	**12**	0	5	0	**5**	**17**	0	0	2	**2**	0	1	0	**1**	**3**	**20**
08:15	08:30	2	12	0	**14**	0	7	0	**7**	**21**	2	0	0	**2**	0	1	0	**1**	**3**	**24**
08:30	08:45	1	4	1	**6**	0	4	0	**4**	**10**	0	1	1	**2**	0	3	0	**3**	**5**	**15**
08:45	09:00	1	7	1	**9**	2	8	1	**11**	**20**	0	0	4	**4**	1	0	1	**2**	**6**	**26**
09:00	09:15	0	9	3	**12**	0	8	1	**9**	**21**	0	1	1	**2**	0	0	0	**0**	**2**	**23**
09:15	09:30	4	4	2	**10**	0	3	1	**4**	**14**	0	0	2	**2**	1	1	1	**3**	**5**	**19**
09:30	09:45	2	10	0	**12**	0	5	0	**5**	**17**	0	0	6	**6**	0	1	1	**2**	**8**	**25**
09:45	10:00	1	4	2	**7**	0	5	0	**5**	**12**	0	0	2	**2**	1	0	0	**1**	**3**	**15**
11:30	11:45	2	0	0	**2**	0	8	0	**8**	**10**	0	0	1	**1**	0	0	0	**0**	**1**	**11**
11:45	12:00	0	3	0	**3**	0	5	1	**6**	**9**	2	0	3	**5**	0	0	0	**0**	**5**	**14**
12:00	12:15	2	5	1	**8**	0	3	1	**4**	**12**	0	0	0	**0**	0	0	0	**0**	**0**	**12**
12:15	12:30	1	7	2	**10**	0	5	4	**9**	**19**	0	0	1	**1**	1	2	1	**4**	**5**	**24**
12:30	12:45	1	1	0	**2**	0	5	1	**6**	**8**	1	0	2	**3**	0	1	0	**1**	**4**	**12**
12:45	13:00	4	2	0	**6**	0	8	1	**9**	**15**	0	1	1	**2**	0	1	0	**1**	**3**	**18**
13:00	13:15	2	10	1	**13**	1	4	0	**5**	**18**	0	1	3	**4**	1	2	0	**3**	**7**	**25**
13:15	13:30	0	4	1	**5**	1	4	1	**6**	**11**	1	1	3	**5**	2	0	0	**2**	**7**	**18**
15:00	15:15	0	3	0	**3**	0	1	1	**2**	**5**	0	2	2	**4**	1	1	0	**2**	**6**	**11**
15:15	15:30	1	6	1	**8**	0	4	0	**4**	**12**	1	2	1	**4**	0	0	0	**0**	**4**	**16**
15:30	15:45	1	1	0	**2**	0	6	2	**8**	**10**	0	0	0	**0**	1	0	1	**2**	**2**	**12**
15:45	16:00	2	5	0	**7**	0	7	0	**7**	**14**	0	0	3	**3**	0	0	0	**0**	**3**	**17**
16:00	16:15	2	5	0	**7**	0	4	0	**4**	**11**	0	0	0	**0**	1	0	0	**1**	**1**	**12**
16:15	16:30	1	5	0	**6**	0	7	0	**7**	**13**	0	0	1	**1**	0	0	1	**1**	**2**	**15**
16:30	16:45	1	6	1	**8**	0	3	1	**4**	**12**	0	1	1	**2**	0	0	0	**0**	**2**	**14**
16:45	17:00	1	2	0	**3**	0	3	2	**5**	**8**	1	0	3	**4**	1	0	0	**1**	**5**	**13**
17:00	17:15	1	4	0	**5**	0	2	0	**2**	**7**	1	0	1	**2**	0	0	0	**0**	**2**	**9**
17:15	17:30	1	1	1	**3**	0	5	0	**5**	**8**	0	1	1	**2**	0	0	0	**0**	**2**	**10**
17:30	17:45	0	2	0	**2**	0	3	0	**3**	**5**	0	0	0	**0**	0	0	0	**0**	**0**	**5**
17:45	18:00	2	0	0	**2**	0	3	1	**4**	**6**	0	0	0	**0**	0	0	0	**0**	**0**	**6**
Total:	None	42	156	17	**215**	4	156	22	**182**	**397**	11	12	53	**76**	11	16	6	**33**	**109**	**506**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ SOLANDT RD

Survey Date: Wednesday, August 10, 2016 **WO No:** 36153

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		MARCH RD Northbound U-Turn Total	MARCH RD Southbound U-Turn Total	SOLANDT RD Eastbound U-Turn Total	SOLANDT RD Westbound U-Turn Total	Total
07:00	07:15	0	3	0	0	**3**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	1	1	0	0	**2**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	1	3	0	0	**4**
08:30	08:45	0	1	0	0	**1**
08:45	09:00	0	7	0	0	**7**
09:00	09:15	1	0	0	0	**1**
09:15	09:30	1	1	0	0	**2**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	2	4	0	0	**6**
11:45	12:00	3	6	0	0	**9**
12:00	12:15	6	1	0	0	**7**
12:15	12:30	2	3	0	0	**5**
12:30	12:45	0	5	0	0	**5**
12:45	13:00	0	5	0	0	**5**
13:00	13:15	0	5	0	0	**5**
13:15	13:30	2	3	0	0	**5**
15:00	15:15	1	2	0	0	**3**
15:15	15:30	0	4	0	0	**4**
15:30	15:45	0	1	0	0	**1**
15:45	16:00	1	1	0	0	**2**
16:00	16:15	0	1	0	0	**1**
16:15	16:30	3	1	0	0	**4**
16:30	16:45	1	7	0	0	**8**
16:45	17:00	1	2	0	0	**3**
17:00	17:15	0	4	0	0	**4**
17:15	17:30	5	1	0	0	**6**
17:30	17:45	1	4	0	0	**5**
17:45	18:00	2	5	0	0	**7**
Total		34	81	0	0	**115**

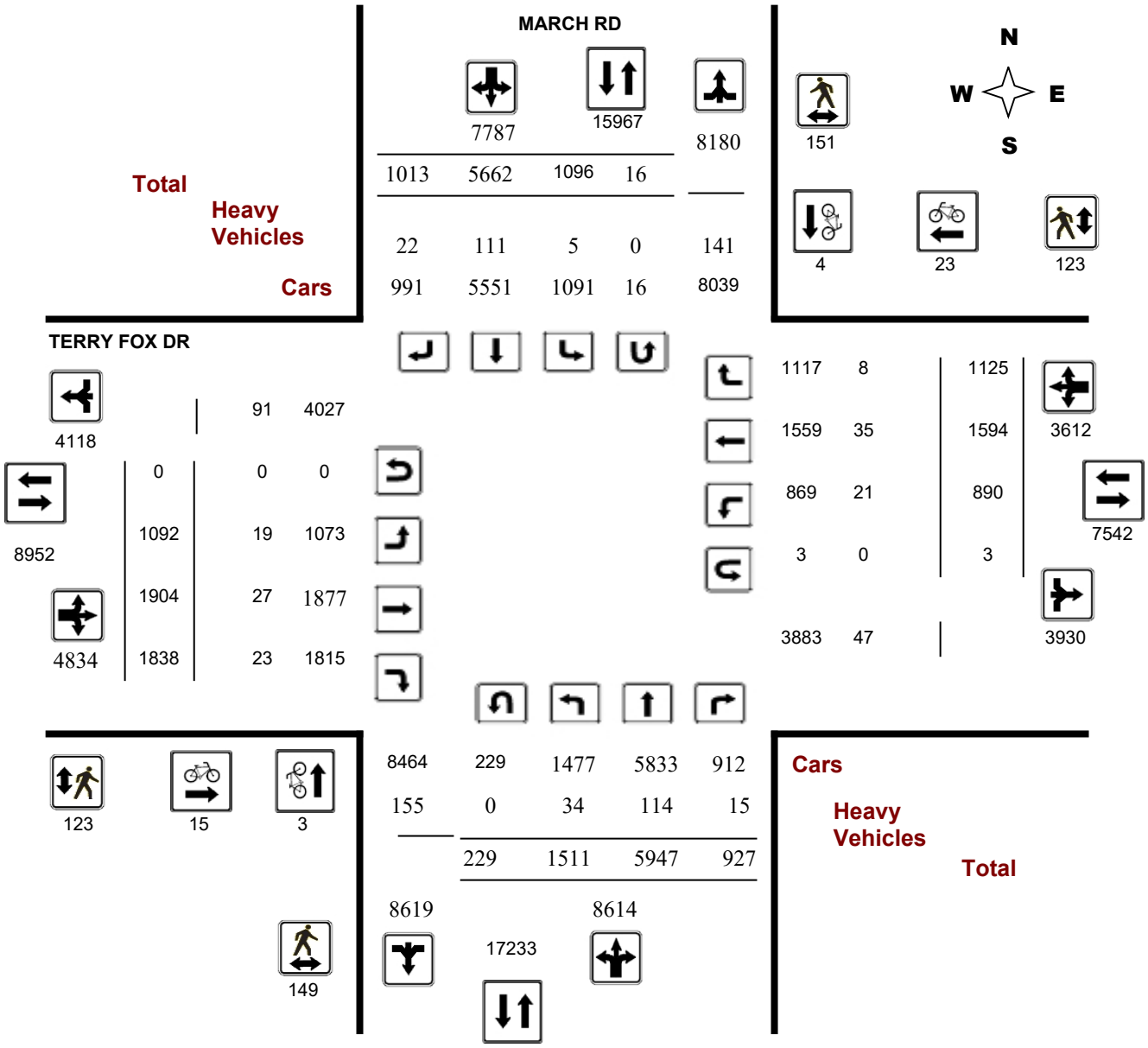
Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018
Start Time: 07:00
WO No: 37663
Device: Miovision

Full Study Diagram



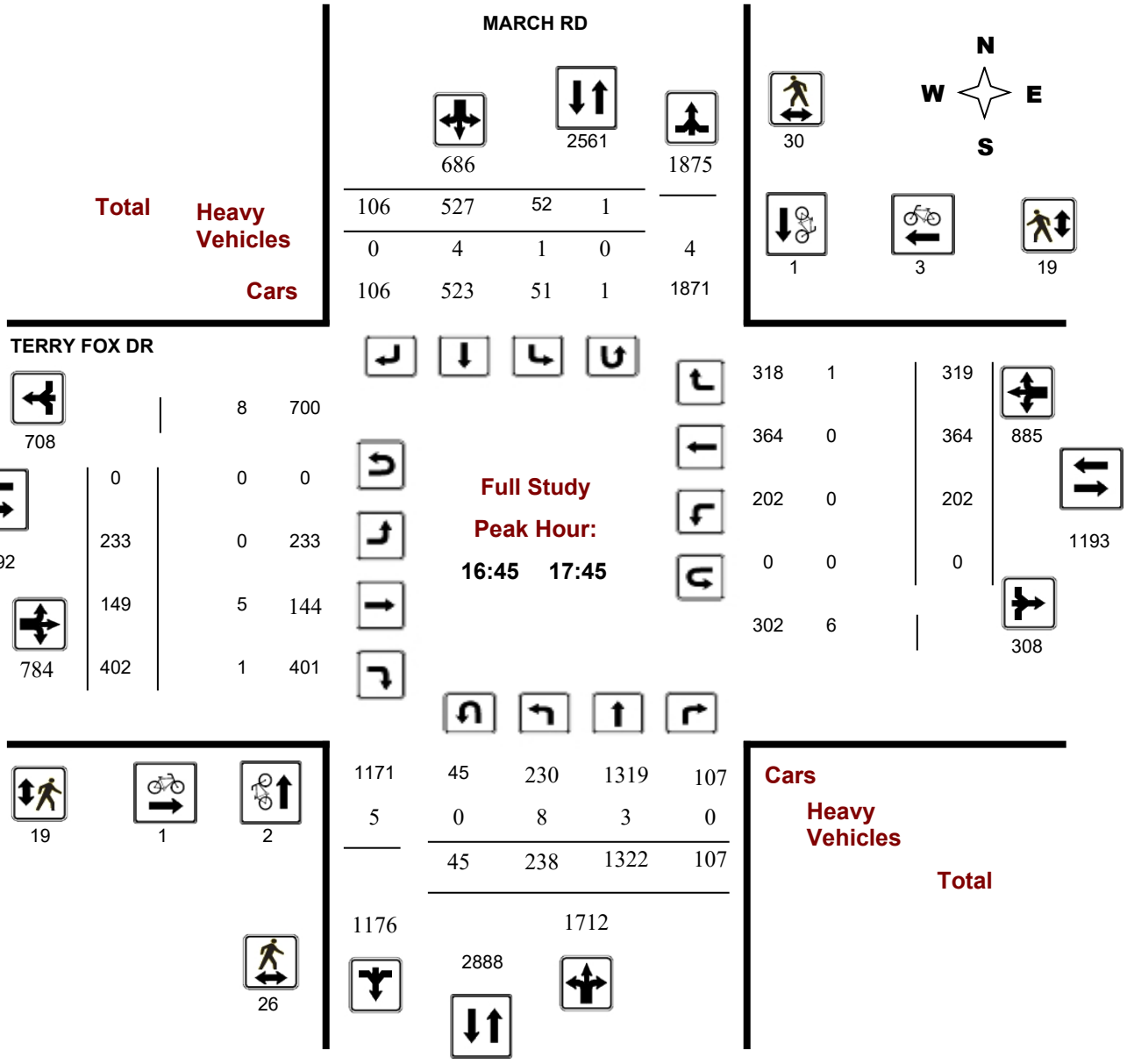
Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018
Start Time: 07:00
WO No: 37663
Device: Miovision

Full Study Peak Hour Diagram



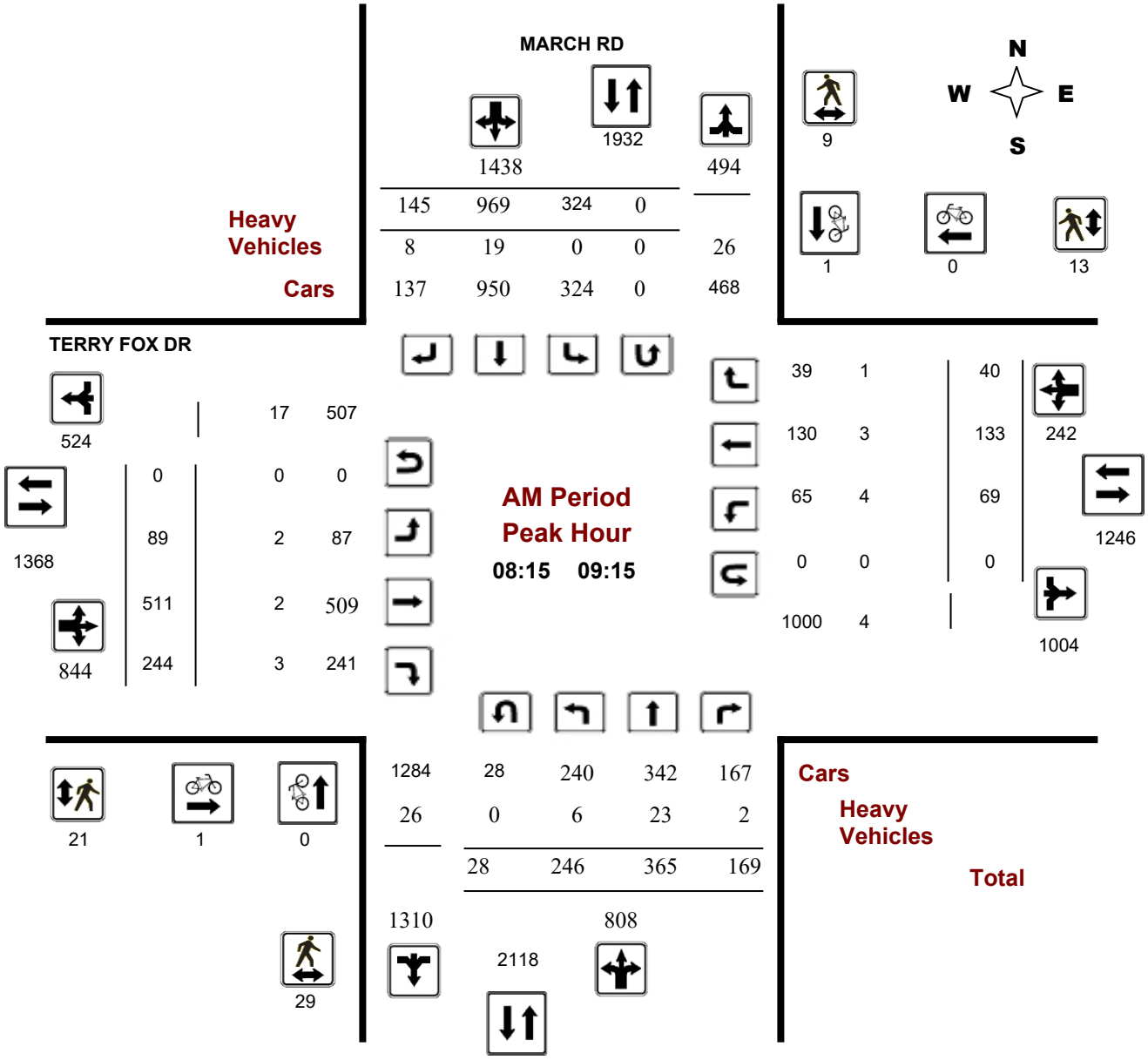
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018 **WO No:** 37663

Start Time: 07:00 **Device:** Miovision



Comments

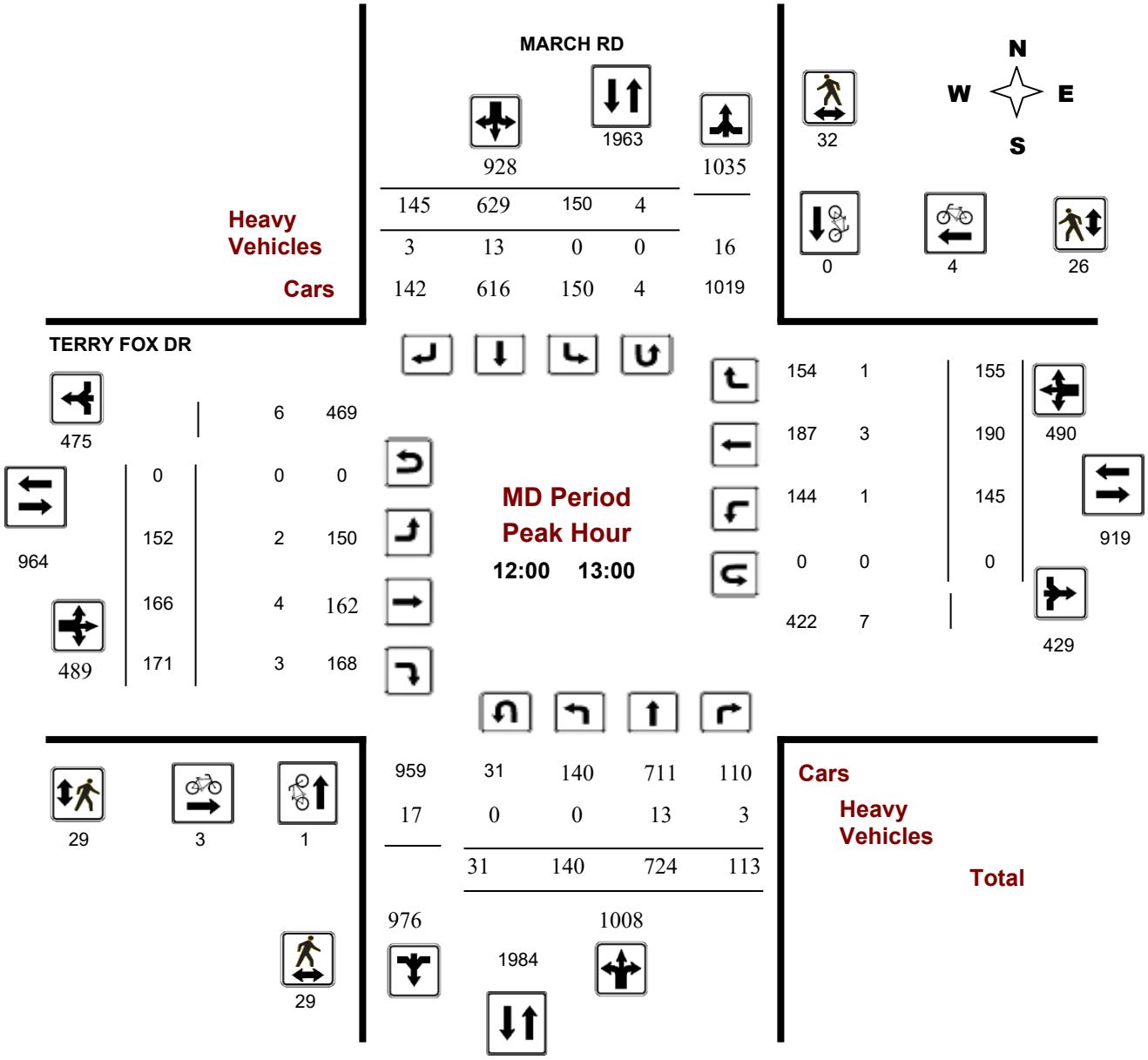
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018
Start Time: 07:00

WO No: 37663
Device: Miovision



Comments

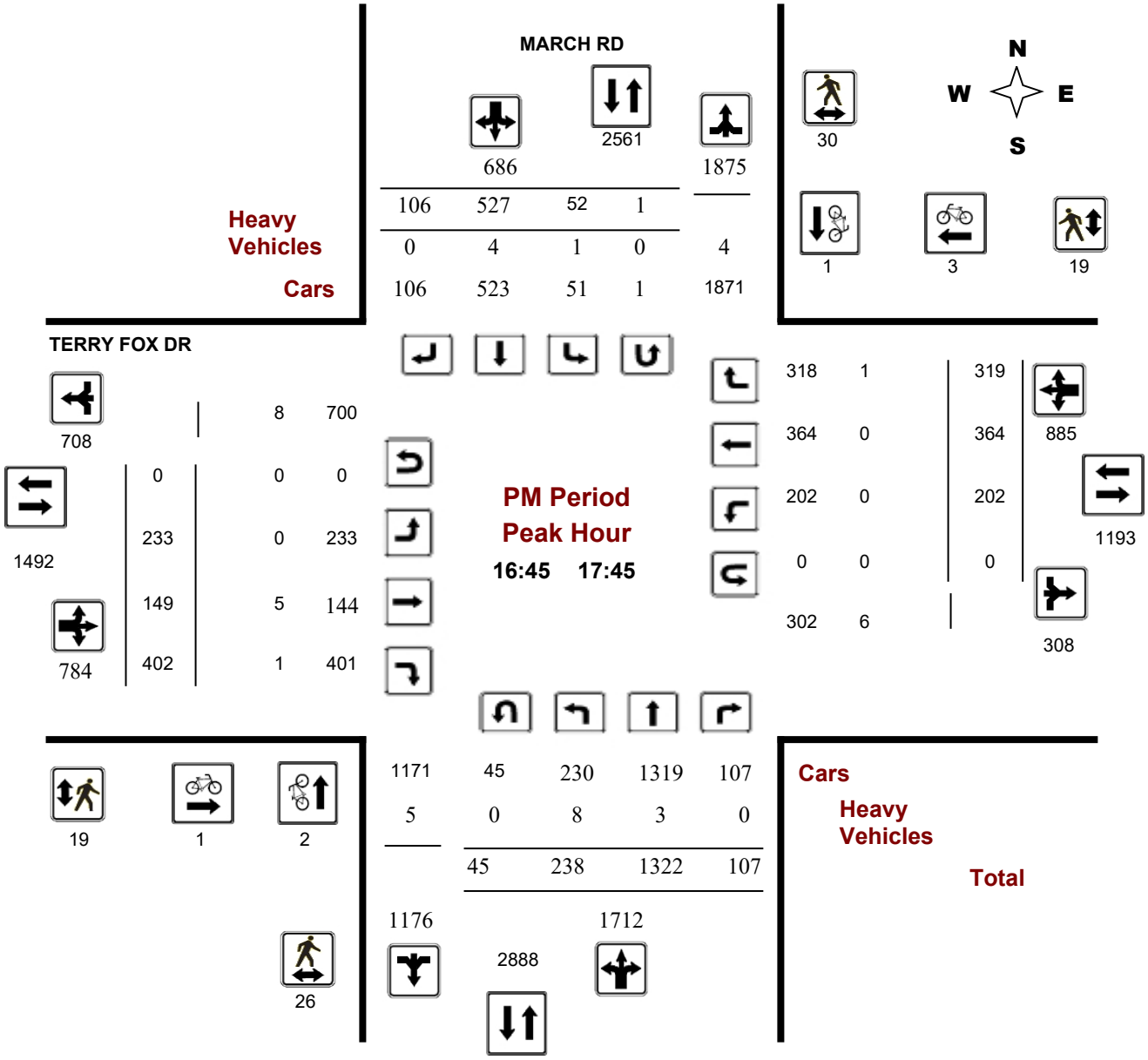
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018 **WO No:** 37663

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018 **WO No:** 37663

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, April 11, 2018

Total Observed U-Turns

Northbound: 229 Southbound: 16

Eastbound: 0 Westbound: 3

AADT Factor

.90

	MARCH RD									TERRY FOX DR									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	135	301	99	**535**	182	1128	111	**1421**	**1956**	49	304	229	**582**	55	74	20	**149**	**731**	**2687**
08:00 09:00	229	359	167	**755**	328	966	135	**1429**	**2184**	84	480	266	**830**	55	113	38	**206**	**1036**	**3220**
09:00 10:00	243	357	139	**739**	192	836	154	**1182**	**1921**	83	412	165	**660**	65	128	35	**228**	**888**	**2809**
11:30 12:30	133	676	123	**932**	104	593	120	**817**	**1749**	143	119	172	**434**	150	222	170	**542**	**976**	**2725**
12:30 13:30	114	653	106	**873**	144	625	146	**915**	**1788**	134	216	156	**506**	122	152	99	**373**	**879**	**2667**
15:00 16:00	192	1076	96	**1364**	51	463	110	**624**	**1988**	183	92	153	**428**	96	213	166	**475**	**903**	**2891**
16:00 17:00	245	1242	105	**1592**	36	510	125	**671**	**2263**	187	126	291	**604**	132	327	272	**731**	**1335**	**3598**
17:00 18:00	220	1283	92	**1595**	59	541	112	**712**	**2307**	229	155	406	**790**	215	365	325	**905**	**1695**	**4002**
Sub Total	1511	5947	927	**8385**	1096	5662	1013	**7771**	**16156**	1092	1904	1838	**4834**	890	1594	1125	**3609**	**8443**	**24599**
U Turns	229			**229**	16			**16**	**245**	**0**			**0**	3			**3**	**3**	**248**
Total	1740	5947	927	**8614**	1112	5662	1013	**7787**	**16401**	1092	1904	1838	**4834**	893	1594	1125	**3612**	**8446**	**24847**
EQ 12Hr	2419	8266	1289	**11974**	1546	7870	1408	**10824**	**22798**	1518	2647	2555	**6720**	1241	2216	1564	**5021**	**11741**	**34539**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	2177	7439	1160	**10776**	1391	7083	1267	**9741**	**20517**	1366	2382	2300	**6048**	1117	1994	1408	**4519**	**10567**	**31084**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	2852	9745	1520	**14117**	1822	9279	1660	**12761**	**26878**	1789	3120	3013	**7922**	1463	2612	1844	**5919**	**13841**	**40719**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018 **WO No:** 37663

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		MARCH RD									TERRY FOX DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	27	58	21	106	26	282	20	328	**434**	7	42	54	103	11	11	4	26	**129**	**563**
07:15	07:30	34	83	21	138	35	274	23	332	**470**	12	74	62	148	14	16	7	37	**185**	**655**
07:30	07:45	37	89	25	151	52	313	28	393	**544**	10	74	55	139	16	20	7	43	**182**	**726**
07:45	08:00	50	71	32	153	71	259	40	370	**523**	20	114	58	192	15	27	2	44	**236**	**759**
08:00	08:15	61	72	46	179	84	259	41	384	**563**	11	92	68	171	11	24	8	43	**214**	**777**
08:15	08:30	59	95	46	200	80	237	22	339	**539**	26	130	75	231	15	24	15	54	**285**	**824**
08:30	08:45	60	96	31	187	86	249	30	365	**552**	21	124	60	205	13	26	5	44	**249**	**801**
08:45	09:00	72	96	44	212	78	221	42	341	**553**	26	134	63	223	16	39	10	65	**288**	**841**
09:00	09:15	83	78	48	209	80	262	51	393	**602**	16	123	46	185	25	44	10	79	**264**	**866**
09:15	09:30	75	90	37	202	58	233	42	333	**535**	25	135	39	199	13	40	8	61	**260**	**795**
09:30	09:45	79	99	27	205	32	183	37	252	**457**	19	100	45	164	19	27	8	54	**218**	**675**
09:45	10:00	41	90	27	158	25	158	24	207	**365**	23	54	35	112	8	17	9	34	**146**	**511**
11:30	11:45	26	149	25	200	26	130	29	185	**385**	28	19	41	88	31	51	31	113	**201**	**586**
11:45	12:00	45	147	34	226	23	163	26	212	**438**	36	32	45	113	36	59	53	148	**261**	**699**
12:00	12:15	54	202	34	290	26	165	29	220	**510**	44	32	40	116	43	71	41	155	**271**	**781**
12:15	12:30	46	178	30	254	34	135	36	205	**459**	35	36	46	117	40	41	45	126	**243**	**702**
12:30	12:45	25	191	21	237	51	176	37	264	**501**	30	33	39	102	24	35	42	101	**203**	**704**
12:45	13:00	46	153	28	227	43	153	43	239	**466**	43	65	46	154	38	43	27	108	**262**	**728**
13:00	13:15	29	175	26	230	32	166	31	229	**459**	30	63	34	127	32	42	19	93	**220**	**679**
13:15	13:30	28	134	31	193	20	130	35	185	**378**	31	55	37	123	28	32	11	71	**194**	**572**
15:00	15:15	54	230	21	305	18	121	27	166	**471**	45	22	45	112	27	40	22	89	**201**	**672**
15:15	15:30	34	238	27	299	11	101	16	128	**427**	51	18	31	100	28	42	36	106	**206**	**633**
15:30	15:45	63	303	21	387	10	120	28	158	**545**	41	26	34	101	16	66	50	132	**233**	**778**
15:45	16:00	67	305	27	399	13	121	39	173	**572**	46	26	43	115	26	65	58	149	**264**	**836**
16:00	16:15	90	285	31	406	16	130	33	179	**585**	45	34	68	147	30	89	74	193	**340**	**925**
16:15	16:30	62	336	23	421	5	131	30	166	**587**	47	37	65	149	37	51	76	164	**313**	**900**
16:30	16:45	61	272	19	352	9	117	36	162	**514**	52	30	77	159	38	101	59	198	**357**	**871**
16:45	17:00	68	349	32	449	8	132	26	166	**615**	43	25	81	149	27	86	63	176	**325**	**940**
17:00	17:15	74	302	29	405	12	145	26	183	**588**	68	56	111	235	60	127	92	279	**514**	**1102**
17:15	17:30	82	373	22	477	17	126	21	164	**641**	56	36	107	199	65	70	84	219	**418**	**1059**
17:30	17:45	59	298	24	381	16	124	33	173	**554**	66	32	103	201	50	81	80	211	**412**	**966**
17:45	18:00	49	310	17	376	15	146	32	193	**569**	39	31	85	155	41	87	69	197	**352**	**921**
Total:		1740	5947	927	8614	1112	5662	1013	7787	**16401**	1092	1904	1838	4834	893	1594	1125	3612	**16401**	**24,847**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018 **WO No:** 37663

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		MARCH RD			TERRY FOX DR			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	1	**1**	1	0	**1**	**2**
07:15	07:30	0	0	**0**	0	1	**1**	**1**
07:30	07:45	0	0	**0**	1	1	**2**	**2**
07:45	08:00	0	1	**1**	2	1	**3**	**4**
08:00	08:15	0	0	**0**	1	1	**2**	**2**
08:15	08:30	0	0	**0**	1	0	**1**	**1**
08:30	08:45	0	1	**1**	0	0	**0**	**1**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	0	**0**	0	0	**0**	**0**
09:15	09:30	0	0	**0**	1	0	**1**	**1**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	0	0	**0**	1	1	**2**	**2**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	1	6	**7**	**7**
12:00	12:15	0	0	**0**	0	2	**2**	**2**
12:15	12:30	0	0	**0**	0	2	**2**	**2**
12:30	12:45	1	0	**1**	1	0	**1**	**2**
12:45	13:00	0	0	**0**	2	0	**2**	**2**
13:00	13:15	0	0	**0**	1	0	**1**	**1**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	0	**0**	0	1	**1**	**1**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	0	0	**0**	0	0	**0**	**0**
16:30	16:45	0	0	**0**	1	3	**4**	**4**
16:45	17:00	1	1	**2**	0	1	**1**	**3**
17:00	17:15	0	0	**0**	0	1	**1**	**1**
17:15	17:30	1	0	**1**	0	0	**0**	**1**
17:30	17:45	0	0	**0**	1	1	**2**	**2**
17:45	18:00	0	0	**0**	0	1	**1**	**1**
Total		3	4	**7**	15	23	**38**	**45**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018 **WO No:** 37663

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

	MARCH RD			TERRY FOX DR			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	4	0	**4**	0	1	**1**	**5**
07:15 07:30	0	2	**2**	0	0	**0**	**2**
07:30 07:45	3	1	**4**	4	3	**7**	**11**
07:45 08:00	2	1	**3**	3	2	**5**	**8**
08:00 08:15	3	0	**3**	1	1	**2**	**5**
08:15 08:30	6	1	**7**	6	2	**8**	**15**
08:30 08:45	6	3	**9**	5	1	**6**	**15**
08:45 09:00	10	1	**11**	4	2	**6**	**17**
09:00 09:15	7	4	**11**	6	8	**14**	**25**
09:15 09:30	5	0	**5**	5	5	**10**	**15**
09:30 09:45	1	0	**1**	1	1	**2**	**3**
09:45 10:00	2	0	**2**	0	1	**1**	**3**
11:30 11:45	2	1	**3**	2	7	**9**	**12**
11:45 12:00	14	9	**23**	9	10	**19**	**42**
12:00 12:15	5	7	**12**	6	2	**8**	**20**
12:15 12:30	10	16	**26**	16	8	**24**	**50**
12:30 12:45	7	2	**9**	0	10	**10**	**19**
12:45 13:00	7	7	**14**	7	6	**13**	**27**
13:00 13:15	11	16	**27**	14	9	**23**	**50**
13:15 13:30	7	7	**14**	7	7	**14**	**28**
15:00 15:15	0	4	**4**	1	0	**1**	**5**
15:15 15:30	1	0	**1**	1	0	**1**	**2**
15:30 15:45	1	3	**4**	0	1	**1**	**5**
15:45 16:00	1	3	**4**	1	3	**4**	**8**
16:00 16:15	4	1	**5**	0	6	**6**	**11**
16:15 16:30	0	11	**11**	2	1	**3**	**14**
16:30 16:45	2	14	**16**	1	4	**5**	**21**
16:45 17:00	5	5	**10**	2	6	**8**	**18**
17:00 17:15	12	9	**21**	8	8	**16**	**37**
17:15 17:30	5	9	**14**	6	4	**10**	**24**
17:30 17:45	4	7	**11**	3	1	**4**	**15**
17:45 18:00	2	7	**9**	2	3	**5**	**14**
Total	149	151	**300**	123	123	**246**	**546**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018 **WO No:** 37663

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		MARCH RD									TERRY FOX DR									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	1	3	1	**5**	0	3	1	**4**	**9**	0	1	1	**2**	0	1	0	**1**	**3**	**12**
07:15	07:30	1	2	0	**3**	1	2	2	**5**	**8**	1	1	3	**5**	0	2	0	**2**	**7**	**15**
07:30	07:45	2	1	0	**3**	0	4	1	**5**	**8**	0	0	1	**1**	3	2	0	**5**	**6**	**14**
07:45	08:00	0	3	0	**3**	0	0	1	**1**	**4**	2	0	2	**4**	4	0	0	**4**	**8**	**12**
08:00	08:15	0	2	0	**2**	0	3	1	**4**	**6**	1	0	1	**2**	0	2	0	**2**	**4**	**10**
08:15	08:30	2	5	1	**8**	0	4	0	**4**	**12**	1	2	2	**5**	3	0	1	**4**	**9**	**21**
08:30	08:45	2	5	1	**8**	0	5	2	**7**	**15**	0	0	0	**0**	0	2	0	**2**	**2**	**17**
08:45	09:00	1	10	0	**11**	0	6	2	**8**	**19**	0	0	1	**1**	1	0	0	**1**	**2**	**21**
09:00	09:15	1	3	0	**4**	0	4	4	**8**	**12**	1	0	0	**1**	0	1	0	**1**	**2**	**14**
09:15	09:30	1	5	1	**7**	0	1	2	**3**	**10**	1	0	0	**1**	0	2	0	**2**	**3**	**13**
09:30	09:45	0	7	0	**7**	1	6	0	**7**	**14**	0	1	0	**1**	0	2	1	**3**	**4**	**18**
09:45	10:00	1	6	0	**7**	0	6	0	**6**	**13**	0	1	0	**1**	1	2	0	**3**	**4**	**17**
11:30	11:45	1	4	0	**5**	0	5	0	**5**	**10**	1	1	0	**2**	2	3	1	**6**	**8**	**18**
11:45	12:00	1	3	0	**4**	0	3	0	**3**	**7**	1	2	0	**3**	0	0	0	**0**	**3**	**10**
12:00	12:15	0	3	0	**3**	0	7	1	**8**	**11**	2	0	0	**2**	0	1	1	**2**	**4**	**15**
12:15	12:30	0	3	1	**4**	0	1	1	**2**	**6**	0	1	1	**2**	0	0	0	**0**	**2**	**8**
12:30	12:45	0	6	1	**7**	0	1	1	**2**	**9**	0	1	1	**2**	0	1	0	**1**	**3**	**12**
12:45	13:00	0	1	1	**2**	0	4	0	**4**	**6**	0	2	1	**3**	1	1	0	**2**	**5**	**11**
13:00	13:15	0	6	2	**8**	1	5	0	**6**	**14**	0	1	1	**2**	1	1	1	**3**	**5**	**19**
13:15	13:30	2	2	1	**5**	0	3	1	**4**	**9**	0	1	0	**1**	1	3	2	**6**	**7**	**16**
15:00	15:15	1	3	0	**4**	0	4	0	**4**	**8**	0	0	3	**3**	1	3	0	**4**	**7**	**15**
15:15	15:30	1	4	1	**6**	0	5	0	**5**	**11**	2	0	0	**2**	1	1	0	**2**	**4**	**15**
15:30	15:45	0	6	1	**7**	0	1	0	**1**	**8**	2	2	0	**4**	0	5	0	**5**	**9**	**17**
15:45	16:00	2	4	1	**7**	0	8	0	**8**	**15**	2	2	1	**5**	1	0	0	**1**	**6**	**21**
16:00	16:15	1	4	1	**6**	0	5	1	**6**	**12**	0	1	0	**1**	1	0	0	**1**	**2**	**14**
16:15	16:30	2	5	0	**7**	0	4	1	**5**	**12**	1	1	2	**4**	0	0	0	**0**	**4**	**16**
16:30	16:45	2	1	1	**4**	1	5	0	**6**	**10**	1	0	1	**2**	0	0	0	**0**	**2**	**12**
16:45	17:00	1	0	0	**1**	0	2	0	**2**	**3**	0	1	0	**1**	0	0	1	**1**	**2**	**5**
17:00	17:15	3	0	0	**3**	1	1	0	**2**	**5**	0	2	1	**3**	0	0	0	**0**	**3**	**8**
17:15	17:30	2	2	0	**4**	0	1	0	**1**	**5**	0	1	0	**1**	0	0	0	**0**	**1**	**6**
17:30	17:45	2	1	0	**3**	0	0	0	**0**	**3**	0	1	0	**1**	0	0	0	**0**	**1**	**4**
17:45	18:00	1	4	0	**5**	0	2	0	**2**	**7**	0	1	0	**1**	0	0	0	**0**	**1**	**8**
Total:	None	34	114	15	**163**	5	111	22	**138**	**301**	19	27	23	**69**	21	35	8	**64**	**133**	**434**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

MARCH RD @ TERRY FOX DR

Survey Date: Wednesday, April 11, 2018 **WO No:** 37663

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		MARCH RD Northbound U-Turn Total	MARCH RD Southbound U-Turn Total	TERRY FOX DR Eastbound U-Turn Total	TERRY FOX DR Westbound U-Turn Total	Total
07:00	07:15	2	0	0	0	**2**
07:15	07:30	4	1	0	0	**5**
07:30	07:45	4	0	0	0	**4**
07:45	08:00	3	1	0	1	**5**
08:00	08:15	6	0	0	0	**6**
08:15	08:30	5	0	0	0	**5**
08:30	08:45	4	0	0	0	**4**
08:45	09:00	8	0	0	0	**8**
09:00	09:15	11	0	0	0	**11**
09:15	09:30	10	2	0	0	**12**
09:30	09:45	10	1	0	0	**11**
09:45	10:00	4	0	0	0	**4**
11:30	11:45	7	0	0	0	**7**
11:45	12:00	10	1	0	0	**11**
12:00	12:15	13	2	0	0	**15**
12:15	12:30	8	2	0	0	**10**
12:30	12:45	3	0	0	0	**3**
12:45	13:00	7	0	0	0	**7**
13:00	13:15	3	1	0	0	**4**
13:15	13:30	1	1	0	0	**2**
15:00	15:15	5	0	0	0	**5**
15:15	15:30	6	0	0	1	**7**
15:30	15:45	8	0	0	0	**8**
15:45	16:00	7	1	0	0	**8**
16:00	16:15	18	2	0	0	**20**
16:15	16:30	6	0	0	0	**6**
16:30	16:45	5	0	0	0	**5**
16:45	17:00	7	0	0	0	**7**
17:00	17:15	14	0	0	0	**14**
17:15	17:30	13	1	0	0	**14**
17:30	17:45	11	0	0	0	**11**
17:45	18:00	6	0	0	1	**7**
Total		229	16	0	3	**248**

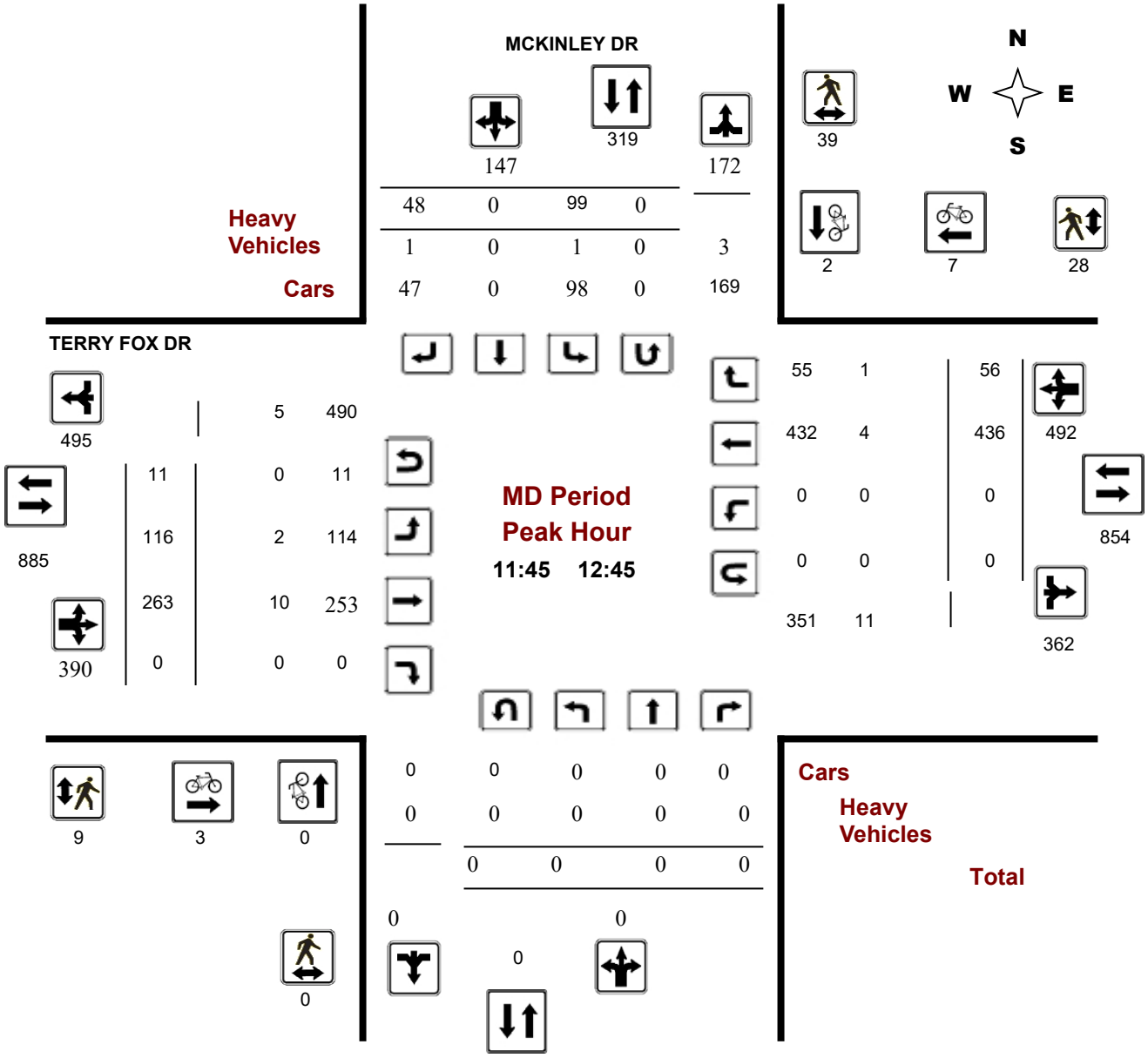
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MCKINLEY DR @ TERRY FOX DR

Survey Date: Tuesday, July 09, 2013
Start Time: 07:00

WO No: 39645
Device: Miovision



Comments

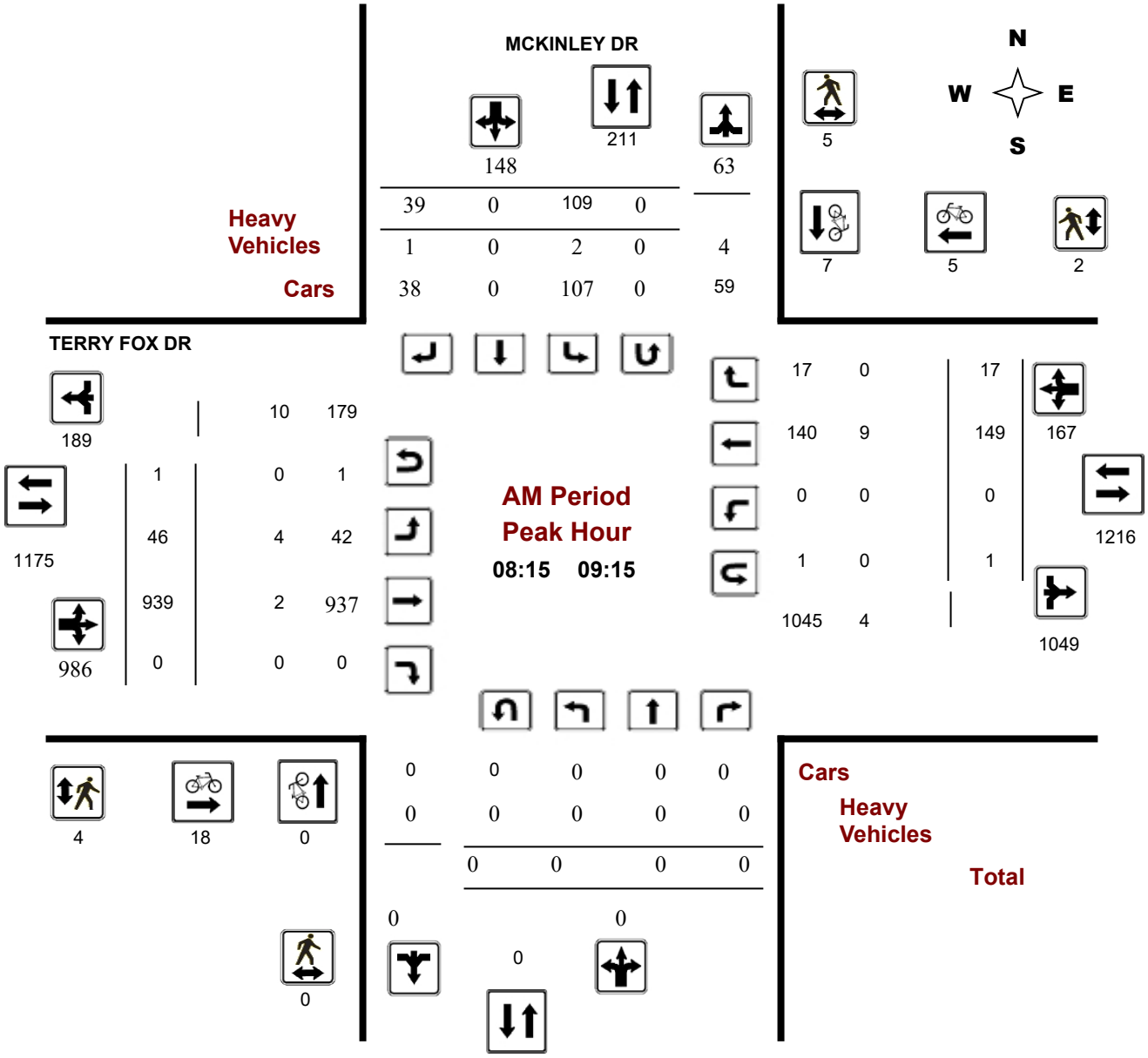
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MCKINLEY DR @ TERRY FOX DR

Survey Date: Tuesday, July 09, 2013 **WO No:** 39645

Start Time: 07:00 **Device:** Miovision



Comments

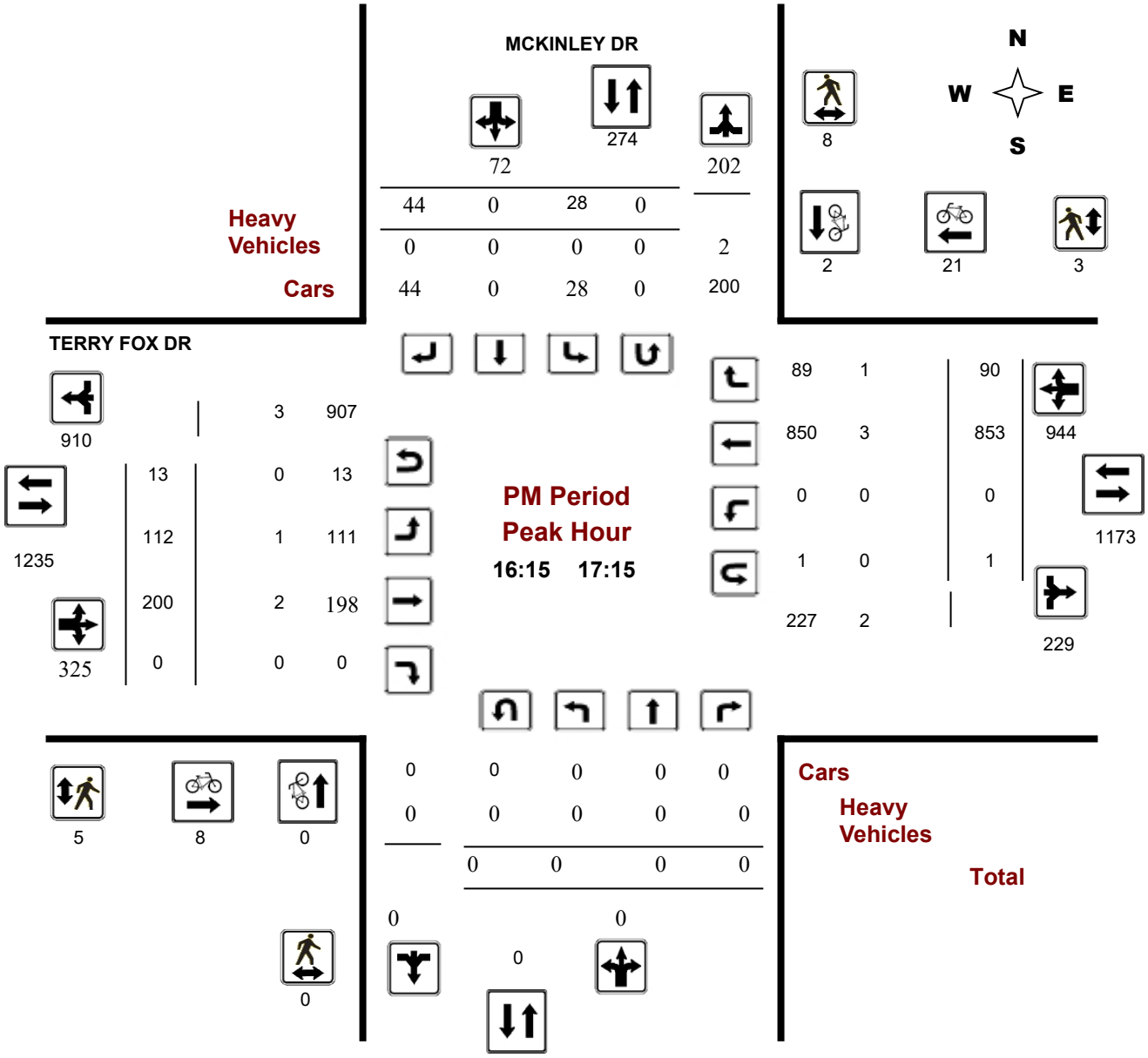
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MCKINLEY DR @ TERRY FOX DR

Survey Date: Tuesday, July 09, 2013 **WO No:** 39645

Start Time: 07:00 **Device:** Miovision



Comments

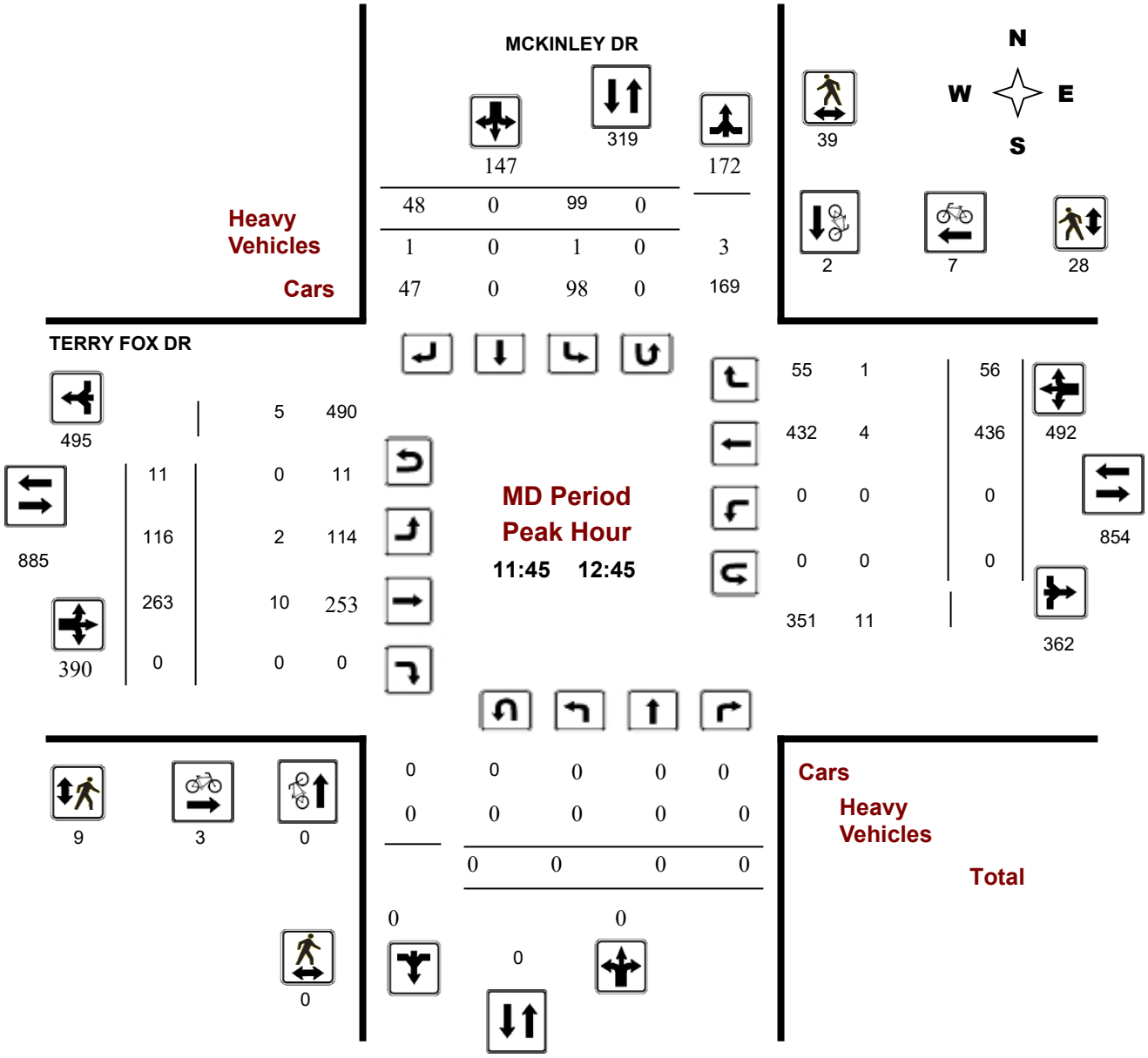
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MCKINLEY DR @ TERRY FOX DR

Survey Date: Tuesday, July 09, 2013 **WO No:** 39645

Start Time: 07:00 **Device:** Miovision



Comments

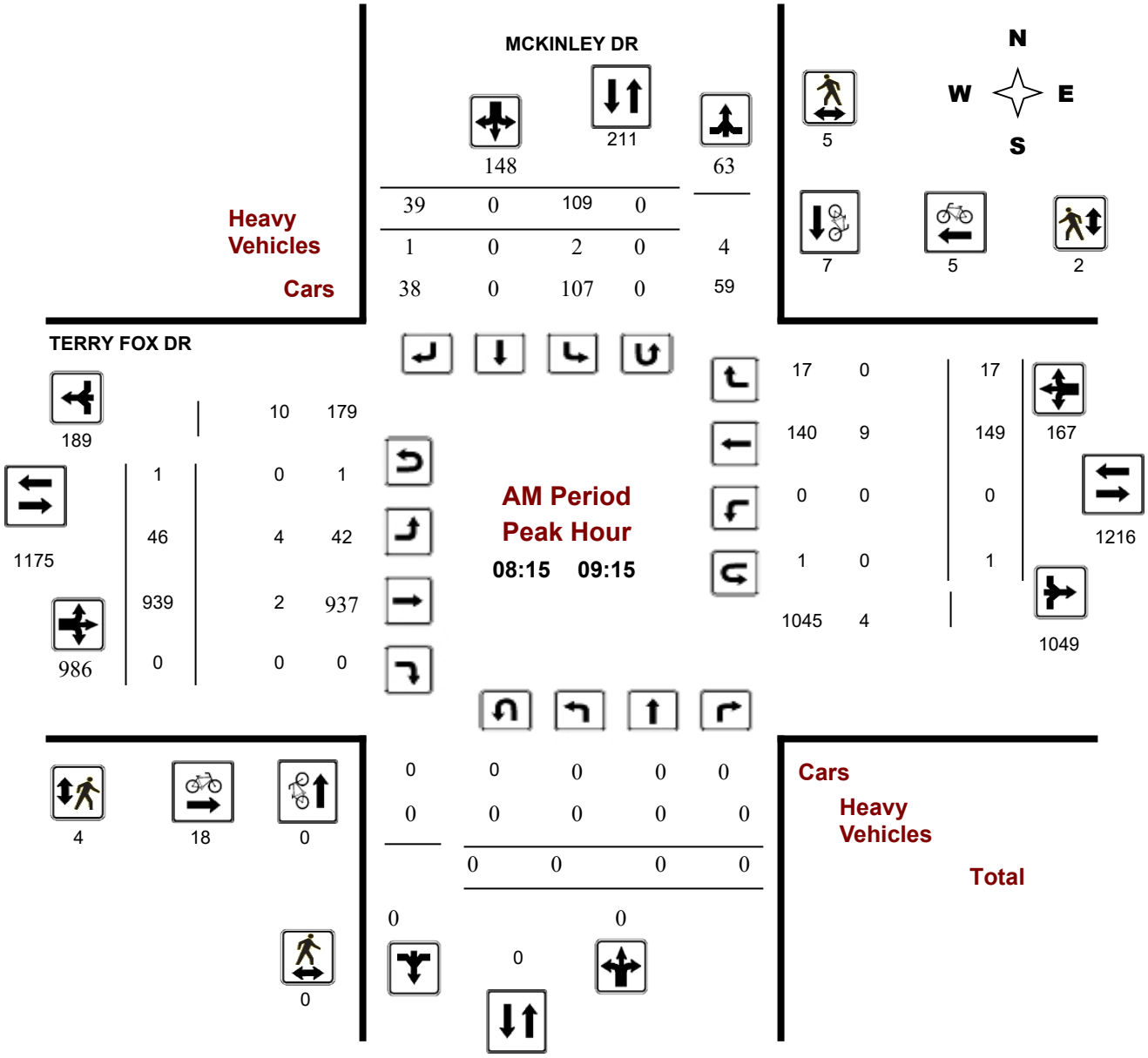
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MCKINLEY DR @ TERRY FOX DR

Survey Date: Tuesday, July 09, 2013 **WO No:** 39645

Start Time: 07:00 **Device:** Miovision



Comments

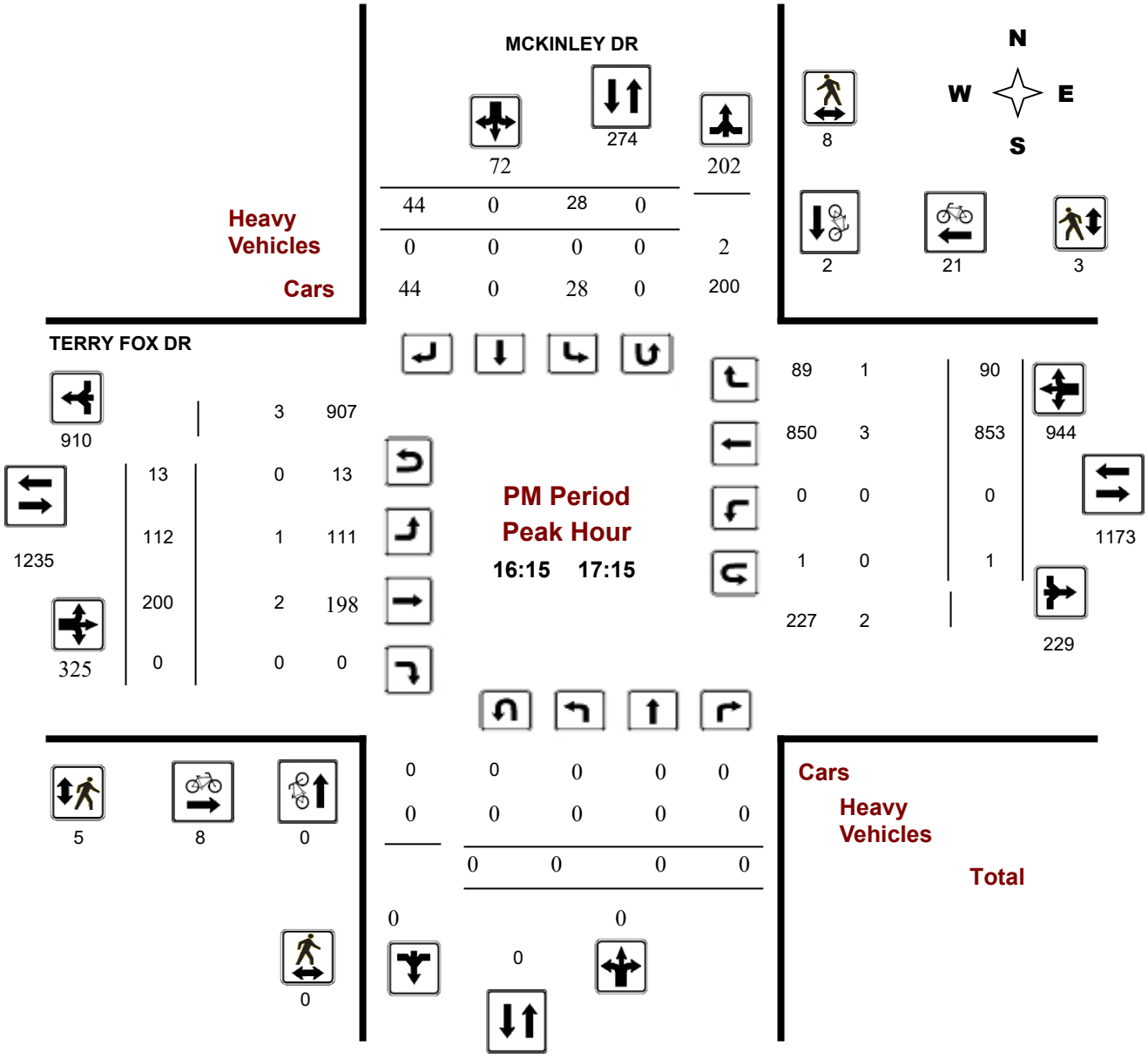
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MCKINLEY DR @ TERRY FOX DR

Survey Date: Tuesday, July 09, 2013 **WO No:** 39645

Start Time: 07:00 **Device:** Miovision



Comments

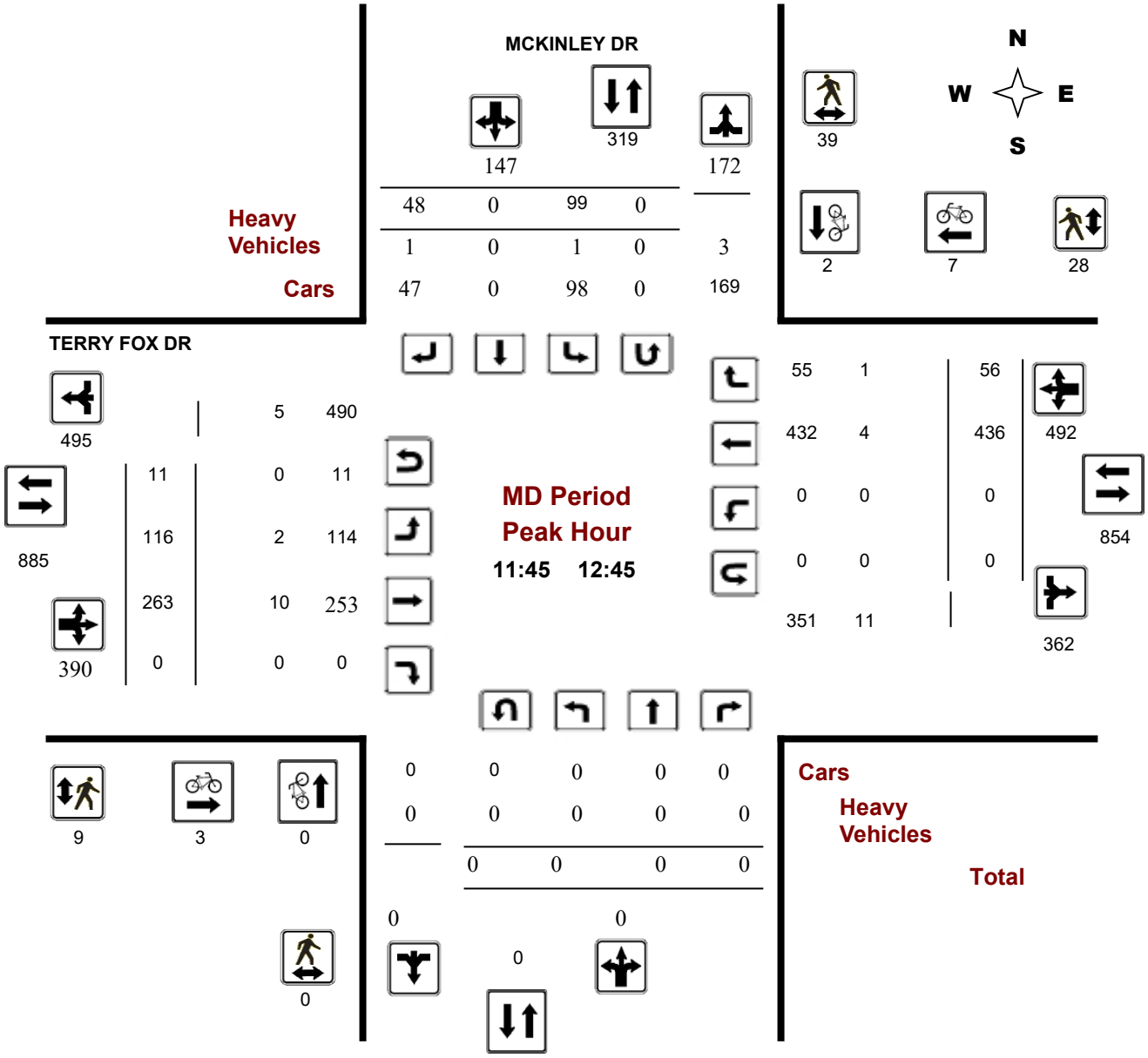
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MCKINLEY DR @ TERRY FOX DR

Survey Date: Tuesday, July 09, 2013 **WO No:** 39645

Start Time: 07:00 **Device:** Miovision



Comments

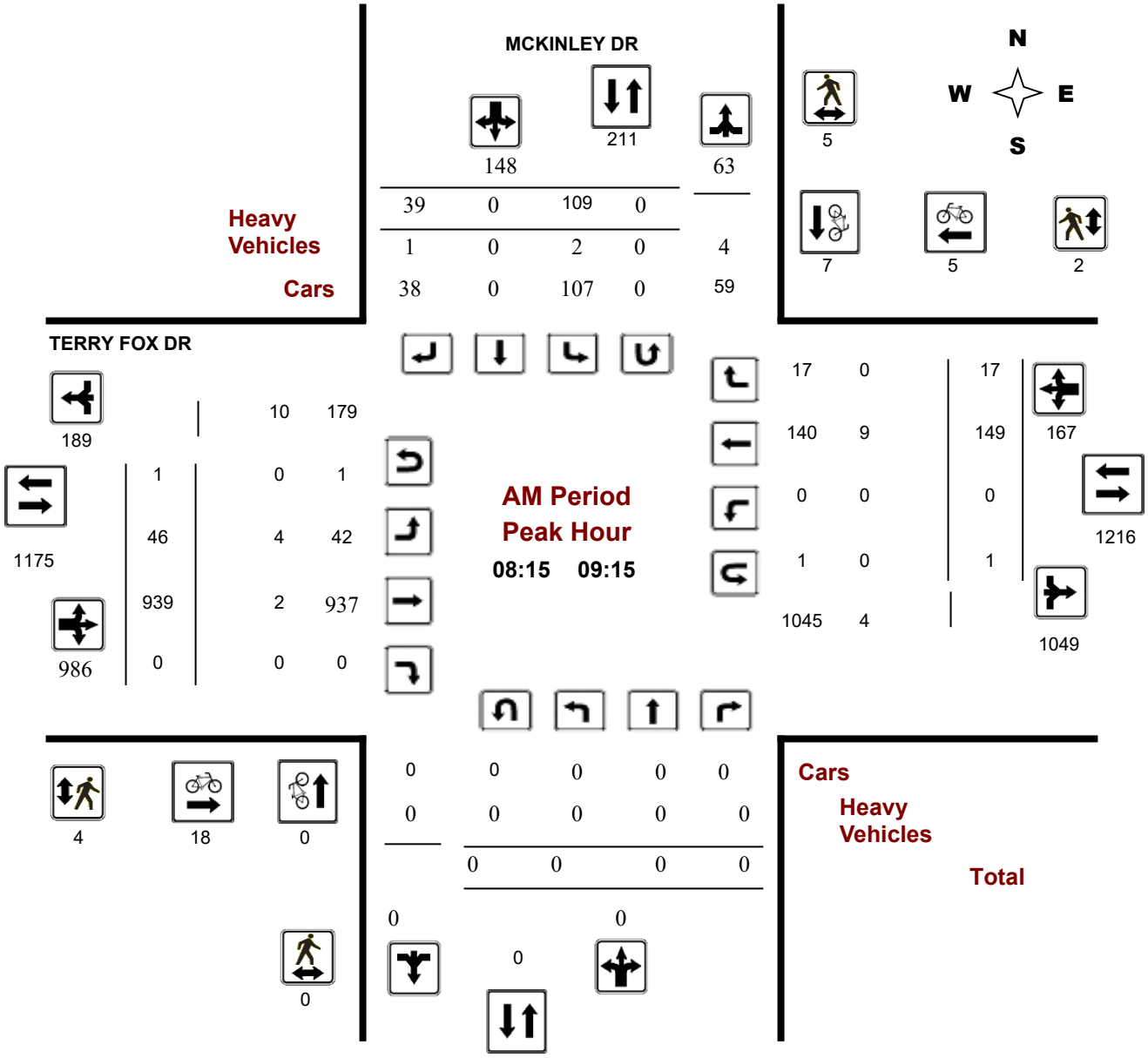
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MCKINLEY DR @ TERRY FOX DR

Survey Date: Tuesday, July 09, 2013 **WO No:** 39645

Start Time: 07:00 **Device:** Miovision



Comments

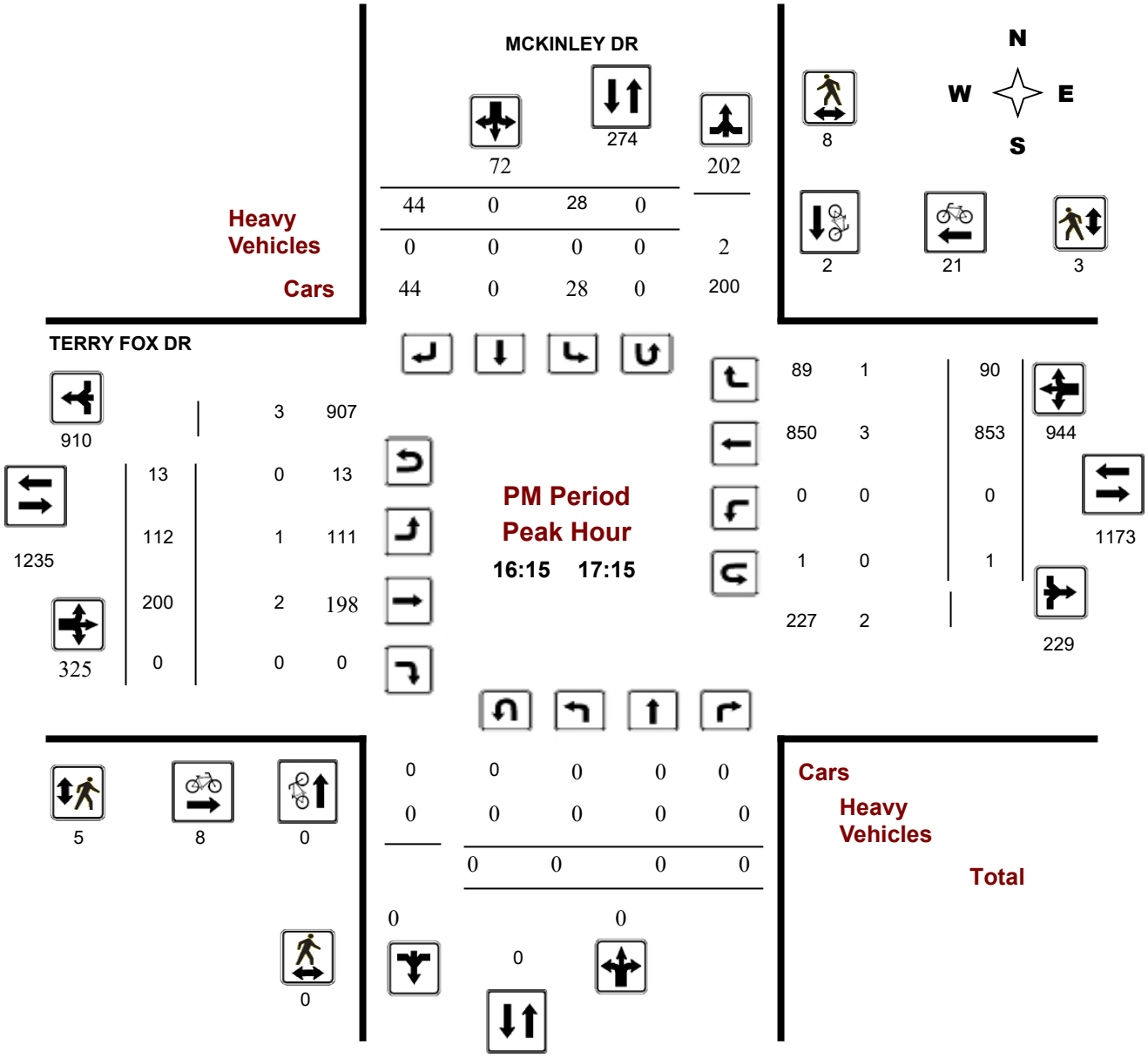
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

MCKINLEY DR @ TERRY FOX DR

Survey Date: Tuesday, July 09, 2013 **WO No:** 39645

Start Time: 07:00 **Device:** Miovision



Comments

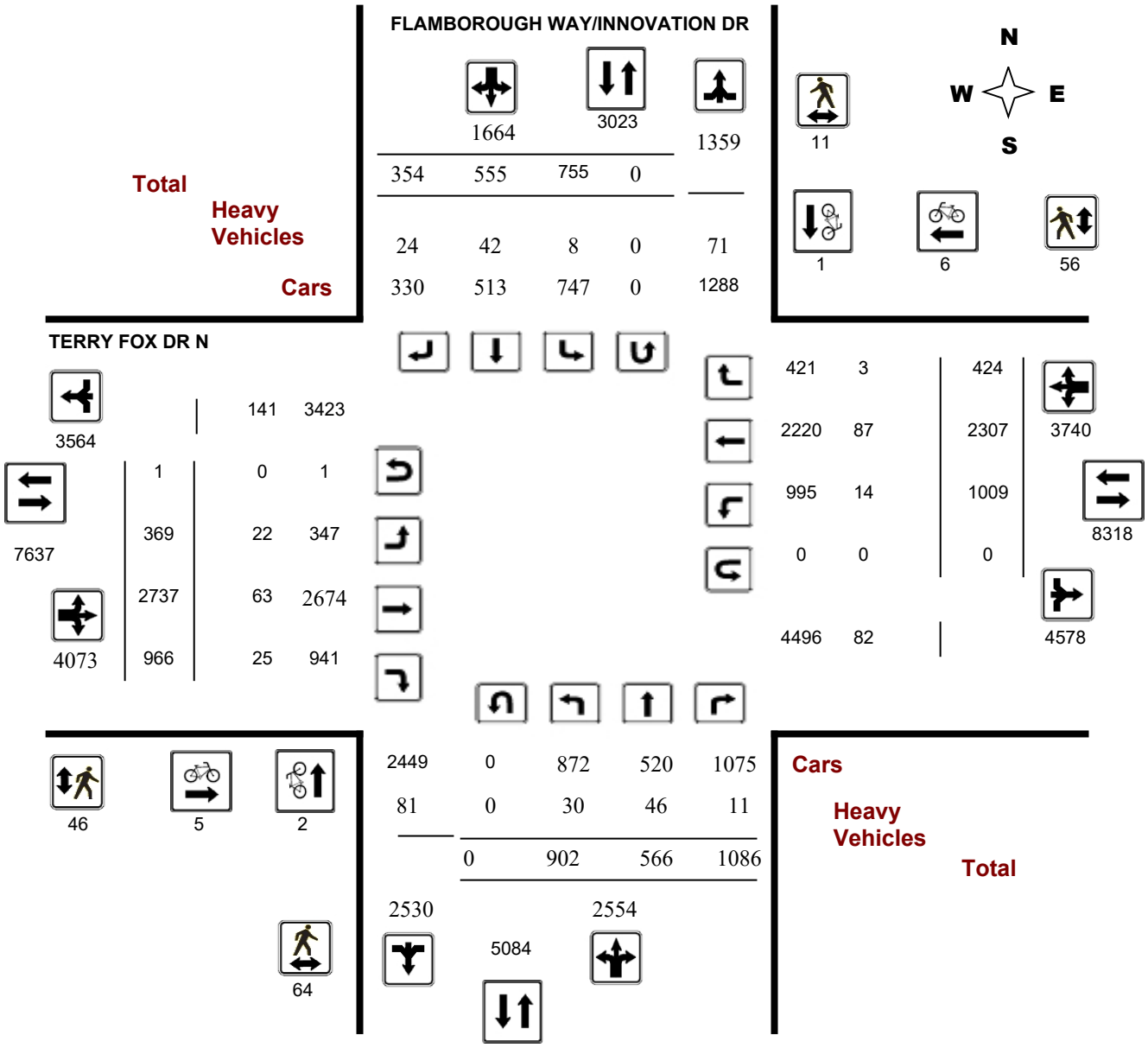
Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR N @ FLAMBOROUGH WAY/INNOVATION DR

Survey Date: Tuesday, April 11, 2017
Start Time: 07:00
WO No: 36910
Device: Miovision

Full Study Diagram



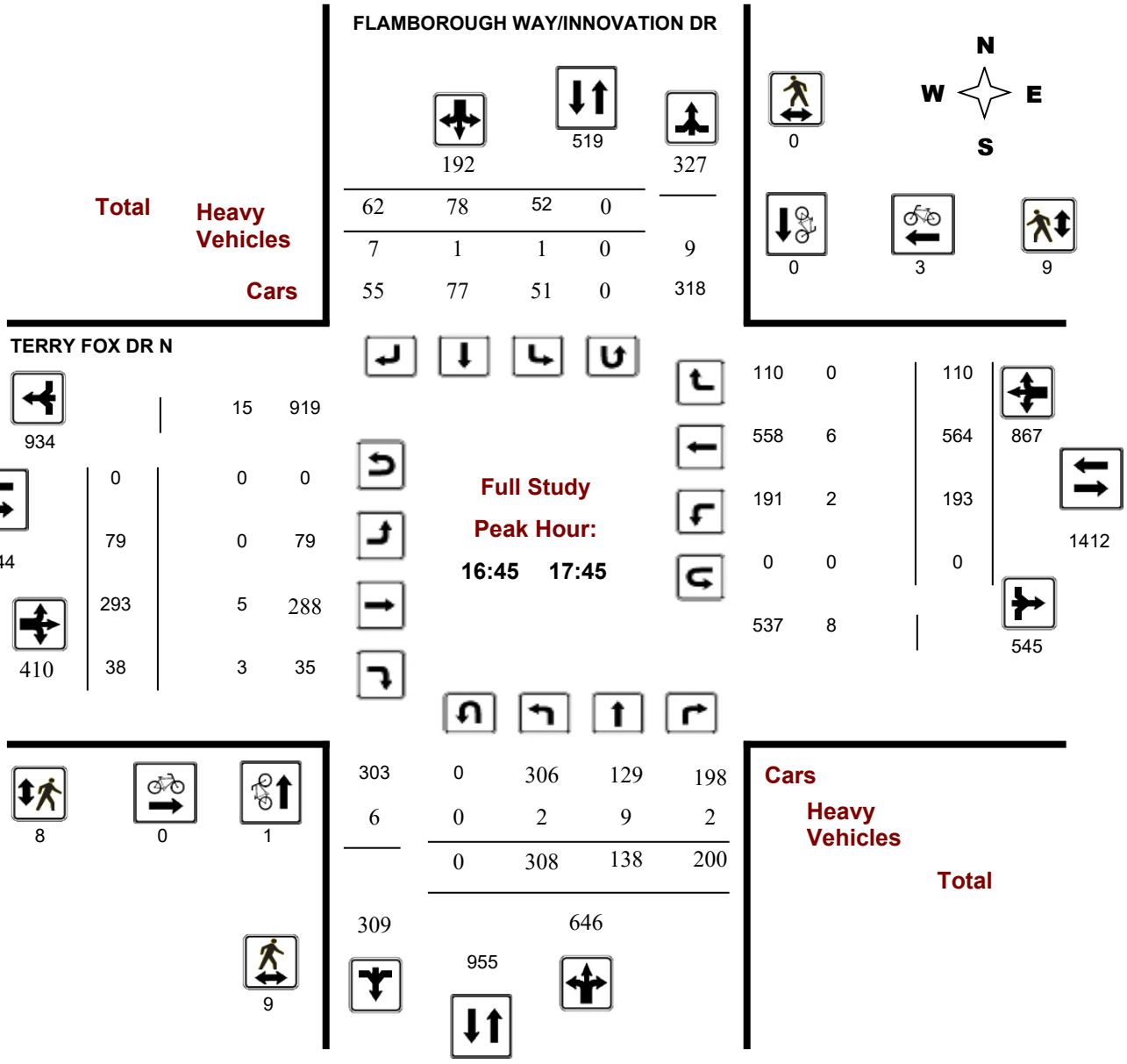
Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR N @ FLAMBOROUGH WAY/INNOVATION DR

Survey Date: Tuesday, April 11, 2017
Start Time: 07:00
WO No: 36910
Device: Miovision

Full Study Peak Hour Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR N @ FLAMBOROUGH WAY/INNOVATION DR

Survey Date: Tuesday, April 11, 2017 **WO No:** 36910

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, April 11, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 1 Westbound: 0

AADT Factor

.90

	FLAMBOROUGH WAY/INNOVATION DR									TERRY FOX DR N									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	23	33	90	**146**	188	105	37	**330**	**476**	23	391	142	**556**	74	113	21	**208**	**764**	**1240**
08:00 09:00	30	74	182	**286**	143	122	59	**324**	**610**	38	562	322	**922**	150	160	23	**333**	**1255**	**1865**
09:00 10:00	26	38	163	**227**	120	93	44	**257**	**484**	31	434	235	**700**	169	155	19	**343**	**1043**	**1527**
11:30 12:30	128	65	119	**312**	52	33	30	**115**	**427**	29	211	50	**290**	117	318	42	**477**	**767**	**1194**
12:30 13:30	53	45	110	**208**	65	37	36	**138**	**346**	28	308	101	**437**	99	223	29	**351**	**788**	**1134**
15:00 16:00	98	65	83	**246**	49	45	33	**127**	**373**	68	293	41	**402**	75	316	77	**468**	**870**	**1243**
16:00 17:00	249	113	147	**509**	76	53	57	**186**	**695**	65	241	36	**342**	123	495	113	**731**	**1073**	**1768**
17:00 18:00	295	133	192	**620**	62	67	58	**187**	**807**	87	297	39	**423**	202	527	100	**829**	**1252**	**2059**
Sub Total	902	566	1086	**2554**	755	555	354	**1664**	**4218**	369	2737	966	**4072**	1009	2307	424	**3740**	**7812**	**12030**
U Turns	0			**0**	0			**0**	**0**	**1**			**1**	0			**0**	**1**	**1**
Total	902	566	1086	**2554**	755	555	354	**1664**	**4218**	370	2737	966	**4073**	1009	2307	424	**3740**	**7813**	**12031**
EQ 12Hr	1254	787	1510	**3551**	1049	771	492	**2312**	**5863**	514	3804	1343	**5661**	1403	3207	589	**5199**	**10860**	**16723**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	1129	708	1359	**3196**	944	694	443	**2081**	**5277**	463	3424	1209	**5096**	1263	2886	530	**4679**	**9775**	**15052**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	1479	927	1780	**4186**	1237	909	580	**2726**	**6912**	607	4485	1584	**6676**	1655	3781	694	**6130**	**12806**	**19718**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR N @ FLAMBOROUGH WAY/INNOVATION DR

Survey Date: Tuesday, April 11, 2017 **WO No:** 36910

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		FLAMBOROUGH WAY/INNOVATION DR									TERRY FOX DR N									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	6	4	12	22	39	19	7	65	**87**	7	71	25	103	13	27	7	47	**150**	**237**
07:15	07:30	4	9	19	32	51	18	10	79	**111**	4	99	25	128	15	26	4	45	**173**	**284**
07:30	07:45	4	8	25	37	60	26	7	93	**130**	6	90	38	134	17	28	5	50	**184**	**314**
07:45	08:00	9	12	34	55	38	42	13	93	**148**	6	131	54	191	29	32	5	66	**257**	**405**
08:00	08:15	8	21	36	65	35	44	12	91	**156**	6	138	71	215	37	40	4	81	**296**	**452**
08:15	08:30	9	19	54	82	45	20	18	83	**165**	12	138	83	233	32	39	3	74	**307**	**472**
08:30	08:45	1	12	34	47	34	20	12	66	**113**	11	145	80	236	39	36	9	84	**320**	**433**
08:45	09:00	12	22	58	92	29	38	17	84	**176**	9	141	88	238	42	45	7	94	**332**	**508**
09:00	09:15	6	10	53	69	35	28	17	80	**149**	11	166	94	271	63	31	6	100	**371**	**520**
09:15	09:30	7	10	47	64	35	32	4	71	**135**	12	116	55	183	64	41	6	111	**294**	**429**
09:30	09:45	8	12	34	54	28	23	15	66	**120**	4	84	47	135	24	52	4	80	**215**	**335**
09:45	10:00	5	6	29	40	22	10	8	40	**80**	4	68	39	111	18	31	3	52	**163**	**243**
11:30	11:45	36	17	26	79	19	9	8	36	**115**	4	51	12	67	24	75	9	108	**175**	**290**
11:45	12:00	30	15	30	75	16	5	11	32	**107**	8	50	10	68	24	80	11	115	**183**	**290**
12:00	12:15	32	20	32	84	9	8	5	22	**106**	9	49	10	68	31	80	9	120	**188**	**294**
12:15	12:30	30	13	31	74	8	11	6	25	**99**	8	61	18	87	38	83	13	134	**221**	**320**
12:30	12:45	18	19	28	65	15	11	13	39	**104**	6	68	24	98	25	55	5	85	**183**	**287**
12:45	13:00	14	10	23	47	18	9	10	37	**84**	5	82	24	111	22	57	13	92	**203**	**287**
13:00	13:15	10	9	31	50	15	10	7	32	**82**	11	84	27	122	35	58	6	99	**221**	**303**
13:15	13:30	11	7	28	46	17	7	6	30	**76**	7	74	26	107	17	53	5	75	**182**	**258**
15:00	15:15	25	11	16	52	9	7	3	19	**71**	19	78	6	103	15	58	11	84	**187**	**258**
15:15	15:30	21	12	22	55	13	5	8	26	**81**	13	68	13	94	20	67	14	101	**195**	**276**
15:30	15:45	27	24	20	71	12	12	10	34	**105**	19	75	10	104	18	94	29	141	**245**	**350**
15:45	16:00	25	18	25	68	15	21	12	48	**116**	17	72	12	101	22	97	23	142	**243**	**359**
16:00	16:15	54	27	31	112	24	16	16	56	**168**	19	55	13	87	34	121	25	180	**267**	**435**
16:15	16:30	64	28	34	126	24	7	10	41	**167**	18	59	7	84	20	108	33	161	**245**	**412**
16:30	16:45	65	29	33	127	14	11	15	40	**167**	16	53	10	79	36	125	28	189	**268**	**435**
16:45	17:00	66	29	49	144	14	19	16	49	**193**	12	74	6	92	33	141	27	201	**293**	**486**
17:00	17:15	83	39	50	172	15	27	19	61	**233**	19	59	12	90	45	125	26	196	**286**	**519**
17:15	17:30	83	37	54	174	14	15	14	43	**217**	23	93	10	126	63	157	38	258	**384**	**601**
17:30	17:45	76	33	47	156	9	17	13	39	**195**	25	67	10	102	52	141	19	212	**314**	**509**
17:45	18:00	53	24	41	118	24	8	12	44	**162**	20	78	7	105	42	104	17	163	**268**	**430**
Total:		902	566	1086	2554	755	555	354	1664	**4218**	370	2737	966	4073	1009	2307	424	3740	**4218**	**12,031**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR N @ FLAMBOROUGH WAY/INNOVATION DR

Survey Date: Tuesday, April 11, 2017 **WO No:** 36910

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		FLAMBOROUGH WAY/INNOVATION DR			TERRY FOX DR N			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	1	**1**	**1**
07:15	07:30	0	0	**0**	0	0	**0**	**0**
07:30	07:45	0	0	**0**	1	0	**1**	**1**
07:45	08:00	0	0	**0**	1	0	**1**	**1**
08:00	08:15	0	0	**0**	1	0	**1**	**1**
08:15	08:30	0	1	**1**	0	0	**0**	**1**
08:30	08:45	0	0	**0**	1	0	**1**	**1**
08:45	09:00	0	0	**0**	0	0	**0**	**0**
09:00	09:15	0	0	**0**	0	0	**0**	**0**
09:15	09:30	0	0	**0**	0	0	**0**	**0**
09:30	09:45	0	0	**0**	0	0	**0**	**0**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	0	**0**	0	0	**0**	**0**
11:45	12:00	0	0	**0**	0	0	**0**	**0**
12:00	12:15	0	0	**0**	0	0	**0**	**0**
12:15	12:30	1	0	**1**	0	1	**1**	**2**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	0	**0**	0	1	**1**	**1**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	0	**0**	0	0	**0**	**0**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	0	0	**0**	**0**
16:00	16:15	0	0	**0**	0	0	**0**	**0**
16:15	16:30	0	0	**0**	1	0	**1**	**1**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	0	0	**0**	0	0	**0**	**0**
17:00	17:15	0	0	**0**	0	1	**1**	**1**
17:15	17:30	1	0	**1**	0	2	**2**	**3**
17:30	17:45	0	0	**0**	0	0	**0**	**0**
17:45	18:00	0	0	**0**	0	0	**0**	**0**
Total		2	1	**3**	5	6	**11**	**14**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR N @ FLAMBOROUGH WAY/INNOVATION DR

Survey Date: Tuesday, April 11, 2017 **WO No:** 36910

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

	FLAMBOROUGH WAY/INNOVATION DR			TERRY FOX DR N			
Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	**Total**	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	**Total**	**Grand Total**
07:00 07:15	0	0	**0**	0	0	**0**	**0**
07:15 07:30	0	0	**0**	1	1	**2**	**2**
07:30 07:45	0	0	**0**	0	0	**0**	**0**
07:45 08:00	5	0	**5**	2	3	**5**	**10**
08:00 08:15	2	2	**4**	0	2	**2**	**6**
08:15 08:30	1	0	**1**	1	3	**4**	**5**
08:30 08:45	0	0	**0**	2	2	**4**	**4**
08:45 09:00	0	1	**1**	1	2	**3**	**4**
09:00 09:15	2	1	**3**	0	3	**3**	**6**
09:15 09:30	0	0	**0**	0	1	**1**	**1**
09:30 09:45	0	0	**0**	0	1	**1**	**1**
09:45 10:00	1	0	**1**	0	0	**0**	**1**
11:30 11:45	3	0	**3**	2	0	**2**	**5**
11:45 12:00	3	0	**3**	3	1	**4**	**7**
12:00 12:15	6	0	**6**	3	1	**4**	**10**
12:15 12:30	4	0	**4**	3	4	**7**	**11**
12:30 12:45	5	0	**5**	5	2	**7**	**12**
12:45 13:00	4	1	**5**	0	4	**4**	**9**
13:00 13:15	4	0	**4**	0	3	**3**	**7**
13:15 13:30	4	0	**4**	1	0	**1**	**5**
15:00 15:15	3	0	**3**	2	0	**2**	**5**
15:15 15:30	0	1	**1**	1	4	**5**	**6**
15:30 15:45	1	0	**1**	1	0	**1**	**2**
15:45 16:00	2	2	**4**	2	2	**4**	**8**
16:00 16:15	1	0	**1**	3	2	**5**	**6**
16:15 16:30	0	1	**1**	2	0	**2**	**3**
16:30 16:45	3	1	**4**	3	5	**8**	**12**
16:45 17:00	3	0	**3**	7	2	**9**	**12**
17:00 17:15	1	0	**1**	0	2	**2**	**3**
17:15 17:30	2	0	**2**	0	4	**4**	**6**
17:30 17:45	3	0	**3**	1	1	**2**	**5**
17:45 18:00	1	1	**2**	0	1	**1**	**3**
Total	64	11	**75**	46	56	**102**	**177**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR N @ FLAMBOROUGH WAY/INNOVATION DR

Survey Date: Tuesday, April 11, 2017 **WO No:** 36910

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		FLAMBOROUGH WAY/INNOVATION DR									TERRY FOX DR N									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	2	1	0	**3**	0	3	1	**4**	**7**	1	5	1	**7**	0	0	0	**0**	**7**	**14**
07:15	07:30	1	4	0	**5**	0	1	0	**1**	**6**	2	3	0	**5**	0	3	1	**4**	**9**	**15**
07:30	07:45	1	2	0	**3**	0	3	1	**4**	**7**	1	1	2	**4**	0	8	0	**8**	**12**	**19**
07:45	08:00	1	2	2	**5**	0	2	0	**2**	**7**	0	4	2	**6**	1	0	0	**1**	**7**	**14**
08:00	08:15	0	0	1	**1**	0	2	0	**2**	**3**	3	3	0	**6**	0	4	0	**4**	**10**	**13**
08:15	08:30	3	1	0	**4**	2	1	2	**5**	**9**	1	2	1	**4**	0	3	0	**3**	**7**	**16**
08:30	08:45	0	1	0	**1**	0	0	2	**2**	**3**	2	1	1	**4**	2	4	1	**7**	**11**	**14**
08:45	09:00	1	3	0	**4**	0	3	1	**4**	**8**	0	0	1	**1**	2	2	0	**4**	**5**	**13**
09:00	09:15	0	1	1	**2**	0	2	2	**4**	**6**	0	7	1	**8**	3	6	0	**9**	**17**	**23**
09:15	09:30	1	1	0	**2**	0	1	0	**1**	**3**	1	2	0	**3**	1	3	0	**4**	**7**	**10**
09:30	09:45	0	1	0	**1**	0	2	0	**2**	**3**	0	1	1	**2**	0	7	0	**7**	**9**	**12**
09:45	10:00	1	1	0	**2**	0	1	0	**1**	**3**	0	3	0	**3**	0	0	0	**0**	**3**	**6**
11:30	11:45	1	1	1	**3**	0	2	0	**2**	**5**	0	1	1	**2**	1	4	0	**5**	**7**	**12**
11:45	12:00	1	1	0	**2**	1	1	0	**2**	**4**	0	3	0	**3**	0	3	1	**4**	**7**	**11**
12:00	12:15	2	1	1	**4**	0	1	0	**1**	**5**	1	1	2	**4**	1	3	0	**4**	**8**	**13**
12:15	12:30	1	1	1	**3**	0	1	0	**1**	**4**	0	3	0	**3**	0	1	0	**1**	**4**	**8**
12:30	12:45	0	1	0	**1**	0	2	0	**2**	**3**	0	0	2	**2**	0	2	0	**2**	**4**	**7**
12:45	13:00	2	1	0	**3**	0	1	0	**1**	**4**	0	1	0	**1**	0	1	0	**1**	**2**	**6**
13:00	13:15	1	1	0	**2**	0	1	1	**2**	**4**	0	3	2	**5**	0	4	0	**4**	**9**	**13**
13:15	13:30	2	1	0	**3**	0	1	0	**1**	**4**	0	1	0	**1**	0	2	0	**2**	**3**	**7**
15:00	15:15	0	0	0	**0**	1	3	1	**5**	**5**	5	1	1	**7**	0	1	0	**1**	**8**	**13**
15:15	15:30	1	2	0	**3**	0	2	0	**2**	**5**	1	3	0	**4**	0	4	0	**4**	**8**	**13**
15:30	15:45	1	1	0	**2**	0	1	0	**1**	**3**	3	2	1	**6**	0	3	0	**3**	**9**	**12**
15:45	16:00	2	2	1	**5**	0	3	0	**3**	**8**	1	2	0	**3**	0	2	0	**2**	**5**	**13**
16:00	16:15	2	1	0	**3**	0	0	2	**2**	**5**	0	0	2	**2**	0	3	0	**3**	**5**	**10**
16:15	16:30	1	2	1	**4**	1	1	0	**2**	**6**	0	2	0	**2**	0	4	0	**4**	**6**	**12**
16:30	16:45	0	1	0	**1**	0	0	2	**2**	**3**	0	0	1	**1**	1	3	0	**4**	**5**	**8**
16:45	17:00	1	1	0	**2**	0	0	1	**1**	**3**	0	2	1	**3**	0	0	0	**0**	**3**	**6**
17:00	17:15	0	1	0	**1**	0	0	1	**1**	**2**	0	0	1	**1**	0	2	0	**2**	**3**	**5**
17:15	17:30	0	3	1	**4**	1	0	2	**3**	**7**	0	1	0	**1**	2	1	0	**3**	**4**	**11**
17:30	17:45	1	4	1	**6**	0	1	3	**4**	**10**	0	2	1	**3**	0	3	0	**3**	**6**	**16**
17:45	18:00	0	2	0	**2**	2	0	2	**4**	**6**	0	3	0	**3**	0	1	0	**1**	**4**	**10**
Total:	None	30	46	11	**87**	8	42	24	**74**	**161**	22	63	25	**110**	14	87	3	**104**	**214**	**375**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

TERRY FOX DR N @ FLAMBOROUGH WAY/INNOVATION DR

Survey Date: Tuesday, April 11, 2017 **WO No:** 36910

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		FLAMBOROUGH WAY/INNOVATION DR		TERRY FOX DR N		Total
		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	0	0	0	0	**0**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	0	0	0	0	**0**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	0	1	0	**1**
15:00	15:15	0	0	0	0	**0**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	0	0	0	**0**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	0	0	0	**0**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	0	0	0	**0**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		0	0	1	0	**1**

Appendix B TRANSPORTATION DEMAND MANAGEMENT CHECKLISTS

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☑
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☑
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☑

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☑
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☑
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☑
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☑
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☑
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☑
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☑
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
	2.	**WALKING AND CYCLING**	
	2.1	**Information on walking/cycling routes & destinations**	
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☑
	2.2	**Bicycle skills training**	
BETTER	2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	☐

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances *(multi-family, condominium)*	☑
BETTER		3.1.2	Provide real-time arrival information display at entrances *(multi-family, condominium)*	☐
		3.2	**Transit fare incentives**	
BASIC	★	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☑
BETTER		3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in	☐
		3.3	**Enhanced public transit service**	
BETTER	★	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☐
		3.4	**Private transit service**	
BETTER		3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☐
		4.	**CARSHARING & BIKESHARING**	
		4.1	**Bikeshare stations & memberships**	
BETTER		4.1.1	Contract with provider to install on-site bikeshare station (*multi-family)*	☐
BETTER		4.1.2	Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☐
		4.2	**Carshare vehicles & memberships**	
BETTER		4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents	☐
BETTER		4.2.2	Provide residents with carshare memberships, either free or subsidized	☐
		5.	**PARKING**	
		5.1	**Priced parking**	
BASIC	★	5.1.1	Unbundle parking cost from purchase price *(condominium)*	☐
BASIC	★	5.1.2	Unbundle parking cost from monthly rent *(multi-family)*	☑

TDM measures: *Residential developments*				Check if proposed & add descriptions
		6.	**TDM MARKETING & COMMUNICATIONS**	
		6.1	**Multimodal travel information**	
BASIC	★	6.1.1	Provide a multimodal travel option information package to new residents	☑
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☑
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☑
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☑

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☑
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☑
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☑
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☑
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☑
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☑
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☑
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☑
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☑
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
	2.	**WALKING AND CYCLING**	
	2.1	**Information on walking/cycling routes & destinations**	
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances	☑
	2.2	**Bicycle skills training**	
		Commuter travel	
BETTER ★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
	2.3	**Valet bike parking**	
		Visitor travel	
BETTER	2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances	☑
BASIC		3.1.2	Provide online links to OC Transpo and STO information	☑
BETTER		3.1.3	Provide real-time arrival information display at entrances	☐
		3.2	**Transit fare incentives**	
			Commuter travel	
BETTER		3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☐
BETTER	★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☐
			Visitor travel	
BETTER		3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
		3.3	**Enhanced public transit service**	
			Commuter travel	
BETTER		3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4	**Private transit service**	
			Commuter travel	
BETTER		3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

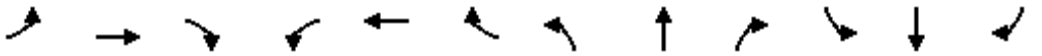
		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4. RIDESHARING	
		4.1 Ridematching service	
		Commuter travel	
BASIC	★ 4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☑
		4.2 Carpool parking price incentives	
		Commuter travel	
BETTER	4.2.1	Provide discounts on parking costs for registered carpools	☐
		4.3 Vanpool service	
		Commuter travel	
BETTER	4.3.1	Provide a vanpooling service for long-distance commuters	☐
		5. CARSHARING & BIKESHARING	
		5.1 Bikeshare stations & memberships	
BETTER	5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☐
		Commuter travel	
BETTER	5.1.2	Provide employees with bikeshare memberships for local business travel	☐
		5.2 Carshare vehicles & memberships	
		Commuter travel	
BETTER	5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐
BETTER	5.2.2	Provide employees with carshare memberships for local business travel	☐
		6. PARKING	
		6.1 Priced parking	
		Commuter travel	
BASIC	★ 6.1.1	Charge for long-term parking (daily, weekly, monthly)	☑
BASIC	6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☑
		Visitor travel	
BETTER	6.1.3	Charge for short-term parking (hourly)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☑
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☐
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	☑
BETTER		8.2.2	Encourage compressed workweeks	☐
BETTER	★	8.2.3	Encourage telework	☐
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☑
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☐

Appendix C INTERSECTION PERFORMANCE WORKSHEETS

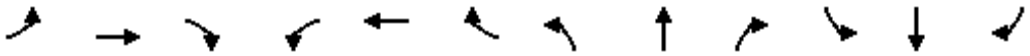
Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	31	158	113	10	21	39	503	31	90	1409	9
v/c Ratio	0.15	0.48	0.67	0.05	0.08	0.35	0.17	0.03	0.56	0.42	0.01
Control Delay	49.6	12.0	72.7	46.9	0.6	58.3	11.5	0.8	69.1	11.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	12.0	72.7	46.9	0.6	58.3	11.5	0.8	69.1	11.6	0.0
Queue Length 50th (m)	7.2	0.0	28.1	2.3	0.0	10.7	18.8	0.0	22.4	59.1	0.0
Queue Length 95th (m)	15.8	18.4	45.7	7.2	0.0	22.6	14.9	0.2	38.6	86.2	0.0
Internal Link Dist (m)	116.4			136.8			274.6			145.2	
Turn Bay Length (m)		10.0	38.0		38.0	130.0		25.0	68.0		25.0
Base Capacity (vph)	391	487	320	401	411	188	2907	956	200	3339	1029
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	0.08	0.32	0.35	0.02	0.05	0.21	0.17	0.03	0.45	0.42	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	17	142	102	9	19	35	453	28	81	1268	8
Future Volume (vph)	11	17	142	102	9	19	35	453	28	81	1268	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.96
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	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1783	1515	1706	1655	1450	1679	4644	1476	1729	4969	1488
Flt Permitted		0.89	1.00	0.74	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1614	1515	1323	1655	1450	1679	4644	1476	1729	4969	1488
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)	12	19	158	113	10	21	39	503	31	90	1409	9
RTOR Reduction (vph)	0	0	138	0	0	18	0	0	12	0	0	3
Lane Group Flow (vph)	0	31	20	113	10	3	39	503	19	90	1409	6
Confl. Peds. (#/hr)	3		3	3		3	5		6	6		5
Confl. Bikes (#/hr)			3						8			1
Heavy Vehicles (%)	0%	0%	0%	1%	10%	5%	3%	7%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		16.5	16.5	16.5	16.5	16.5	7.4	81.4	81.4	12.1	86.1	86.1
Effective Green, g (s)		16.5	16.5	16.5	16.5	16.5	7.4	81.4	81.4	12.1	86.1	86.1
Actuated g/C Ratio		0.13	0.13	0.13	0.13	0.13	0.06	0.63	0.63	0.09	0.66	0.66
Clearance Time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
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)		204	192	167	210	184	95	2907	924	160	3291	985
v/s Ratio Prot					0.01		0.02	0.11		c0.05	c0.28	
v/s Ratio Perm		0.02	0.01	c0.09		0.00			0.01			0.00
v/c Ratio		0.15	0.10	0.68	0.05	0.01	0.41	0.17	0.02	0.56	0.43	0.01
Uniform Delay, d1		50.5	50.2	54.2	49.8	49.6	59.2	10.2	9.2	56.4	10.3	7.4
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.88	1.01	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3	0.2	10.4	0.1	0.0	2.8	0.1	0.0	4.5	0.4	0.0
Delay (s)		50.9	50.5	64.6	49.9	49.7	54.6	10.4	9.2	60.9	10.8	7.5
Level of Service		D	D	E	D	D	D	B	A	E	B	A
Approach Delay (s)		50.5			61.4			13.4			13.7	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

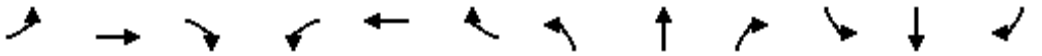


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	99	568	271	77	148	44	273	437	188	360	1159	161
v/c Ratio	0.46	0.74	0.51	0.38	0.22	0.11	0.69	0.30	0.32	0.97	0.59	0.24
Control Delay	65.4	53.0	8.0	63.8	42.2	0.5	58.7	47.4	20.2	88.0	26.9	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.4	53.0	8.0	63.8	42.2	0.5	58.7	47.4	20.2	88.0	26.9	4.2
Queue Length 50th (m)	12.7	72.2	0.4	9.9	16.5	0.0	35.2	32.5	2.8	~99.3	89.8	10.5
Queue Length 95th (m)	21.9	86.3	21.7	18.0	24.2	0.0	51.4	51.9	36.9	#183.1	118.0	15.9
Internal Link Dist (m)		245.5			128.6			223.1			274.6	
Turn Bay Length (m)	104.0		52.0	72.0		100.0	142.0		82.0	100.0		98.0
Base Capacity (vph)	232	931	590	223	912	502	457	1452	579	370	1971	661
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.61	0.46	0.35	0.16	0.09	0.60	0.30	0.32	0.97	0.59	0.24

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.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	511	244	69	133	40	246	393	169	324	1043	145
Future Volume (vph)	89	511	244	69	133	40	246	393	169	324	1043	145
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96
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	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
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)	99	568	271	77	148	44	273	437	188	360	1159	161
RTOR Reduction (vph)	0	0	209	0	0	35	0	0	132	0	0	98
Lane Group Flow (vph)	99	568	62	77	148	9	273	437	56	360	1159	63
Confl. Peds. (#/hr)	9		29	29		9	21		13	13		21
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	2%	0%	1%	6%	2%	3%	2%	6%	1%	0%	2%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.6	28.9	28.9	6.9	27.2	27.2	15.6	38.9	38.9	27.9	51.2	51.2
Effective Green, g (s)	8.6	28.9	28.9	6.9	27.2	27.2	15.6	38.9	38.9	27.9	51.2	51.2
Actuated g/C Ratio	0.07	0.22	0.22	0.05	0.21	0.21	0.12	0.30	0.30	0.21	0.39	0.39
Clearance Time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	217	768	325	167	709	307	394	1402	443	371	1918	550
v/s Ratio Prot	c0.03	c0.16		0.02	0.04		0.08	0.09		c0.21	c0.24	
v/s Ratio Perm			0.04			0.01			0.04			0.05
v/c Ratio	0.46	0.74	0.19	0.46	0.21	0.03	0.69	0.31	0.13	0.97	0.60	0.12
Uniform Delay, d1	58.4	47.0	41.0	59.7	42.5	40.9	54.9	35.2	33.2	50.6	31.3	25.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.37	4.09	0.95	0.79	0.69
Incremental Delay, d2	1.5	3.8	0.3	2.0	0.1	0.0	4.9	0.5	0.6	37.1	1.3	0.4
Delay (s)	60.0	50.8	41.3	61.8	42.6	40.9	54.6	48.7	136.3	85.2	26.0	17.7
Level of Service	E	D	D	E	D	D	D	D	F	F	C	B
Approach Delay (s)		49.0			47.8			68.8			37.9	
Approach LOS		D			D			E			D	

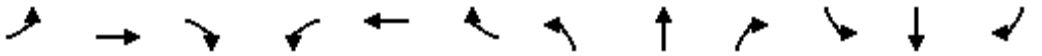
Intersection Summary			
HCM 2000 Control Delay	48.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.4
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	32	128	142	59	183	672	904	750	116	1334	126
v/c Ratio	0.36	0.52	0.44	0.33	0.66	1.38	0.40	0.62	0.54	1.03	0.20
Control Delay	71.3	58.6	11.6	64.5	60.7	215.0	10.7	5.5	51.1	75.3	15.9
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	71.3	58.6	11.6	64.5	60.7	215.0	10.7	5.5	51.1	75.3	15.9
Queue Length 50th (m)	8.1	30.7	0.0	7.6	43.5	~215.4	53.0	16.8	15.5	~192.4	0.5
Queue Length 95th (m)	18.9	47.7	17.4	14.8	64.7	#291.6	76.7	57.1	#51.1	#262.5	24.4
Internal Link Dist (m)		112.5			205.8		333.2			181.1	
Turn Bay Length (m)	65.0		100.0	90.0		157.0			140.0		76.0
Base Capacity (vph)	88	349	395	179	341	488	2274	1205	215	1289	644
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	0.36	0.37	0.36	0.33	0.54	1.38	0.40	0.62	0.54	1.03	0.20

Intersection Summary

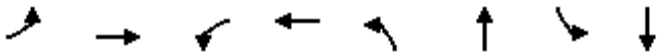
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



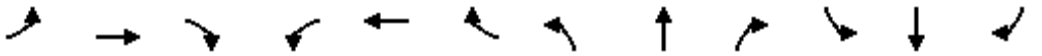
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	115	128	53	134	31	605	814	675	104	1201	113
Future Volume (vph)	29	115	128	53	134	31	605	814	675	104	1201	113
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
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	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1616	1784	1435	3288	1710		1712	3325	1500	1695	3357	1469
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.07	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	1616	1784	1435	3288	1710		134	3325	1500	562	3357	1469
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)	32	128	142	59	149	34	672	904	750	116	1334	126
RTOR Reduction (vph)	0	0	121	0	7	0	0	0	190	0	0	80
Lane Group Flow (vph)	32	128	21	59	176	0	672	904	560	116	1334	46
Confl. Peds. (#/hr)	7		8	8		7	6					6
Confl. Bikes (#/hr)			1			1			1			12
Heavy Vehicles (%)	7%	2%	5%	2%	3%	3%	1%	4%	1%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	4.3	19.1	19.1	5.7	20.5		86.5	86.5	86.5	47.5	47.5	47.5
Effective Green, g (s)	4.3	19.1	19.1	5.7	20.5		86.5	86.5	86.5	47.5	47.5	47.5
Actuated g/C Ratio	0.03	0.15	0.15	0.04	0.16		0.67	0.67	0.67	0.37	0.37	0.37
Clearance Time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3	6.3	6.3	6.3	6.3
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)	53	262	210	144	269		486	2212	998	205	1226	536
v/s Ratio Prot	c0.02	0.07		0.02	c0.10		c0.35	0.27			0.40	
v/s Ratio Perm			0.01				c0.57		0.37	0.21		0.03
v/c Ratio	0.60	0.49	0.10	0.41	0.66		1.38	0.41	0.56	0.57	1.09	0.09
Uniform Delay, d1	62.0	51.0	48.0	60.5	51.4		41.6	10.0	11.6	33.0	41.2	27.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.18	1.09	3.19
Incremental Delay, d2	17.9	1.4	0.2	1.9	5.6		184.7	0.6	2.3	9.4	51.6	0.3
Delay (s)	79.9	52.4	48.2	62.4	57.1		226.3	10.6	13.9	48.3	96.6	86.4
Level of Service	E	D	D	E	E		F	B	B	D	F	F
Approach Delay (s)		53.3			58.4			74.0			92.2	
Approach LOS		D			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	78.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	109.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	477	423	2	18	110	253	36	263
v/c Ratio	0.72	0.50	0.00	0.03	0.42	0.52	0.14	0.54
Control Delay	19.2	9.3	8.0	6.6	26.0	23.6	21.0	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	9.3	8.0	6.6	26.0	23.6	21.0	23.7
Queue Length 50th (m)	32.7	16.9	0.1	0.5	8.7	19.5	2.6	20.3
Queue Length 95th (m)	85.9	48.7	1.1	3.6	29.8	55.6	11.7	57.7
Internal Link Dist (m)		205.8		177.5		261.1		580.4
Turn Bay Length (m)	130.0		42.0		65.0		35.0	
Base Capacity (vph)	1229	1483	781	1241	706	1270	698	1288
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	0.39	0.29	0.00	0.01	0.16	0.20	0.05	0.20

Intersection Summary



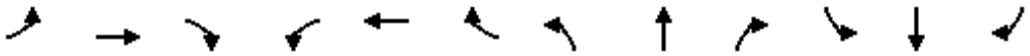
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	429	143	238	2	10	6	99	179	49	32	184	53
Future Volume (vph)	429	143	238	2	10	6	99	179	49	32	184	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.91		1.00	0.94		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1611		1728	1358		1601	1721		1554	1740	
Flt Permitted	0.75	1.00		0.47	1.00		0.57	1.00		0.58	1.00	
Satd. Flow (perm)	1349	1611		854	1358		955	1721		954	1740	
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)	477	159	264	2	11	7	110	199	54	36	204	59
RTOR Reduction (vph)	0	57	0	0	3	0	0	9	0	0	10	0
Lane Group Flow (vph)	477	366	0	2	15	0	110	244	0	36	253	0
Confl. Peds. (#/hr)	4		1	1		4			11	11		
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	0%	1%	1%	0%	30%	17%	8%	2%	0%	10%	1%	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)	28.6	28.6		28.6	28.6		16.1	16.1		16.1	16.1	
Effective Green, g (s)	28.6	28.6		28.6	28.6		16.1	16.1		16.1	16.1	
Actuated g/C Ratio	0.50	0.50		0.50	0.50		0.28	0.28		0.28	0.28	
Clearance Time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	675	806		427	680		269	485		268	490	
v/s Ratio Prot		0.23			0.01			0.14			c0.15	
v/s Ratio Perm	c0.35			0.00			0.12			0.04		
v/c Ratio	0.71	0.45		0.00	0.02		0.41	0.50		0.13	0.52	
Uniform Delay, d1	11.0	9.2		7.1	7.2		16.6	17.1		15.3	17.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	0.4		0.0	0.0		1.0	0.8		0.2	0.9	
Delay (s)	14.4	9.6		7.1	7.2		17.7	18.0		15.5	18.1	
Level of Service	B	A		A	A		B	B		B	B	
Approach Delay (s)		12.1			7.2			17.9			17.8	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	57.1	Sum of lost time (s)	12.4
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	525	536	44	130	39	38
Future Volume (Veh/h)	525	536	44	130	39	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	583	596	49	144	43	42
Pedestrians				2	17	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	323					
pX, platoon unblocked			0.80		0.80	0.80
vC, conflicting volume			1196		1140	900
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1118		1048	746
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			90		76	87
cM capacity (veh/h)			467		176	319

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1179	193	85
Volume Left	0	49	43
Volume Right	596	0	42
cSH	1700	467	226
Volume to Capacity	0.69	0.10	0.38
Queue Length 95th (m)	0.0	2.7	12.5
Control Delay (s)	0.0	4.6	30.2
Lane LOS		A	D
Approach Delay (s)	0.0	4.6	30.2
Approach LOS			D

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		



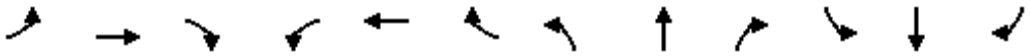
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	1100	0	0	174	20	0	0	0	128	0	46
Future Volume (Veh/h)	54	1100	0	0	174	20	0	0	0	128	0	46
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	60	1222	0	0	193	22	0	0	0	142	0	51
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (m)		153										
pX, platoon unblocked				0.81			0.81	0.81	0.81	0.81	0.81	
vC, conflicting volume	215			1222			1597	1557	1222	1546	1546	204
vC1, stage 1 conf vol							1342	1342		204	204	
vC2, stage 2 conf vol							255	215		1342	1342	
vCu, unblocked vol	215			1155			1620	1571	1155	1557	1557	204
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	0	100	94
cM capacity (veh/h)	1355			488			127	150	193	131	152	837

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	60	1222	215	193
Volume Left	60	0	0	142
Volume Right	0	0	22	51
cSH	1355	1700	1700	169
Volume to Capacity	0.04	0.72	0.13	1.14
Queue Length 95th (m)	1.1	0.0	0.0	77.0
Control Delay (s)	7.8	0.0	0.0	167.6
Lane LOS	A			F
Approach Delay (s)	0.4		0.0	167.6
Approach LOS				F

Intersection Summary			
Average Delay	19.4		
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group
Lane Group Flow (vph)
v/c Ratio
Control Delay
Queue Delay
Total Delay
Queue Length 50th (m)
Queue Length 95th (m)
Internal Link Dist (m)
Turn Bay Length (m)
Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type												
Protected Phases												
Permitted Phases												
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

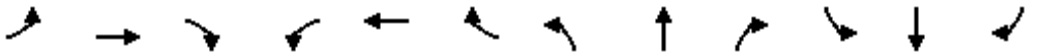
Intersection Summary			
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	36	82	84	38	113	318	1813	130	61	639	23
v/c Ratio	0.23	0.35	0.59	0.20	0.43	0.75	0.54	0.12	0.46	0.27	0.03
Control Delay	54.9	14.4	70.9	53.4	13.9	77.1	3.2	0.2	67.4	19.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	14.4	70.9	53.4	13.9	77.1	3.2	0.2	67.4	19.7	0.0
Queue Length 50th (m)	8.6	0.0	20.9	9.1	0.0	86.0	14.9	0.0	15.2	34.1	0.0
Queue Length 95th (m)	18.4	14.2	36.5	18.9	16.7	m#119.0	22.7	m0.0	28.9	42.6	0.0
Internal Link Dist (m)	116.4			136.8			274.6			145.2	
Turn Bay Length (m)		10.0	38.0		38.0	130.0		25.0	68.0		25.0
Base Capacity (vph)	352	429	321	436	453	426	3348	1045	194	2394	775
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	0.10	0.19	0.26	0.09	0.25	0.75	0.54	0.12	0.31	0.27	0.03

Intersection Summary

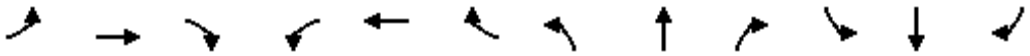
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	21	74	76	34	102	286	1632	117	55	575	21
Future Volume (vph)	12	21	74	76	34	102	286	1632	117	55	575	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1637	1513	1719	1802	1519	1729	4919	1493	1729	4871	1483
Flt Permitted		0.87	1.00	0.73	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1454	1513	1327	1802	1519	1729	4919	1493	1729	4871	1483
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)	13	23	82	84	38	113	318	1813	130	61	639	23
RTOR Reduction (vph)	0	0	73	0	0	101	0	0	30	0	0	12
Lane Group Flow (vph)	0	36	9	84	38	12	318	1813	100	61	639	11
Confl. Peds. (#/hr)	5		5	5		5	5		4	4		5
Confl. Bikes (#/hr)			2						1			5
Heavy Vehicles (%)	0%	14%	0%	0%	1%	0%	0%	1%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		14.1	14.1	14.1	14.1	14.1	32.0	87.2	87.2	8.7	63.9	63.9
Effective Green, g (s)		14.1	14.1	14.1	14.1	14.1	32.0	87.2	87.2	8.7	63.9	63.9
Actuated g/C Ratio		0.11	0.11	0.11	0.11	0.11	0.25	0.67	0.67	0.07	0.49	0.49
Clearance Time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
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)		157	164	143	195	164	425	3299	1001	115	2394	728
v/s Ratio Prot					0.02		c0.18	c0.37		0.04	0.13	
v/s Ratio Perm		0.02	0.01	c0.06		0.01			0.07			0.01
v/c Ratio		0.23	0.05	0.59	0.19	0.07	0.75	0.55	0.10	0.53	0.27	0.02
Uniform Delay, d1		53.0	52.0	55.2	52.8	52.1	45.3	11.2	7.6	58.7	19.3	16.9
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.53	0.23	0.01	1.00	1.00	1.00
Incremental Delay, d2		0.7	0.1	6.0	0.5	0.2	4.6	0.4	0.1	4.6	0.3	0.0
Delay (s)		53.7	52.1	61.2	53.3	52.3	73.9	3.0	0.2	63.3	19.6	17.0
Level of Service		D	D	E	D	D	E	A	A	E	B	B
Approach Delay (s)		52.6			55.6			12.8			23.2	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	259	166	447	224	404	354	314	1580	119	58	630	118
v/c Ratio	0.68	0.20	0.92	0.63	0.48	0.62	0.79	0.84	0.18	0.45	0.41	0.21
Control Delay	64.4	38.1	56.5	63.4	43.6	14.6	66.5	22.3	2.7	70.2	30.9	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	38.1	56.5	63.4	43.6	14.6	66.5	22.3	2.7	70.2	30.9	2.6
Queue Length 50th (m)	33.1	16.9	75.0	28.7	45.0	14.6	35.1	157.1	3.4	15.8	31.7	0.3
Queue Length 95th (m)	46.5	26.7	#136.0	40.9	60.5	45.7	m31.0	m131.5	m3.1	30.6	42.1	4.5
Internal Link Dist (m)		245.5			130.3			223.1			274.6	
Turn Bay Length (m)	104.0		52.0	72.0		100.0	142.0		82.0	100.0		98.0
Base Capacity (vph)	443	921	517	443	934	602	412	1874	652	209	1529	563
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.18	0.86	0.51	0.43	0.59	0.76	0.84	0.18	0.28	0.41	0.21

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	233	149	402	202	364	319	45	238	1422	107	52	567
Future Volume (vph)	233	149	402	202	364	319	45	238	1422	107	52	567
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.8	7.0	7.0	6.8	7.0	7.0		6.9	6.7	6.7	6.9	6.7
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00		0.97	0.91	1.00	1.00	0.91
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.95		1.00	1.00	0.96	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)	3354	3357	1483	3354	3458	1474		3272	4969	1484	1695	4919
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3354	3357	1483	3354	3458	1474		3272	4969	1484	1695	4919
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)	259	166	447	224	404	354	50	264	1580	119	58	630
RTOR Reduction (vph)	0	0	114	0	0	212	0	0	0	75	0	0
Lane Group Flow (vph)	259	166	333	224	404	142	0	314	1580	44	58	630
Confl. Peds. (#/hr)	30		26	26		30		19		19	19	
Confl. Bikes (#/hr)			1			3				1		
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	3%	0%	0%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases			4			8				2		
Actuated Green, G (s)	14.8	32.5	32.5	13.8	31.5	31.5		15.8	47.7	47.7	8.6	40.5
Effective Green, g (s)	14.8	32.5	32.5	13.8	31.5	31.5		15.8	47.7	47.7	8.6	40.5
Actuated g/C Ratio	0.11	0.25	0.25	0.11	0.24	0.24		0.12	0.37	0.37	0.07	0.31
Clearance Time (s)	6.8	7.0	7.0	6.8	7.0	7.0		6.9	6.7	6.7	6.9	6.7
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)	381	839	370	356	837	357		397	1823	544	112	1532
v/s Ratio Prot	c0.08	0.05		0.07	0.12			c0.10	c0.32		0.03	0.13
v/s Ratio Perm			c0.22			0.10				0.03		
v/c Ratio	0.68	0.20	0.90	0.63	0.48	0.40		0.79	0.87	0.08	0.52	0.41
Uniform Delay, d1	55.3	38.5	47.2	55.6	42.3	41.3		55.5	38.2	26.8	58.7	35.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.17	0.49	1.04	1.05	0.81
Incremental Delay, d2	4.8	0.1	24.0	3.5	0.4	0.7		1.0	0.6	0.0	3.9	0.8
Delay (s)	60.1	38.6	71.2	59.1	42.7	42.0		66.1	19.4	27.8	65.7	29.5
Level of Service	E	D	E	E	D	D		E	B	C	E	C
Approach Delay (s)		61.7			46.2				27.2			31.1
Approach LOS		E			D				C			C

Intersection Summary			
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.4
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	106
Future Volume (vph)	106
Ideal Flow (vphpl)	1800
Total Lost time (s)	6.7
Lane Util. Factor	1.00
Frpb, ped/bikes	0.96
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1483
Flt Permitted	1.00
Satd. Flow (perm)	1483
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	118
RTOR Reduction (vph)	81
Lane Group Flow (vph)	37
Confl. Peds. (#/hr)	19
Confl. Bikes (#/hr)	2
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	40.5
Effective Green, g (s)	40.5
Actuated g/C Ratio	0.31
Clearance Time (s)	6.7
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	462
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.08
Uniform Delay, d1	31.6
Progression Factor	0.70
Incremental Delay, d2	0.3
Delay (s)	22.5
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

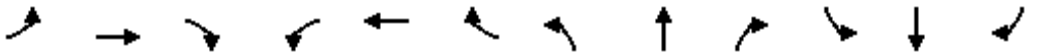
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	51	717	681	282	127	1898	73	26	1068	76
v/c Ratio	0.59	0.15	1.79	0.95	0.51	1.01	1.25	0.11	0.46	0.90	0.13
Control Delay	69.9	44.7	393.1	73.5	30.2	110.6	150.7	4.3	49.2	38.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	44.7	393.1	73.5	30.2	110.6	150.7	4.3	49.2	38.0	0.6
Queue Length 50th (m)	24.1	10.9	~249.7	89.1	41.8	~19.3	~318.7	0.0	4.3	94.1	0.1
Queue Length 95th (m)	40.7	22.6	#323.8	#124.4	73.4	#60.1	#360.8	7.7	m10.2	#161.1	m0.0
Internal Link Dist (m)		112.5			205.8		333.2			181.1	
Turn Bay Length (m)	65.0		100.0	90.0		157.0			140.0		76.0
Base Capacity (vph)	352	342	400	724	554	126	1519	692	56	1191	590
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	0.28	0.15	1.79	0.94	0.51	1.01	1.25	0.11	0.46	0.90	0.13

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

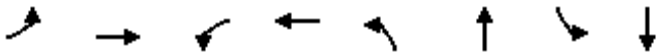
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	46	645	613	76	178	114	1708	66	23	961	68
Future Volume (vph)	87	46	645	613	76	178	114	1708	66	23	961	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.96
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	0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1631	1733	1495	3354	1599		1662	3424	1461	1729	3390	1435
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.08	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	1631	1733	1495	3354	1599		135	3424	1461	159	3390	1435
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)	97	51	717	681	84	198	127	1898	73	26	1068	76
RTOR Reduction (vph)	0	0	104	0	56	0	0	0	41	0	0	49
Lane Group Flow (vph)	97	51	613	681	226	0	127	1898	32	26	1068	27
Confl. Peds. (#/hr)	8		5	5		8	11		1	1		11
Confl. Bikes (#/hr)			4			2			5			2
Heavy Vehicles (%)	6%	5%	1%	0%	0%	0%	4%	1%	3%	0%	2%	4%
Turn Type	Prot	NA	Perm	Prot	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	13.1	25.7	25.7	27.9	40.5		57.7	57.7	57.7	45.7	45.7	45.7
Effective Green, g (s)	13.1	25.7	25.7	27.9	40.5		57.7	57.7	57.7	45.7	45.7	45.7
Actuated g/C Ratio	0.10	0.20	0.20	0.21	0.31		0.44	0.44	0.44	0.35	0.35	0.35
Clearance Time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3	6.3	6.3	6.3	6.3
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)	164	342	295	719	498		126	1519	648	55	1191	504
v/s Ratio Prot	0.06	0.03		c0.20	0.14		0.04	c0.55			0.32	
v/s Ratio Perm			c0.41				0.40		0.02	0.16		0.02
v/c Ratio	0.59	0.15	2.08	0.95	0.45		1.01	1.25	0.05	0.47	0.90	0.05
Uniform Delay, d1	55.9	43.1	52.1	50.3	35.9		30.3	36.1	20.6	32.8	39.9	27.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.73	0.72	0.93
Incremental Delay, d2	5.6	0.2	496.1	21.4	0.7		82.3	117.9	0.1	21.8	8.9	0.2
Delay (s)	61.5	43.3	548.3	71.7	36.5		112.6	154.1	20.7	45.9	37.5	26.0
Level of Service	E	D	F	E	D		F	F	C	D	D	C
Approach Delay (s)		463.9			61.4			146.9			36.9	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	159.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

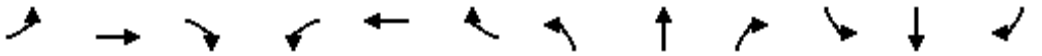


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	71	49	172	322	121	3	769
v/c Ratio	0.33	0.21	0.21	0.66	0.75	0.10	0.01	1.10
Control Delay	41.0	13.3	37.2	50.5	35.4	5.8	21.0	91.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	13.3	37.2	50.5	35.4	5.8	21.0	91.2
Queue Length 50th (m)	10.8	1.8	8.4	31.6	41.9	6.4	0.4	~163.1
Queue Length 95th (m)	22.7	13.1	18.5	53.2	#87.4	15.2	2.3	#258.1
Internal Link Dist (m)		205.8		177.5		261.1		580.4
Turn Bay Length (m)	130.0		42.0		65.0		35.0	
Base Capacity (vph)	357	581	453	491	465	1271	438	701
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	0.17	0.12	0.11	0.35	0.69	0.10	0.01	1.10

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.



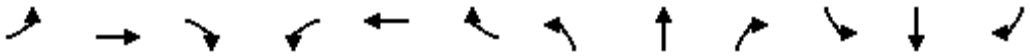
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	10	54	44	146	9	290	106	3	3	246	446
Future Volume (vph)	56	10	54	44	146	9	290	106	3	3	246	446
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.87		1.00	0.99		1.00	1.00		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1716	1544		1725	1393		1601	1776		1533	1624	
Flt Permitted	0.56	1.00		0.71	1.00		0.09	1.00		0.68	1.00	
Satd. Flow (perm)	1019	1544		1291	1393		145	1776		1096	1624	
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)	62	11	60	49	162	10	322	118	3	3	273	496
RTOR Reduction (vph)	0	49	0	0	2	0	0	1	0	0	50	0
Lane Group Flow (vph)	62	22	0	49	170	0	322	120	0	3	719	0
Confl. Peds. (#/hr)	4		1	1		4			11	11		
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	0%	1%	1%	0%	30%	17%	8%	2%	0%	10%	1%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.5	18.5		18.5	18.5		69.0	69.0		40.2	40.2	
Effective Green, g (s)	18.5	18.5		18.5	18.5		69.0	69.0		40.2	40.2	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.69	0.69		0.40	0.40	
Clearance Time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	188	285		239	257		429	1226		441	653	
v/s Ratio Prot		0.01			c0.12		c0.17	0.07			c0.44	
v/s Ratio Perm	0.06			0.04			0.35			0.00		
v/c Ratio	0.33	0.08		0.21	0.66		0.75	0.10		0.01	1.10	
Uniform Delay, d1	35.3	33.6		34.5	37.8		27.0	5.1		17.9	29.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.1		0.4	6.0		7.2	0.0		0.0	66.4	
Delay (s)	36.4	33.8		34.9	43.8		34.3	5.2		17.9	96.2	
Level of Service	D	C		C	D		C	A		B	F	
Approach Delay (s)		35.0			41.8			26.3			95.9	
Approach LOS		C			D			C			F	

Intersection Summary			
HCM 2000 Control Delay	63.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	18.6
Intersection Capacity Utilization	105.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	24	611	288	40	119	78
Future Volume (Veh/h)	24	611	288	40	119	78
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	679	320	44	132	87
Pedestrians			13			
Lane Width (m)			3.7			
Walking Speed (m/s)			1.1			
Percent Blockage			1			
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)					312	
pX, platoon unblocked						
vC, conflicting volume	232		922	188		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	232		922	188		
tC, single (s)	4.1		6.4	6.3		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.4		
p0 queue free %	98		0	95		
cM capacity (veh/h)	1331		293	816		

Direction, Lane #	WB 1	NB 1	SE 1
Volume Total	706	364	219
Volume Left	27	320	0
Volume Right	0	44	87
cSH	1331	317	1700
Volume to Capacity	0.02	1.15	0.13
Queue Length 95th (m)	0.5	113.6	0.0
Control Delay (s)	0.5	132.6	0.0
Lane LOS	A	F	
Approach Delay (s)	0.5	132.6	0.0
Approach LOS		F	

Intersection Summary			
Average Delay	37.7		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	234	0	0	999	105	0	0	0	52	0	33
Future Volume (Veh/h)	131	234	0	0	999	105	0	0	0	52	0	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	146	260	0	0	1110	117	0	0	0	58	0	37
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (m)		154										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	1227			260			1758	1779	260	1720	1720	1168
vC1, stage 1 conf vol							552	552		1168	1168	
vC2, stage 2 conf vol							1206	1227		552	552	
vCu, unblocked vol	1227			214			1767	1789	214	1729	1729	1168
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	74			100			100	100	100	63	100	84
cM capacity (veh/h)	568			1308			39	90	796	156	171	235

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	146	260	1227	95
Volume Left	146	0	0	58
Volume Right	0	0	117	37
cSH	568	1700	1700	180
Volume to Capacity	0.26	0.15	0.72	0.53
Queue Length 95th (m)	7.7	0.0	0.0	20.4
Control Delay (s)	13.5	0.0	0.0	45.4
Lane LOS	B			E
Approach Delay (s)	4.9		0.0	45.4
Approach LOS				E

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

Queues

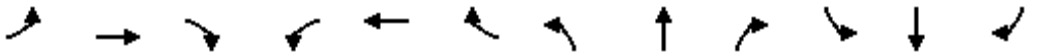
1: March Road N/March Road S & Morgan's Grant Way/Shirley's Brook Dr

06/03/2022

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	65	134	104	19	23	41	983	33	156	2100	9
v/c Ratio	0.31	0.44	0.66	0.09	0.09	0.36	0.36	0.04	0.67	0.63	0.01
Control Delay	53.9	12.3	72.7	48.7	0.7	56.8	9.2	0.4	66.7	14.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.9	12.3	72.7	48.7	0.7	56.8	9.2	0.4	66.7	14.6	0.0
Queue Length 50th (m)	15.4	0.0	25.8	4.4	0.0	11.3	21.3	0.2	38.4	108.3	0.0
Queue Length 95th (m)	28.1	17.3	42.7	11.3	0.0	m20.1	25.7	m0.3	58.9	154.2	0.0
Internal Link Dist (m)	116.4			136.8			274.6			145.2	
Turn Bay Length (m)		10.0	38.0		38.0	130.0		25.0	68.0		25.0
Base Capacity (vph)	417	469	311	401	411	188	2723	902	242	3352	1033
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	0.16	0.29	0.33	0.05	0.06	0.22	0.36	0.04	0.64	0.63	0.01

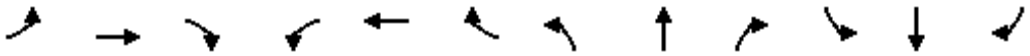
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	49	121	94	17	21	37	885	30	140	1890	8
Future Volume (vph)	10	49	121	94	17	21	37	885	30	140	1890	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.96
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	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1804	1514	1706	1655	1450	1679	4644	1476	1729	4969	1488
Flt Permitted		0.95	1.00	0.71	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1720	1514	1283	1655	1450	1679	4644	1476	1729	4969	1488
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)	11	54	134	104	19	23	41	983	33	156	2100	9
RTOR Reduction (vph)	0	0	117	0	0	20	0	0	14	0	0	3
Lane Group Flow (vph)	0	65	17	104	19	3	41	983	19	156	2100	6
Confl. Peds. (#/hr)	3		3	3		3	5		6	6		5
Confl. Bikes (#/hr)			3						8			1
Heavy Vehicles (%)	0%	0%	0%	1%	10%	5%	3%	7%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		16.1	16.1	16.1	16.1	16.1	7.5	76.2	76.2	17.7	86.4	86.4
Effective Green, g (s)		16.1	16.1	16.1	16.1	16.1	7.5	76.2	76.2	17.7	86.4	86.4
Actuated g/C Ratio		0.12	0.12	0.12	0.12	0.12	0.06	0.59	0.59	0.14	0.66	0.66
Clearance Time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
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)		213	187	158	204	179	96	2722	865	235	3302	988
v/s Ratio Prot					0.01		0.02	0.21		c0.09	c0.42	
v/s Ratio Perm		0.04	0.01	c0.08		0.00			0.01			0.00
v/c Ratio		0.31	0.09	0.66	0.09	0.02	0.43	0.36	0.02	0.66	0.64	0.01
Uniform Delay, d1		51.9	50.5	54.3	50.5	50.0	59.2	14.1	11.3	53.3	12.7	7.3
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.86	0.58	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.8	0.2	9.5	0.2	0.0	2.7	0.3	0.0	6.9	0.9	0.0
Delay (s)		52.7	50.7	63.8	50.7	50.0	53.6	8.5	11.3	60.2	13.6	7.4
Level of Service		D	D	E	D	D	D	A	B	E	B	A
Approach Delay (s)		51.3			59.9			10.3			16.8	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

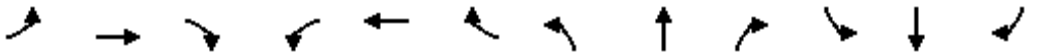


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	158	457	230	80	123	74	233	783	162	474	1643	220
v/c Ratio	0.69	0.68	0.49	0.39	0.22	0.20	0.64	0.54	0.28	1.14	0.77	0.30
Control Delay	75.3	54.0	8.9	64.0	45.5	1.2	43.2	62.3	23.9	129.4	24.7	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.3	54.0	8.9	64.0	45.5	1.2	43.2	62.3	23.9	129.4	24.7	2.1
Queue Length 50th (m)	20.7	58.8	0.0	10.3	14.3	0.0	28.0	75.8	16.7	~141.2	132.7	4.1
Queue Length 95th (m)	#33.9	72.3	20.5	18.4	21.7	0.0	44.7	89.5	37.1	#234.4	#187.1	7.5
Internal Link Dist (m)		245.5			95.7			295.3			274.6	
Turn Bay Length (m)	104.0		52.0	72.0		100.0	142.0		82.0	100.0		98.0
Base Capacity (vph)	232	931	562	223	912	502	459	1452	571	417	2144	729
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.49	0.41	0.36	0.13	0.15	0.51	0.54	0.28	1.14	0.77	0.30

Intersection Summary

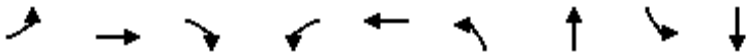
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	411	207	72	111	67	210	705	146	427	1479	198
Future Volume (vph)	142	411	207	72	111	67	210	705	146	427	1479	198
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96
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	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
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)	158	457	230	80	123	74	233	783	162	474	1643	220
RTOR Reduction (vph)	0	0	185	0	0	61	0	0	114	0	0	116
Lane Group Flow (vph)	158	457	45	80	123	13	233	783	48	474	1643	104
Confl. Peds. (#/hr)	9		29	29		9	21		13	13		21
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	2%	0%	1%	6%	2%	3%	2%	6%	1%	0%	2%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	25.3	25.3	7.0	23.3	23.3	14.5	38.9	38.9	31.4	55.8	55.8
Effective Green, g (s)	9.0	25.3	25.3	7.0	23.3	23.3	14.5	38.9	38.9	31.4	55.8	55.8
Actuated g/C Ratio	0.07	0.19	0.19	0.05	0.18	0.18	0.11	0.30	0.30	0.24	0.43	0.43
Clearance Time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	227	672	284	170	607	263	366	1402	443	417	2090	599
v/s Ratio Prot	c0.05	c0.13		0.03	0.04		0.07	0.17		c0.27	c0.34	
v/s Ratio Perm			0.03			0.01			0.03			0.07
v/c Ratio	0.70	0.68	0.16	0.47	0.20	0.05	0.64	0.56	0.11	1.14	0.79	0.17
Uniform Delay, d1	59.2	48.6	43.5	59.7	45.4	44.2	55.2	38.3	33.0	49.3	32.0	22.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.65	1.63	4.65	1.07	0.67	0.25
Incremental Delay, d2	8.9	2.8	0.3	2.1	0.2	0.1	3.4	1.5	0.5	83.0	2.5	0.5
Delay (s)	68.1	51.4	43.8	61.8	45.6	44.3	39.1	64.1	154.1	136.0	24.0	6.2
Level of Service	E	D	D	E	D	D	D	E	F	F	C	A
Approach Delay (s)		52.5			49.9			71.5			45.0	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	53.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.4
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

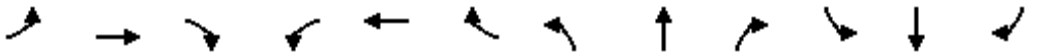


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	99	121	51	154	571	1818	141	1870
v/c Ratio	0.44	0.44	0.37	0.29	0.69	1.83	1.06	0.62	1.21
Control Delay	75.5	57.7	5.2	63.5	66.2	416.6	67.6	67.0	132.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.5	57.7	5.2	63.5	66.2	416.6	67.6	67.0	132.5
Queue Length 50th (m)	9.6	23.9	0.0	6.5	35.6	~220.9	~264.1	35.0	~317.3
Queue Length 95th (m)	21.3	39.4	5.7	13.4	55.5	#289.5	#306.8	#82.8	#383.1
Internal Link Dist (m)		112.5			205.8		333.2		208.2
Turn Bay Length (m)	65.0		100.0	90.0		157.0		140.0	
Base Capacity (vph)	87	343	411	177	334	312	1719	229	1547
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	0.44	0.29	0.29	0.29	0.46	1.83	1.06	0.62	1.21

Intersection Summary

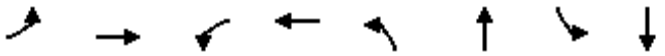
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



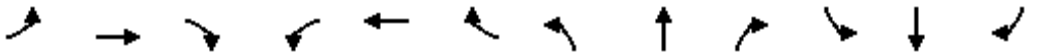
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	89	109	46	105	33	514	1049	587	127	1546	137
Future Volume (vph)	34	89	109	46	105	33	514	1049	587	127	1546	137
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3		4.5	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1616	1784	1435	3288	1693		1712	3155		1695	3311	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1616	1784	1435	3288	1693		1712	3155		1695	3311	
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)	38	99	121	51	117	37	571	1166	652	141	1718	152
RTOR Reduction (vph)	0	0	106	0	10	0	0	59	0	0	4	0
Lane Group Flow (vph)	38	99	15	51	144	0	571	1759	0	141	1866	0
Confl. Peds. (#/hr)	7		8	8		7	6					6
Confl. Bikes (#/hr)			1			1			1			12
Heavy Vehicles (%)	7%	2%	5%	2%	3%	3%	1%	4%	1%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	5.6	16.3	16.3	5.6	16.3		23.7	67.3		17.6	59.4	
Effective Green, g (s)	5.6	16.3	16.3	5.6	16.3		23.7	67.3		17.6	59.4	
Actuated g/C Ratio	0.04	0.13	0.13	0.04	0.13		0.18	0.52		0.14	0.46	
Clearance Time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3		4.5	6.3	
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)	69	223	179	141	212		312	1633		229	1512	
v/s Ratio Prot	c0.02	0.06		0.02	c0.09		c0.33	0.56		0.08	c0.56	
v/s Ratio Perm			0.01									
v/c Ratio	0.55	0.44	0.08	0.36	0.68		1.83	1.08		0.62	1.23	
Uniform Delay, d1	61.0	52.7	50.3	60.5	54.4		53.1	31.4		53.0	35.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.2	1.4	0.2	1.6	8.7		385.9	46.2		4.9	111.2	
Delay (s)	70.1	54.1	50.5	62.0	63.0		439.0	77.5		57.9	146.5	
Level of Service	E	D	D	E	E		F	E		E	F	
Approach Delay (s)		54.7			62.8			163.9			140.3	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	144.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	117.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	507	379	11	19	100	208	4	300
v/c Ratio	0.75	0.44	0.02	0.03	0.43	0.42	0.01	0.60
Control Delay	20.9	8.1	8.6	6.6	29.1	22.9	21.8	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	8.1	8.6	6.6	29.1	22.9	21.8	27.1
Queue Length 50th (m)	39.9	14.6	0.6	0.6	8.7	16.7	0.3	26.5
Queue Length 95th (m)	96.8	40.4	3.1	3.8	30.5	48.9	3.0	72.3
Internal Link Dist (m)		205.8		177.5		261.1		203.5
Turn Bay Length (m)	130.0		42.0		65.0		35.0	
Base Capacity (vph)	1188	1436	816	1199	571	1186	701	1210
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	0.43	0.26	0.01	0.02	0.18	0.18	0.01	0.25

Intersection Summary



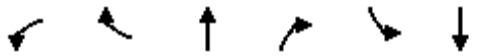
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	456	120	221	10	10	7	90	145	42	4	218	52
Future Volume (vph)	456	120	221	10	10	7	90	145	42	4	218	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1718	1604		1727	1354		1601	1717		1551	1748	
Flt Permitted	0.75	1.00		0.51	1.00		0.49	1.00		0.63	1.00	
Satd. Flow (perm)	1347	1604		919	1354		827	1717		1024	1748	
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)	507	133	246	11	11	8	100	161	47	4	242	58
RTOR Reduction (vph)	0	62	0	0	4	0	0	11	0	0	9	0
Lane Group Flow (vph)	507	317	0	11	15	0	100	197	0	4	291	0
Confl. Peds. (#/hr)	4		1	1		4			11	11		
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	0%	1%	1%	0%	30%	17%	8%	2%	0%	10%	1%	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)	31.9	31.9		31.9	31.9		17.8	17.8		17.8	17.8	
Effective Green, g (s)	31.9	31.9		31.9	31.9		17.8	17.8		17.8	17.8	
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.29	0.29		0.29	0.29	
Clearance Time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	691	823		472	695		237	492		293	501	
v/s Ratio Prot		0.20			0.01			0.11			c0.17	
v/s Ratio Perm	c0.38			0.01			0.12			0.00		
v/c Ratio	0.73	0.39		0.02	0.02		0.42	0.40		0.01	0.58	
Uniform Delay, d1	11.8	9.2		7.4	7.4		18.0	17.9		15.9	19.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.0	0.3		0.0	0.0		1.2	0.5		0.0	1.7	
Delay (s)	15.8	9.5		7.5	7.4		19.2	18.4		15.9	20.7	
Level of Service	B	A		A	A		B	B		B	C	
Approach Delay (s)		13.1			7.4			18.7			20.6	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	62.1	Sum of lost time (s)	12.4
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	538	494	40	147	41	27
Future Volume (Veh/h)	538	494	40	147	41	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	598	549	44	163	46	30
Pedestrians				2	17	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	306					
pX, platoon unblocked			0.83		0.83	0.83
vC, conflicting volume			1164		1140	892
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1093		1065	763
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			91		75	91
cM capacity (veh/h)			495		182	324

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1147	207	76
Volume Left	0	44	46
Volume Right	549	0	30
cSH	1700	495	220
Volume to Capacity	0.67	0.09	0.35
Queue Length 95th (m)	0.0	2.2	11.1
Control Delay (s)	0.0	3.8	29.8
Lane LOS		A	D
Approach Delay (s)	0.0	3.8	29.8
Approach LOS			D

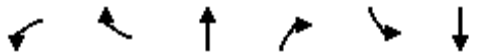
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1085	0	0	0
Future Volume (Veh/h)	0	0	1085	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	1206	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			232			247
pX, platoon unblocked	0.54	0.54			0.54	
vC, conflicting volume	1206	603			1206	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	552	585			875	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	804	402	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.47	0.24	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

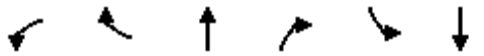
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1085	0	0	0
Future Volume (Veh/h)	0	0	1085	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	1206	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			322			157
pX, platoon unblocked	0.56	0.56			0.56	
vC, conflicting volume	1206	603			1206	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	572	606			907	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	804	402	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.47	0.24	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

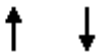
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	1085	0	0	0
Future Volume (Veh/h)	0	0	1085	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	1206	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			78
pX, platoon unblocked	0.58	0.58			0.58	
vC, conflicting volume	1206	603			1206	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	589	625			935	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	804	402	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.47	0.24	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

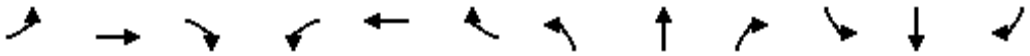
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	NBT	SBT
Lane Group Flow (vph)	1206	1954
v/c Ratio	0.36	0.58
Control Delay	0.0	10.2
Queue Delay	0.0	0.0
Total Delay	0.0	10.2
Queue Length 50th (m)	0.0	109.9
Queue Length 95th (m)	m0.0	114.5
Internal Link Dist (m)	54.1	77.0
Turn Bay Length (m)		
Base Capacity (vph)	3390	3390
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.36	0.58

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	1085	0	0	1759	0
Future Volume (vph)	0	0	0	0	0	0	0	1085	0	0	1759	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)								4.5			4.5	
Lane Util. Factor								0.95			0.95	
Frt								1.00			1.00	
Flt Protected								1.00			1.00	
Satd. Flow (prot)								3390			3390	
Flt Permitted								1.00			1.00	
Satd. Flow (perm)								3390			3390	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	1206	0	0	1954	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	1206	0	0	1954	0
Turn Type	pm+pt			pm+pt			Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)								130.0			130.0	
Effective Green, g (s)								130.0			130.0	
Actuated g/C Ratio								1.00			1.00	
Clearance Time (s)								4.5			4.5	
Vehicle Extension (s)								3.0			3.0	
Lane Grp Cap (vph)								3390			3390	
v/s Ratio Prot								0.36			c0.58	
v/s Ratio Perm												
v/c Ratio								0.36			0.58	
Uniform Delay, d1								0.0			0.0	
Progression Factor								1.00			1.00	
Incremental Delay, d2								0.0			0.5	
Delay (s)								0.0			0.5	
Level of Service								A			A	
Approach Delay (s)		0.0			0.0			0.0			0.5	
Approach LOS		A			A			A			A	

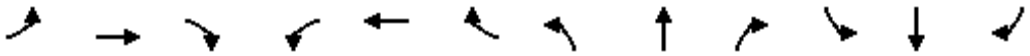
Intersection Summary			
HCM 2000 Control Delay	0.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	984	0	0	188	0	0
Future Volume (Veh/h)	984	0	0	188	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1093	0	0	209	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	207					
pX, platoon unblocked			0.84		0.84	0.84
vC, conflicting volume			1093		1302	1093
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1014		1264	1014
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			573		157	243

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1093	209	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.64	0.12	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

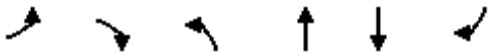
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	19	0	5	0	130	43	0	288	0
Future Volume (Veh/h)	0	0	0	19	0	5	0	130	43	0	288	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	21	0	6	0	144	48	0	320	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	494	512	320	488	488	168	320			192		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	494	512	320	488	488	168	320			192		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	99	100			100		
cM capacity (veh/h)	482	465	721	490	480	876	1240			1381		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	27	192	320
Volume Left	0	21	0	0
Volume Right	0	6	48	0
cSH	1700	543	1240	1381
Volume to Capacity	0.00	0.05	0.00	0.00
Queue Length 95th (m)	0.0	1.2	0.0	0.0
Control Delay (s)	0.0	12.0	0.0	0.0
Lane LOS	A	B		
Approach Delay (s)	0.0	12.0	0.0	0.0
Approach LOS	A	B		

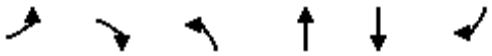
Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	26.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	217	326	0
Future Volume (Veh/h)	0	0	0	217	326	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	241	362	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				388		
pX, platoon unblocked						
vC, conflicting volume	603	362	362			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	603	362	362			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	462	683	1197			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	241	362
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1197	1700
Volume to Capacity	0.00	0.00	0.21
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

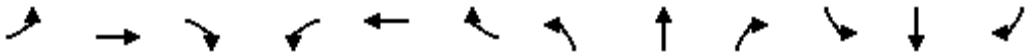
Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		21.4%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	217	326	0
Future Volume (Veh/h)	0	0	0	217	326	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	241	362	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				227		
pX, platoon unblocked						
vC, conflicting volume	603	362	362			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	603	362	362			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	462	683	1197			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	241	362
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1197	1700
Volume to Capacity	0.00	0.00	0.21
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		21.4%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	984	0	0	188	14	0	0	0	93	0	33
Future Volume (Veh/h)	39	984	0	0	188	14	0	0	0	93	0	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	43	1093	0	0	209	16	0	0	0	103	0	37
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		152										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	225			1093			1433	1404	1093	1396	1396	217
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	225			1016			1420	1386	1016	1376	1376	217
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	100	100	0	100	96
cM capacity (veh/h)	1344			574			89	116	243	100	118	823

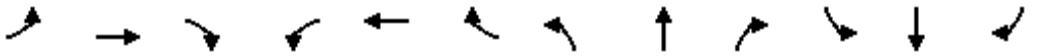
Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	43	1093	225	140
Volume Left	43	0	0	103
Volume Right	0	0	16	37
cSH	1344	1700	1700	131
Volume to Capacity	0.03	0.64	0.13	1.07
Queue Length 95th (m)	0.8	0.0	0.0	59.7
Control Delay (s)	7.8	0.0	0.0	164.8
Lane LOS	A			F
Approach Delay (s)	0.3		0.0	164.8
Approach LOS				F

Intersection Summary				
Average Delay	15.6			
Intersection Capacity Utilization	68.9%	ICU Level of Service	C	
Analysis Period (min)	15			

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	70	87	73	230	267	2350	150	156	1170	22
v/c Ratio	0.36	0.28	0.59	0.38	0.66	0.67	0.85	0.16	0.67	0.48	0.03
Control Delay	56.6	10.7	69.2	57.2	19.2	69.2	12.0	0.2	66.7	22.8	0.1
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	56.6	10.7	69.2	57.2	19.2	69.2	12.0	0.2	66.7	22.8	0.1
Queue Length 50th (m)	17.2	0.0	21.6	17.7	6.1	65.7	23.0	0.0	38.4	71.1	0.0
Queue Length 95th (m)	30.3	10.6	36.8	30.8	30.2	m76.6	m210.1	m0.0	58.9	83.4	0.0
Internal Link Dist (m)	116.4			136.8			274.6			145.2	
Turn Bay Length (m)		10.0	38.0		38.0	130.0		25.0	68.0		25.0
Base Capacity (vph)	408	428	309	401	505	399	2756	911	242	2442	777
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	0.16	0.28	0.18	0.46	0.67	0.85	0.16	0.64	0.48	0.03

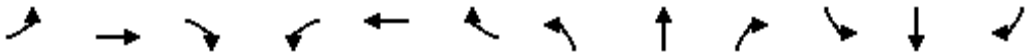
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	52	63	78	66	207	240	2115	135	140	1053	20
Future Volume (vph)	12	52	63	78	66	207	240	2115	135	140	1053	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.96
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	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1802	1514	1706	1655	1450	1679	4644	1476	1729	4969	1488
Flt Permitted		0.93	1.00	0.71	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1684	1514	1276	1655	1450	1679	4644	1476	1729	4969	1488
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)	13	58	70	87	73	230	267	2350	150	156	1170	22
RTOR Reduction (vph)	0	0	62	0	0	180	0	0	37	0	0	11
Lane Group Flow (vph)	0	71	8	87	73	50	267	2350	113	156	1170	11
Confl. Peds. (#/hr)	3		3	3		3	5		6	6		5
Confl. Bikes (#/hr)			3						8			1
Heavy Vehicles (%)	0%	0%	0%	1%	10%	5%	3%	7%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		15.2	15.2	15.2	15.2	15.2	30.9	77.1	77.1	17.7	63.9	63.9
Effective Green, g (s)		15.2	15.2	15.2	15.2	15.2	30.9	77.1	77.1	17.7	63.9	63.9
Actuated g/C Ratio		0.12	0.12	0.12	0.12	0.12	0.24	0.59	0.59	0.14	0.49	0.49
Clearance Time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
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)		196	177	149	193	169	399	2754	875	235	2442	731
v/s Ratio Prot					0.04		c0.16	c0.51		0.09	0.24	
v/s Ratio Perm		0.04	0.01	c0.07		0.03			0.08			0.01
v/c Ratio		0.36	0.05	0.58	0.38	0.29	0.67	0.85	0.13	0.66	0.48	0.01
Uniform Delay, d1		52.9	51.0	54.4	53.0	52.5	44.9	21.8	11.7	53.3	22.0	16.9
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.46	0.42	0.01	1.00	1.00	1.00
Incremental Delay, d2		1.1	0.1	5.7	1.2	1.0	1.3	1.1	0.1	6.9	0.7	0.0
Delay (s)		54.1	51.1	60.1	54.3	53.5	66.7	10.2	0.2	60.2	22.7	17.0
Level of Service		D	D	E	D	D	E	B	A	E	C	B
Approach Delay (s)		52.6			55.1			15.1			26.9	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



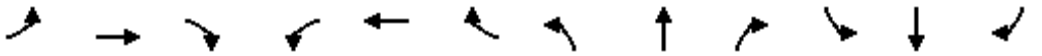
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	310	134	380	207	336	414	230	2000	110	86	1059	181
v/c Ratio	0.77	0.20	0.72	0.62	0.55	0.85	0.66	1.08	0.16	0.55	0.57	0.28
Control Delay	68.3	42.4	18.9	63.8	50.9	33.3	64.1	71.7	3.1	68.2	44.7	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	42.4	18.9	63.8	50.9	33.3	64.1	71.7	3.1	68.2	44.7	16.4
Queue Length 50th (m)	39.7	15.2	18.2	26.5	42.0	37.6	28.0	~214.1	0.5	22.5	68.3	4.1
Queue Length 95th (m)	55.3	22.2	50.2	38.4	50.7	70.8	41.3	#299.4	m5.2	40.8	86.1	24.8
Internal Link Dist (m)		245.5			118.4			283.0			274.6	
Turn Bay Length (m)	104.0		52.0	72.0		100.0	142.0		82.0	100.0		98.0
Base Capacity (vph)	435	931	611	418	912	594	407	1859	678	214	1851	643
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.14	0.62	0.50	0.37	0.70	0.57	1.08	0.16	0.40	0.57	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

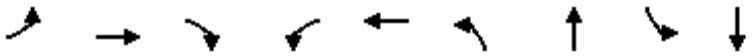
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	121	342	186	302	373	207	1800	99	77	953	163
Future Volume (vph)	279	121	342	186	302	373	207	1800	99	77	953	163
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96
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	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
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)	310	134	380	207	336	414	230	2000	110	86	1059	181
RTOR Reduction (vph)	0	0	239	0	0	223	0	0	66	0	0	112
Lane Group Flow (vph)	310	134	141	207	336	191	230	2000	44	86	1059	69
Confl. Peds. (#/hr)	9		29	29		9	21		13	13		21
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	2%	0%	1%	6%	2%	3%	2%	6%	1%	0%	2%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.0	25.6	25.6	13.7	23.3	23.3	13.9	51.6	51.6	11.7	49.4	49.4
Effective Green, g (s)	16.0	25.6	25.6	13.7	23.3	23.3	13.9	51.6	51.6	11.7	49.4	49.4
Actuated g/C Ratio	0.12	0.20	0.20	0.11	0.18	0.18	0.11	0.40	0.40	0.09	0.38	0.38
Clearance Time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	404	680	288	333	607	263	351	1860	588	155	1850	530
v/s Ratio Prot	c0.09	0.04		0.07	0.10		c0.07	c0.43		0.05	0.22	
v/s Ratio Perm			0.10			c0.13			0.03			0.05
v/c Ratio	0.77	0.20	0.49	0.62	0.55	0.73	0.66	1.08	0.07	0.55	0.57	0.13
Uniform Delay, d1	55.2	43.6	46.4	55.7	48.6	50.3	55.7	39.2	24.4	56.7	31.9	26.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.04	0.72	1.33	1.00	1.27	3.02
Incremental Delay, d2	8.5	0.1	1.3	3.6	1.1	9.5	3.1	41.7	0.2	3.9	1.2	0.5
Delay (s)	63.7	43.8	47.7	59.3	49.7	59.9	60.9	70.0	32.5	60.6	41.7	79.7
Level of Service	E	D	D	E	D	E	E	E	C	E	D	E
Approach Delay (s)		53.1			56.2			67.3			48.1	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	58.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.4
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

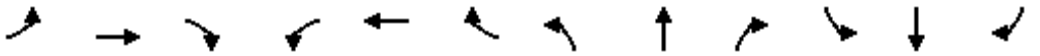


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	43	609	579	278	108	2280	29	1503
v/c Ratio	0.75	0.10	1.40	1.75	0.58	1.44	1.47	0.45	1.07
Control Delay	87.4	39.1	224.2	383.2	30.3	300.7	242.4	82.4	82.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.4	39.1	224.2	383.2	30.3	300.7	242.4	82.4	82.5
Queue Length 50th (m)	27.0	8.6	~185.9	~113.4	37.0	~37.5	~437.6	7.4	~224.6
Queue Length 95th (m)	#53.5	18.5	#257.2	#148.7	66.5	#74.8	#478.6	#18.9	#267.8
Internal Link Dist (m)		112.5			205.8		333.2		208.2
Turn Bay Length (m)	65.0		100.0	90.0		157.0		140.0	
Base Capacity (vph)	152	432	435	331	476	75	1555	65	1401
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	0.70	0.10	1.40	1.75	0.58	1.44	1.47	0.45	1.07

Intersection Summary

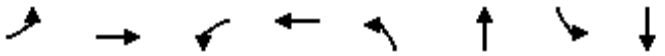
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	39	548	521	61	189	97	1997	55	26	1270	83
Future Volume (vph)	96	39	548	521	61	189	97	1997	55	26	1270	83
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3		4.5	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.98		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	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1616	1784	1436	3288	1539		1712	3312		1695	3322	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1616	1784	1436	3288	1539		1712	3312		1695	3322	
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)	107	43	609	579	68	210	108	2219	61	29	1411	92
RTOR Reduction (vph)	0	0	87	0	85	0	0	2	0	0	3	0
Lane Group Flow (vph)	107	43	522	579	193	0	108	2278	0	29	1500	0
Confl. Peds. (#/hr)	7		8	8		7	6					6
Confl. Bikes (#/hr)			1			1			1			12
Heavy Vehicles (%)	7%	2%	5%	2%	3%	3%	1%	4%	1%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	11.6	31.5	31.5	13.1	33.0		5.7	59.2		3.0	54.7	
Effective Green, g (s)	11.6	31.5	31.5	13.1	33.0		5.7	59.2		3.0	54.7	
Actuated g/C Ratio	0.09	0.24	0.24	0.10	0.25		0.04	0.46		0.02	0.42	
Clearance Time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3		4.5	6.3	
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)	144	432	347	331	390		75	1508		39	1397	
v/s Ratio Prot	0.07	0.02		c0.18	0.13		c0.06	c0.69		0.02	0.45	
v/s Ratio Perm			c0.36									
v/c Ratio	0.74	0.10	1.50	1.75	0.49		1.44	1.51		0.74	1.07	
Uniform Delay, d1	57.7	38.2	49.2	58.5	41.4		62.1	35.4		63.1	37.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.6	0.1	241.3	349.4	1.0		258.2	233.4		54.3	46.4	
Delay (s)	76.3	38.3	290.6	407.9	42.4		320.4	268.8		117.4	84.1	
Level of Service	E	D	F	F	D		F	F		F	F	
Approach Delay (s)		246.1			289.3			271.1			84.7	
Approach LOS		F			F			F			F	

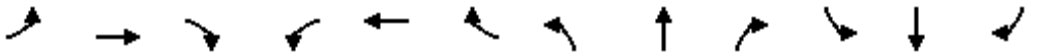
Intersection Summary			
HCM 2000 Control Delay	218.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	110.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	66	59	41	129	293	91	3	656
v/c Ratio	0.32	0.19	0.19	0.54	0.65	0.07	0.01	0.90
Control Delay	40.9	11.6	37.7	45.3	21.7	4.7	19.0	41.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	11.6	37.7	45.3	21.7	4.7	19.0	41.9
Queue Length 50th (m)	11.1	0.2	6.8	21.9	25.7	4.2	0.3	100.7
Queue Length 95th (m)	24.1	10.6	16.4	40.8	57.6	10.1	2.3	#190.6
Internal Link Dist (m)		205.8		177.5		261.1		203.5
Turn Bay Length (m)	130.0		42.0		65.0		35.0	
Base Capacity (vph)	443	585	476	510	511	1317	467	726
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	0.10	0.09	0.25	0.57	0.07	0.01	0.90

Intersection Summary

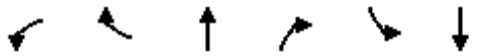
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	1	52	37	107	9	264	79	3	3	207	383
Future Volume (vph)	59	1	52	37	107	9	264	79	3	3	207	383
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.85		1.00	0.99		1.00	1.00		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1714	1502		1725	1391		1601	1774		1533	1623	
Flt Permitted	0.67	1.00		0.72	1.00		0.13	1.00		0.70	1.00	
Satd. Flow (perm)	1217	1502		1305	1391		215	1774		1127	1623	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	66	1	58	41	119	10	293	88	3	3	230	426
RTOR Reduction (vph)	0	48	0	0	3	0	0	1	0	0	50	0
Lane Group Flow (vph)	66	11	0	41	126	0	293	90	0	3	606	0
Confl. Peds. (#/hr)	4		1	1		4			11	11		
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	0%	1%	1%	0%	30%	17%	8%	2%	0%	10%	1%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.3	16.3		16.3	16.3		67.4	67.4		40.1	40.1	
Effective Green, g (s)	16.3	16.3		16.3	16.3		67.4	67.4		40.1	40.1	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.70	0.70		0.42	0.42	
Clearance Time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	206	254		221	235		455	1244		470	677	
v/s Ratio Prot		0.01			c0.09		c0.14	0.05			c0.37	
v/s Ratio Perm	0.05			0.03			0.31			0.00		
v/c Ratio	0.32	0.04		0.19	0.53		0.64	0.07		0.01	0.90	
Uniform Delay, d1	35.0	33.4		34.2	36.4		18.6	4.5		16.4	26.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.1		0.4	2.3		3.1	0.0		0.0	14.4	
Delay (s)	35.9	33.4		34.6	38.8		21.7	4.5		16.4	40.5	
Level of Service	D	C		C	D		C	A		B	D	
Approach Delay (s)		34.8			37.8			17.6			40.4	
Approach LOS		C			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	18.6
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

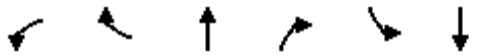
Intersection Sign configuration not allowed in HCM analysis.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	2145	0	0	0
Future Volume (Veh/h)	0	0	2145	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	2383	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			232			247
pX, platoon unblocked	0.55	0.55			0.55	
vC, conflicting volume	2383	1192			2383	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1888	0			1888	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	34	602			174	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	1589	794	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.93	0.47	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

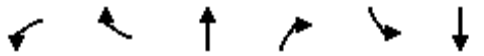
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	2145	0	0	0
Future Volume (Veh/h)	0	0	2145	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	2383	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			322			157
pX, platoon unblocked	0.56	0.56			0.56	
vC, conflicting volume	2383	1192			2383	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1895	0			1895	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	34	605			174	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	1589	794	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.93	0.47	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

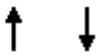
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	2145	0	0	0
Future Volume (Veh/h)	0	0	2145	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	2383	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			78
pX, platoon unblocked	0.56	0.56			0.56	
vC, conflicting volume	2383	1192			2383	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1901	0			1901	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	34	609			174	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	1589	794	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.93	0.47	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

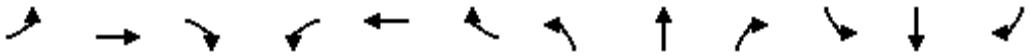
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	NBT	SBT
Lane Group Flow (vph)	2383	1646
v/c Ratio	0.70	0.49
Control Delay	10.5	4.0
Queue Delay	0.0	0.0
Total Delay	10.5	4.0
Queue Length 50th (m)	107.4	37.6
Queue Length 95th (m)	m6.4	55.5
Internal Link Dist (m)	54.1	89.2
Turn Bay Length (m)		
Base Capacity (vph)	3390	3390
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.70	0.49

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	2145	0	0	1481	0
Future Volume (vph)	0	0	0	0	0	0	0	2145	0	0	1481	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)								4.5			4.5	
Lane Util. Factor								0.95			0.95	
Frt								1.00			1.00	
Flt Protected								1.00			1.00	
Satd. Flow (prot)								3390			3390	
Flt Permitted								1.00			1.00	
Satd. Flow (perm)								3390			3390	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	2383	0	0	1646	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	2383	0	0	1646	0
Turn Type	Perm			Perm			Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)								130.0			130.0	
Effective Green, g (s)								130.0			130.0	
Actuated g/C Ratio								1.00			1.00	
Clearance Time (s)								4.5			4.5	
Vehicle Extension (s)								3.0			3.0	
Lane Grp Cap (vph)								3390			3390	
v/s Ratio Prot								c0.70			0.49	
v/s Ratio Perm												
v/c Ratio								0.70			0.49	
Uniform Delay, d1								0.0			0.0	
Progression Factor								1.00			1.00	
Incremental Delay, d2								0.1			0.4	
Delay (s)								0.1			0.4	
Level of Service								A			A	
Approach Delay (s)		0.0			0.0			0.1			0.4	
Approach LOS		A			A			A			A	

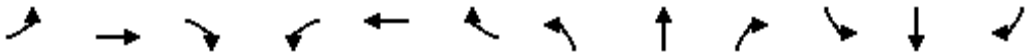
Intersection Summary			
HCM 2000 Control Delay	0.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	296	0	0	873	0	0
Future Volume (Veh/h)	296	0	0	873	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	329	0	0	970	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	214					
pX, platoon unblocked			0.98		0.98	0.98
vC, conflicting volume			329		1299	329
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			299		1294	299
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1231		175	722

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	329	970	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.19	0.57	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

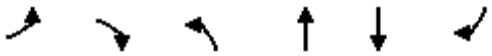
Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		51.8%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	49	0	23	0	177	12	0	51	0
Future Volume (Veh/h)	0	0	0	49	0	23	0	177	12	0	51	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	54	0	26	0	197	13	0	57	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	286	267	57	260	260	204	57			210		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	286	267	57	260	260	204	57			210		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	92	100	97	100			100		
cM capacity (veh/h)	645	639	1009	692	644	837	1547			1361		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	80	210	57
Volume Left	0	54	0	0
Volume Right	0	26	13	0
cSH	1700	734	1547	1361
Volume to Capacity	0.00	0.11	0.00	0.00
Queue Length 95th (m)	0.0	2.8	0.0	0.0
Control Delay (s)	0.0	10.5	0.0	0.0
Lane LOS	A	B		
Approach Delay (s)	0.0	10.5	0.0	0.0
Approach LOS	A	B		

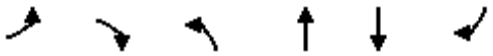
Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	21.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	177	149	0
Future Volume (Veh/h)	0	0	0	177	149	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	197	166	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				388		
pX, platoon unblocked						
vC, conflicting volume	363	166	166			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	363	166	166			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	636	878	1412			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	197	166
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1412	1700
Volume to Capacity	0.00	0.00	0.10
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

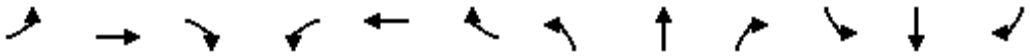
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	13.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	177	149	0
Future Volume (Veh/h)	0	0	0	177	149	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	197	166	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				227		
pX, platoon unblocked						
vC, conflicting volume	363	166	166			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	363	166	166			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	636	878	1412			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	197	166
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1412	1700
Volume to Capacity	0.00	0.00	0.10
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	13.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	296	0	0	873	77	0	0	0	24	0	37
Future Volume (Veh/h)	95	296	0	0	873	77	0	0	0	24	0	37
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	106	329	0	0	970	86	0	0	0	27	0	41
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (m)		142										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	1056			329			1595	1597	329	1554	1554	1013
vC1, stage 1 conf vol							541	541		1013	1013	
vC2, stage 2 conf vol							1054	1056		541	541	
vCu, unblocked vol	1056			284			1599	1601	284	1556	1556	1013
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			100			100	100	100	86	100	86
cM capacity (veh/h)	659			1231			108	155	727	193	208	290

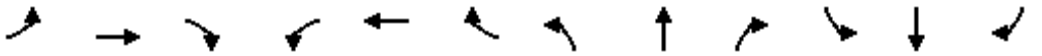
Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	106	329	1056	68
Volume Left	106	0	0	27
Volume Right	0	0	86	41
cSH	659	1700	1700	242
Volume to Capacity	0.16	0.19	0.62	0.28
Queue Length 95th (m)	4.3	0.0	0.0	8.5
Control Delay (s)	11.5	0.0	0.0	25.6
Lane LOS	B			D
Approach Delay (s)	2.8		0.0	25.6
Approach LOS				D

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	65	134	104	19	23	41	1038	33	156	2258	9
v/c Ratio	0.31	0.44	0.66	0.09	0.09	0.36	0.38	0.04	0.67	0.67	0.01
Control Delay	53.9	12.3	72.7	48.7	0.7	54.8	11.1	0.4	66.7	15.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.9	12.3	72.7	48.7	0.7	54.8	11.1	0.4	66.7	15.7	0.0
Queue Length 50th (m)	15.4	0.0	25.8	4.4	0.0	11.0	28.0	0.1	38.4	123.3	0.0
Queue Length 95th (m)	28.1	17.3	42.7	11.3	0.0	m19.3	30.9	m0.2	58.9	174.8	0.0
Internal Link Dist (m)	116.4			136.8			274.6			145.2	
Turn Bay Length (m)		10.0	38.0		38.0	130.0		25.0	68.0		25.0
Base Capacity (vph)	417	469	311	401	411	188	2723	902	242	3352	1033
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	0.16	0.29	0.33	0.05	0.06	0.22	0.38	0.04	0.64	0.67	0.01

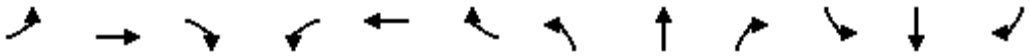
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	49	121	94	17	21	37	934	30	140	2032	8
Future Volume (vph)	10	49	121	94	17	21	37	934	30	140	2032	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.96
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	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1804	1514	1706	1655	1450	1679	4644	1476	1729	4969	1488
Flt Permitted		0.95	1.00	0.71	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1720	1514	1283	1655	1450	1679	4644	1476	1729	4969	1488
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)	11	54	134	104	19	23	41	1038	33	156	2258	9
RTOR Reduction (vph)	0	0	117	0	0	20	0	0	14	0	0	3
Lane Group Flow (vph)	0	65	17	104	19	3	41	1038	19	156	2258	6
Confl. Peds. (#/hr)	3		3	3		3	5		6	6		5
Confl. Bikes (#/hr)			3						8			1
Heavy Vehicles (%)	0%	0%	0%	1%	10%	5%	3%	7%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		16.1	16.1	16.1	16.1	16.1	7.5	76.2	76.2	17.7	86.4	86.4
Effective Green, g (s)		16.1	16.1	16.1	16.1	16.1	7.5	76.2	76.2	17.7	86.4	86.4
Actuated g/C Ratio		0.12	0.12	0.12	0.12	0.12	0.06	0.59	0.59	0.14	0.66	0.66
Clearance Time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
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)		213	187	158	204	179	96	2722	865	235	3302	988
v/s Ratio Prot					0.01		0.02	0.22		c0.09	c0.45	
v/s Ratio Perm		0.04	0.01	c0.08		0.00			0.01			0.00
v/c Ratio		0.31	0.09	0.66	0.09	0.02	0.43	0.38	0.02	0.66	0.68	0.01
Uniform Delay, d1		51.9	50.5	54.3	50.5	50.0	59.2	14.3	11.3	53.3	13.4	7.3
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.83	0.69	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.8	0.2	9.5	0.2	0.0	2.6	0.3	0.0	6.9	1.2	0.0
Delay (s)		52.7	50.7	63.8	50.7	50.0	51.6	10.3	11.3	60.2	14.6	7.4
Level of Service		D	D	E	D	D	D	B	B	E	B	A
Approach Delay (s)		51.3			59.9			11.8			17.5	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



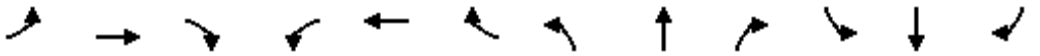
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	158	429	313	69	114	62	319	856	161	428	1846	220
v/c Ratio	0.69	0.65	0.59	0.35	0.21	0.17	0.71	0.59	0.28	1.00	0.90	0.32
Control Delay	75.3	53.5	9.4	63.1	45.9	1.0	49.8	57.1	23.0	92.7	32.0	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.3	53.5	9.4	63.1	45.9	1.0	49.8	57.1	23.0	92.7	32.0	2.9
Queue Length 50th (m)	20.7	54.8	0.0	8.9	13.3	0.0	44.6	58.4	10.7	~115.1	163.9	5.7
Queue Length 95th (m)	#33.9	68.0	24.0	16.5	20.4	0.0	59.1	90.3	m34.7	#207.2	#235.4	11.1
Internal Link Dist (m)		245.5			137.1			295.3			274.6	
Turn Bay Length (m)	104.0		52.0	72.0		100.0	142.0		82.0	100.0		98.0
Base Capacity (vph)	232	931	622	223	912	502	486	1452	570	427	2048	692
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.46	0.50	0.31	0.13	0.12	0.66	0.59	0.28	1.00	0.90	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

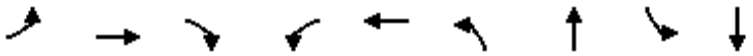
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	386	282	62	103	56	287	770	145	385	1661	198
Future Volume (vph)	142	386	282	62	103	56	287	770	145	385	1661	198
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96
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	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
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)	158	429	313	69	114	62	319	856	161	428	1846	220
RTOR Reduction (vph)	0	0	253	0	0	51	0	0	113	0	0	107
Lane Group Flow (vph)	158	429	60	69	114	11	319	856	48	428	1846	113
Confl. Peds. (#/hr)	9		29	29		9	21		13	13		21
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	2%	0%	1%	6%	2%	3%	2%	6%	1%	0%	2%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	24.8	24.8	6.8	22.6	22.6	17.8	38.9	38.9	32.1	53.2	53.2
Effective Green, g (s)	9.0	24.8	24.8	6.8	22.6	22.6	17.8	38.9	38.9	32.1	53.2	53.2
Actuated g/C Ratio	0.07	0.19	0.19	0.05	0.17	0.17	0.14	0.30	0.30	0.25	0.41	0.41
Clearance Time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	227	659	279	165	589	255	450	1402	443	426	1993	571
v/s Ratio Prot	c0.05	c0.12		0.02	0.03		0.10	0.18		c0.25	c0.38	
v/s Ratio Perm			0.04			0.01			0.03			0.08
v/c Ratio	0.70	0.65	0.21	0.42	0.19	0.04	0.71	0.61	0.11	1.00	0.93	0.20
Uniform Delay, d1	59.2	48.6	44.4	59.7	45.9	44.7	53.6	39.1	33.0	49.0	36.5	24.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.81	1.46	4.50	1.12	0.69	0.28
Incremental Delay, d2	8.9	2.3	0.4	1.7	0.2	0.1	3.7	1.4	0.4	39.3	7.2	0.6
Delay (s)	68.1	50.9	44.8	61.4	46.1	44.8	47.0	58.6	148.9	94.3	32.3	7.5
Level of Service	E	D	D	E	D	D	D	E	F	F	C	A
Approach Delay (s)		51.8			50.1			66.8			40.7	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.4
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

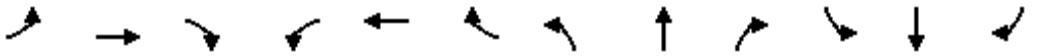


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	99	121	53	154	571	2092	141	2050
v/c Ratio	0.44	0.44	0.37	0.30	0.69	1.83	1.22	0.62	1.32
Control Delay	75.5	57.7	5.2	63.8	66.2	416.6	133.0	67.0	181.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.5	57.7	5.2	63.8	66.2	416.6	133.0	67.0	181.0
Queue Length 50th (m)	9.6	23.9	0.0	6.8	35.6	~220.9	~348.5	35.0	~368.4
Queue Length 95th (m)	21.3	39.4	5.7	13.7	55.5	#289.5	#390.4	#82.8	#433.6
Internal Link Dist (m)		112.5			205.8		333.2		208.2
Turn Bay Length (m)	65.0		100.0	90.0		157.0		140.0	
Base Capacity (vph)	87	343	411	177	334	312	1717	229	1548
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	0.44	0.29	0.29	0.30	0.46	1.83	1.22	0.62	1.32

Intersection Summary

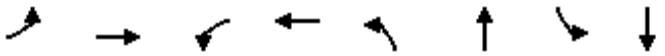
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



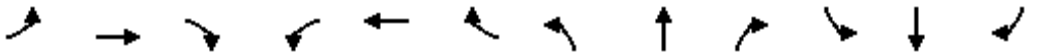
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	89	109	48	105	33	514	1490	392	127	1708	137
Future Volume (vph)	34	89	109	48	105	33	514	1490	392	127	1708	137
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3		4.5	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		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	1.00	0.85	1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1616	1784	1435	3288	1693		1712	3227		1695	3315	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1616	1784	1435	3288	1693		1712	3227		1695	3315	
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)	38	99	121	53	117	37	571	1656	436	141	1898	152
RTOR Reduction (vph)	0	0	106	0	10	0	0	18	0	0	4	0
Lane Group Flow (vph)	38	99	15	53	144	0	571	2074	0	141	2046	0
Confl. Peds. (#/hr)	7		8	8		7	6					6
Confl. Bikes (#/hr)			1			1			1			12
Heavy Vehicles (%)	7%	2%	5%	2%	3%	3%	1%	4%	1%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	5.6	16.3	16.3	5.6	16.3		23.7	67.3		17.6	59.4	
Effective Green, g (s)	5.6	16.3	16.3	5.6	16.3		23.7	67.3		17.6	59.4	
Actuated g/C Ratio	0.04	0.13	0.13	0.04	0.13		0.18	0.52		0.14	0.46	
Clearance Time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3		4.5	6.3	
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)	69	223	179	141	212		312	1670		229	1514	
v/s Ratio Prot	c0.02	0.06		0.02	c0.09		c0.33	0.64		0.08	c0.62	
v/s Ratio Perm			0.01									
v/c Ratio	0.55	0.44	0.08	0.38	0.68		1.83	1.24		0.62	1.35	
Uniform Delay, d1	61.0	52.7	50.3	60.5	54.4		53.1	31.4		53.0	35.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.2	1.4	0.2	1.7	8.7		385.9	114.1		4.9	162.6	
Delay (s)	70.1	54.1	50.5	62.2	63.0		439.0	145.4		57.9	197.9	
Level of Service	E	D	D	E	E		F	F		E	F	
Approach Delay (s)		54.7			62.8			208.4			188.9	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	187.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	122.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	213	322	11	19	100	208	4	302
v/c Ratio	0.40	0.46	0.03	0.04	0.34	0.39	0.01	0.56
Control Delay	12.6	8.4	9.0	7.3	15.2	13.2	10.5	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	8.4	9.0	7.3	15.2	13.2	10.5	16.4
Queue Length 50th (m)	9.7	8.5	0.4	0.4	5.0	9.9	0.2	15.7
Queue Length 95th (m)	26.7	26.8	2.8	3.4	15.9	25.7	1.7	38.2
Internal Link Dist (m)		205.8		177.5		261.1		203.5
Turn Bay Length (m)	130.0		42.0		65.0		35.0	
Base Capacity (vph)	1340	1603	1028	1351	918	1619	961	1653
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	0.16	0.20	0.01	0.01	0.11	0.13	0.00	0.18

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	102	188	10	10	7	90	145	42	4	218	54
Future Volume (vph)	192	102	188	10	10	7	90	145	42	4	218	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1722	1604		1728	1355		1601	1719		1558	1747	
Flt Permitted	0.75	1.00		0.57	1.00		0.58	1.00		0.63	1.00	
Satd. Flow (perm)	1350	1604		1029	1355		971	1719		1029	1747	
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)	213	113	209	11	11	8	100	161	47	4	242	60
RTOR Reduction (vph)	0	77	0	0	5	0	0	10	0	0	8	0
Lane Group Flow (vph)	213	245	0	11	14	0	100	198	0	4	294	0
Confl. Peds. (#/hr)	4		1	1		4			11	11		
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	0%	1%	1%	0%	30%	17%	8%	2%	0%	10%	1%	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)	16.3	16.3		16.3	16.3		12.6	12.6		12.6	12.6	
Effective Green, g (s)	16.3	16.3		16.3	16.3		12.6	12.6		12.6	12.6	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.31	0.31		0.31	0.31	
Clearance Time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	532	633		406	534		296	524		313	532	
v/s Ratio Prot		0.15			0.01			0.11			c0.17	
v/s Ratio Perm	c0.16			0.01			0.10			0.00		
v/c Ratio	0.40	0.39		0.03	0.03		0.34	0.38		0.01	0.55	
Uniform Delay, d1	9.0	8.9		7.6	7.6		11.1	11.3		10.0	12.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.4		0.0	0.0		0.7	0.5		0.0	1.2	
Delay (s)	9.5	9.3		7.7	7.7		11.8	11.7		10.0	13.2	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		9.4			7.7			11.7			13.2	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	12.4
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	538	366	40	147	14	27
Future Volume (Veh/h)	538	366	40	147	14	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	598	407	44	163	16	30
Pedestrians				2	17	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	302					
pX, platoon unblocked			0.84		0.84	0.84
vC, conflicting volume			1022		1070	820
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			933		989	694
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			92		92	92
cM capacity (veh/h)			582		209	362

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1005	207	46
Volume Left	0	44	16
Volume Right	407	0	30
cSH	1700	582	289
Volume to Capacity	0.59	0.08	0.16
Queue Length 95th (m)	0.0	1.9	4.2
Control Delay (s)	0.0	3.3	19.8
Lane LOS		A	C
Approach Delay (s)	0.0	3.3	19.8
Approach LOS			C

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	1370	298	0	0
Future Volume (Veh/h)	0	5	1370	298	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	1522	331	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			232			247
pX, platoon unblocked	0.49	0.49			0.49	
vC, conflicting volume	1688	926			1853	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	347	0			682	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	308	537			449	

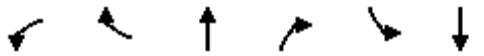
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	1015	838	0	0
Volume Left	0	0	0	0	0
Volume Right	6	0	331	0	0
cSH	537	1700	1700	1700	1700
Volume to Capacity	0.01	0.60	0.49	0.00	0.00
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	11.8	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.8	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	1186	52	0	0
Future Volume (Veh/h)	0	5	1186	52	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	1318	58	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			322			157
pX, platoon unblocked	0.54	0.54			0.54	
vC, conflicting volume	1347	688			1376	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	550	583			872	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	879	497	0	0
Volume Left	0	0	0	0	0
Volume Right	6	0	58	0	0
cSH	583	1700	1700	1700	1700
Volume to Capacity	0.01	0.52	0.29	0.00	0.00
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.0
Control Delay (s)	11.2	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.2	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	19	1186	5	0	0
Future Volume (Veh/h)	0	19	1186	5	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	21	1318	6	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			78
pX, platoon unblocked	0.56	0.56			0.56	
vC, conflicting volume	1321	662			1324	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	15	0			21	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			100	
cM capacity (veh/h)	563	610			896	

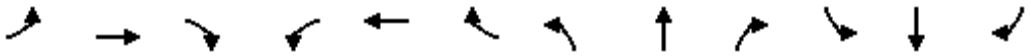
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	879	445	0	0
Volume Left	0	0	0	0	0
Volume Right	21	0	6	0	0
cSH	610	1700	1700	1700	1700
Volume to Capacity	0.03	0.52	0.26	0.00	0.00
Queue Length 95th (m)	0.8	0.0	0.0	0.0	0.0
Control Delay (s)	11.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	6	12	181	148	6	1226	112	286	1954
v/c Ratio	0.05	0.14	0.75	0.44	0.08	0.72	0.68	0.71	0.77
Control Delay	43.8	45.7	69.0	12.7	56.8	19.0	17.3	74.5	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	45.7	69.0	12.7	56.8	19.0	17.3	74.5	19.2
Queue Length 50th (m)	1.5	1.5	45.6	1.4	1.7	53.4	5.4	77.3	84.4
Queue Length 95th (m)	4.9	8.0	63.1	20.4	m1.7	m60.9	m2.9	m89.7	#143.8
Internal Link Dist (m)		124.3		188.6		54.1			77.0
Turn Bay Length (m)	37.5		65.0		37.5			75.0	
Base Capacity (vph)	235	233	259	377	79	1694	164	400	2550
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	0.03	0.05	0.70	0.39	0.08	0.72	0.68	0.71	0.77

Intersection Summary

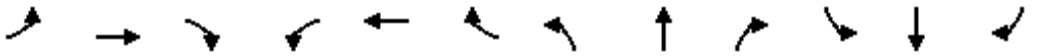
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	5	163	5	128	5	1103	101	257	1759	0
Future Volume (vph)	5	5	5	163	5	128	5	1103	101	257	1759	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.0	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.93		1.00	0.86		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1695	1650		1695	1528		1695	3390	1517	1695	3390	
Flt Permitted	1.00	1.00		0.48	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1784	1650		860	1528		1695	3390	1517	1695	3390	
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)	6	6	6	181	6	142	6	1226	112	286	1954	0
RTOR Reduction (vph)	0	6	0	0	122	0	0	0	112	0	0	0
Lane Group Flow (vph)	6	6	0	181	26	0	6	1226	0	286	1954	0
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	NA	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	5.2	3.8		24.5	18.6		1.4	61.3	0.0	30.7	90.6	
Effective Green, g (s)	5.2	3.8		24.5	18.6		1.4	61.3	0.0	30.7	90.6	
Actuated g/C Ratio	0.04	0.03		0.19	0.14		0.01	0.47	0.00	0.24	0.70	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	70	48		266	218		18	1598	0	400	2362	
v/s Ratio Prot	0.00	0.00		c0.08	0.02		0.00	0.36		c0.17	c0.58	
v/s Ratio Perm	0.00			c0.04								
v/c Ratio	0.09	0.13		0.68	0.12		0.33	0.77	0.00	0.71	0.83	
Uniform Delay, d1	60.1	61.5		48.0	48.6		63.8	28.4	65.0	45.6	14.1	
Progression Factor	1.00	1.00		1.00	1.00		0.96	0.68	1.00	1.49	1.51	
Incremental Delay, d2	0.5	1.2		7.0	0.2		1.0	0.3	0.0	3.3	1.9	
Delay (s)	60.6	62.7		55.0	48.8		62.3	19.6	65.0	71.3	23.2	
Level of Service	E	E		D	D		E	B	E	E	C	
Approach Delay (s)		62.0			52.2			23.6			29.3	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		

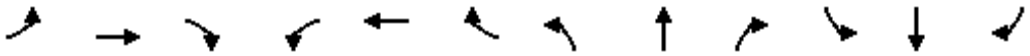
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	772	84	0	215	26	0	0	5	128	0	47
Future Volume (Veh/h)	70	772	84	0	215	26	0	0	5	128	0	47
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	78	858	93	0	239	29	0	0	6	142	0	52
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (m)		161										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	268			951			1366	1328	904	1274	1360	254
vC1, stage 1 conf vol							1060	1060		254	254	
vC2, stage 2 conf vol							306	268		1020	1107	
vCu, unblocked vol	268			855			1343	1298	800	1234	1336	254
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			100	100	98	32	100	93
cM capacity (veh/h)	1296			668			189	212	328	208	205	785

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	78	951	268	6	194
Volume Left	78	0	0	0	142
Volume Right	0	93	29	6	52
cSH	1296	1700	1700	328	259
Volume to Capacity	0.06	0.56	0.16	0.02	0.75
Queue Length 95th (m)	1.5	0.0	0.0	0.4	40.8
Control Delay (s)	8.0	0.0	0.0	16.2	50.9
Lane LOS	A			C	F
Approach Delay (s)	0.6		0.0	16.2	50.9
Approach LOS				C	F

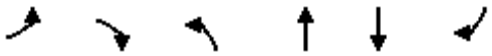
Intersection Summary				
Average Delay	7.1			
Intersection Capacity Utilization	72.1%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	26	248	19	10	5	26	4	43	26	343	5
Future Volume (Veh/h)	5	26	248	19	10	5	26	4	43	26	343	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	29	276	21	11	6	29	4	48	29	381	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	540	552	384	818	531	28	387			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	540	552	384	818	531	28	387			52		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	93	58	87	97	99	98			98		
cM capacity (veh/h)	427	423	664	158	434	1047	1171			1554		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	311	38	81	416
Volume Left	6	21	29	29
Volume Right	276	6	48	6
cSH	624	231	1171	1554
Volume to Capacity	0.50	0.16	0.02	0.02
Queue Length 95th (m)	21.2	4.4	0.6	0.4
Control Delay (s)	16.4	23.6	3.1	0.7
Lane LOS	C	C	A	A
Approach Delay (s)	16.4	23.6	3.1	0.7
Approach LOS	C	C		

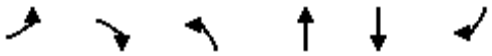
Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	46.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	27	5	26	298	332
Future Volume (Veh/h)	20	27	5	26	298	332
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	30	6	29	331	369
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				388		
pX, platoon unblocked						
vC, conflicting volume	556	516	700			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	556	516	700			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	95	99			
cM capacity (veh/h)	488	559	897			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	52	35	700
Volume Left	22	6	0
Volume Right	30	0	369
cSH	527	897	1700
Volume to Capacity	0.10	0.01	0.41
Queue Length 95th (m)	2.5	0.2	0.0
Control Delay (s)	12.6	1.6	0.0
Lane LOS	B	A	
Approach Delay (s)	12.6	1.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	30	3	16	332	5
Future Volume (Veh/h)	7	30	3	16	332	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	33	3	18	369	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				227		
pX, platoon unblocked						
vC, conflicting volume	396	372	375			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	396	372	375			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	95	100			
cM capacity (veh/h)	607	674	1183			

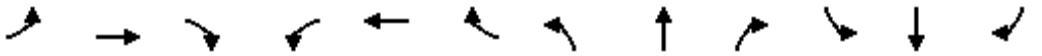
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	41	21	375
Volume Left	8	3	0
Volume Right	33	0	6
cSH	660	1183	1700
Volume to Capacity	0.06	0.00	0.22
Queue Length 95th (m)	1.5	0.1	0.0
Control Delay (s)	10.8	1.2	0.0
Lane LOS	B	A	
Approach Delay (s)	10.8	1.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	70	87	73	230	267	2486	150	156	1277	22
v/c Ratio	0.36	0.28	0.59	0.38	0.66	0.67	0.90	0.16	0.67	0.52	0.03
Control Delay	56.6	10.7	69.2	57.2	19.2	68.7	11.4	0.0	66.7	23.6	0.1
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	56.6	10.7	69.2	57.2	19.2	68.7	11.4	0.0	66.7	23.6	0.1
Queue Length 50th (m)	17.2	0.0	21.6	17.7	6.1	63.3	219.1	0.0	38.4	79.9	0.0
Queue Length 95th (m)	30.3	10.6	36.8	30.8	30.2	m70.7	m205.8	m0.0	58.9	93.0	0.0
Internal Link Dist (m)	116.4			136.8			274.6			145.2	
Turn Bay Length (m)		10.0	38.0		38.0	130.0		25.0	68.0		25.0
Base Capacity (vph)	408	428	309	401	505	399	2756	911	242	2442	777
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	0.16	0.28	0.18	0.46	0.67	0.90	0.16	0.64	0.52	0.03

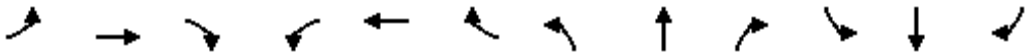
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	52	63	78	66	207	240	2237	135	140	1149	20
Future Volume (vph)	12	52	63	78	66	207	240	2237	135	140	1149	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.96
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	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1802	1514	1706	1655	1450	1679	4644	1476	1729	4969	1488
Flt Permitted		0.93	1.00	0.71	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1684	1514	1276	1655	1450	1679	4644	1476	1729	4969	1488
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)	13	58	70	87	73	230	267	2486	150	156	1277	22
RTOR Reduction (vph)	0	0	62	0	0	180	0	0	37	0	0	11
Lane Group Flow (vph)	0	71	8	87	73	50	267	2486	113	156	1277	11
Confl. Peds. (#/hr)	3		3	3		3	5		6	6		5
Confl. Bikes (#/hr)			3						8			1
Heavy Vehicles (%)	0%	0%	0%	1%	10%	5%	3%	7%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		15.2	15.2	15.2	15.2	15.2	30.9	77.1	77.1	17.7	63.9	63.9
Effective Green, g (s)		15.2	15.2	15.2	15.2	15.2	30.9	77.1	77.1	17.7	63.9	63.9
Actuated g/C Ratio		0.12	0.12	0.12	0.12	0.12	0.24	0.59	0.59	0.14	0.49	0.49
Clearance Time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
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)		196	177	149	193	169	399	2754	875	235	2442	731
v/s Ratio Prot					0.04		c0.16	c0.54		0.09	0.26	
v/s Ratio Perm		0.04	0.01	c0.07		0.03			0.08			0.01
v/c Ratio		0.36	0.05	0.58	0.38	0.29	0.67	0.90	0.13	0.66	0.52	0.01
Uniform Delay, d1		52.9	51.0	54.4	53.0	52.5	44.9	23.2	11.7	53.3	22.6	16.9
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.49	0.37	0.00	1.00	1.00	1.00
Incremental Delay, d2		1.1	0.1	5.7	1.2	1.0	0.4	0.5	0.0	6.9	0.8	0.0
Delay (s)		54.1	51.1	60.1	54.3	53.5	67.2	9.1	0.0	60.2	23.4	17.0
Level of Service		D	D	E	D	D	E	A	A	E	C	B
Approach Delay (s)		52.6			55.1			14.0			27.3	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



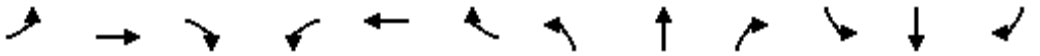
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	310	191	391	163	287	357	364	2232	153	124	1129	181
v/c Ratio	0.77	0.31	0.75	0.56	0.57	0.79	0.74	1.18	0.22	0.64	0.63	0.29
Control Delay	68.3	46.3	19.7	63.6	54.7	26.1	49.9	114.0	8.6	65.5	49.0	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	46.3	19.7	63.6	54.7	26.1	49.9	114.0	8.6	65.5	49.0	18.2
Queue Length 50th (m)	39.7	22.7	17.0	20.9	37.2	20.8	44.0	~250.8	5.5	31.9	76.0	7.1
Queue Length 95th (m)	55.3	31.0	50.2	31.6	45.8	52.0	m42.1	m#299.2	m6.3	54.1	93.7	26.8
Internal Link Dist (m)		245.5			116.0			283.0			274.6	
Turn Bay Length (m)	104.0		52.0	72.0		100.0	142.0		82.0	100.0		98.0
Base Capacity (vph)	435	931	625	418	912	594	497	1895	688	226	1781	625
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.21	0.63	0.39	0.31	0.60	0.73	1.18	0.22	0.55	0.63	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

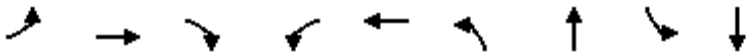
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	172	352	147	258	321	328	2009	138	112	1016	163
Future Volume (vph)	279	172	352	147	258	321	328	2009	138	112	1016	163
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96
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	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
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)	310	191	391	163	287	357	364	2232	153	124	1129	181
RTOR Reduction (vph)	0	0	259	0	0	231	0	0	89	0	0	115
Lane Group Flow (vph)	310	191	132	163	287	126	364	2232	64	124	1129	66
Confl. Peds. (#/hr)	9		29	29		9	21		13	13		21
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	2%	0%	1%	6%	2%	3%	2%	6%	1%	0%	2%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.0	23.5	23.5	12.0	19.5	19.5	19.6	52.5	52.5	14.6	47.5	47.5
Effective Green, g (s)	16.0	23.5	23.5	12.0	19.5	19.5	19.6	52.5	52.5	14.6	47.5	47.5
Actuated g/C Ratio	0.12	0.18	0.18	0.09	0.15	0.15	0.15	0.40	0.40	0.11	0.37	0.37
Clearance Time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	404	625	264	292	508	220	495	1892	598	194	1779	510
v/s Ratio Prot	c0.09	0.06		0.05	0.08		c0.11	c0.48		0.07	0.23	
v/s Ratio Perm			c0.09			c0.09			0.04			0.05
v/c Ratio	0.77	0.31	0.50	0.56	0.56	0.57	0.74	1.18	0.11	0.64	0.63	0.13
Uniform Delay, d1	55.2	46.2	48.0	56.5	51.3	51.4	52.7	38.8	24.1	55.2	34.1	27.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.93	0.93	1.48	0.95	1.32	3.37
Incremental Delay, d2	8.5	0.3	1.5	2.3	1.4	3.6	0.5	81.4	0.0	6.0	1.5	0.5
Delay (s)	63.7	46.5	49.5	58.8	52.8	54.9	49.6	117.6	35.9	58.6	46.6	93.0
Level of Service	E	D	D	E	D	D	D	F	D	E	D	F
Approach Delay (s)		53.8			54.9			104.1			53.5	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	77.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.4
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

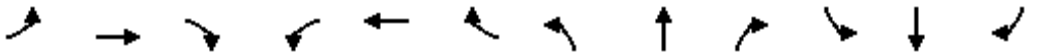


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	43	609	628	278	108	2557	29	1724
v/c Ratio	0.75	0.10	1.40	1.90	0.58	1.44	1.64	0.45	1.23
Control Delay	87.4	39.1	224.2	446.1	30.3	300.7	318.8	82.4	143.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.4	39.1	224.2	446.1	30.3	300.7	318.8	82.4	143.7
Queue Length 50th (m)	27.0	8.6	~185.9	~126.8	37.0	~37.5	~516.3	7.4	~287.4
Queue Length 95th (m)	#53.5	18.5	#257.2	#163.3	66.5	#74.8	#555.8	#18.9	#330.4
Internal Link Dist (m)		112.5			205.8		333.2		208.2
Turn Bay Length (m)	65.0		100.0	90.0		157.0		140.0	
Base Capacity (vph)	152	432	435	331	476	75	1557	65	1402
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	0.70	0.10	1.40	1.90	0.58	1.44	1.64	0.45	1.23

Intersection Summary

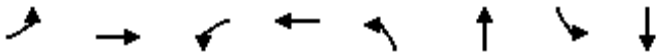
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	39	548	565	61	189	97	2274	27	26	1469	83
Future Volume (vph)	96	39	548	565	61	189	97	2274	27	26	1469	83
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3		4.5	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.98		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	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1616	1784	1436	3288	1539		1712	3319		1695	3327	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1616	1784	1436	3288	1539		1712	3319		1695	3327	
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)	107	43	609	628	68	210	108	2527	30	29	1632	92
RTOR Reduction (vph)	0	0	87	0	85	0	0	1	0	0	3	0
Lane Group Flow (vph)	107	43	522	628	193	0	108	2556	0	29	1721	0
Confl. Peds. (#/hr)	7		8	8		7	6					6
Confl. Bikes (#/hr)			1			1			1			12
Heavy Vehicles (%)	7%	2%	5%	2%	3%	3%	1%	4%	1%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	11.6	31.5	31.5	13.1	33.0		5.7	59.2		3.0	54.7	
Effective Green, g (s)	11.6	31.5	31.5	13.1	33.0		5.7	59.2		3.0	54.7	
Actuated g/C Ratio	0.09	0.24	0.24	0.10	0.25		0.04	0.46		0.02	0.42	
Clearance Time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3		4.5	6.3	
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)	144	432	347	331	390		75	1511		39	1399	
v/s Ratio Prot	0.07	0.02		c0.19	0.13		c0.06	c0.77		0.02	0.52	
v/s Ratio Perm			c0.36									
v/c Ratio	0.74	0.10	1.50	1.90	0.49		1.44	1.69		0.74	1.23	
Uniform Delay, d1	57.7	38.2	49.2	58.5	41.4		62.1	35.4		63.1	37.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.6	0.1	241.3	415.0	1.0		258.2	314.2		54.3	110.1	
Delay (s)	76.3	38.3	290.6	473.4	42.4		320.4	349.6		117.4	147.7	
Level of Service	E	D	F	F	D		F	F		F	F	
Approach Delay (s)		246.1			341.2			348.5			147.2	
Approach LOS		F			F			F			F	

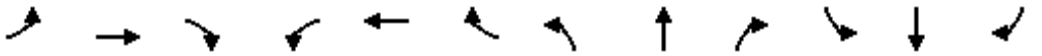
Intersection Summary			
HCM 2000 Control Delay	276.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.71		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	119.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	59	41	126	293	91	3	706
v/c Ratio	0.17	0.20	0.19	0.53	0.69	0.07	0.01	0.97
Control Delay	37.5	11.7	37.8	45.4	29.4	4.7	19.0	52.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	11.7	37.8	45.4	29.4	4.7	19.0	52.4
Queue Length 50th (m)	5.6	0.2	6.8	21.6	33.5	4.2	0.3	113.9
Queue Length 95th (m)	14.4	10.6	16.4	40.3	66.0	10.0	2.2	#210.9
Internal Link Dist (m)		205.8		177.5		261.1		203.5
Turn Bay Length (m)	130.0		42.0		65.0		35.0	
Base Capacity (vph)	444	585	476	511	483	1318	467	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10	0.09	0.25	0.61	0.07	0.01	0.97

Intersection Summary

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



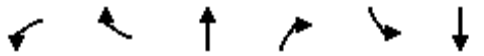
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	1	52	37	107	6	264	79	3	3	207	428
Future Volume (vph)	31	1	52	37	107	6	264	79	3	3	207	428
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.85		1.00	0.99		1.00	1.00		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1714	1502		1725	1394		1601	1774		1533	1616	
Flt Permitted	0.68	1.00		0.72	1.00		0.09	1.00		0.70	1.00	
Satd. Flow (perm)	1220	1502		1305	1394		148	1774		1127	1616	
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)	34	1	58	41	119	7	293	88	3	3	230	476
RTOR Reduction (vph)	0	48	0	0	2	0	0	1	0	0	55	0
Lane Group Flow (vph)	34	11	0	41	124	0	293	90	0	3	651	0
Confl. Peds. (#/hr)	4		1	1		4			11	11		
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	0%	1%	1%	0%	30%	17%	8%	2%	0%	10%	1%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.2	16.2		16.2	16.2		67.4	67.4		40.1	40.1	
Effective Green, g (s)	16.2	16.2		16.2	16.2		67.4	67.4		40.1	40.1	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.70	0.70		0.42	0.42	
Clearance Time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	205	253		220	235		423	1245		470	675	
v/s Ratio Prot		0.01			c0.09		c0.15	0.05			c0.40	
v/s Ratio Perm	0.03			0.03			0.33			0.00		
v/c Ratio	0.17	0.04		0.19	0.53		0.69	0.07		0.01	0.96	
Uniform Delay, d1	34.1	33.4		34.2	36.4		24.1	4.5		16.3	27.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.4	2.1		4.9	0.0		0.0	25.8	
Delay (s)	34.5	33.5		34.7	38.5		29.0	4.5		16.3	53.0	
Level of Service	C	C		C	D		C	A		B	D	
Approach Delay (s)		33.9			37.6			23.2			52.9	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	21	621	133	37	142	43
Future Volume (Veh/h)	21	621	133	37	142	43
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	23	690	148	41	158	48
Pedestrians	2		17			
Lane Width (m)	3.7		3.7			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	0		2			
Right turn flare (veh)						
Median type	None				None	
Median storage veh)						
Upstream signal (m)					308	
pX, platoon unblocked						
vC, conflicting volume	223		935	201		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	223		935	201		
tC, single (s)	4.2		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.3		3.5	3.3		
p0 queue free %	98		48	95		
cM capacity (veh/h)	1279		284	818		

Direction, Lane #	WB 1	NB 1	SE 1
Volume Total	713	189	206
Volume Left	23	148	0
Volume Right	0	41	48
cSH	1279	330	1700
Volume to Capacity	0.02	0.57	0.12
Queue Length 95th (m)	0.4	25.6	0.0
Control Delay (s)	0.5	29.5	0.0
Lane LOS	A	D	
Approach Delay (s)	0.5	29.5	0.0
Approach LOS		D	

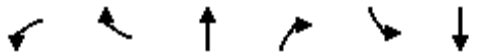
Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	2400	42	0	0
Future Volume (Veh/h)	0	5	2400	42	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	2667	47	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			232			247
pX, platoon unblocked	0.55	0.55			0.55	
vC, conflicting volume	2690	1357			2714	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2442	38			2484	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	14	569			101	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	1778	936	0	0
Volume Left	0	0	0	0	0
Volume Right	6	0	47	0	0
cSH	569	1700	1700	1700	1700
Volume to Capacity	0.01	1.05	0.55	0.00	0.00
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.0
Control Delay (s)	11.4	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.4	0.0		0.0	
Approach LOS	B				

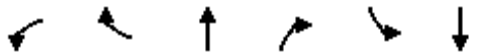
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	2359	23	0	0
Future Volume (Veh/h)	0	5	2359	23	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	2621	26	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			322			157
pX, platoon unblocked	0.56	0.56			0.56	
vC, conflicting volume	2634	1324			2647	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2344	0			2368	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	17	605			113	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	1747	900	0	0
Volume Left	0	0	0	0	0
Volume Right	6	0	26	0	0
cSH	605	1700	1700	1700	1700
Volume to Capacity	0.01	1.03	0.53	0.00	0.00
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.0
Control Delay (s)	11.0	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.0	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	19	2359	5	0	0
Future Volume (Veh/h)	0	19	2359	5	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	21	2621	6	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			78
pX, platoon unblocked	0.56	0.56			0.56	
vC, conflicting volume	2624	1314			2627	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2330	0			2335	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			100	
cM capacity (veh/h)	17	609			117	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	1747	880	0	0
Volume Left	0	0	0	0	0
Volume Right	21	0	6	0	0
cSH	609	1700	1700	1700	1700
Volume to Capacity	0.03	1.03	0.52	0.00	0.00
Queue Length 95th (m)	0.8	0.0	0.0	0.0	0.0
Control Delay (s)	11.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

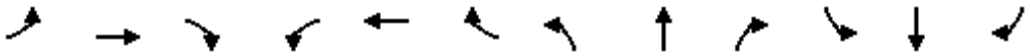
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	6	12	230	349	6	2409	194	81	1620
v/c Ratio	0.11	0.04	0.99	1.09	0.04	1.04	0.18	0.68	0.63
Control Delay	51.0	32.5	109.2	117.0	1.8	36.1	0.0	54.3	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	32.5	109.2	117.0	1.8	36.1	0.0	54.3	11.7
Queue Length 50th (m)	1.3	1.3	59.4	~85.8	0.1	~130.7	0.0	3.0	181.5
Queue Length 95th (m)	5.6	7.0	#110.8	#145.8	m0.1	m18.3	m0.0	m#23.0	65.5
Internal Link Dist (m)		124.3		188.6		54.1			89.2
Turn Bay Length (m)			37.5		37.5			37.5	
Base Capacity (vph)	54	293	233	320	155	2315	1082	120	2563
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	0.11	0.04	0.99	1.09	0.04	1.04	0.18	0.68	0.63

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.

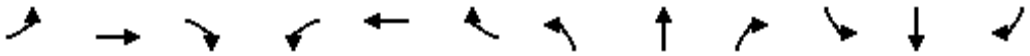
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	5	207	5	309	5	2168	175	73	1458	0
Future Volume (vph)	5	5	5	207	5	309	5	2168	175	73	1458	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.93		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1695	1650		1695	1521		1695	3390	1517	1695	3390	
Flt Permitted	0.18	1.00		0.75	1.00		0.13	1.00	1.00	0.04	1.00	
Satd. Flow (perm)	314	1650		1338	1521		229	3390	1517	76	3390	
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)	6	6	6	230	6	343	6	2409	194	81	1620	0
RTOR Reduction (vph)	0	5	0	0	54	0	0	0	47	0	0	0
Lane Group Flow (vph)	6	7	0	230	295	0	6	2409	147	81	1620	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	22.7	22.7		22.7	22.7		88.8	88.8	88.8	98.3	98.3	
Effective Green, g (s)	22.7	22.7		22.7	22.7		88.8	88.8	88.8	98.3	98.3	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.68	0.68	0.68	0.76	0.76	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
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)	54	288		233	265		156	2315	1036	119	2563	
v/s Ratio Prot		0.00			c0.19			c0.71		0.03	c0.48	
v/s Ratio Perm	0.02			0.17			0.03		0.10	0.48		
v/c Ratio	0.11	0.02		0.99	1.11		0.04	1.04	0.14	0.68	0.63	
Uniform Delay, d1	45.2	44.5		53.5	53.6		6.7	20.6	7.2	37.5	7.4	
Progression Factor	1.00	1.00		1.00	1.00		0.25	0.71	0.00	1.97	1.42	
Incremental Delay, d2	0.9	0.0		54.8	88.5		0.0	19.9	0.0	12.1	1.0	
Delay (s)	46.1	44.5		108.3	142.2		1.7	34.4	0.0	86.1	11.5	
Level of Service	D	D		F	F		A	C	A	F	B	
Approach Delay (s)		45.0			128.7			31.8			15.1	
Approach LOS		D			F			C			B	

Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

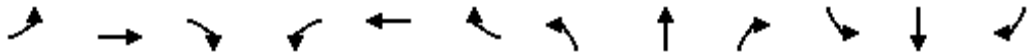
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	264	150	0	685	104	0	0	5	34	0	51
Future Volume (Veh/h)	18	264	150	0	685	104	0	0	5	34	0	51
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	20	293	167	0	761	116	0	0	6	38	0	57
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (m)		140										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	877			460			1292	1294	376	1158	1319	819
vC1, stage 1 conf vol							416	416		819	819	
vC2, stage 2 conf vol							876	877		339	500	
vCu, unblocked vol	877			383			1277	1278	293	1133	1306	819
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	100	99	87	100	85
cM capacity (veh/h)	770			1094			212	260	695	283	269	375

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	20	460	877	6	95
Volume Left	20	0	0	0	38
Volume Right	0	167	116	6	57
cSH	770	1700	1700	695	332
Volume to Capacity	0.03	0.27	0.52	0.01	0.29
Queue Length 95th (m)	0.6	0.0	0.0	0.2	8.8
Control Delay (s)	9.8	0.0	0.0	10.2	20.1
Lane LOS	A			B	C
Approach Delay (s)	0.4		0.0	10.2	20.1
Approach LOS				B	C

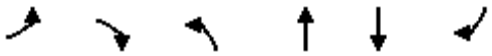
Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	56.7%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	6	35	49	39	23	179	206	12	6	58	5
Future Volume (Veh/h)	5	6	35	49	39	23	179	206	12	6	58	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	7	39	54	43	26	199	229	13	7	64	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	762	721	67	757	718	236	70			242		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	762	721	67	757	718	236	70			242		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	96	80	86	97	87			99		
cM capacity (veh/h)	250	306	997	274	307	804	1531			1324		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	52	123	441	77
Volume Left	6	54	199	7
Volume Right	39	26	13	6
cSH	604	333	1531	1324
Volume to Capacity	0.09	0.37	0.13	0.01
Queue Length 95th (m)	2.1	12.5	3.4	0.1
Control Delay (s)	11.5	22.0	4.1	0.7
Lane LOS	B	C	A	A
Approach Delay (s)	11.5	22.0	4.1	0.7
Approach LOS	B	C		

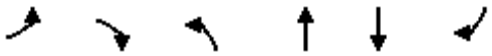
Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	49.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	190	48	5	194	96	47
Future Volume (Veh/h)	190	48	5	194	96	47
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	211	53	6	216	107	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				388		
pX, platoon unblocked						
vC, conflicting volume	361	133	159			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	361	133	159			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	67	94	100			
cM capacity (veh/h)	635	916	1420			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	264	222	159
Volume Left	211	6	0
Volume Right	53	0	52
cSH	677	1420	1700
Volume to Capacity	0.39	0.00	0.09
Queue Length 95th (m)	14.1	0.1	0.0
Control Delay (s)	13.7	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	13.7	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	48	193	3	146	197	5
Future Volume (Veh/h)	48	193	3	146	197	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	53	214	3	162	219	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				227		
pX, platoon unblocked						
vC, conflicting volume	390	222	225			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	390	222	225			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	74	100			
cM capacity (veh/h)	613	818	1344			

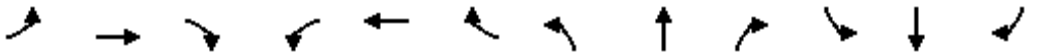
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	267	165	225
Volume Left	53	3	0
Volume Right	214	0	6
cSH	767	1344	1700
Volume to Capacity	0.35	0.00	0.13
Queue Length 95th (m)	11.9	0.1	0.0
Control Delay (s)	12.2	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	12.2	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	65	134	104	19	23	41	1041	33	156	2258	9
v/c Ratio	0.31	0.44	0.66	0.09	0.09	0.36	0.38	0.04	0.67	0.67	0.01
Control Delay	53.9	12.3	72.7	48.7	0.7	57.5	8.6	0.4	66.7	15.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.9	12.3	72.7	48.7	0.7	57.5	8.6	0.4	66.7	15.7	0.0
Queue Length 50th (m)	15.4	0.0	25.8	4.4	0.0	11.1	18.6	0.1	38.4	123.3	0.0
Queue Length 95th (m)	28.1	17.3	42.7	11.3	0.0	m16.3	m22.1	m0.1	58.9	174.8	0.0
Internal Link Dist (m)	116.4			136.8			274.6			145.2	
Turn Bay Length (m)		10.0	38.0		38.0	130.0		25.0	68.0		25.0
Base Capacity (vph)	417	469	311	401	411	188	2723	902	242	3352	1033
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	0.16	0.29	0.33	0.05	0.06	0.22	0.38	0.04	0.64	0.67	0.01

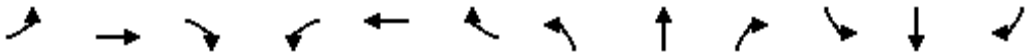
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	49	121	94	17	21	37	937	30	140	2032	8
Future Volume (vph)	10	49	121	94	17	21	37	937	30	140	2032	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.96
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	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1804	1514	1706	1655	1450	1679	4644	1476	1729	4969	1488
Flt Permitted		0.95	1.00	0.71	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1720	1514	1283	1655	1450	1679	4644	1476	1729	4969	1488
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)	11	54	134	104	19	23	41	1041	33	156	2258	9
RTOR Reduction (vph)	0	0	117	0	0	20	0	0	14	0	0	3
Lane Group Flow (vph)	0	65	17	104	19	3	41	1041	19	156	2258	6
Confl. Peds. (#/hr)	3		3	3		3	5		6	6		5
Confl. Bikes (#/hr)			3						8			1
Heavy Vehicles (%)	0%	0%	0%	1%	10%	5%	3%	7%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		16.1	16.1	16.1	16.1	16.1	7.5	76.2	76.2	17.7	86.4	86.4
Effective Green, g (s)		16.1	16.1	16.1	16.1	16.1	7.5	76.2	76.2	17.7	86.4	86.4
Actuated g/C Ratio		0.12	0.12	0.12	0.12	0.12	0.06	0.59	0.59	0.14	0.66	0.66
Clearance Time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
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)		213	187	158	204	179	96	2722	865	235	3302	988
v/s Ratio Prot					0.01		0.02	0.22		c0.09	c0.45	
v/s Ratio Perm		0.04	0.01	c0.08		0.00			0.01			0.00
v/c Ratio		0.31	0.09	0.66	0.09	0.02	0.43	0.38	0.02	0.66	0.68	0.01
Uniform Delay, d1		51.9	50.5	54.3	50.5	50.0	59.2	14.3	11.3	53.3	13.4	7.3
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.89	0.54	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.8	0.2	9.5	0.2	0.0	2.2	0.3	0.0	6.9	1.2	0.0
Delay (s)		52.7	50.7	63.8	50.7	50.0	55.1	8.0	11.3	60.2	14.6	7.4
Level of Service		D	D	E	D	D	E	A	B	E	B	A
Approach Delay (s)		51.3			59.9			9.8			17.5	
Approach LOS		D			E			A			B	

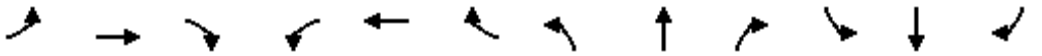
Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	158	429	313	80	114	62	319	860	161	428	1846	220
v/c Ratio	0.89	0.63	0.65	0.47	0.19	0.15	0.67	0.71	0.17	0.82	0.91	0.32
Control Delay	105.1	52.1	18.4	69.2	44.3	0.7	60.2	48.5	4.6	62.5	34.2	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	105.1	52.1	18.4	69.2	44.3	0.7	60.2	48.5	4.6	62.5	34.2	3.4
Queue Length 50th (m)	21.1	54.3	16.0	10.4	13.1	0.0	40.0	76.5	5.9	81.8	168.2	0.6
Queue Length 95th (m)	#41.5	66.8	44.4	18.8	20.1	0.0	#61.9	93.8	13.8	#163.4	#209.0	12.7
Internal Link Dist (m)		245.5			129.1			295.3			274.6	
Turn Bay Length (m)	104.0		52.0	72.0		100.0	142.0		82.0	100.0		98.0
Base Capacity (vph)	177	931	570	170	912	544	479	1216	1025	520	2020	695
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.46	0.55	0.47	0.13	0.11	0.67	0.71	0.16	0.82	0.91	0.32

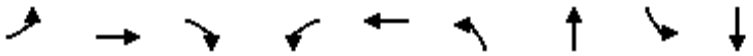
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	386	282	72	103	56	287	774	145	385	1661	198
Future Volume (vph)	142	386	282	72	103	56	287	774	145	385	1661	198
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96
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	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3288	3458	1463	3164	3390	1469	3288	4687	1483	1729	4871	1397
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)	158	429	313	80	114	62	319	860	161	428	1846	220
RTOR Reduction (vph)	0	0	194	0	0	51	0	0	48	0	0	118
Lane Group Flow (vph)	158	429	119	80	114	11	319	860	113	428	1846	102
Confl. Peds. (#/hr)	9		29	29		9	21		13	13		21
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	2%	0%	1%	6%	2%	3%	2%	6%	1%	0%	2%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	custom	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2 7 4			6
Actuated Green, G (s)	7.0	25.5	25.5	5.6	24.1	24.1	18.9	32.4	71.6	39.1	52.6	52.6
Effective Green, g (s)	7.0	25.5	25.5	5.6	24.1	24.1	18.9	32.4	71.6	39.1	52.6	52.6
Actuated g/C Ratio	0.05	0.20	0.20	0.04	0.19	0.19	0.15	0.25	0.55	0.30	0.40	0.40
Clearance Time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7		6.9	6.7	6.7
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)	177	678	286	136	628	272	478	1168	816	520	1970	565
v/s Ratio Prot	c0.05	c0.12		0.03	0.03		0.10	0.18		c0.25	c0.38	
v/s Ratio Perm			0.08			0.01			0.08			0.07
v/c Ratio	0.89	0.63	0.42	0.59	0.18	0.04	0.67	0.74	0.14	0.82	0.94	0.18
Uniform Delay, d1	61.1	48.0	45.7	61.1	44.6	43.5	52.6	44.9	14.2	42.2	37.1	24.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.21	0.73	0.48
Incremental Delay, d2	38.7	1.9	1.0	6.4	0.1	0.1	3.5	4.2	0.1	8.0	8.1	0.5
Delay (s)	99.8	49.9	46.7	67.4	44.8	43.5	56.1	49.0	14.3	59.2	35.3	12.5
Level of Service	F	D	D	E	D	D	E	D	B	E	D	B
Approach Delay (s)		57.6			51.6			46.5			37.4	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	44.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.4
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

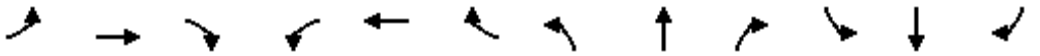


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	38	99	121	53	154	571	2092	141	2038
v/c Ratio	0.44	0.44	0.12	0.30	0.69	1.76	1.22	0.62	1.34
Control Delay	75.5	57.7	0.9	63.8	66.2	384.8	133.0	67.0	187.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.5	57.7	0.9	63.8	66.2	384.8	133.0	67.0	187.4
Queue Length 50th (m)	9.6	23.9	0.0	6.8	35.6	~217.3	~348.5	35.0	~368.7
Queue Length 95th (m)	21.3	39.4	2.4	13.7	55.5	#286.0	#390.4	#82.8	#433.9
Internal Link Dist (m)		112.5			205.8		333.2		208.2
Turn Bay Length (m)	65.0		100.0	90.0		157.0		140.0	
Base Capacity (vph)	87	343	1078	177	334	325	1717	229	1523
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	0.44	0.29	0.11	0.30	0.46	1.76	1.22	0.62	1.34

Intersection Summary

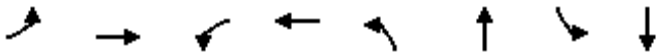
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



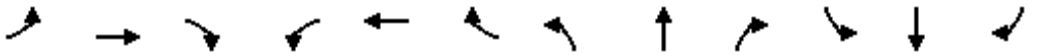
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	89	109	48	105	33	514	1490	392	127	1697	137
Future Volume (vph)	34	89	109	48	105	33	514	1490	392	127	1697	137
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3		4.5	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		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	1.00	0.85	1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1616	1784	1437	3288	1693		1712	3227		1695	3315	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1616	1784	1437	3288	1693		1712	3227		1695	3315	
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)	38	99	121	53	117	37	571	1656	436	141	1886	152
RTOR Reduction (vph)	0	0	43	0	10	0	0	18	0	0	4	0
Lane Group Flow (vph)	38	99	78	53	144	0	571	2074	0	141	2034	0
Confl. Peds. (#/hr)	7		8	8		7	6					6
Confl. Bikes (#/hr)			1			1			1			12
Heavy Vehicles (%)	7%	2%	5%	2%	3%	3%	1%	4%	1%	2%	3%	2%
Turn Type	Prot	NA	custom	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4 2									
Actuated Green, G (s)	5.6	16.3	83.6	5.6	16.3		24.7	67.3		17.6	58.4	
Effective Green, g (s)	5.6	16.3	83.6	5.6	16.3		24.7	67.3		17.6	58.4	
Actuated g/C Ratio	0.04	0.13	0.64	0.04	0.13		0.19	0.52		0.14	0.45	
Clearance Time (s)	5.9	6.5		5.9	6.5		6.3	6.3		4.5	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	69	223	924	141	212		325	1670		229	1489	
v/s Ratio Prot	c0.02	0.06		0.02	c0.09		c0.33	0.64		0.08	c0.61	
v/s Ratio Perm			0.05									
v/c Ratio	0.55	0.44	0.08	0.38	0.68		1.76	1.24		0.62	1.37	
Uniform Delay, d1	61.0	52.7	8.8	60.5	54.4		52.6	31.4		53.0	35.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.2	1.4	0.0	1.7	8.7		353.0	114.1		4.9	169.1	
Delay (s)	70.1	54.1	8.8	62.2	63.0		405.7	145.4		57.9	204.9	
Level of Service	E	D	A	E	E		F	F		E	F	
Approach Delay (s)		35.2			62.8			201.2			195.4	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	185.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	122.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	213	322	11	19	100	208	4	302
v/c Ratio	0.40	0.46	0.03	0.04	0.34	0.39	0.01	0.56
Control Delay	12.6	8.4	9.0	7.3	15.2	13.2	10.5	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	8.4	9.0	7.3	15.2	13.2	10.5	16.4
Queue Length 50th (m)	9.7	8.5	0.4	0.4	5.0	9.9	0.2	15.7
Queue Length 95th (m)	26.7	26.8	2.8	3.4	15.9	25.7	1.7	38.2
Internal Link Dist (m)		205.8		177.5		261.1		203.5
Turn Bay Length (m)	130.0		42.0		65.0		35.0	
Base Capacity (vph)	1340	1603	1028	1351	918	1619	961	1653
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	0.16	0.20	0.01	0.01	0.11	0.13	0.00	0.18

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	102	188	10	10	7	90	145	42	4	218	54
Future Volume (vph)	192	102	188	10	10	7	90	145	42	4	218	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1722	1604		1728	1355		1601	1719		1558	1747	
Flt Permitted	0.75	1.00		0.57	1.00		0.58	1.00		0.63	1.00	
Satd. Flow (perm)	1350	1604		1029	1355		971	1719		1029	1747	
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)	213	113	209	11	11	8	100	161	47	4	242	60
RTOR Reduction (vph)	0	77	0	0	5	0	0	10	0	0	8	0
Lane Group Flow (vph)	213	245	0	11	14	0	100	198	0	4	294	0
Confl. Peds. (#/hr)	4		1	1		4			11	11		
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	0%	1%	1%	0%	30%	17%	8%	2%	0%	10%	1%	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)	16.3	16.3		16.3	16.3		12.6	12.6		12.6	12.6	
Effective Green, g (s)	16.3	16.3		16.3	16.3		12.6	12.6		12.6	12.6	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.31	0.31		0.31	0.31	
Clearance Time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	532	633		406	534		296	524		313	532	
v/s Ratio Prot		0.15			0.01			0.11			c0.17	
v/s Ratio Perm	c0.16			0.01			0.10			0.00		
v/c Ratio	0.40	0.39		0.03	0.03		0.34	0.38		0.01	0.55	
Uniform Delay, d1	9.0	8.9		7.6	7.6		11.1	11.3		10.0	12.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.4		0.0	0.0		0.7	0.5		0.0	1.2	
Delay (s)	9.5	9.3		7.7	7.7		11.8	11.7		10.0	13.2	
Level of Service	A	A		A	A		B	B		B	B	
Approach Delay (s)		9.4			7.7			11.7			13.2	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	12.4
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	538	366	40	147	24	27
Future Volume (Veh/h)	538	366	40	147	24	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	598	407	44	163	27	30
Pedestrians				2	17	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	305					
pX, platoon unblocked			0.84		0.84	0.84
vC, conflicting volume			1022		1070	820
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			933		990	694
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			92		87	92
cM capacity (veh/h)			582		209	362

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1005	207	57
Volume Left	0	44	27
Volume Right	407	0	30
cSH	1700	582	269
Volume to Capacity	0.59	0.08	0.21
Queue Length 95th (m)	0.0	1.9	6.0
Control Delay (s)	0.0	3.3	22.0
Lane LOS		A	C
Approach Delay (s)	0.0	3.3	22.0
Approach LOS			C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	1370	298	0	0
Future Volume (Veh/h)	0	5	1370	298	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	1522	331	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			232			247
pX, platoon unblocked	0.49	0.49			0.49	
vC, conflicting volume	1688	926			1853	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	347	0			682	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	308	537			449	

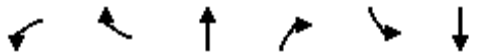
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	1015	838	0	0
Volume Left	0	0	0	0	0
Volume Right	6	0	331	0	0
cSH	537	1700	1700	1700	1700
Volume to Capacity	0.01	0.60	0.49	0.00	0.00
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	11.8	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.8	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	1186	52	0	0
Future Volume (Veh/h)	0	5	1186	52	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	1318	58	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			322			157
pX, platoon unblocked	0.54	0.54			0.54	
vC, conflicting volume	1347	688			1376	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	550	583			872	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	879	497	0	0
Volume Left	0	0	0	0	0
Volume Right	6	0	58	0	0
cSH	583	1700	1700	1700	1700
Volume to Capacity	0.01	0.52	0.29	0.00	0.00
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.0
Control Delay (s)	11.2	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.2	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	19	1186	5	0	0
Future Volume (Veh/h)	0	19	1186	5	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	21	1318	6	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			78
pX, platoon unblocked	0.56	0.56			0.56	
vC, conflicting volume	1321	662			1324	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	15	0			21	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			100	
cM capacity (veh/h)	563	610			896	

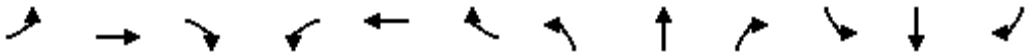
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	879	445	0	0
Volume Left	0	0	0	0	0
Volume Right	21	0	6	0	0
cSH	610	1700	1700	1700	1700
Volume to Capacity	0.03	0.52	0.26	0.00	0.00
Queue Length 95th (m)	0.8	0.0	0.0	0.0	0.0
Control Delay (s)	11.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	6	12	170	148	6	1253	112	286	1960
v/c Ratio	0.04	0.05	0.81	0.41	0.07	0.72	0.13	0.83	0.76
Control Delay	38.4	27.7	71.6	11.1	18.6	24.6	3.5	62.4	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	27.7	71.6	11.1	18.6	24.6	3.5	62.4	10.5
Queue Length 50th (m)	1.1	1.1	34.7	1.1	0.7	112.4	0.0	58.2	116.3
Queue Length 95th (m)	4.8	6.4	#65.1	17.9	3.4	143.8	9.2	#89.4	145.3
Internal Link Dist (m)		124.3		188.6		54.1			77.0
Turn Bay Length (m)	37.5		65.0		37.5			75.0	
Base Capacity (vph)	163	297	237	387	91	1748	836	392	2575
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	0.04	0.04	0.72	0.38	0.07	0.72	0.13	0.73	0.76

Intersection Summary

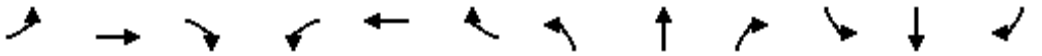
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	5	153	5	128	5	1128	101	257	1759	5
Future Volume (vph)	5	5	5	153	5	128	5	1128	101	257	1759	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.93		1.00	0.86		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1695	1650		1695	1528		1695	3390	1517	1695	3389	
Flt Permitted	0.52	1.00		0.75	1.00		0.10	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	925	1650		1338	1528		179	3390	1517	1695	3389	
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)	6	6	6	170	6	142	6	1253	112	286	1954	6
RTOR Reduction (vph)	0	5	0	0	120	0	0	0	54	0	0	0
Lane Group Flow (vph)	6	7	0	170	28	0	6	1253	58	286	1960	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Prot	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2			
Actuated Green, G (s)	17.4	17.4		17.4	17.4		56.8	56.8	56.8	22.3	83.6	
Effective Green, g (s)	17.4	17.4		17.4	17.4		56.8	56.8	56.8	22.3	83.6	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.52	0.52	0.52	0.20	0.76	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
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)	146	261		211	241		92	1750	783	343	2575	
v/s Ratio Prot		0.00			0.02			0.37		c0.17	c0.58	
v/s Ratio Perm	0.01			c0.13			0.03		0.04			
v/c Ratio	0.04	0.03		0.81	0.12		0.07	0.72	0.07	0.83	0.76	
Uniform Delay, d1	39.2	39.1		44.7	39.7		13.3	20.4	13.4	42.1	7.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.0		19.6	0.2		1.4	2.5	0.2	15.8	2.2	
Delay (s)	39.3	39.2		64.3	39.9		14.7	23.0	13.6	57.9	9.7	
Level of Service	D	D		E	D		B	C	B	E	A	
Approach Delay (s)		39.2			53.0			22.1			15.8	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

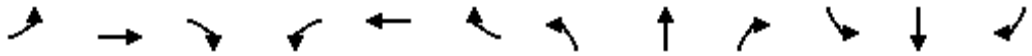
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	772	84	0	225	21	0	0	5	132	0	47
Future Volume (Veh/h)	67	772	84	0	225	21	0	0	5	132	0	47
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	74	858	93	0	250	23	0	0	6	147	0	52
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (m)		153										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	273			951			1366	1326	904	1274	1360	262
vC1, stage 1 conf vol							1052	1052		262	262	
vC2, stage 2 conf vol							314	273		1012	1099	
vCu, unblocked vol	273			856			1343	1295	802	1234	1336	262
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			100	100	98	30	100	93
cM capacity (veh/h)	1290			669			191	215	328	211	207	777

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	74	951	273	6	199
Volume Left	74	0	0	0	147
Volume Right	0	93	23	6	52
cSH	1290	1700	1700	328	260
Volume to Capacity	0.06	0.56	0.16	0.02	0.76
Queue Length 95th (m)	1.4	0.0	0.0	0.4	42.7
Control Delay (s)	8.0	0.0	0.0	16.2	52.8
Lane LOS	A			C	F
Approach Delay (s)	0.6		0.0	16.2	52.8
Approach LOS				C	F

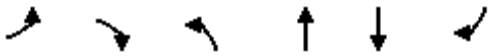
Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	72.3%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	26	248	19	5	5	26	9	43	26	323	5
Future Volume (Veh/h)	5	26	248	19	5	5	26	9	43	26	323	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	29	276	21	6	6	29	10	48	29	359	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	521	536	362	802	515	34	365			58		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	521	536	362	802	515	34	365			58		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	93	60	87	99	99	98			98		
cM capacity (veh/h)	444	432	683	165	444	1039	1194			1546		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	311	33	87	394
Volume Left	6	21	29	29
Volume Right	276	6	48	6
cSH	641	225	1194	1546
Volume to Capacity	0.48	0.15	0.02	0.02
Queue Length 95th (m)	20.2	3.8	0.6	0.4
Control Delay (s)	15.8	23.7	2.8	0.7
Lane LOS	C	C	A	A
Approach Delay (s)	15.8	23.7	2.8	0.7
Approach LOS	C	C		

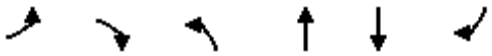
Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	45.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	7	5	26	298	332
Future Volume (Veh/h)	27	7	5	26	298	332
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	30	8	6	29	331	369
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				388		
pX, platoon unblocked						
vC, conflicting volume	556	516	700			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	556	516	700			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	99	99			
cM capacity (veh/h)	488	559	897			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	38	35	700
Volume Left	30	6	0
Volume Right	8	0	369
cSH	502	897	1700
Volume to Capacity	0.08	0.01	0.41
Queue Length 95th (m)	1.9	0.2	0.0
Control Delay (s)	12.8	1.6	0.0
Lane LOS	B	A	
Approach Delay (s)	12.8	1.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	30	3	19	332	5
Future Volume (Veh/h)	7	30	3	19	332	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	33	3	21	369	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				227		
pX, platoon unblocked						
vC, conflicting volume	399	372	375			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	399	372	375			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	95	100			
cM capacity (veh/h)	605	674	1183			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	41	24	375
Volume Left	8	3	0
Volume Right	33	0	6
cSH	659	1183	1700
Volume to Capacity	0.06	0.00	0.22
Queue Length 95th (m)	1.5	0.1	0.0
Control Delay (s)	10.8	1.0	0.0
Lane LOS	B	A	
Approach Delay (s)	10.8	1.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

Queues

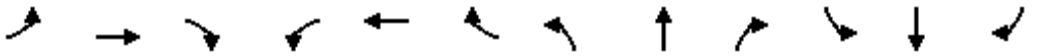
1: March Road N/March Road S & Morgan's Grant Way/Shirley's Brook Dr

06/01/2022

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	70	87	73	230	267	2486	150	156	1277	22
v/c Ratio	0.36	0.28	0.59	0.38	0.66	0.67	0.90	0.16	0.67	0.52	0.03
Control Delay	56.6	10.7	69.2	57.2	19.2	68.7	11.5	0.0	66.7	23.6	0.1
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	56.6	10.7	69.2	57.2	19.2	68.7	11.5	0.0	66.7	23.6	0.1
Queue Length 50th (m)	17.2	0.0	21.6	17.7	6.1	63.3	219.1	0.0	38.4	79.9	0.0
Queue Length 95th (m)	30.3	10.6	36.8	30.8	30.2	m70.7	m205.7	m0.0	58.9	93.0	0.0
Internal Link Dist (m)	116.4			136.8			274.6			145.2	
Turn Bay Length (m)		10.0	38.0		38.0	130.0		25.0	68.0		25.0
Base Capacity (vph)	408	428	309	401	505	399	2756	911	242	2442	777
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	0.16	0.28	0.18	0.46	0.67	0.90	0.16	0.64	0.52	0.03

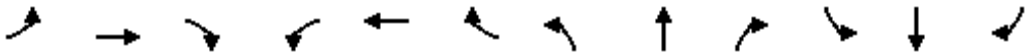
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	52	63	78	66	207	240	2237	135	140	1149	20
Future Volume (vph)	12	52	63	78	66	207	240	2237	135	140	1149	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes		1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.96
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	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1802	1514	1706	1655	1450	1679	4644	1476	1729	4969	1488
Flt Permitted		0.93	1.00	0.71	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1684	1514	1276	1655	1450	1679	4644	1476	1729	4969	1488
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)	13	58	70	87	73	230	267	2486	150	156	1277	22
RTOR Reduction (vph)	0	0	62	0	0	180	0	0	37	0	0	11
Lane Group Flow (vph)	0	71	8	87	73	50	267	2486	113	156	1277	11
Confl. Peds. (#/hr)	3		3	3		3	5		6	6		5
Confl. Bikes (#/hr)			3						8			1
Heavy Vehicles (%)	0%	0%	0%	1%	10%	5%	3%	7%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		15.2	15.2	15.2	15.2	15.2	30.9	77.1	77.1	17.7	63.9	63.9
Effective Green, g (s)		15.2	15.2	15.2	15.2	15.2	30.9	77.1	77.1	17.7	63.9	63.9
Actuated g/C Ratio		0.12	0.12	0.12	0.12	0.12	0.24	0.59	0.59	0.14	0.49	0.49
Clearance Time (s)		7.5	7.5	7.5	7.5	7.5	6.4	6.1	6.1	6.4	6.1	6.1
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)		196	177	149	193	169	399	2754	875	235	2442	731
v/s Ratio Prot					0.04		c0.16	c0.54		0.09	0.26	
v/s Ratio Perm		0.04	0.01	c0.07		0.03			0.08			0.01
v/c Ratio		0.36	0.05	0.58	0.38	0.29	0.67	0.90	0.13	0.66	0.52	0.01
Uniform Delay, d1		52.9	51.0	54.4	53.0	52.5	44.9	23.2	11.7	53.3	22.6	16.9
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.49	0.37	0.00	1.00	1.00	1.00
Incremental Delay, d2		1.1	0.1	5.7	1.2	1.0	0.4	0.5	0.0	6.9	0.8	0.0
Delay (s)		54.1	51.1	60.1	54.3	53.5	67.3	9.2	0.0	60.2	23.4	17.0
Level of Service		D	D	E	D	D	E	A	A	E	C	B
Approach Delay (s)		52.6			55.1			14.1			27.3	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



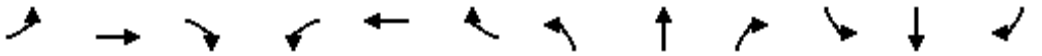
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	310	180	391	163	287	357	360	2232	153	124	1129	181
v/c Ratio	0.77	0.29	0.75	0.56	0.57	0.79	0.73	1.18	0.13	0.64	0.63	0.29
Control Delay	68.3	46.0	19.7	63.6	54.7	26.1	44.6	118.1	2.3	65.5	48.8	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	46.0	19.7	63.6	54.7	26.1	44.6	118.1	2.3	65.5	48.8	18.2
Queue Length 50th (m)	39.7	21.4	17.0	20.9	37.2	20.8	42.4	~254.1	3.7	31.9	76.0	7.1
Queue Length 95th (m)	55.3	29.3	50.2	31.6	45.8	52.0	m38.9	m#276.1	m3.6	54.1	93.7	26.8
Internal Link Dist (m)		245.5			137.0			283.0			274.6	
Turn Bay Length (m)	104.0		52.0	72.0		100.0	142.0		82.0	100.0		98.0
Base Capacity (vph)	435	931	625	418	912	594	493	1895	1294	226	1788	627
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.19	0.63	0.39	0.31	0.60	0.73	1.18	0.12	0.55	0.63	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

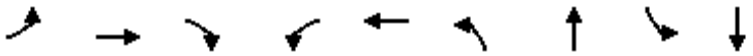
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	162	352	147	258	321	324	2009	138	112	1016	163
Future Volume (vph)	279	162	352	147	258	321	324	2009	138	112	1016	163
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7	6.7	6.9	6.7	6.7
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96
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	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	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3288	3458	1463	3164	3390	1469	3288	4687	1484	1729	4871	1397
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3288	3458	1463	3164	3390	1469	3288	4687	1484	1729	4871	1397
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)	310	180	391	163	287	357	360	2232	153	124	1129	181
RTOR Reduction (vph)	0	0	259	0	0	231	0	0	37	0	0	115
Lane Group Flow (vph)	310	180	132	163	287	126	360	2232	116	124	1129	66
Confl. Peds. (#/hr)	9		29	29		9	21		13	13		21
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	2%	0%	1%	6%	2%	3%	2%	6%	1%	0%	2%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	custom	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2 7 4			6
Actuated Green, G (s)	16.0	23.5	23.5	12.0	19.5	19.5	19.4	52.5	98.7	14.6	47.7	47.7
Effective Green, g (s)	16.0	23.5	23.5	12.0	19.5	19.5	19.4	52.5	98.7	14.6	47.7	47.7
Actuated g/C Ratio	0.12	0.18	0.18	0.09	0.15	0.15	0.15	0.40	0.76	0.11	0.37	0.37
Clearance Time (s)	6.8	7.0	7.0	6.8	7.0	7.0	6.9	6.7		6.9	6.7	6.7
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)	404	625	264	292	508	220	490	1892	1126	194	1787	512
v/s Ratio Prot	c0.09	0.05		0.05	0.08		c0.11	c0.48		0.07	0.23	
v/s Ratio Perm			c0.09			c0.09			0.08			0.05
v/c Ratio	0.77	0.29	0.50	0.56	0.56	0.57	0.73	1.18	0.10	0.64	0.63	0.13
Uniform Delay, d1	55.2	46.0	48.0	56.5	51.3	51.4	52.8	38.8	4.1	55.2	33.9	27.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.83	1.10	3.44	0.95	1.32	3.37
Incremental Delay, d2	8.5	0.3	1.5	2.3	1.4	3.6	0.5	81.4	0.0	6.0	1.5	0.5
Delay (s)	63.7	46.3	49.5	58.8	52.8	54.9	44.3	124.1	14.1	58.6	46.4	92.7
Level of Service	E	D	D	E	D	D	D	F	B	E	D	F
Approach Delay (s)		53.8			54.9			107.5			53.3	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	79.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.4
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

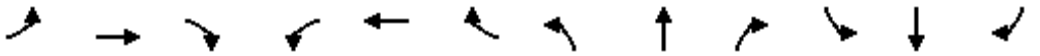


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	43	609	628	278	108	2557	29	1724
v/c Ratio	0.74	0.18	0.56	1.54	0.79	0.64	1.42	0.34	1.07
Control Delay	85.8	48.8	5.0	293.9	47.2	40.7	217.6	70.3	78.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.8	48.8	5.0	293.9	47.2	40.7	217.6	70.3	78.5
Queue Length 50th (m)	27.0	9.9	17.9	~116.4	42.8	12.0	~486.1	7.3	~267.0
Queue Length 95th (m)	#52.5	19.8	34.3	#152.9	70.5	#51.2	#543.0	#18.9	#314.7
Internal Link Dist (m)		112.5			205.8		333.2		208.2
Turn Bay Length (m)	65.0		100.0	90.0		157.0		140.0	
Base Capacity (vph)	156	343	1115	407	423	169	1805	86	1604
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	0.69	0.13	0.55	1.54	0.66	0.64	1.42	0.34	1.07

Intersection Summary

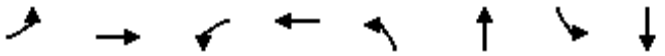
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	39	548	565	61	189	97	2274	27	26	1469	83
Future Volume (vph)	96	39	548	565	61	189	97	2274	27	26	1469	83
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.9	6.5	6.5	5.9	6.5		6.3	6.3		4.5	6.3	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.98		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	1.00	0.85	1.00	0.89		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1616	1784	1437	3288	1538		1712	3319		1695	3327	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.06	1.00		0.95	1.00	
Satd. Flow (perm)	1616	1784	1437	3288	1538		105	3319		1695	3327	
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)	107	43	609	628	68	210	108	2527	30	29	1632	92
RTOR Reduction (vph)	0	0	104	0	91	0	0	0	0	0	3	0
Lane Group Flow (vph)	107	43	505	628	187	0	108	2557	0	29	1721	0
Confl. Peds. (#/hr)	7		8	8		7	6					6
Confl. Bikes (#/hr)			1			1			1			12
Heavy Vehicles (%)	7%	2%	5%	2%	3%	3%	1%	4%	1%	2%	3%	2%
Turn Type	Prot	NA	custom	Prot	NA		pm+pt	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4 2				2					
Actuated Green, G (s)	11.7	17.5	86.4	16.1	21.9		77.7	68.9		4.3	62.6	
Effective Green, g (s)	11.7	17.5	86.4	16.1	21.9		77.7	68.9		4.3	62.6	
Actuated g/C Ratio	0.09	0.13	0.66	0.12	0.17		0.60	0.53		0.03	0.48	
Clearance Time (s)	5.9	6.5		5.9	6.5		6.3	6.3		4.5	6.3	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	145	240	955	407	259		171	1759		56	1602	
v/s Ratio Prot	0.07	0.02		c0.19	c0.12		c0.04	c0.77		0.02	0.52	
v/s Ratio Perm			0.35				0.33					
v/c Ratio	0.74	0.18	0.53	1.54	0.72		0.63	1.45		0.52	1.07	
Uniform Delay, d1	57.7	49.9	11.3	57.0	51.2		29.4	30.5		61.8	33.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.7	0.4	0.5	256.3	9.5		7.4	207.3		7.9	45.4	
Delay (s)	75.3	50.2	11.8	313.3	60.6		36.8	237.8		69.7	79.1	
Level of Service	E	D	B	F	E		D	F		E	E	
Approach Delay (s)		22.9			235.7			229.7			78.9	
Approach LOS		C			F			F			E	

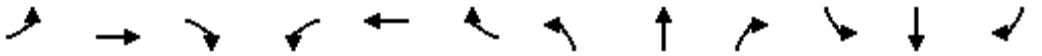
Intersection Summary			
HCM 2000 Control Delay	161.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	119.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	59	41	129	293	91	3	706
v/c Ratio	0.17	0.19	0.19	0.54	0.70	0.07	0.01	0.97
Control Delay	37.5	11.6	37.7	45.3	29.6	4.7	19.0	52.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	11.6	37.7	45.3	29.6	4.7	19.0	52.7
Queue Length 50th (m)	5.6	0.2	6.8	21.9	33.6	4.2	0.3	113.9
Queue Length 95th (m)	14.2	10.6	16.4	40.8	66.5	10.1	2.3	#211.4
Internal Link Dist (m)		205.8		177.5		261.1		203.5
Turn Bay Length (m)	130.0		42.0		65.0		35.0	
Base Capacity (vph)	443	585	476	510	482	1317	467	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10	0.09	0.25	0.61	0.07	0.01	0.97

Intersection Summary

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



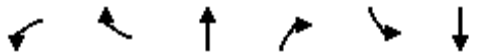
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	1	52	37	107	9	264	79	3	3	207	428
Future Volume (vph)	31	1	52	37	107	9	264	79	3	3	207	428
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.85		1.00	0.99		1.00	1.00		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1714	1502		1725	1391		1601	1774		1533	1616	
Flt Permitted	0.67	1.00		0.72	1.00		0.09	1.00		0.70	1.00	
Satd. Flow (perm)	1217	1502		1305	1391		147	1774		1127	1616	
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)	34	1	58	41	119	10	293	88	3	3	230	476
RTOR Reduction (vph)	0	48	0	0	3	0	0	1	0	0	55	0
Lane Group Flow (vph)	34	11	0	41	126	0	293	90	0	3	651	0
Confl. Peds. (#/hr)	4		1	1		4			11	11		
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	0%	1%	1%	0%	30%	17%	8%	2%	0%	10%	1%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.3	16.3		16.3	16.3		67.4	67.4		40.1	40.1	
Effective Green, g (s)	16.3	16.3		16.3	16.3		67.4	67.4		40.1	40.1	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.70	0.70		0.42	0.42	
Clearance Time (s)	6.2	6.2		6.2	6.2		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	206	254		221	235		422	1244		470	674	
v/s Ratio Prot		0.01			c0.09		c0.15	0.05			c0.40	
v/s Ratio Perm	0.03			0.03			0.33			0.00		
v/c Ratio	0.17	0.04		0.19	0.53		0.69	0.07		0.01	0.97	
Uniform Delay, d1	34.1	33.4		34.2	36.4		24.2	4.5		16.4	27.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.4	2.3		4.9	0.0		0.0	26.1	
Delay (s)	34.5	33.4		34.6	38.8		29.1	4.5		16.4	53.4	
Level of Service	C	C		C	D		C	A		B	D	
Approach Delay (s)		33.8			37.8			23.3			53.2	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	41.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	18.6
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	142	43	21	621	133	37
Future Volume (Veh/h)	142	43	21	621	133	37
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	158	48	23	690	148	41
Pedestrians				2	17	
Lane Width (m)				3.7	3.7	
Walking Speed (m/s)				1.1	1.1	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	302					
pX, platoon unblocked						
vC, conflicting volume			223		935	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			223		935	201
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		48	95
cM capacity (veh/h)			1279		284	818

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	206	713	189
Volume Left	0	23	148
Volume Right	48	0	41
cSH	1700	1279	330
Volume to Capacity	0.12	0.02	0.57
Queue Length 95th (m)	0.0	0.4	25.6
Control Delay (s)	0.0	0.5	29.5
Lane LOS		A	D
Approach Delay (s)	0.0	0.5	29.5
Approach LOS			D

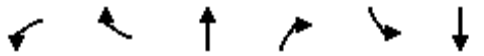
Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	2400	42	0	0
Future Volume (Veh/h)	0	5	2400	42	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	2667	47	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			232			247
pX, platoon unblocked	0.48	0.48			0.48	
vC, conflicting volume	2690	1357			2714	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2355	0			2404	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	14	521			94	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	1778	936	0	0
Volume Left	0	0	0	0	0
Volume Right	6	0	47	0	0
cSH	521	1700	1700	1700	1700
Volume to Capacity	0.01	1.05	0.55	0.00	0.00
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	12.0	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.0	0.0		0.0	
Approach LOS	B				

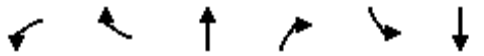
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	2359	23	0	0
Future Volume (Veh/h)	0	5	2359	23	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	2621	26	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			322			157
pX, platoon unblocked	0.48	0.48			0.48	
vC, conflicting volume	2634	1324			2647	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2243	0			2270	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	17	524			107	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	1747	900	0	0
Volume Left	0	0	0	0	0
Volume Right	6	0	26	0	0
cSH	524	1700	1700	1700	1700
Volume to Capacity	0.01	1.03	0.53	0.00	0.00
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	11.9	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.9	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	19	2359	5	0	0
Future Volume (Veh/h)	0	19	2359	5	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	21	2621	6	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			401			78
pX, platoon unblocked	0.49	0.49			0.49	
vC, conflicting volume	2624	1314			2627	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2227	0			2233	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	18	528			111	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	1747	880	0	0
Volume Left	0	0	0	0	0
Volume Right	21	0	6	0	0
cSH	528	1700	1700	1700	1700
Volume to Capacity	0.04	1.03	0.52	0.00	0.00
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0
Control Delay (s)	12.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

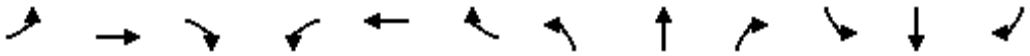
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	6	12	230	349	6	2414	194	81	1626
v/c Ratio	0.09	0.03	0.77	0.89	0.05	1.14	0.20	0.60	0.68
Control Delay	40.6	26.4	64.3	62.5	4.4	78.0	0.2	45.7	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.6	26.4	64.3	62.5	4.4	78.0	0.2	45.7	11.3
Queue Length 50th (m)	1.2	1.2	54.3	69.6	0.2	~385.2	0.0	2.4	185.5
Queue Length 95th (m)	5.0	6.2	82.0	#112.5	m0.1	m41.1	m0.0	m#23.6	221.1
Internal Link Dist (m)		124.3		188.6		54.1			89.2
Turn Bay Length (m)			37.5		37.5			37.5	
Base Capacity (vph)	81	429	344	444	129	2122	992	134	2395
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	0.07	0.03	0.67	0.79	0.05	1.14	0.20	0.60	0.68

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.

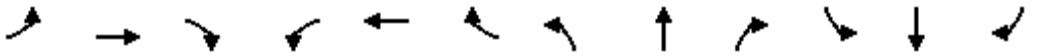
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	5	207	5	309	5	2173	175	73	1458	5
Future Volume (vph)	5	5	5	207	5	309	5	2173	175	73	1458	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.93		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1695	1650		1695	1521		1695	3390	1517	1695	3388	
Flt Permitted	0.18	1.00		0.75	1.00		0.12	1.00	1.00	0.05	1.00	
Satd. Flow (perm)	316	1650		1338	1521		207	3390	1517	83	3388	
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)	6	6	6	230	6	343	6	2414	194	81	1620	6
RTOR Reduction (vph)	0	5	0	0	54	0	0	0	43	0	0	0
Lane Group Flow (vph)	6	7	0	230	295	0	6	2414	151	81	1626	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	29.1	29.1		29.1	29.1		81.3	81.3	81.3	91.9	91.9	
Effective Green, g (s)	29.1	29.1		29.1	29.1		81.3	81.3	81.3	91.9	91.9	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.63	0.63	0.63	0.71	0.71	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
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)	70	369		299	340		129	2120	948	134	2395	
v/s Ratio Prot		0.00			c0.19			c0.71		0.03	c0.48	
v/s Ratio Perm	0.02			0.17			0.03		0.10	0.40		
v/c Ratio	0.09	0.02		0.77	0.87		0.05	1.14	0.16	0.60	0.68	
Uniform Delay, d1	39.9	39.3		47.3	48.6		9.4	24.4	10.1	32.8	10.7	
Progression Factor	1.00	1.00		1.00	1.00		0.38	0.44	0.04	1.93	0.85	
Incremental Delay, d2	0.5	0.0		11.3	20.0		0.1	63.0	0.0	6.1	1.3	
Delay (s)	40.5	39.4		58.6	68.6		3.6	73.8	0.4	69.4	10.4	
Level of Service	D	D		E	E		A	E	A	E	B	
Approach Delay (s)		39.7			64.6			68.2			13.2	
Approach LOS		D			E			E			B	

Intersection Summary			
HCM 2000 Control Delay	48.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

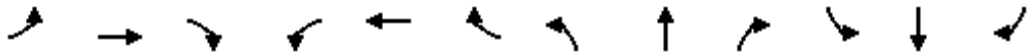
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	263	150	0	685	111	0	0	5	34	5	54
Future Volume (Veh/h)	20	263	150	0	685	111	0	0	5	34	5	54
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	292	167	0	761	123	0	0	6	38	6	60
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (m)		161										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	884			459			1305	1304	376	1164	1326	822
vC1, stage 1 conf vol							420	420		822	822	
vC2, stage 2 conf vol							886	884		342	503	
vCu, unblocked vol	884			385			1291	1290	296	1141	1313	822
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	100	99	86	98	84
cM capacity (veh/h)	765			1096			203	257	694	281	267	374

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	22	459	884	6	104
Volume Left	22	0	0	0	38
Volume Right	0	167	123	6	60
cSH	765	1700	1700	694	327
Volume to Capacity	0.03	0.27	0.52	0.01	0.32
Queue Length 95th (m)	0.7	0.0	0.0	0.2	10.2
Control Delay (s)	9.8	0.0	0.0	10.2	21.1
Lane LOS	A			B	C
Approach Delay (s)	0.5		0.0	10.2	21.1
Approach LOS				B	C

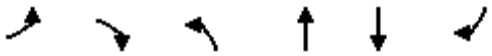
Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	57.6%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	6	35	49	39	23	179	206	12	6	64	5
Future Volume (Veh/h)	5	6	35	49	39	23	179	206	12	6	64	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	7	39	54	43	26	199	229	13	7	71	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	769	728	74	764	724	236	77			242		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	769	728	74	764	724	236	77			242		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	96	80	86	97	87			99		
cM capacity (veh/h)	247	303	988	271	304	804	1522			1324		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	52	123	441	84
Volume Left	6	54	199	7
Volume Right	39	26	13	6
cSH	598	330	1522	1324
Volume to Capacity	0.09	0.37	0.13	0.01
Queue Length 95th (m)	2.2	12.7	3.4	0.1
Control Delay (s)	11.6	22.3	4.1	0.7
Lane LOS	B	C	A	A
Approach Delay (s)	11.6	22.3	4.1	0.7
Approach LOS	B	C		

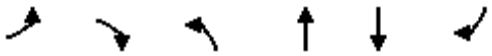
Intersection Summary				
Average Delay	7.5			
Intersection Capacity Utilization	49.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	190	48	0	194	102	47
Future Volume (Veh/h)	190	48	0	194	102	47
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	211	53	0	216	113	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				388		
pX, platoon unblocked						
vC, conflicting volume	355	139	165			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355	139	165			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	67	94	100			
cM capacity (veh/h)	643	909	1413			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	264	216	165
Volume Left	211	0	0
Volume Right	53	0	52
cSH	683	1413	1700
Volume to Capacity	0.39	0.00	0.10
Queue Length 95th (m)	13.9	0.0	0.0
Control Delay (s)	13.5	0.0	0.0
Lane LOS	B		
Approach Delay (s)	13.5	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	48	193	3	146	197	5
Future Volume (Veh/h)	48	193	3	146	197	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	53	214	3	162	219	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				227		
pX, platoon unblocked						
vC, conflicting volume	390	222	225			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	390	222	225			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	74	100			
cM capacity (veh/h)	613	818	1344			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	267	165	225
Volume Left	53	3	0
Volume Right	214	0	6
cSH	767	1344	1700
Volume to Capacity	0.35	0.00	0.13
Queue Length 95th (m)	11.9	0.1	0.0
Control Delay (s)	12.2	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	12.2	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix D MMLOS TABLE

Multi-Modal Level of Service - Intersections Form

Consultant	**Stantec Consulting**	**Project**	**Nokia Campus Re-development**
Scenario	**2022 Existing**	**Date**	
Comments			

INTERSECTIONS		March Road and Morgan's Grant Way				March Road and Terry Fox Drive				March Road and Solandt Road				Solandt Road and Legget Drive			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes	10+	10+	9	9	10+	10+	10+	10+	10+	10+	10+	10+	6	6	6	6
	Median	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	Median > 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Permissive	Permissive	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Protected	Permissive	Protected/ Permissive	Permissive	Permissive	Permissive	Protected/ Permissive
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Right Turn Channel	Conv'tl without Receiving Lane	Conventional with Receiving Lane	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane	Conv'tl without Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	Conventional with Receiving Lane	No Channel	No Channel	No Channel	No Channel
	Corner Radius	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m	15-25m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	**-43**	**-46**	**-19**	**-10**	**-35**	**-38**	**-38**	**-38**	**-38**	**-38**	**-46**	**-46**	**18**	**18**	**18**	**18**
	Ped. Exposure to Traffic LoS	**#N/A**	**#N/A**	**#N/A**	**F**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**F**	**F**	**F**	**F**
	Cycle Length	130	130	130	130	130	130	130	130	130	130	130	130	119	119	119	119
	Effective Walk Time	8	8	53	53	7	7	15	15	8	8	46	34	23	23	59	28
	Average Pedestrian Delay	**57**	**57**	**23**	**23**	**58**	**58**	**51**	**51**	**57**	**57**	**27**	**35**	**39**	**39**	**15**	**35**
	Pedestrian Delay LoS	**E**	**E**	**C**	**C**	**E**	**E**	**E**	**E**	**E**	**E**	**C**	**D**	**D**	**D**	**B**	**D**
	Level of Service	**#N/A**	**#N/A**	**#N/A**	**F**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**#N/A**	**F**	**F**	**F**	**F**
		#N/A				**#N/A**				**#N/A**				**F**			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Pocket Bike Lane	Pocket Bike Lane	Pocket Bike Lane	Pocket Bike Lane	Pocket Bike Lane	Pocket Bike Lane	Pocket Bike Lane	Pocket Bike Lane	Pocket Bike Lane	Pocket Bike Lane	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	IF Dedicated Right Turn Lane, THEN Right Turn Configuration, ELSE <blank>	Bike lane shifts to the left of right turn	Bike lane shifts to the left of right turn	Bike lane shifts to the left of right turn	Bike lane shifts to the left of right turn	Bike lane shifts to the left of right turn	Bike lane shifts to the left of right turn	Bike lane shifts to the left of right turn	Bike lane shifts to the left of right turn	> 50 m Introduced right turn lane	> 50 m Introduced right turn lane		> 50 m				
	Dedicated Right Turning Speed	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	≤ 25 km/h		≤ 25 km/h				
	Cyclist Through Movement	**D**	**D**	**D**	**D**	**D**	**D**	**D**	**D**	**D**	**D**		**F**				
	Separated or Mixed Traffic	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed	No lane crossed
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 40 to ≤ 50 km/h	> 40 to ≤ 50 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h
	Left Turning Cyclist	**F**	**F**	**B**	**B**	**F**	**F**	**F**	**F**	**F**	**F**	**C**	**C**	**C**	**C**	**C**	**C**
	Level of Service	**F**	**F**	**D**	**D**	**F**	**F**	**F**	**F**	**F**	**F**	**C**	**F**	**C**	**C**	**C**	**C**
		F				**F**				**F**				**C**			
Transit	Average Signal Delay	≤ 30 sec	≤ 20 sec	> 40 sec	> 40 sec	≤ 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	> 40 sec	≤ 30 sec	> 40 sec	≤ 40 sec
	Level of Service	**D**	**C**	**F**	**F**	**E**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**D**	**F**	**E**
		F				**F**				**F**				**F**			
Truck	Effective Corner Radius	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m
	Number of Receiving Lanes on Departure from Intersection	1	1	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	1	1	1	1
	Level of Service	**C**	**C**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**C**	**C**	**C**	**C**
		C				**A**				**A**				**C**			
Auto	Volume to Capacity Ratio	0.61 - 0.70				0.81 - 0.90				> 1.00				0.91 - 1.00			
	Level of Service	**B**				**D**				**F**				**E**			

Multi-Modal Level of Service - Intersections Form

Consultant	**Stantec Consulting**	**Project**	**Nokia Campus Re-development**
Scenario	**2037 Ultimate**	**Date**	
Comments			

	INTERSECTIONS	**March Road and Morgan's Grant Way**				**March Road and Terry Fox Drive**				**March Road and Solandt Road**				**Solandt Road and Legget Drive**			
	Crossing Side	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Pedestrian	Lanes	10+	10+	5	4	10+	10+	8	7	10+	10+	5	5	3	3	3	3
	Median	Median > 2.4 m	Median > 2.4 m	No Median - 2.4 m	Median > 2.4 m	Median > 2.4 m	Median > 2.4 m	No Median - 2.4 m	Median > 2.4 m	Median > 2.4 m	Median > 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m
	Conflicting Left Turns	Protected	Protected	Permissive	Permissive	Protected	Protected	Permissive	Permissive	Protected	Protected	Permissive	Permissive	Permissive	Protected/ Permissive	Permissive	Permissive
	Conflicting Right Turns	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	Right Turns on Red (RToR) ?	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Signal Leading Interval?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Right Turn Channel	Smart Channel	Smart Channel	Smart Channel	Smart Channel	Smart Channel	Smart Channel	Smart Channel	Smart Channel	Smart Channel	Smart Channel	Smart Channel	Smart Channel	No Channel	No Channel	No Channel	No Channel
	Corner Radius	>25m	>25m	>25m	>25m	>25m	>25m	>25m	>25m	>25m	>25m	>25m	>25m	15-25m	15-25m	15-25m	15-25m
	Crosswalk Type	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings
	PETSI Score	**-24**	**-24**	**40**	**58**	**-24**	**-24**	**-9**	**13**	**-24**	**-24**	**40**	**40**	**68**	**68**	**68**	**68**
	Ped. Exposure to Traffic LoS	**#N/A**	**#N/A**	**E**	**D**	**#N/A**	**#N/A**	**F**	**F**	**#N/A**	**#N/A**	**E**	**E**	**C**	**C**	**C**	**C**
	Cycle Length	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130
	Effective Walk Time	31	31	18	18	35	35	26	26	25	25	19	19	19	19	19	19
	Average Pedestrian Delay	**38**	**38**	**48**	**48**	**35**	**35**	**42**	**42**	**42**	**42**	**47**	**47**	**47**	**47**	**47**	**47**
	Pedestrian Delay LoS	**D**	**D**	**E**	**E**	**D**	**D**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**
	Level of Service	**#N/A**	**#N/A**	**E**	**E**	**#N/A**	**#N/A**	**F**	**F**	**#N/A**	**#N/A**	**E**	**E**	**E**	**E**	**E**	**E**
		#N/A				**#N/A**				**#N/A**				**E**			
	Approach From	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**	**NORTH**	**SOUTH**	**EAST**	**WEST**
Bicycle	Bicycle Lane Arrangement on Approach	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	IF Dedicated Right Turn Lane, THEN Right Turn Configuration, ELSE <blank>	Not Applicable	Not Applicable	> 50 m	> 50 m	Not Applicable	Not Applicable	> 50 m	> 50 m	Not Applicable	Not Applicable	> 50 m	> 50 m				
	Dedicated Right Turning Speed	Not Applicable	Not Applicable	≤ 25 km/h	>25 km/h	Not Applicable	Not Applicable	>25 km/h	>25 km/h	Not Applicable	Not Applicable	>25 km/h	>25 km/h				
	Cyclist Through Movement	**Not Applicable**	**Not Applicable**	**F**	**F**	**Not Applicable**	**Not Applicable**	**F**	**F**	**Not Applicable**	**Not Applicable**	**F**	**F**				
	Separated or Mixed Traffic	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Separated**	**Separated**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**	**Mixed Traffic**
	Left Turn Approach	≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	No lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	One lane crossed	One lane crossed	One lane crossed	One lane crossed	One lane crossed
	Operating Speed	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	≥ 60 km/h	≥ 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h	> 50 to < 60 km/h
	Left Turning Cyclist	**F**	**F**	**E**	**C**	**F**	**F**	**F**	**F**	**F**	**F**	**E**	**E**	**E**	**E**	**E**	**E**
	Level of Service	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**E**	**E**	**E**	**E**
		F				**F**				**F**				**E**			
Transit	Average Signal Delay	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec	≤ 20 sec
	Level of Service	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**
		C				**C**				**C**				**C**			
Truck	Effective Corner Radius	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m	> 15 m
	Number of Receiving Lanes on Departure from Intersection	≥ 2	≥ 2	1	1	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	≥ 2	1	1	1	1	1	1
	Level of Service	**A**	**A**	**C**	**C**	**A**	**A**	**A**	**A**	**A**	**A**	**C**	**C**	**C**	**C**	**C**	**C**
		C				**A**				**C**				**C**			
Auto	Volume to Capacity Ratio	> 1.00				> 1.00				> 1.00				0.71 - 0.80			
	Level of Service	**F**				**F**				**F**				**C**			