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Riverfront Phase Two Transportation Assessment, Niagara Falls

Paradigm Transportation Solutions Limited

April 2024
220542



Project Number
220542

Date: April 2024
Version 2.0.0

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Riverfront Phase Two, Transportation Assessment, Niagara Falls



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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Traffic Impact Study (TIS) study for a proposed development in the City of Niagara Falls.

This study determines the impacts of the additional traffic generated by the subject site on the surrounding road network and the remedial measures necessary to accommodate future traffic satisfactorily.

Development Concept

The subject lands, which are currently vacant, are bounded by the Dorchester Road to the west, CP Rail Line to the South, and established industrial land uses to the east. The draft plan proposes a total of 656 residential units (330 condominium units, 66 townhouse units and 260 retirement units), a 330-room hotel and approximately 19,610 m² (211,080 square feet) of commercial space. The development is assumed to be built out and occupied by 2026.

Conclusions

Detailed traffic analysis was conducted for each of the study area intersections under Base (2023) and 2031 traffic conditions. The capacity analysis showed that deficiencies currently exist and are projected to occur at certain locations within the study area with anticipated growth in traffic, including the proposed development. The following capacity constraints at the study area intersections are identified.

McLeod Road and Dorchester Road

Base Year Operations:	Increased Delays	●
Background Operations:	Significant Delays	●
Total Operations:	Significant Delays	●

McLeod Road and Dorchester Road operates well currently however the northbound left turn movement performs moderately during weekday AM peak hour, but poorly during weekday PM and Saturdays. It is expected that several movements will face capacity issues under the Background and Total horizon. Specifically, left turn movements for eastbound and northbound traffic are projected to operate with a v/c ratio exceeding 1.00. The through movements for eastbound, westbound, and southbound traffic will also face challenges, operating with a v/c ratio exceeding 1.00. Additionally, the left turn movement for



westbound traffic will operate at moderately with a v/c ratio of 0.78 during the weekday PM and Saturday peak hours.

To accommodate projected traffic volumes from the proposed development, adjustments to the roadway geometry are likely required and include the following:

- ▶ Double left turn lane for northbound traffic that is fully protected.
- ▶ Optimizing the timing of traffic signals

In addition, with traffic generated from other area developments and generally growth in the future, it is expected that additional geometric improvements will be required. Some possible upgrades include implementing the following:

- ▶ Separate right turn lanes for southbound, traffic
- ▶ Optimizing the timing of traffic signals

McLeod Road and Drummond Road

Base Year Operations:	Tolerable Delays	●
Background Operations:	Significant Delays	●
Total Operations:	Significant Delays	●

Presently faces heavy traffic during weekday AM and PM peak hours but performs well on Saturdays. It is expected that there will be a significant increase in traffic volume under the Background horizon, with all approaches operating with a v/c ratio over, the exception being the southbound through movement that will operate with a v/c ratio no greater than 0.71.

In terms of accommodating traffic generated from the proposed development, no specific improvements have been identified other than optimizing the timings of traffic signals.

To accommodate traffic generated from other area developments and general growth in the future, it is expected that geometric improvements will be required. Some possible upgrades include implementing the following:

- ▶ Separate left turn lane for eastbound, westbound and northbound traffic
- ▶ Optimizing the timing of traffic signals



Montrose Road and Lyons Creek Road/Biggar Road

Base Year Operations:	Significant Delays	●
Background Operations:	Tolerable Delays	●
Total Operations:	Tolerable Delays	●

Currently experiences significant traffic during peak hours, particularly on the northbound approach. This results in a high level of delay and the intersection exceeding capacity during the weekday PM and Saturday peak hours. Intersection improvements that are being planned by the Region will lead to better operation under Background and Total horizon, with a v/c ratio no greater than 0.85.

Lyons Creek Road and Stanley Avenue

Base Year Operations:	Tolerable Delays	●
Background Operations:	Significant Delays	●
Total Operations:	Significant Delays	●

Operates currently acceptably during peak hours on weekdays and Saturdays. Under the Background and Total horizon, during peak hours for all approaches, there will be significant traffic that could cause delays and result in poor operations under all-way stop control. The utilization rate is projected to exceed 1.00.

In terms of accommodating traffic generated from the proposed development, no specific improvements have been identified.

To accommodate traffic generated from other area developments and general growth in the future, it is expected that geometric improvements will be required. Some possible upgrades include implementing the following:

- ▶ Traffic control signals with actuated uncoordinated control
- ▶ Double left turn lane for eastbound traffic that is fully protected

Dorchester Road and Jill Drive

Base Year Operations:	Tolerable Delays	●
Background Operations:	Tolerable Delays	●
Total Operations:	Significant Delays	●

Currently operates well during weekdays and Saturday peak hours. Based on the Background horizon projections, there may be a slight decrease in quality of service for each movement during weekday and Saturday peak hours, but utilization levels should not exceed 0.65. However, with increased traffic under the Total horizon, northbound



and southbound approaches may experience significant delay with utilization levels exceeding 1.00.

A signal warrant analysis was conducted to determine if the projected traffic conditions would warrant improvements to the existing form of traffic control. The signal warrant analysis indicates traffic control signals are not warranted under the 2031 horizon.

Even though the signal criteria have not been met, the installation of unwarranted traffic control signals would improve operations.

To accommodate projected traffic volumes from the proposed development, adjustments to traffic control are likely required and include the following:

- ▶ Traffic control signals with actuated uncoordinated control

Dorchester Road and Oldfield Road

Base Year Operations:	Tolerable Delays	●
Background Operations:	Tolerable Delays	●
Total Operations:	Significant Delays	●

Currently operates well during weekdays and Saturday peak hours. Under the Background Horizon, it is expected that individual movements will operate well during peak hours on weekdays and Saturdays. The utilization degree is predicted to stay under 0.55. However, delays are expected to increase in the Total horizon for both northbound and southbound approaches. During the weekday PM and Saturday peak hour, the northbound and southbound approach is forecasted to operate poorly under all-way stop control with the degree of utilization exceeding 1.00.

The proposed development's traffic demands may not be fully resolved by the EA's preferred improvement plan. While it's possible that traffic growth may not occur as predicted, additional roadway capacity or alternative traffic control may be required to enhance operations at the intersection of Dorchester Road and Oldfield Road.

To accommodate projected traffic volumes from the proposed development, adjustments to traffic control are likely required and include the following:

- ▶ Traffic control signals with actuated uncoordinated control



Chippawa Parkway and Stanley Avenue

Base Year Operations:	Tolerable Delays	●
Background Operations:	Significant Delays	●
Total Operations:	Significant Delays	●

Currently is operating well on weekdays and Saturdays. Under the Background and Total horizon, it is expected that the stop-controlled approaches in the eastbound and westbound directions will be operating beyond capacity during peak hours, with a v/c ratio of over 1.00.

In terms of accommodating traffic generated from the proposed development, no specific improvements have been identified.

To accommodate traffic generated from other area developments and general growth in the future, it is expected that geometric improvements will be required. Some possible upgrades include implementing the following:

- ▶ Traffic control signals with actuated uncoordinated control
- ▶ Separate left turn lane for eastbound, westbound, northbound and southbound traffic
- ▶ Separate right turn lanes for southbound traffic

Dorchester Road at Street J

Total Operations:	Increased Delays	●
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During the weekday PM peak hour and Saturday peak hour the intersection is projected to operate with high delays and a v/c ratio nearing 1.00 for the westbound approach. A signal warrant analysis was conducted to determine if the projected traffic conditions would warrant improvements to the existing form of traffic control. The signal warrant analysis indicates traffic control signals are not warranted under the 2031 horizon.

Even though the signal criteria have not been met, the installation of unwarranted traffic control signals would improve operations.

A southbound left turn lane with 30 metres of storage along Dorchester Road at Street J is warranted.

To accommodate projected traffic volumes from the proposed development, adjustments to traffic control are likely required and include the following:



- ▶ Traffic control signals with actuated uncoordinated control
- ▶ Separate westbound left and right-turn lanes
- ▶ Southbound left turn lane

Access Review

- ▶ Internal Road at Dorchester Road would not meet the minimum spacing requirements for a full movement connection. As a result, it is recommended that the Internal Road to Dorchester Road be restricted to right in/out operations with stop control for the minor approach.

Roadway Classification and Capacity Guidelines

- ▶ Street J will be classified as a collector road and could have daily two-way traffic volumes of 6,000 vehicles per day. These volumes are appropriate for a collector roadway. Peak hour peak direction traffic volumes on Street J between Dorchester Road and Street K are approximately 150 to 375. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.
- ▶ Street K will be classified as a local road and could have daily two-way traffic volumes of 450 vehicles per day. These volumes are appropriate for a local commercial roadway. Peak hour peak direction traffic volumes on Street K between Dorchester Road and Street J are approximately 10 to 45. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.
- ▶ Internal Road will be classified as a local road and could have daily two-way traffic volumes of 2,100 vehicles per day. These volumes are appropriate for a local commercial roadway. Peak hour peak direction traffic volumes on the Internal Road between Dorchester Road and Street J are approximately 50 to 340. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.
- ▶ Peak hour peak direction traffic volumes on Dorchester Road between Oldfield Road and Street K are approximately 300 to 700. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.

Commercial Parking Review

- ▶ Based on the general by-law, the commercial land uses require 750 parking spaces. The proposed parking supply of 715 spaces is 35 spaces below the required amount.



- ▶ Consideration of shared parking opportunities is common within retail facilities. Paradigm used and adapted a shared parking model using inputs from the ULI to model this activity. The model started with a baseline demand of 750 spaces calculated based on the Zoning By-law requirements. After adjusting for shared parking, the peak demand is approximately 653 spaces.
- ▶ Considering shared parking, the proposed supply of 715 spaces is sufficient to accommodate the projected demand of the commercial uses.

Recommendations

Based on the findings of this study, the following is recommended:

- ▶ The Internal Road at Dorchester Road is recommended to be restricted to right in/out operations with stop control for the minor approach given insufficient spacing requirements along Dorchester Road.
- ▶ The Applicant be responsible for costs related to the new roadway connection to Dorchester Road (Street J), which includes a southbound left turn lane and potentially unwarranted traffic control signals.
- ▶ The Applicant will bear the cost of potentially unwarranted traffic control signals due to the deterioration of operations at the intersection of Dorchester Road and Jill Drive, caused by the build-out of the development.
- ▶ The Applicant will bear the cost of potentially unwarranted traffic control signals due to the deterioration of operations at the intersection of Dorchester Road and Oldfield Road caused by the build-out of the development.
- ▶ The Applicant will bear the cost of potentially constructing double left-turn lanes for the northbound approach at McLeod Road and Dorchester Road along with protected signal phasing for the northbound and southbound left turn movements.
- ▶ As the increase in traffic at some of the study area intersections as a result of other development applications and overall general growth, the City and Region are recommended to coordinate the improvement plan for additional improvements to the following intersections:
 - McLeod Road at Dorchester Road
 - McLeod Road at Drummond Road
 - Chippawa Parkway at Stanley Avenue



- Lyons Creek Road at Stanley Avenue
- ▶ The City support the proposed reduction in parking proposed for the commercial area based on the shared parking methodology.



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1 Introduction

1.1 Riverfront Community Master Plan

The Riverfront lands are in the City of Niagara Falls, located generally south of Oldfield Road, west of the Thundering Waters Golf Course and Stanley Avenue Industrial Business Park, north of the Welland River, and east of the Ontario Power Generation (OPG) Canal. In April 2018, Paradigm completed the report, “Riverfront Community Master Plan, Transportation Study”, which was part of the planning application for an Official Plan Amendment (OPA) for the Riverfront Lands. Phase 1 of the lands received Draft Plan Approval in 2020 for the construction of 918 residential units.

The Applicant is now seeking to move forward with seeking Draft Plan Approval for Phase 2 of the Riverfront Community Master Plan. This phase comprises a mix of commercial and residential. Phase 2 are located within the western limit of the lands and will have access provided through a new internal roadway network that will connect to Dorchester Road. Several driveway connections are also proposed to provide access to Dorchester Road.

1.2 Overview

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study (TIS) and Parking Study for Phase 2 of the Riverfront Community Master located east of Dorchester Road and generally south of Oldfield Road in Niagara Falls.

Figure 1.1 shows the location of the Master Plan Area within the City of Niagara Falls and highlights the Phase 2 development area in the westerly portion of these lands.

This study determines the impacts of the additional traffic generated by the subject site on the surrounding road network and the remedial measures necessary to accommodate future traffic satisfactorily. The scope of this study includes:

- ▶ Determine and assess the current study area traffic conditions;
- ▶ Forecast the additional traffic generated by the proposed development;
- ▶ Analyze the impacts of the additional traffic on the study area intersections for the horizon year of five years from full occupancy (2031);



- ▶ Recommend any necessary remedial measures to mitigate the traffic impacts; and
- ▶ Review the proposed parking supply, and determine its adequacy compared to estimated parking demands.
- ▶ Confirm that any new intersections on Dorchester Road are feasible in terms of intersection spacing and sight lines.

The study has been carried out in general accordance with the City of Niagara Falls Traffic Impact Study Guidelines and pre-study consultation correspondence that was exchanged with City and Regional staff to refine the scope. **Appendix A** contains the pre-study consultation material.

1.3 Study Area

The study area intersections assessed in this study include:

- ▶ Chippawa Parkway and Stanley Avenue
- ▶ Dorchester Road and Oldfield Road
- ▶ Dorchester Road and Jill Drive
- ▶ McLeod Road and Oakwood Drive
- ▶ McLeod Road and Dorchester Road
- ▶ Montrose Road and Lyons Creek Road/Biggar Road
- ▶ McLeod Road and Montrose Road
- ▶ McLeod Road and Drummond Road
- ▶ Stanley Avenue and Lyons Creek Road
- ▶ Stanley Avenue and Marineland Parkway
- ▶ Marineland Parkway and Thundering Waters Blvd

Figure 1.2 shows the study area as agreed to with City of Niagara Falls and Niagara Region staff during pre-consultation.



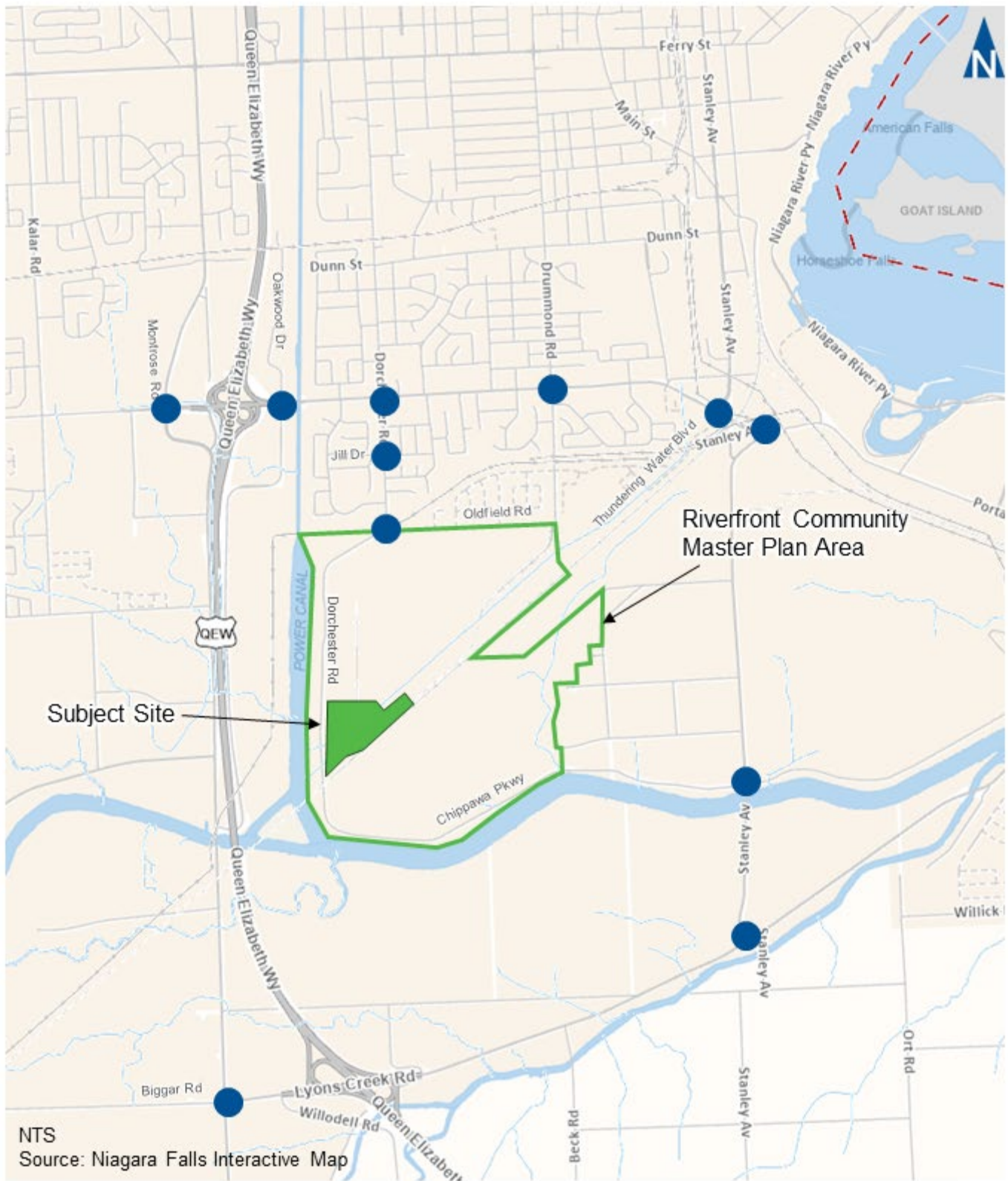


NTS
 Source: Niagara Falls Interactive Map



Master Plan Area

Figure 1.1



Study Area

2 Existing Conditions

2.1 Roadway Characteristics

- ▶ **McLeod Road (Niagara Region Road 49)** is an east-west arterial road under Niagara Region jurisdiction¹ with a four-lane cross-section throughout most of the study area. At the east end, McLeod Road continues as Marineland Parkway through its intersections with Stanley Avenue and Portage Road. McLeod Road provides access to the QEW from the southern built-up area of the City of Niagara Falls. It has a posted speed limit of 50 kilometres per hour within the study area;
- ▶ **Montrose Road (Niagara Region Road 98)** is a north-south road under Niagara Region jurisdiction with a two-lane cross-section. It widens to a four-lane cross-section at the Niagara Square Commercial Centre to McLeod Road. The road runs parallel with and provides an alternate route to the QEW during emergency closures or delays on the highway. South of McLeod Road to the south limit of the Niagara Square Shopping Centre, Montrose Road has a posted speed limit of 50 kilometres per hour. South of the Niagara Square Shopping Centre, Montrose Road has a posted speed limit of 60 kilometres per hour;
- ▶ **Stanley Avenue (Niagara Region Road 102)** is a north-south arterial road under Niagara Region jurisdiction with a four-lane cross-section north of Marineland Parkway and a two-lane section to the south. Stanley Avenue provides direct access to Downtown Niagara Falls and the Falls Tourist District from the study area. North of Marineland Parkway, Stanley Avenue has a posted speed limit of 50 kilometres per hour, while south of Marineland Parkway, the road has a posted speed limit of 60 kilometres per hour;
- ▶ **Lyons Creek Road (Niagara Region Road 47)** is an east-west arterial road under Niagara Region jurisdiction with a two-lane cross-section that connects Montrose Road to Stanley Avenue in the study area. West of its intersection with Montrose Road, the road continues as Biggar Road. Lyons Creek Road widens to a four-lane cross-section at its grade-separated interchange with the QEW. The road directly connects to the QEW from rural Niagara Falls and the community of Chippawa. Lyons Creek Road has a posted speed limit of 60 to 80 kilometres per hour in the study area;

¹ Niagara Region – Regional Road Map 2021

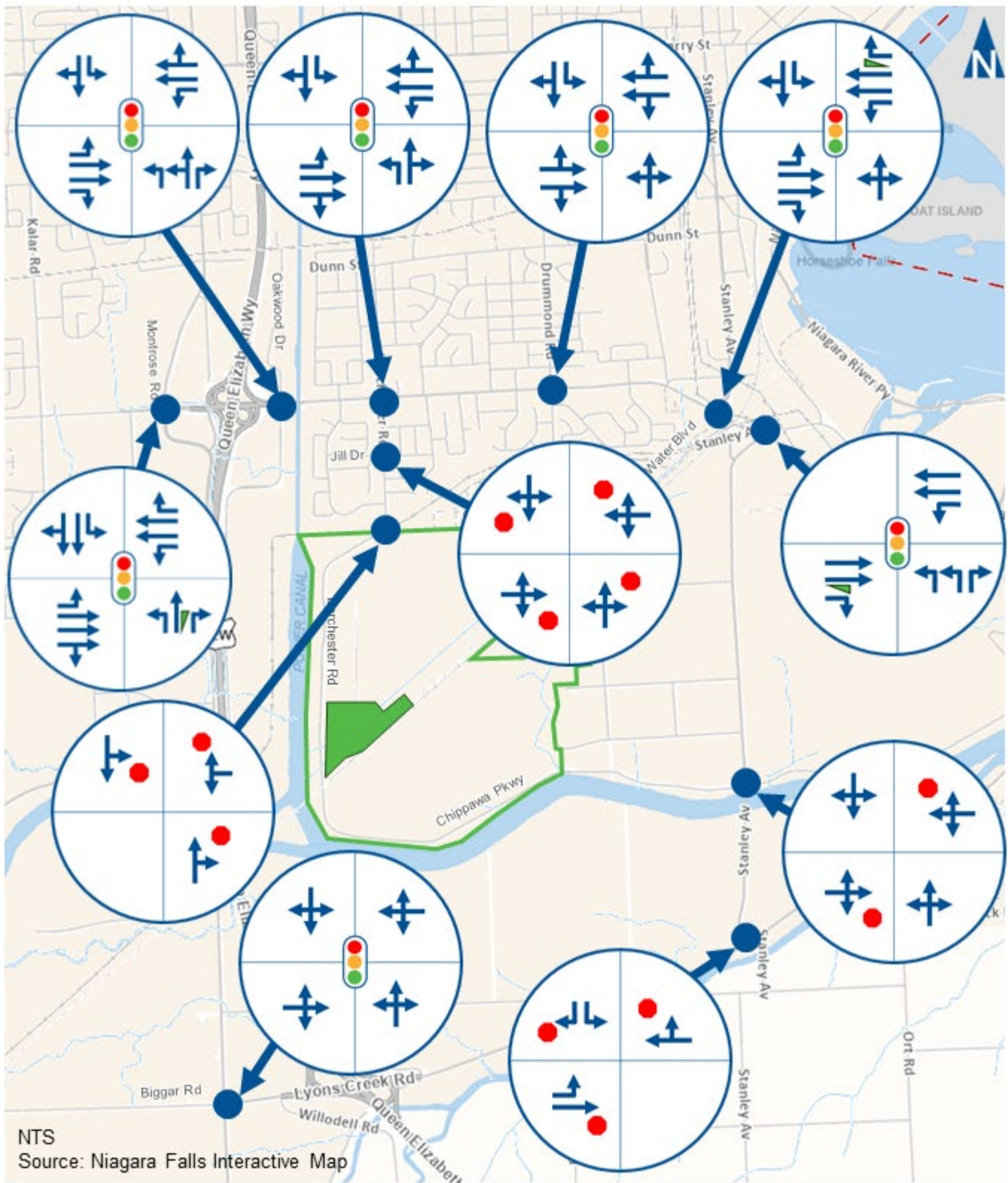


- ▶ **Oakwood Drive** is a north-south collector road² under the jurisdiction of the City of Niagara Falls. The road connects McLeod Road to the SmartCentres commercial plaza on the east side of QEW and the residential and commercial land uses between the QEW and the Welland River. Oakwood Drive curves under the QEW at its southern limit and connects to Montrose Road. There are two signalized intersections with the SmartCentres commercial plaza on Oakwood Drive. The posted speed limit for Oakwood Drive ranges from 50 to 60 kilometres per hour;
- ▶ **Dorchester Road** is a north-south road under the jurisdiction of the City of Niagara Falls. The road is designated as an arterial in the City's Official Plan, except for the short segment between McLeod Road and Oldfield Road within the study area that is classified as a collector. Dorchester Road extends from the north limit of Niagara Falls into the study area, where it curves and connects to Chippawa Parkway. The speed limit on Dorchester Road is 50 kilometres per hour north of Oldfield Road and 60 kilometers per hour south of Oldfield Road;
- ▶ **Oldfield Road** is an east-west road under the jurisdiction of the City of Niagara Falls and runs between Dorchester Road and Drummond Road. The road is designated as an arterial in the City's Official Plan, and the speed limit on Oldfield Road is assumed to be 50 kilometres per hour (unposted);
- ▶ **Drummond Road** is a north-south arterial road under the jurisdiction of the City of Niagara Falls. It has a four-lane cross-section north of Lundy's Lane and two-lane cross-section south of Lundy's Lane. The posted speed limit is 50 kilometres per hour; and
- ▶ **Chippawa Parkway** is an east-west, two-lane road under the jurisdiction of the City of Niagara Falls. The road is designated as an arterial in the City's Official Plan for the Dorchester Road and Stanley Avenue section. It has a maximum posted speed limit of 60 km/h, and curve ahead warning signs with advisory speeds of 40 km/h are posted at three locations – one to the east of the subject lands, one along the site frontage, and one where Chippawa Parkway transitions into Dorchester Road.

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

² City of Niagara Falls – Official Plan Schedule C 2008





Existing Lane Configuration and Traffic Control

2.2 Transit

Niagara Region Transit is the public transit operator for the City of Niagara Falls.

Currently, there are no public transit routes running along the subject land's Dorchester Road or Chippawa Parkway frontages. **Figure 2.2** shows the existing Niagara Region Transit services that serve this part of the city. The closest route is Route 103, which 103 provides hourly transit service between 6:30 AM to 6:00 PM from Main/Ferry transit stop and the Niagara Square transit stop via McLeod Road and Drummond Road from Monday to Saturday. During peak times (7:00 AM – 10:00 AM and 3:30 PM – 6:30 PM) 30-minute service times are provided, Monday to Friday. Route 103 operates as Route 203 during the evenings on Monday to Saturday as well as on Sundays and holidays.

2.3 Active Transportation

With the subject lands being vacant, no sidewalks or bicycle facilities are serving this area. The Millennium Trail runs north-south along the Hydro Canal to the west of the site and east-west along the Welland River to the south.

There are various types of bicycle facilities along several roads near the periphery of the site, which will provide opportunities for connections with the Riverfront Community as it develops.

2.4 Traffic Volumes

Turning Movement Counts (TMC) are used to assess intersection operations and quantify vehicle movement. The traffic counts are usually collected during peak periods at an intersection to complete the level of service analysis. Existing traffic counts at an intersection or road section form the foundation for analysis.

Table 2.1 summarizes the location and date of the existing TMC data that was collected for use in the analysis. Weekday peak hour TMC data was collected by Paradigm in May 2023.

The intersection of Montrose Road and Lyons Creek Road/Biggar Road however was under construction with Biggar Road closed to vehicular traffic. As a result, an October 2018 count was obtained from Niagara Region and factored to 2023 volumes through the use of a 1.0% per annum growth rate. As the Region did not have a Saturday count available, the weekday PM peak hour traffic volumes have also been utilized for the Saturday peak hour. **Figure 2.3** shows the base



year (2023) traffic volumes for the weekday and Saturday peak hours. **Appendix B** contains the original traffic data for reference.



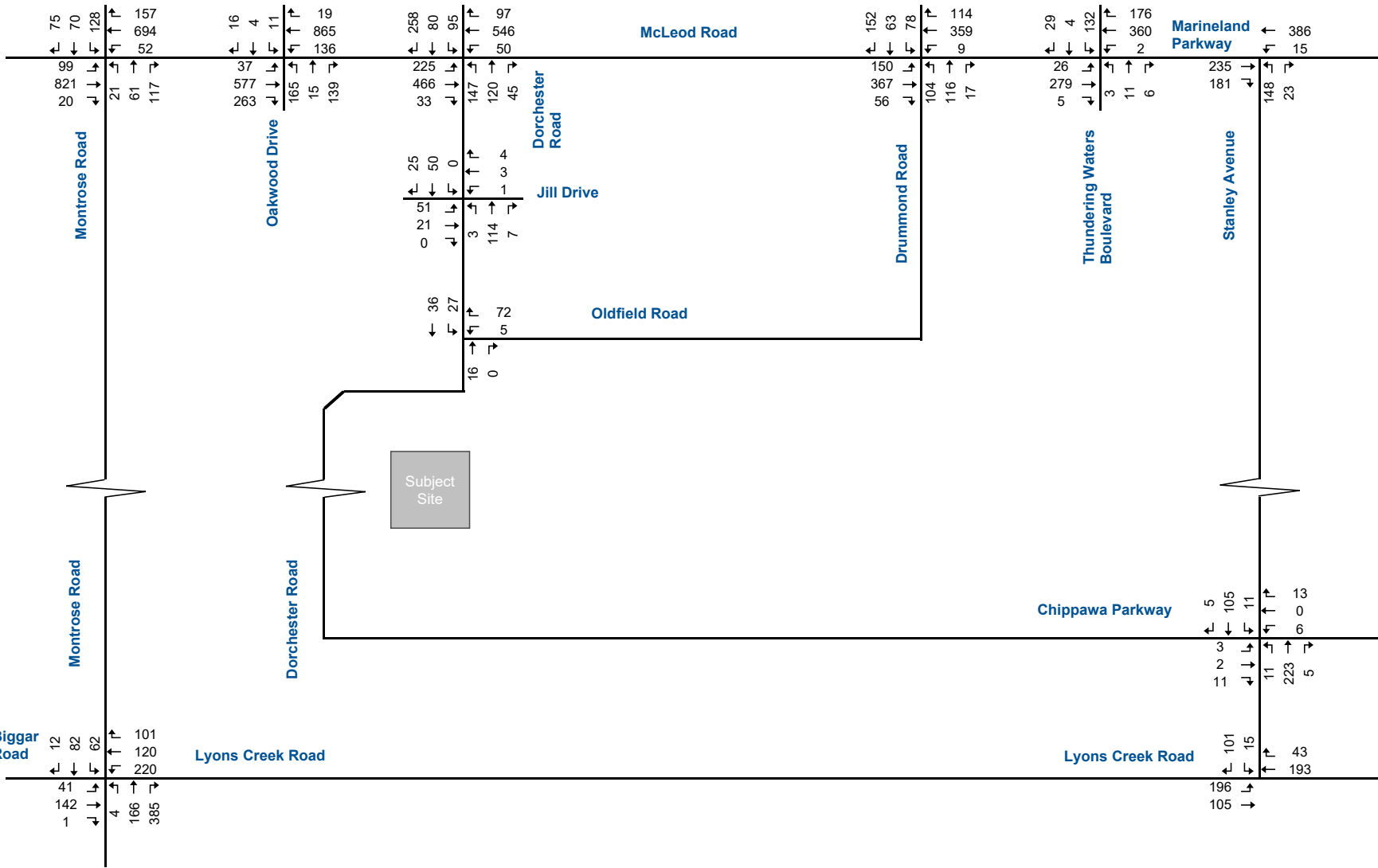
TABLE 2.1: TRAFFIC DATA

Intersection	Type	Date	Conducted By
Chippawa Parkway and Stanley Avenue	Weekday	May 2023	Paradigm
	Saturday	May 2023	Paradigm
Dorchester Road and Oldfield Road	Weekday	May 2023	Paradigm
	Saturday	May 2023	Paradigm
Dorchester Road and Jill Drive	Weekday	May 2023	Paradigm
	Saturday	May 2023	Paradigm
McLeod Road and Oakwood Drive	Weekday	May 2023	Paradigm
	Saturday	May 2023	Paradigm
McLeod Road and Dorchester Road	Weekday	May 2023	Paradigm
	Saturday	May 2023	Paradigm
Montrose Road and Lyons Creek Road/Biggar Road	Weekday	October 2018	Niagara Region
	Saturday	-	-
McLeod Road and Montrose Road	Weekday	May 2023	Paradigm
	Saturday	May 2023	Paradigm
McLeod Road and Drummond Road	Weekday	May 2023	Paradigm
	Saturday	May 2023	Paradigm
Stanley Avenue and Lyons Creek Road	Weekday	May 2023	Paradigm
	Saturday	May 2023	Paradigm
Stanley Avenue and Marineland Parkway	Weekday	May 2023	Paradigm
	Saturday	May 2023	Paradigm
Marineland Parkway and Thundering Waters Blvd	Weekday	May 2023	Paradigm
	Saturday	May 2023	Paradigm

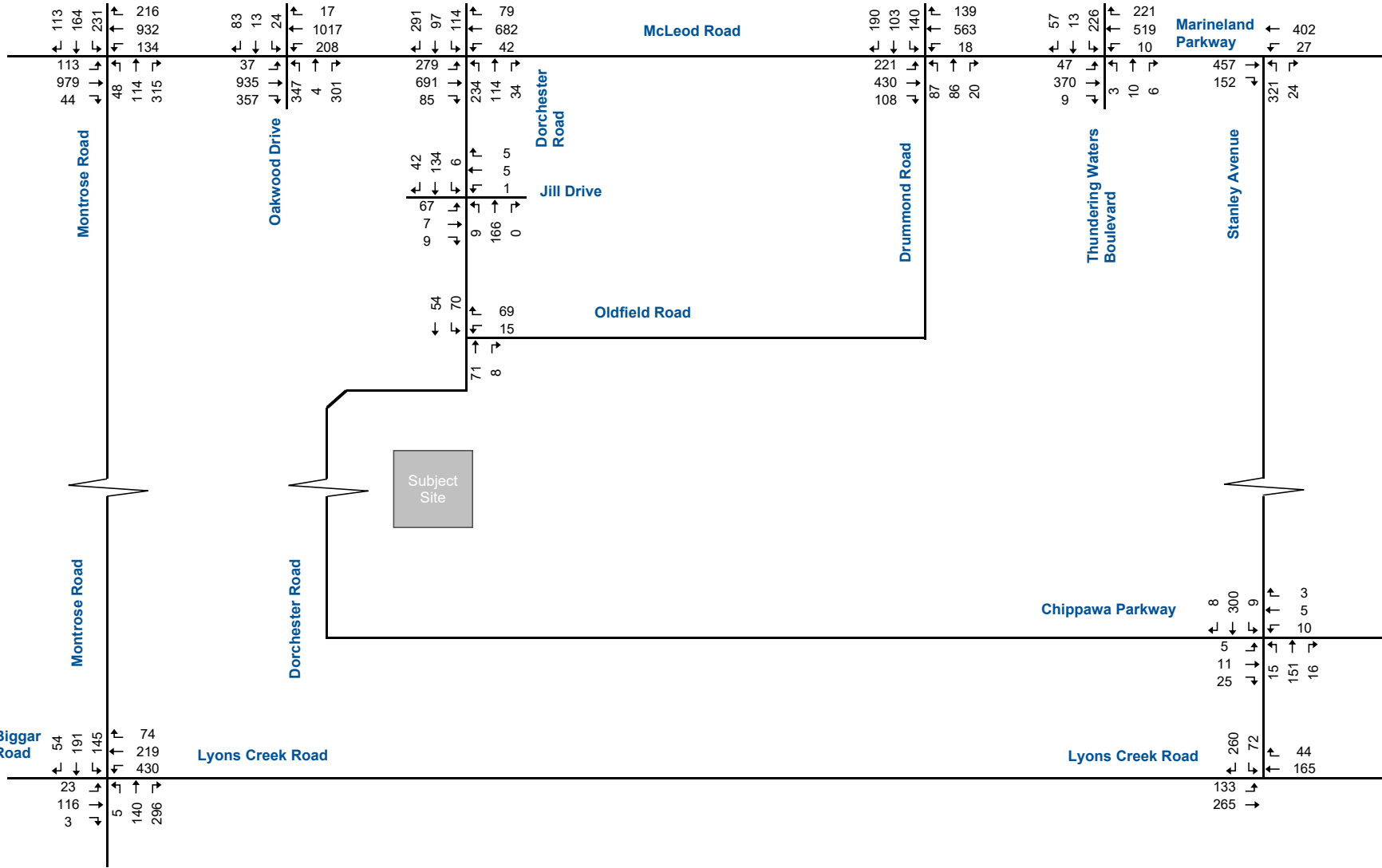




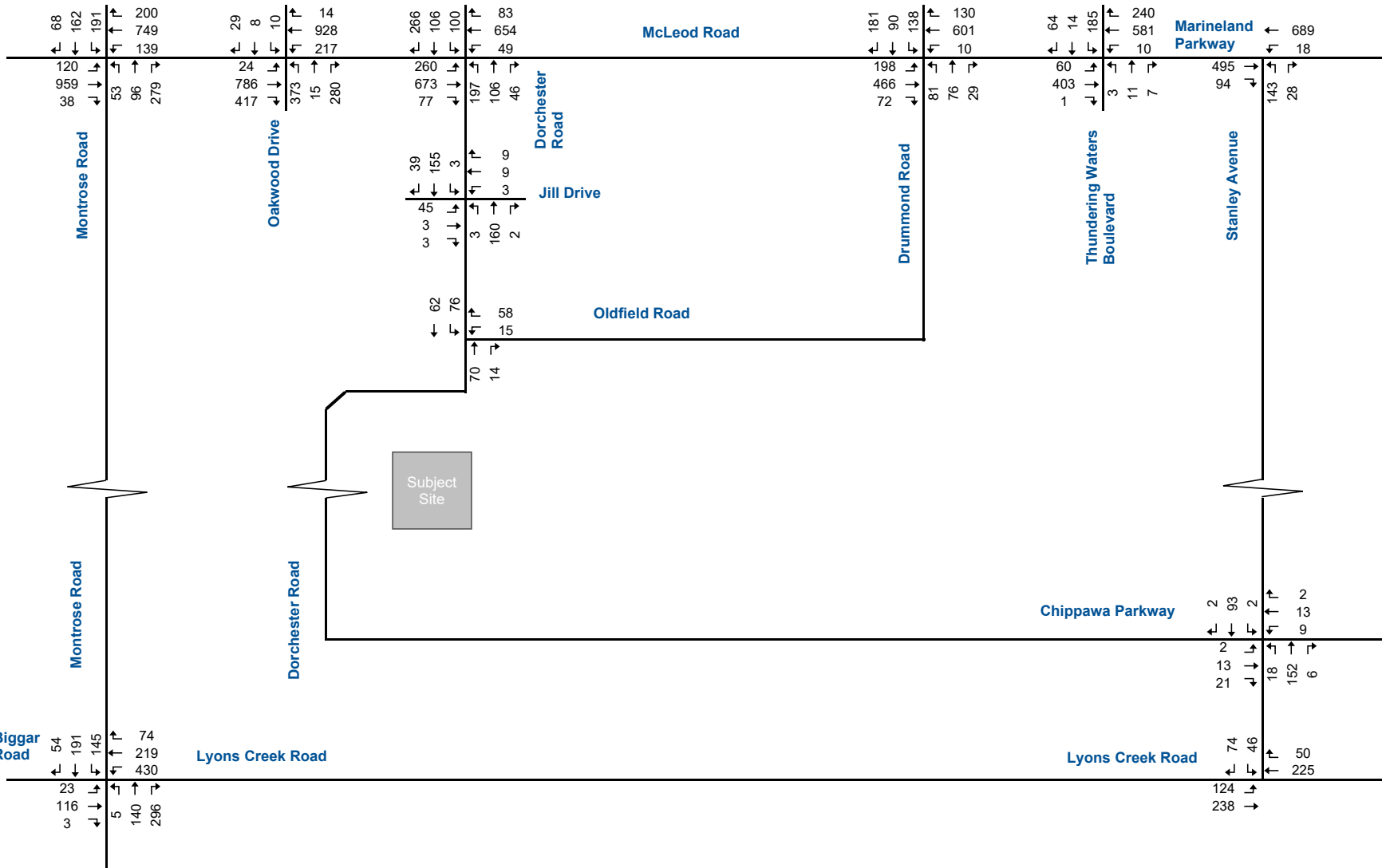
Existing Transit Service



Base Year Traffic Volumes Weekday AM Peak Hour



Base Year Traffic Volumes Weekday PM Peak Hour



Base Year Traffic Volumes Saturday Peak Hour

3 Development Concept

The subject lands, which are currently vacant, are bounded by the Dorchester Road to the west, CP Rail Line to the South and established industrial land uses to the east.

Figure 3.1 shows the Draft Plan of Subdivision including the proposed internal road network.

The draft plan proposes a total of 656 residential units (330 condominium units, 66 townhouse units and 260 retirement units), a 330-room hotel and approximately 19,610 m² (211,080 square feet) of commercial space.

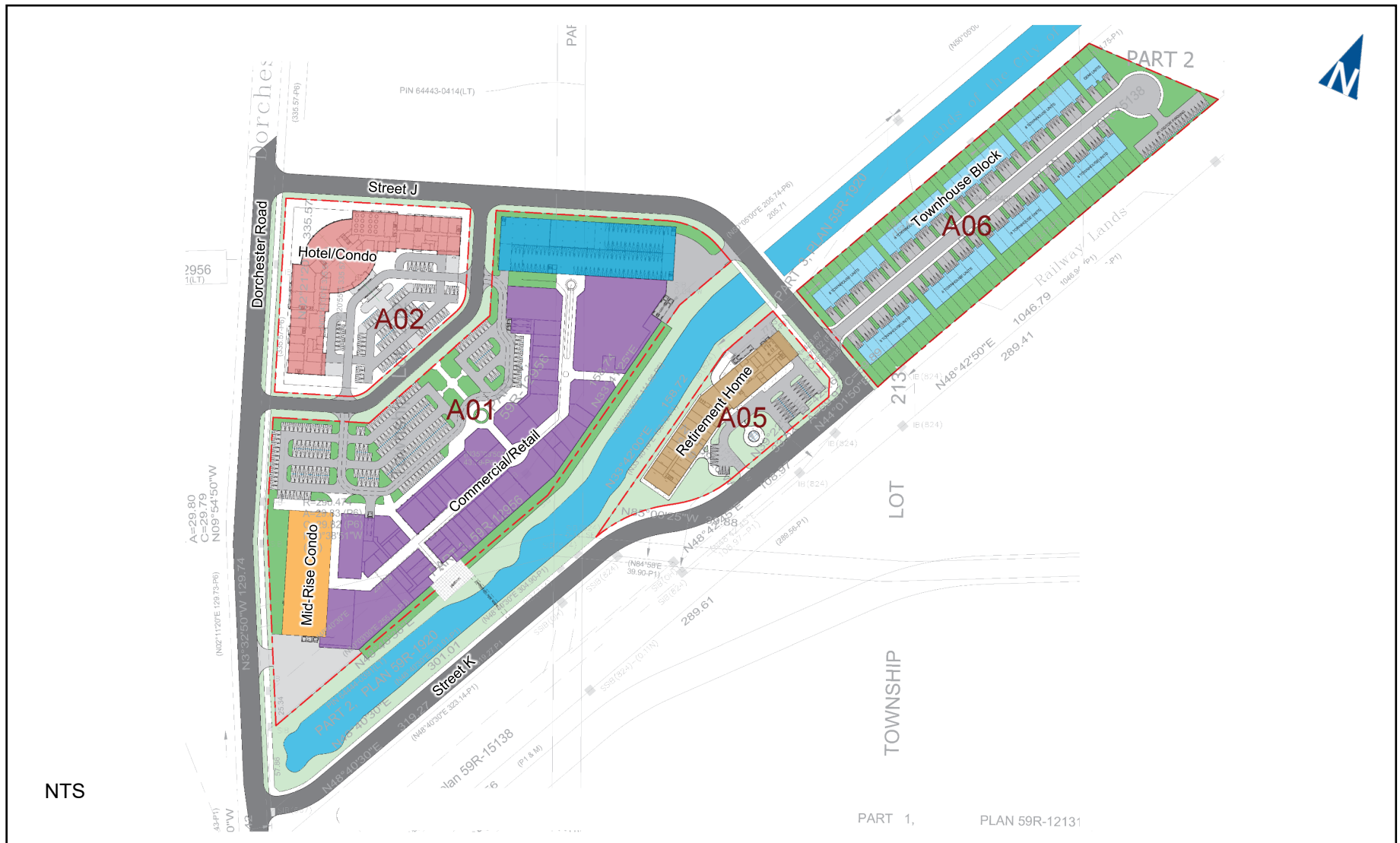
The proposed access points servicing the development from Dorchester Road are noted as follows:

- ▶ Street J is approximately 515 metres north of the CN rail line along Dorchester Road.
- ▶ Street K is approximately 80 metres north of the CN rail line along Dorchester Road.
- ▶ Internal Road is approximately 370 metres north of the CN rail line along Dorchester Road.
- ▶ Retail South Access is approximately 190 metres north of the CN rail line along Dorchester Road.
- ▶ Retail South Loading Area is approximately 145 metres north of the CN rail line along Dorchester Road.

For analysis purposes, all roadways/driveways are assumed to operate with a basic-two lane cross section with stop control provided for the minor approaches.

Parking for the commercial land uses in the A01 block are proposed to be shared across 693 spaces. The 95-unit apartment building within the A01 block will have a separate pool of parking with 150 spaces.





Site Concept Plan

3.1 Commercial Parking Review

Zoning By-law 79-2209 Section 4.19.1 outlines the general parking requirements for commercial land use in the City of Niagara Falls. The following is noted with respect to parking requirements:

- ▶ Restaurant – 1.00 parking space per 5 seats;
- ▶ Retail – 1.00 parking space per 25 m² of GFA;
- ▶ Supermarket – 1.00 parking space per 40 m² of GFA;
- ▶ Cinema – 1.00 parking space per 5 seats; and
- ▶ Bank – 1.00 parking space per 25 m² of GFA.

Table 3.1 summarizes the standard parking calculation.

TABLE 3.1: COMMERCIAL PARKING REQUIREMENTS

By-law	GFA (m ²)	Seats	Parking Rate	Required
Restaurant	5,222	1,461	¹ 1 space per 5 seats	292
Retail	8,241		² 1 space per 25 m ²	234
Supermarket	1,582		1 space per 40 m ²	40
Cinema	3,242	872	³ 1 space per 5 seats	174
Bank	244		1 space per 25 m ²	10
Total				750

1. Restaurant: assume 60% of first floor GFA is dedicated to seating, 40% is the rest. All 2nd floor GFA will be used to calculate seating. Each seat is 25 sqft and 5 seats per parking.

2. Retail: 60% GFA for calculating parking (25sqm/parking), 40% GAF for storage (90sqm/parking)

3. Cinema: assume 60% of GFA is dedicated to seating. Each seat is 26 sqft and 5 seats per parking.

Based on the general by-law, the commercial land uses require 750 parking spaces. The proposed parking supply of 715 spaces is 35 spaces below the required amount.

3.1.1 Shared Parking Demand

Consideration of shared parking opportunities is common within retail facilities. The concept of shared and/or managed parking reflects the variations in usage levels of different land uses by the time of day, day of the week and seasonal factors to derive efficiencies in overall parking supply requirements through a permissive sharing of a common pool of parking that support the range of planned uses at different times. Each land use does not need its dedicated parking supply, yet that is precisely what standard analysis and zoning indicate is needed. In reality, different uses have different peak demands throughout the day.



Paradigm used and adapted a shared parking model using inputs from the Urban Land Institute (ULI) to model this activity. Shared parking accommodates peak parking demand but shares a supply among different uses. If each land use built enough parking to accommodate its peak demand, the supply of spaces would be grossly underutilized.

This analysis is vital because it reflects that specific user groups can share the same parking spaces without requiring additional parking. In the case of the proposed development, it is apparent that the restaurant and spa parking are excellent candidates for sharing parking as they peak at different times of the day. When the projected demands are overlapped temporally, the following is noted:

- ▶ There is no hour in the day when all user groups peak at the same time (contrary to the assumption of superposition);
- ▶ When restaurant demands rise towards their peak for the evening hours, the exhibition space and retail demand falls;

The model started with a baseline demand of 750 spaces calculated based on the Zoning By-law requirements. After adjusting for shared parking, the peak demand is approximately 653 spaces. If each land uses were to build enough parking to accommodate its peak demand, then the supply of spaces would be grossly underutilized. **Table 3.2** outlines the peak shared parking requirement. **Appendix C** contains the calculations.

TABLE 3.2: COMMERCIAL PEAK SHARED PARKING

Weekend			
Land Use	Unadjusted Demand	Peak Adjustment 7:00 PM	Shared Parking Demand
Restaurant	292	100%	292
Retail	234	80%	187
Supermarket	40	85%	34
Cinema	174	80%	139
Bank	10	0%	0
Total	750	87%	653

Weekday			
Land Use	Unadjusted Demand	Peak Adjustment 8:00 PM	Shared Parking Demand
Restaurant	292	100%	292
Retail	234	65%	152
Supermarket	40	25%	10
Cinema	174	100%	174
Bank	10	0%	0
Total	750	84%	629

Considering peak parking, the proposed supply of 715 spaces is sufficient to accommodate the projected demand of the commercial uses.



3.2 Trip Generation

The peak hour trip estimates for the proposed development were based on the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition). The following land uses (LUC) have been utilized:

- ▶ LUC 220 – Multifamily Housing (Low-Rise);
- ▶ LUC 221 – Multifamily Housing (Mid-Rise);
- ▶ LUC 252 – Senior Adult Housing (Multifamily);
- ▶ LUC 310 – Hotel
- ▶ LUC 820 – Shopping Centre

Data for the peak hour of adjacent street traffic were used to estimate trip generation. The resulting summation is the “raw” trip generation – unadjusted, which represents the total trip generation prior to any trip reduction. The effects of other factors on the actual net new trip generation on the local roadway system are discussed in detail in the following sections.

3.2.1 Pass-By Trips

The estimates of pass-by trips were derived using the Trip Generation Handbook published by ITE³. Pass-by trips are a subset of the trip generation that only applies to commercial/retail developments. These trips are made by vehicles already on the roadway, which attract businesses to their site as they pass by.

An example of a pass-by trip is a vehicle driving from home to work and stopping for coffee on the way. It is noted that pass-by trips are already included in the background traffic stream and do not load additional traffic onto the road network. The ITE Trip Generation Handbook provides a 34% pass-by trip rate for LUC 820 during the weekday PM peak hour and 26% pass-by trip rate for mid-day Saturday peak period. No information is available for a pass-by rate during the weekday AM peak hour.

3.2.2 Diverted Trips

The estimates of diverted trips were derived using the Trip Generation Handbook. Diverted trips are a subset of the trip generation that only applies to commercial/retail developments. These trips are attracted

³ Institute of Transportation Engineers. Trip Generation Handbook, 2nd Edition. Washington D.C. 2004.



from roadways within the vicinity of the trip generator but without direct access to the site.

The ITE Trip Generation Handbook provides a 28% derived trip rate for LUC 820 during the weekday PM peak hour for similar sized commercial land uses. No information is available for a diverted rate during the Saturday peak hour; therefore, the PM peak hour rate was used.

3.2.3 Internal Capture

The ITE Trip Generation Handbook describes a multi-use development as a single project that consists of two or more ITE land use classifications in which trips can be made between land uses without using the off-site roadway system. This sharing of trips between compatible land uses an internal capture without travelling off-site.

Based on this information, the proposed development is considered a multi-use development with compatible commercial land, and uses likely to share – or capture – trips that do not require vehicular travel outside the Site.

The ITE Trip Generation Handbook has been utilized to account for internal trips within the development. By way of example, some portion of the traffic destined to and from the retail uses located within the Site will likely originate from the on-site residential units, requiring only a walking trip. The detailed calculations are provided in **Appendix D**. ITE data suggests an internal capture rate of up to 18% for the respective peak hours.

3.2.4 Trip Generation Estimates

Table 3.3 summarizes the projected trip generation associated with the build-out. These estimates were based on the standardized ITE rates with pass-by credits made as noted. As shown, approximately 598-794 new trips during the weekday and Saturday peak hours are forecast to be added to the area roadways.

Table 3.4 compares the current site trip generation with the trip generation estimated in the Riverfront Community Assessment (April 2018) for the subject lands.

The comparison indicates the current site trip generation is generally lower than volume of trips estimated for the subject lands within the Riverfront Community Assessment. The current site statistics result in a reduction of 36 AM, 879 PM, and 1,206 Saturday peak hour trips. The decrease in vehicular trips can be attributed to the change in total



number of residential units, hotel rooms, and shopping centre GFA proposed as well as updated trip generation rates and equations.



TABLE 3.3: TRIP GENERATION ESTIMATES

ITE Land Use Code / Number of Units	Trips	AM Peak Hour				PM Peak Hour				Saturday Peak Hour			
		Rate	In	Out	Sum	Rate	In	Out	Sum	Rate	In	Out	Sum
220 - Multifamily Housing (Low-Rise) - 66 Units	Total	Eqn.	10	33	43	Eqn.	31	18	49	Eqn.	31	18	49
	Internal	0%	0	0	0	35%	11	6	17	35%	11	6	17
	New		10	33	43		20	12	32		20	12	32
221 - Multifamily Housing (Mid-Rise) - 276 Units	Total	Eqn.	25	85	110	Eqn.	66	42	108	Eqn.	57	54	111
	Internal	3%	1	2	3	53%	33	24	57	53%	30	29	59
	New		24	83	107		33	18	51		27	25	52
252 - Senior Adult Housing (Multifamily) - 267 Units	Total	Eqn.	18	34	52	Eqn.	38	29	67	Eqn.	43	37	80
	Internal	0%	0	0	0	42%	18	10	28	42%	18	15	33
	New		18	34	52		20	19	39		25	22	47
310 - Hotel - 320 Rooms	Total	Eqn.	86	67	153	Eqn.	107	102	209	Eqn.	127	100	227
	Internal	4%	0	6	6	14%	21	9	30	14%	18	14	32
	New		86	61	147		86	93	179		109	86	195
820 - Shopping Centre - 211,080 sq.ft	Total	Eqn.	160	98	258	Eqn.	464	502	966	Eqn.	610	563	1,173
	Internal	3%	8	1	9	13%	46	80	126	13%	80	73	153
	Pass-by	--	0	0	0	34%	143	143	286	26%	133	133	266
	Diverted	--	0	0	0	28%	118	118	236	28%	143	143	286
	New	--	152	97	249	--	157	161	318	--	254	214	468
Total	Total	--	299	317	616	--	706	693	1,399	--	868	772	1,640
	Internal	3%	9	9	18	18%	129	129	258	18%	157	137	294
	Pass-by	0%	0	0	0	20%	143	143	286	16%	133	133	266
	Diverted	0%	0	0	0	28%	118	118	236	28%	143	143	286
	New	97%	290	308	598	44%	316	303	619	48%	435	359	794

Equations

LUC 220 Eqn. per Unit AM: $T = 0.31(X) + 22.85$ | PM: $T = 0.43(X) + 20.55$ | Sat: $T = 0.43(X) + 20.55$

LUC 221 Eqn. per Unit AM: $T = 0.44(X) - 11.61$ | PM: $T = 0.39(X) + 0.34$ | Sat: $\ln(T) = 1.00 \ln(X) - 0.91$

LUC 252 Eqn. per Unit AM: $T = 0.19(X) + 0.90$ | PM: $T = 0.25(X) + 0.07$ | Sat: $\ln(T) = 0.93 \ln(X) - 0.81$

LUC 310 Eqn. per Room AM: $T = 0.50(X) - 7.45$ | PM: $T = 0.74(X) - 27.89$ | Sat: $T = 0.69(X) + 5.95$

LUC 820 Eqn. per 1,000 sq.ft GFA AM: $T = 0.59(X) + 133.55$ | PM: $\ln(T) = 0.72 \ln(X) + 3.02$ | Sat: $\ln(T) = 0.76 \ln(X) + 3.00$

TABLE 3.4: TRIP GENERATION COMPARISON

Proposed Land Uses	AM Peak Hour			PM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Current Land Uses									
Multifamily Housing (Low-Rise) - 66 units	290	308	598	316	303	619	435	359	794
Multifamily Housing (Mid-Rise) - 276 units									
Senior Adult Housing - 267 units									
Hotel - 320 rooms									
Shopping Centre - 211,080 sf ² of GFA									
Previous Land Uses (April 2018, Paradigm)									
Residential Condominium/Townhouse - 312 units	337	298	634	750	749	1,498	1,055	945	2,000
Senior Adult Housing - 238 units									
Hotel - 450 rooms									
Shopping Centre - 280,000 sf ² of GFA									
Difference	-47	10	-36	-434	-446	-879	-620	-586	-1,206



3.3 Trip Distribution & Assignment

Table 3.5 shows the directional distribution for site trip assignment purposes, based on the detailed information initially presented in the overall study for the Riverfront lands, namely, “Riverfront Community Assessment, April 2018, Paradigm Transportation Solutions”.

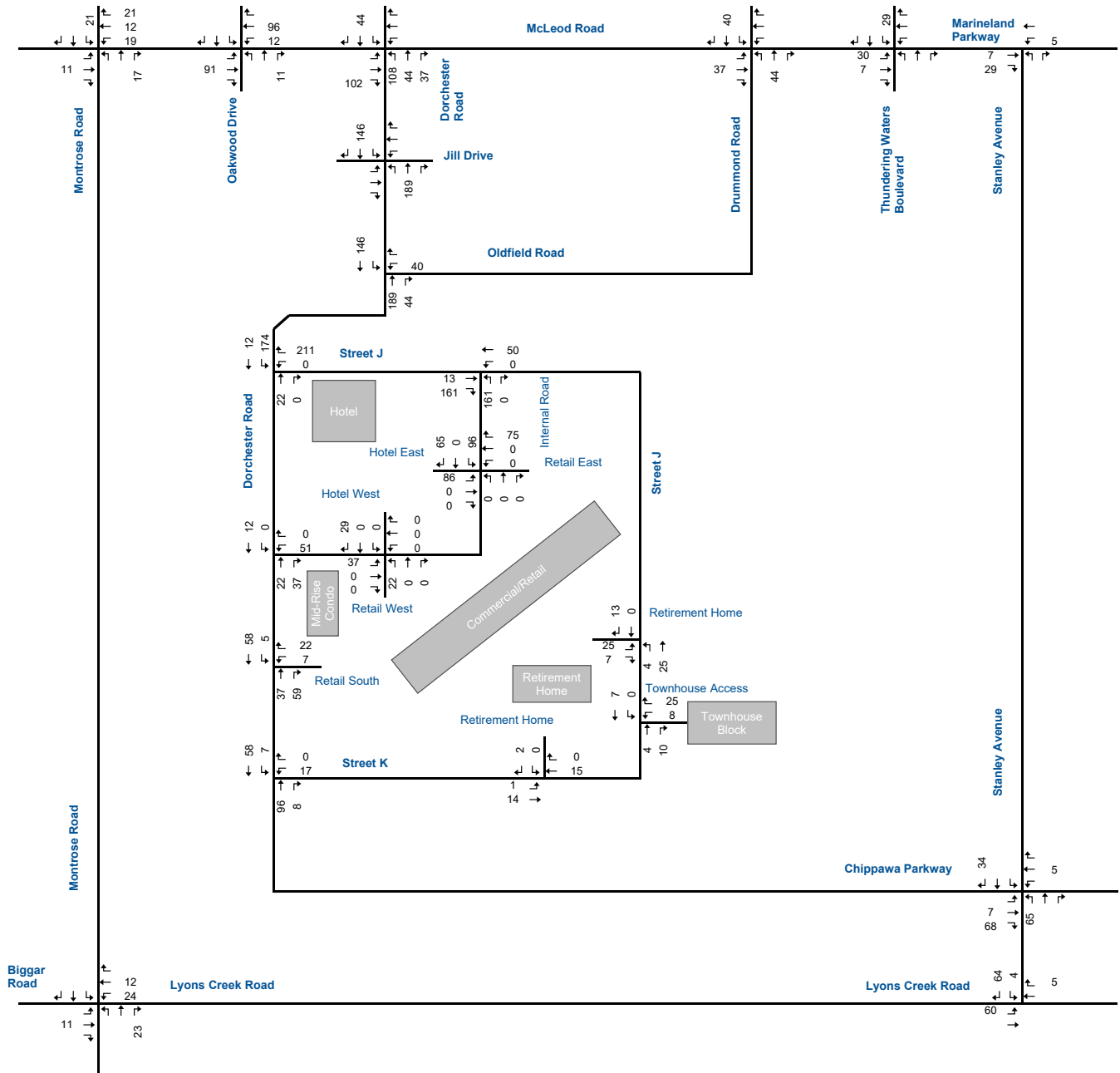
The distribution is based on the Niagara Region travel demand model (EMME Software). The 2041 auto and transit trip matrices were used to determine the geographic distribution of trips to and from the Riverfront Community Lands.

Using the trip generation data and the trip distribution, development traffic was assigned to the adjacent road network. **Figure 3.2** illustrate the site traffic assignment.

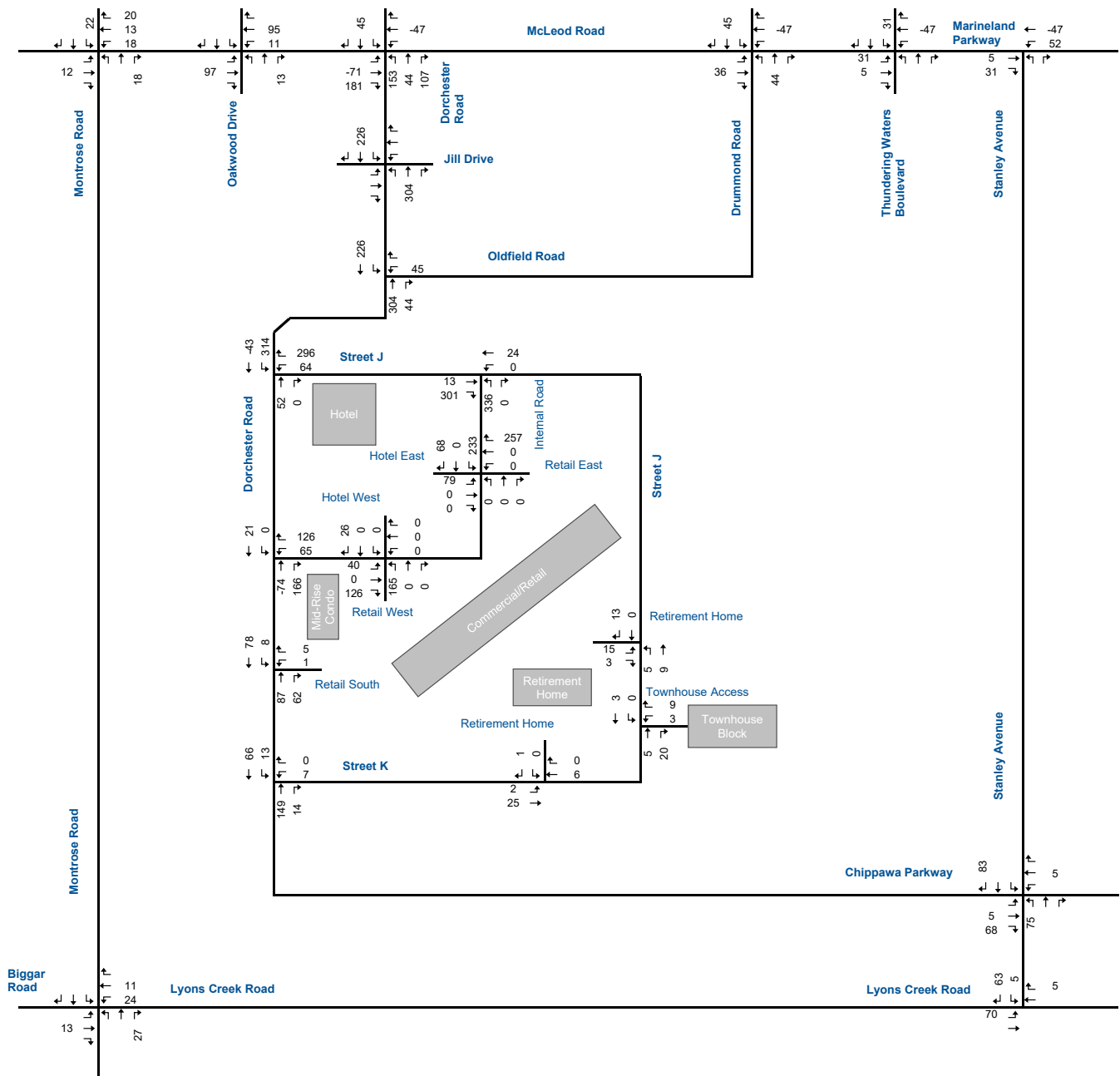
TABLE 3.5: TRIP DISTRIBUTION

Trip Distribution Zone	Distribution
West (McLeod)	4%
North (Montrose)	7%
North (QEW)	14%
North (Dorchester)	14%
North (Drummond)	14%
North (Stanley)	10%
East (Marineland)	2%
East (Chippawa Parkway)	2%
East (Lyons Creek)	2%
South (QEW)	9%
South (Montrose)	8%
West (Biggar)	4%
Internal North (Walmart site via Dorchester-McLeod-Oakwood)	4%
Internal North (Retail lands south of McLeod via Dorchester-McLeod-Montrose)	6%
Total	100%

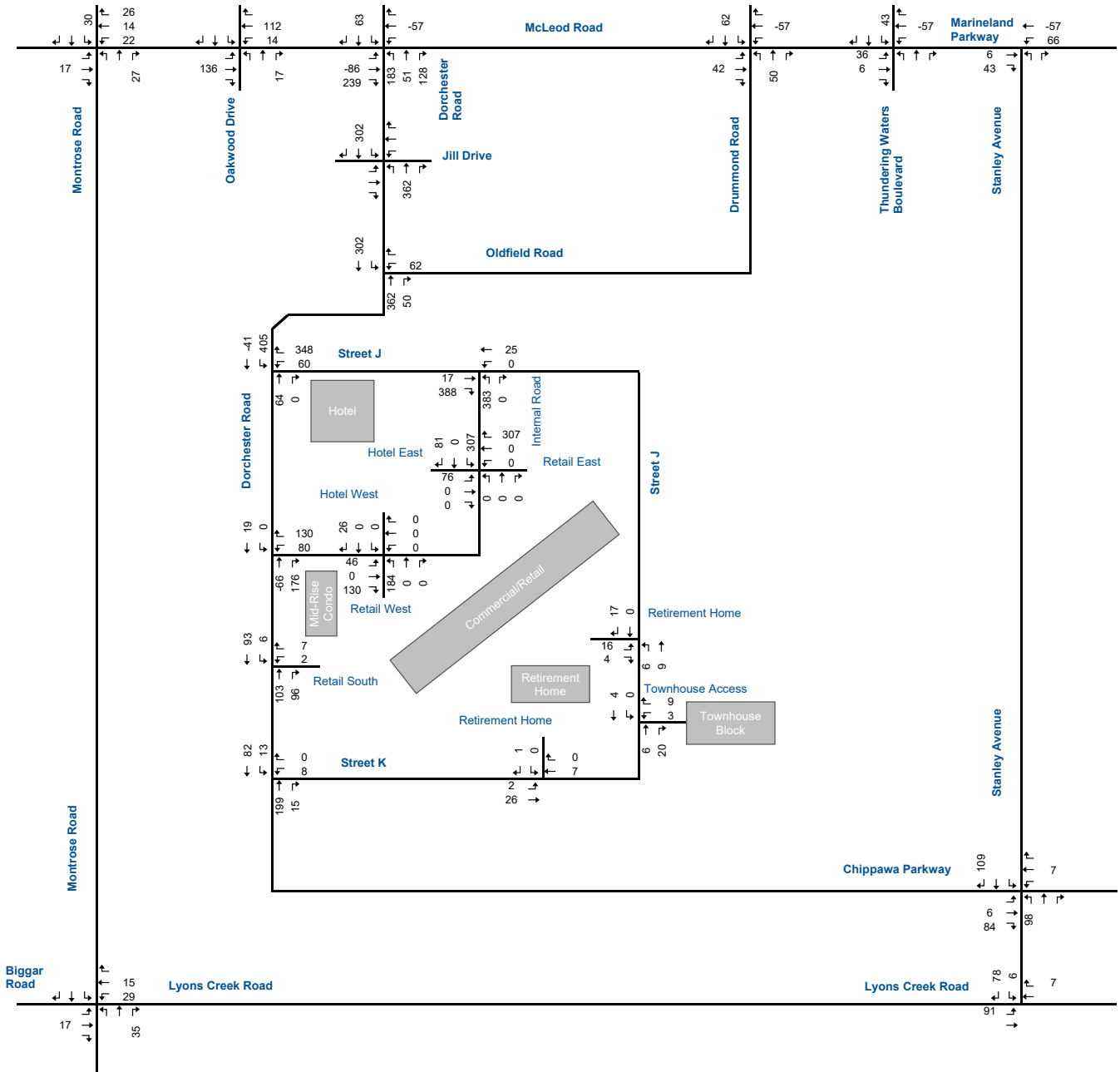




Site Generated Traffic Volumes Weekday AM Peak Hour



Site Generated Traffic Volumes Weekday PM Peak Hour



Site Generated Traffic Volumes Saturday Peak Hour

4 Future Conditions

To be consistent with the terms of reference established, a horizon year of 2031, five-years after full occupancy have been used for traffic forecasting and analyses purposes.

4.1 Traffic Forecasts

Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in demographics. A frequently used procedure is to estimate an annual percentage increase and apply that increase to the study area traffic volumes. An alternative approach is to identify estimated traffic generated by specific planned significant developments that would be expected to affect the project study area roadways. For this assessment, both methods have been utilized.

4.1.1 General Growth Rate

Based on the terms of reference established, a general growth rate of 2.0% was applied to the area roadways to account for population and employment growth.

As per comments received from the City, a general growth rate of 1.0% was applied to study area intersections south of McLeod Road and west of Stanley Avenue. This includes the intersections of Dorchester Road and Jill Drive, Dorchester Road and Oldfield Road, and Montrose Road and Lyons Creek Road/Biggar Road.

4.1.2 Site-Specific Growth

Traffic associated with specific area developments planned or under construction was added to develop the background traffic projections. **Table 4.1** outlines the developments included in the background traffic projections. The projections for these sites have been taken from the respective studies completed. **Appendix E** contains the projections from the area growth developments.

The site traffic contribution for the development of Riverfront Phase 1 + Block 12 (industrial lands) represents a conservative approach (i.e., errs on the high side), as the associated site traffic contribution was estimated based on maximum residential unit densities. It is understood that the most recent site plan for Riverfront Phase 1 indicates a reduced number of dwelling units.



TABLE 4.1: SITE-SPECIFIC DEVELOPMENTS

ID	Development	Land Use	Units	GFA (square feet)
A	Riverfront Phase 1 + Block 12	Residential	918	-
B	8970 & 9015 Stanley Ave	Residential	1,344	-
C	Niagara Village Subdivision	Mixed-Use	1,134	101,010
D	5500 Marineland Parkway	Residential	292	-
E	Portage Road	Res	653	-

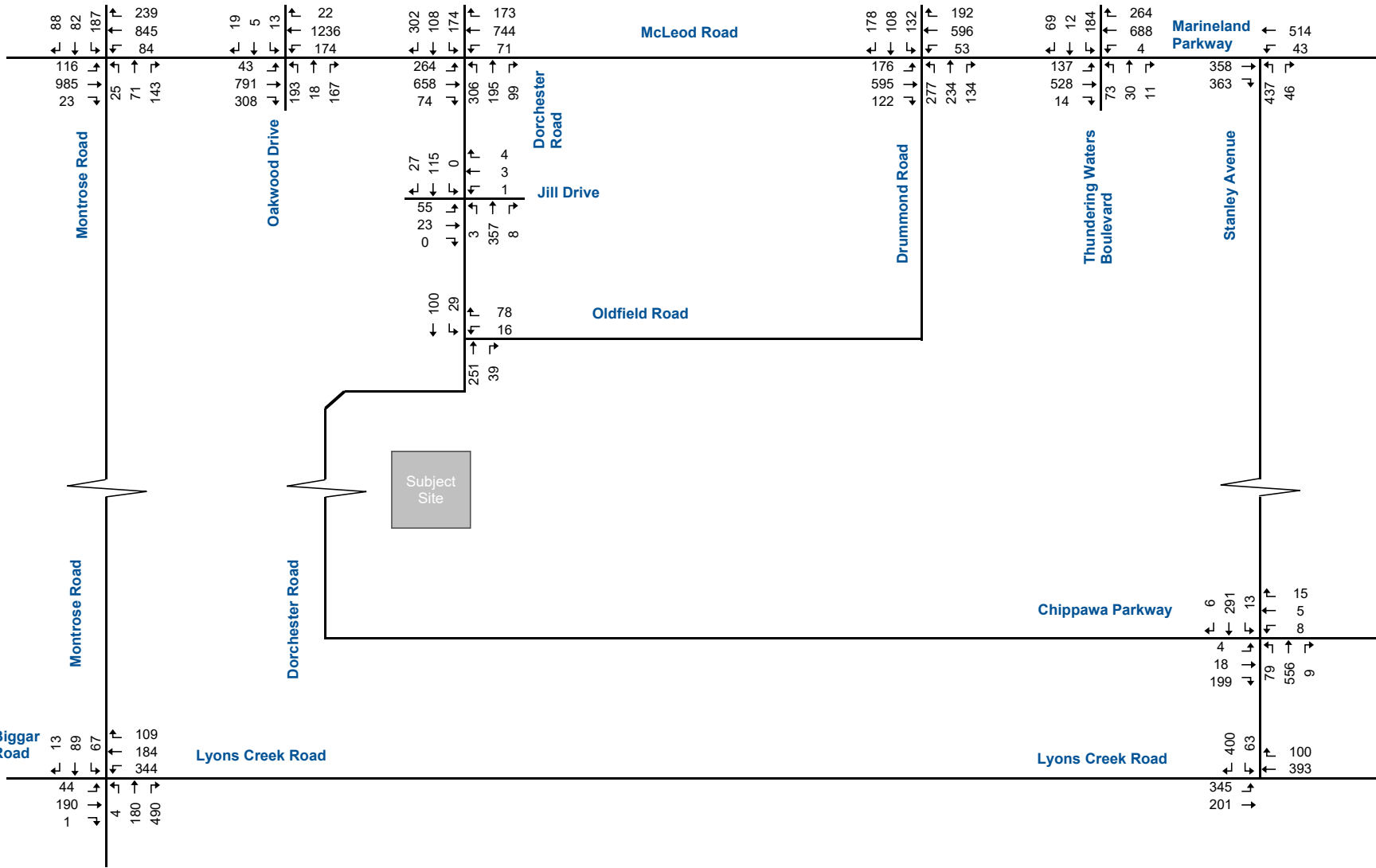
4.1.3 Background Projections

The forecast background traffic volumes within the study area are estimated to consist of generalized background traffic growth and other planned developments. **Figure 4.1** illustrates the forecasted background traffic volumes.

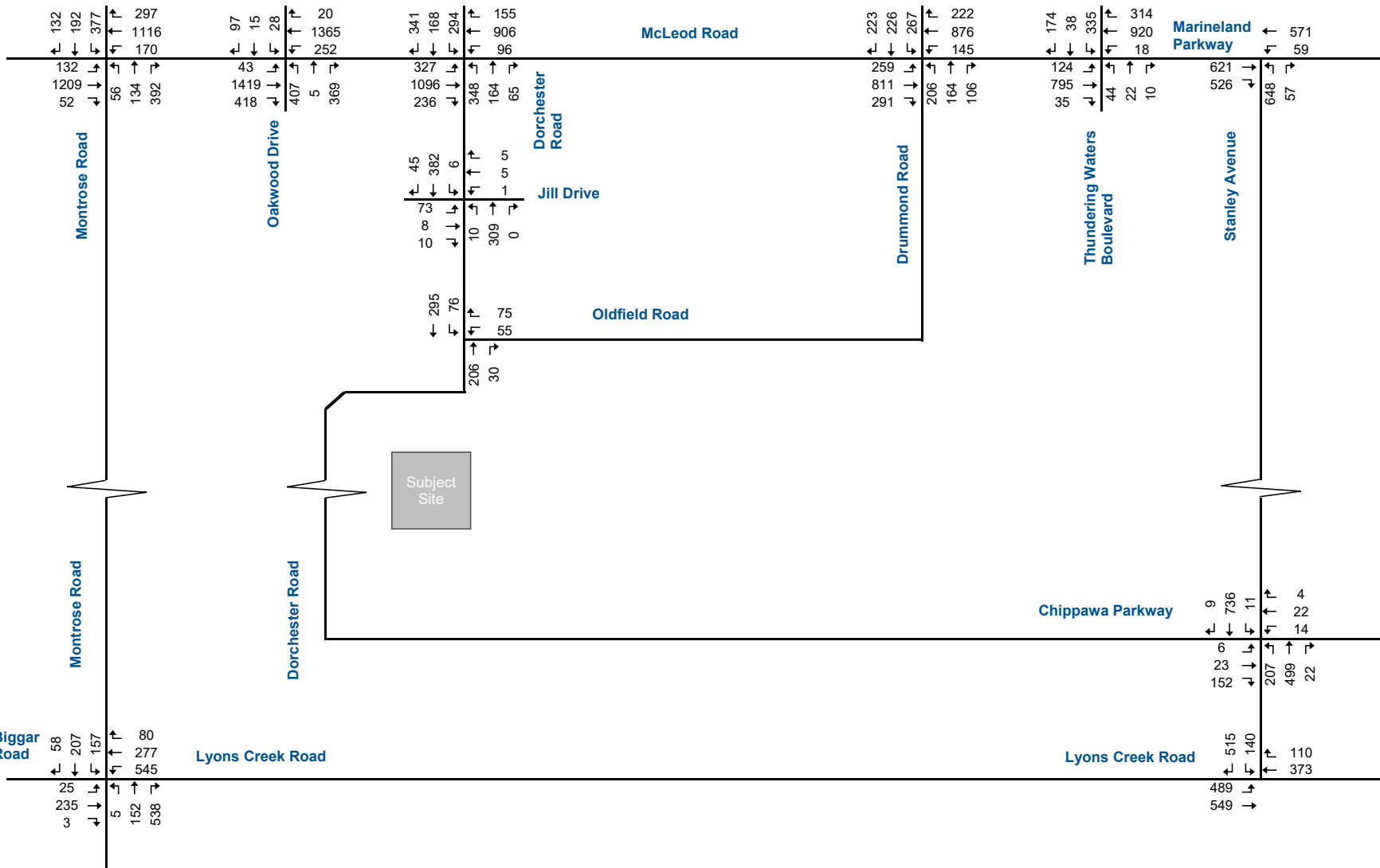
4.1.4 Total Projections

The forecast total traffic volumes within the study area are estimated to consist of generalized background traffic growth, other planned developments, and development traffic. **Figure 4.2** illustrates the forecasted total traffic volumes.

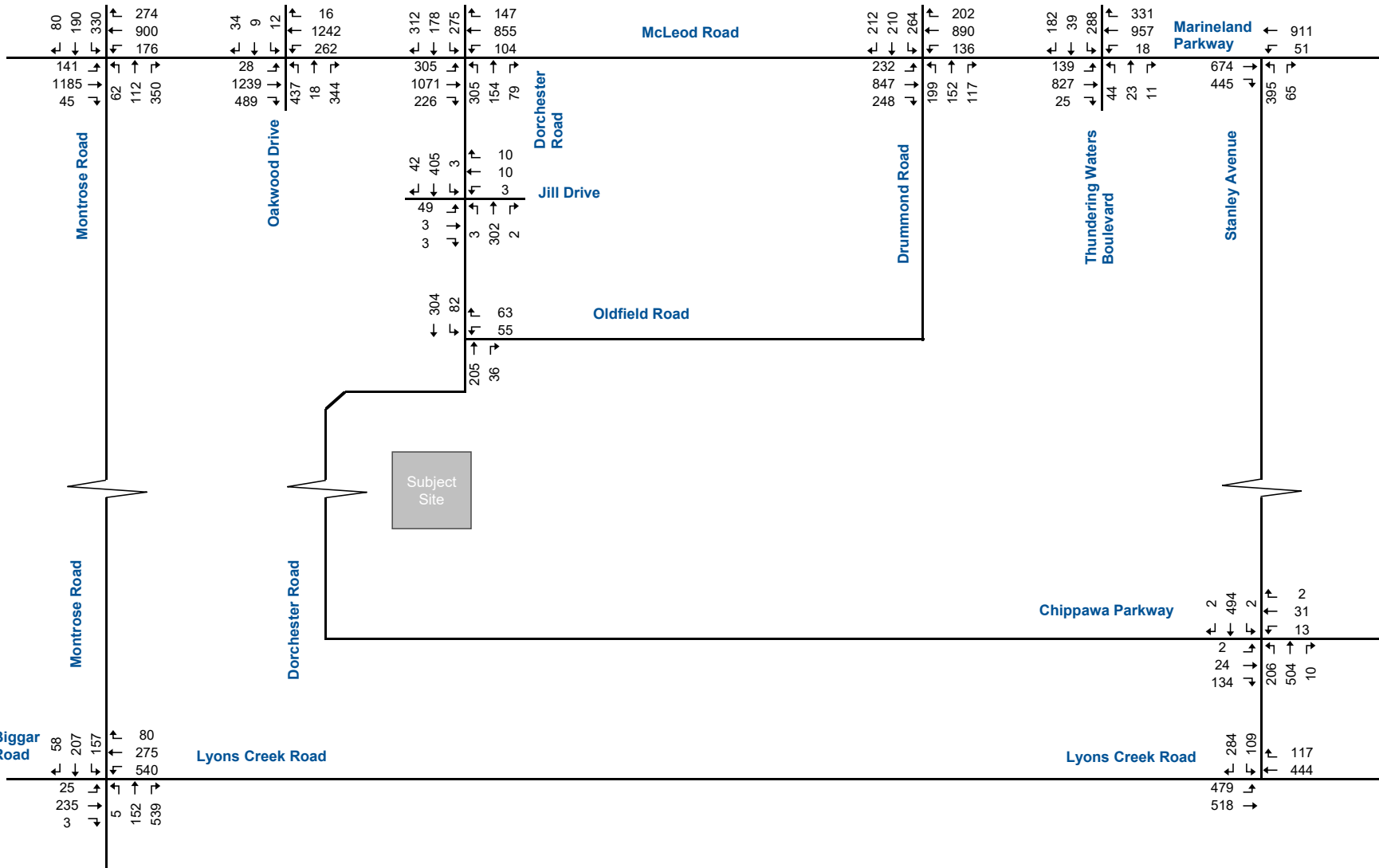




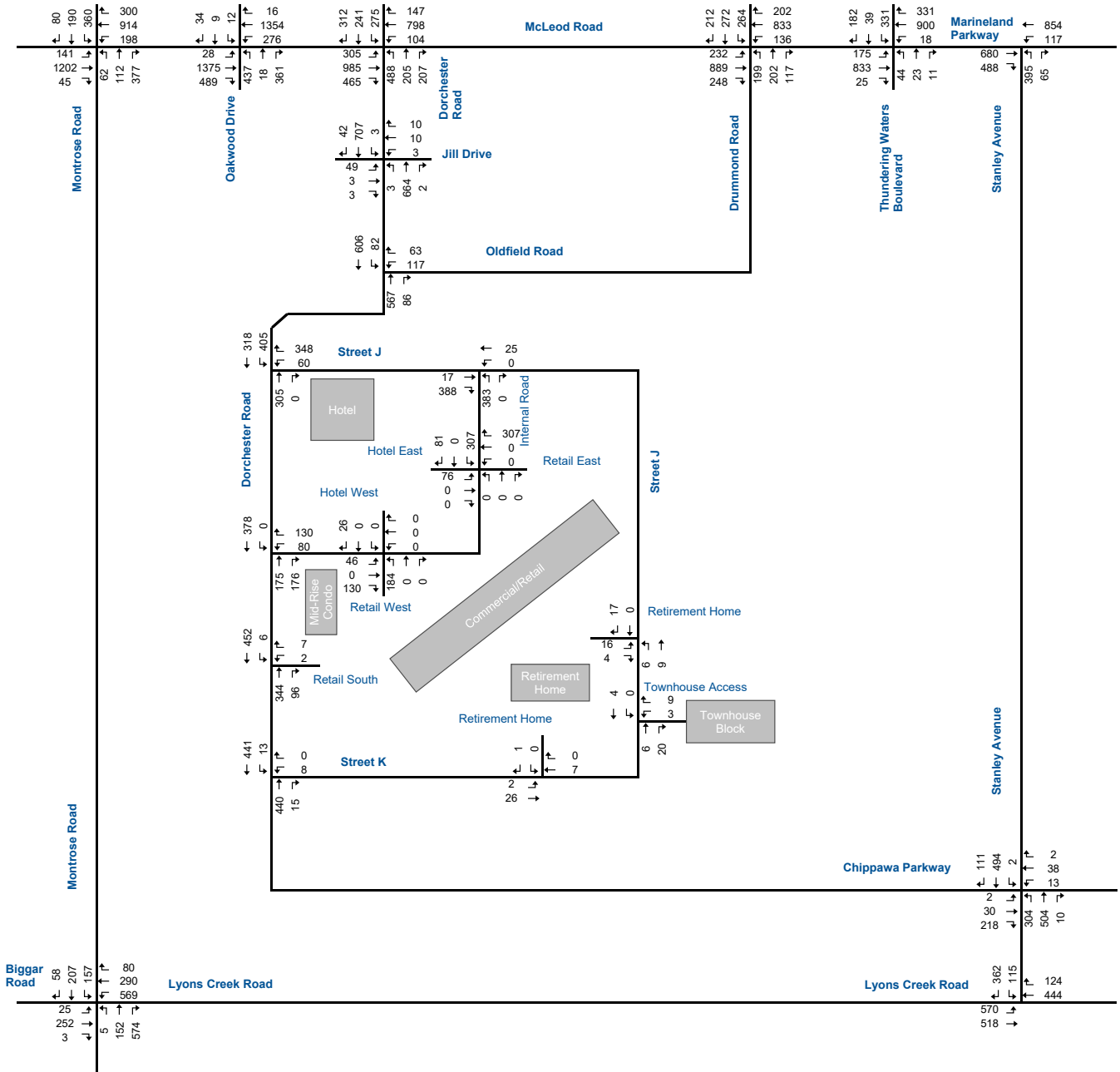
Future Background Traffic Volumes Weekday AM Peak Hour



Future Background Traffic Volumes Weekday PM Peak Hour



Future Background Traffic Volumes Saturday Peak Hour



Future Total Traffic Volumes Saturday Peak Hour

4.2 Dorchester Road Improvements

The City recently reconstructed Dorchester Road between McLeod Road and Oldfield Road. It remains a two-lane cross-section with a bike lane in each direction.

Additionally, the intersection of Dorchester Road and Oldfield Road is undergoing a Municipal Class Environmental Assessment (EA) to evaluate road improvement options to address future travel demands.

This EA recommends the all-way stop control remain at the intersection of Dorchester Road and Oldfield Road, however, a dedicated northbound left turn lane and southbound right turn lane be provided. These improvements have been assumed for the future horizon.

4.3 Montrose Road Improvements

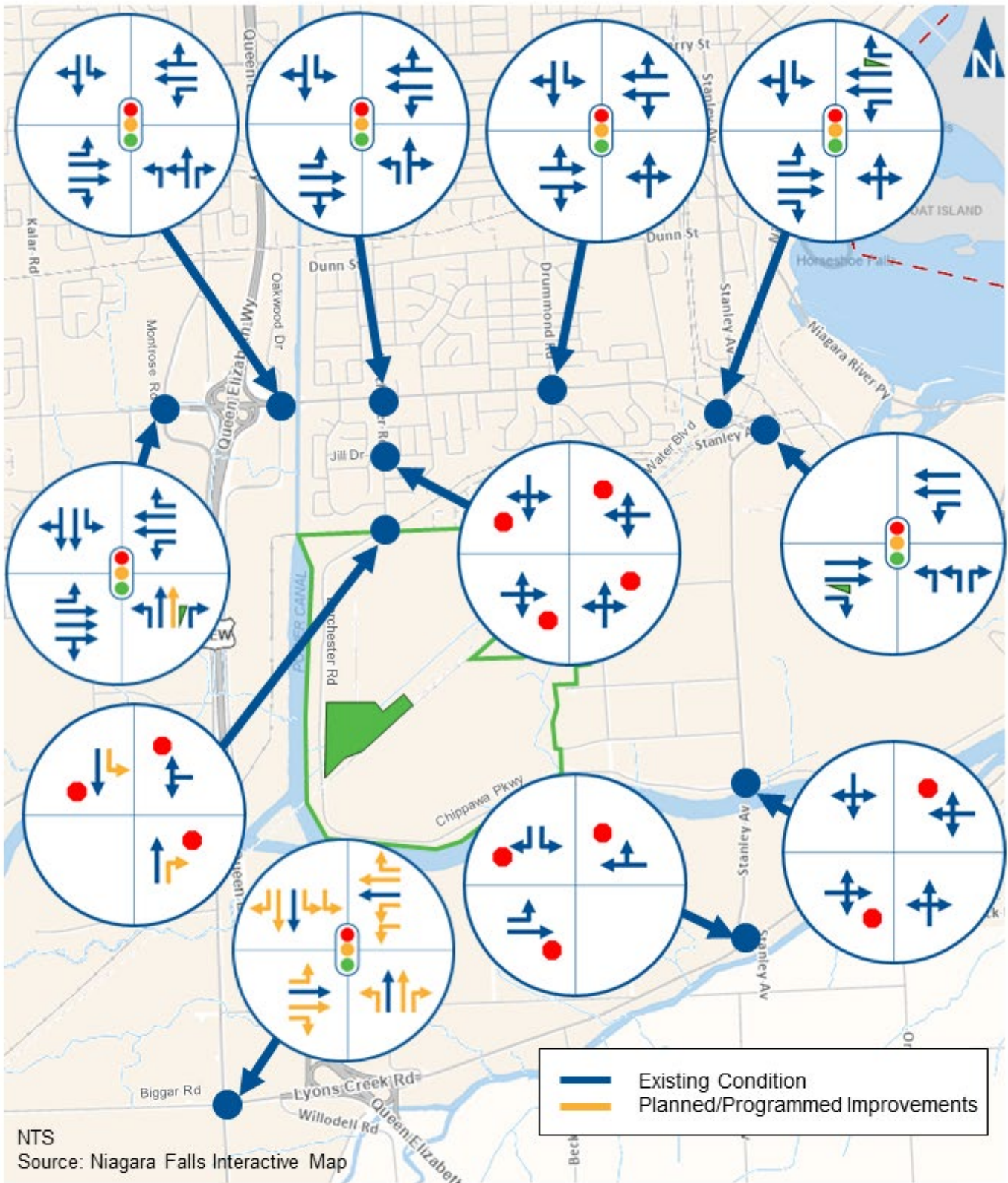
Niagara Region completed an EA in June 2020 to evaluate road improvements for Montrose Road (Regional Road 98) and Lyons Creek Road (Regional Road 47)/Biggar Road in Niagara Falls.

The study recommendations included widening Montrose Road from two to four lanes to support the planned growth in the area as well as intersection improvements. The following intersection improvements have been assumed for the future horizon:

- ▶ Montrose Road at McLeod Road will be widened to operate with an additional northbound lane providing for a four-lane cross-section for all approaches at the intersection. The intersection will continue to operate with traffic control signals; and
- ▶ Montrose Road at Lyons Creek Road/Biggar Road will be widened to operate with an additional through lane for all approaches, separate right turn lane for all approaches, separate left turn lanes for the eastbound and northbound approaches and dual left turn lanes for the southbound and westbound approaches. The intersection will continue to operate with traffic control signals.

Figure 4.3 illustrates the future lane configuration for the study area intersections.





Future Lane Configuration and Traffic Control

5 Analysis

Measuring existing traffic volumes and projecting future traffic volumes quantifies traffic within the study area. To assess the quality of flow, roadway capacity analysis was conducted with respect to base year conditions and projected background and total conditions. The capacity analysis indicates how well the roadway facilities serve the traffic demands. Calculated levels of service classify roadway operating conditions.

5.1 Level of Service Criteria

Level of service (LOS) denotes the different operating conditions on a given roadway segment under various traffic volume loads. It is a qualitative measure that indexes the operational qualities of a roadway segment or an intersection with designations ranging from LOS A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

For this study, an overall LOS of between A-C is classified as tolerable delays, overall, LOS D-E is classified as increased delays and an overall LOS F is classified as Significant Delays.

5.2 Intersection Capacity Analysis

The evaluation criteria for analyzing signalized and unsignalized intersections are based on the 2000 Highway Capacity Manual (HCM)⁴ utilizing Synchro 11.

Table 5.1 - 5.3 summarizes the capacity analyses for the study area intersections for the base year and the 2031 future horizon years for the weekday AM, PM, and Saturday peak hours, respectively.

Appendix F includes the capacity analysis results.

⁴ Transportation Research Board, Highway Capacity Manual, Washington, D.C. 2003.



TABLE 5.1A: WEEKDAY AM PEAK HOUR OPERATIONS (BASE)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 34 0.60 30 55 25	D 35 0.57 89 -	> > > >	D 35	A 8 0.35 4 155 151	C 23 0.69 116 -	D 44 0.12 -	C 26	C 25 0.05 8 115 107	C 25 0.10 0.09 -	C 25	C 20 0.25 33 130 97	> > > >	C 20	C 29 0.44			
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	B 15 0.24 4 50 46	B 17 0.51 95 -	D 38 0.20 66 -	C 23	C 25 0.50 35 80 45	C 34 0.68 133 -	> > > >	C 33	D 37 0.22 36 95 59	D 37 0.22 36 -	C 35 0.10 16 -	D 36	D 48 0.05 9 20 11	> > > >	D 48	C 30 0.43		
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	C 22 0.68 56 55 -1	B 19 0.35 69 -	> > > >	C 20	C 21 0.15 15 40 25	C 29 0.55 121 -	> > > >	C 28	E 59 0.83 48 15 -33	D 39 0.43 52 -	> > > >	D 49	C 34 0.35 27 30 3	D 53 0.77 88 -	> > > >	D 49	C 33 0.71	
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	A 10 0.47 46 -	> > > >	A 10	< < < < <	A 9 0.29 30 -	> > > >	A 9	< < < < <	F 81 0.96 107 -	> > > >	F 81	C 32 0.33 29 20 -9	C 32 0.37 44 -	> > > >	C 32	C 24 0.64	
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	C 20 0.08 11 60 49	B 19 0.20 38 -	B 17 0.00 0 50 50	B 19	C 21 0.00 2 25 23	C 25 0.29 57 -	C 23 0.14 17 64	C 24	< < < < <	D 37 0.04 10 -	> > > >	D 37	D 54 0.57 57 -	D 46 0.04 11 -	> > > >	D 53	C 27 0.28	
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.		C 25 0.33 26 -	C 24 0.14 15 65 51	C 24	C 23 0.08 6 105 99	C 27 0.54 41 -		C 27	A 5 0.09 9 160 151	A 5 0.02 3 80 77		A 5						C 22 0.21
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	B 19 0.32 43 -	> > > >	B 19	< < < < <	E 57 0.96 156 -	> > > >	E 57	< < < < <	C 25 0.70 113 -	> > > >	C 25	< < < < <	B 17 0.34 35 -	> > > >	B 17	C 34 0.82	
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	A 8 0.12 15 -	> > > >	A 8	< < < < <	A 8 0.01 10 -	> > > >	A 8	< < < < <	A 9 0.20 23 -	> > > >	A 9	< < < < <	A 8 0.12 18 -	> > > >	A 8	A 8	
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.					A 7 0.09 20 -			A 7		A 7 0.02 12 -		A 7	< < < < <	A 8 0.09 15 -			A 8	A 7
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	B 11 0.03 1 -	> > > >	B 11	< < < < <	B 11 0.04 1 -	> > > >	B 11	< < < < <	A 1 0.01 0 -	> > > >	A 1	< < < < <	A 1 0.01 0 -	> > > >	A 1	A 2	
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	B 11 0.37 24 55 31	A 8 0.18 18 -		B 10		B 11 0.39 25 -		B 11					A 9 0.04 10 25 15		A 9 0.20 24 -		A 9	B 10

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

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

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

RBT - Roundabout
 <- - Shared Left-turn
 >- - Shared Right-turn



TABLE 5.1B: WEEKDAY AM PEAK HOUR OPERATIONS (BACKGROUND)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 33 0.65 30 55 25	C 32 0.60 101 -	> > > >	C 32	B 12 0.50 3 155 152	B 18 0.73 145 -	C 32 0.18 21 -	C 20	C 31 0.07 10 115 105	C 30 0.08 14 -	C 31 0.12 16 -	C 30	C 27 0.43 54 130 76	C 25 0.11 17 -	> > > >	C 26	C 27 0.57	
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	D 40 0.40 9 50 41	B 20 0.62 132 -	D 43 0.23 70 -	C 27	C 27 0.66 38 80 42	D 36 0.85 198 -	> > > >	D 35	D 51 0.39 47 95 48	D 51 0.39 48 -	D 45 0.12 20 -	D 48	D 44 0.04 9 20 11	D 44 0.03 9 -	> > > >	D 44	C 34 0.58	
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 115 1.08 124 55 -69	C 32 0.63 109 -	> > > >	D 54	C 30 0.39 20 40 20	F 86 1.05 186 -	> > > >	F 82	F 135 1.15 141 15 -126	D 37 0.61 97 -	> > > >	F 87	C 34 0.61 46 30 -16	E 73 0.94 153 -	> > > >	E 62	E 70 1.09	
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	F 164 1.28 181 -	> > > >	F 164	< < < < <	D 47 0.95 141 -	> > > >	D 47	< < < < <	F 273 1.52 285 -	> > > >	F 273	C 22 0.44 39 20 -19	B 19 0.37 49 -	> > > >	B 20	F 132 1.45	
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	C 34 0.68 44 60 16	C 25 0.40 78 -	B 20 0.01 0 50 50	C 26	C 29 0.02 4 25 21	D 42 0.71 137 -	C 32 0.21 23 80 57	D 39	< < < < <	D 42 0.29 46 -	> > > >	D 42	D 54 0.66 75 -	D 43 0.10 17 -	> > > >	D 51	D 36 0.59	
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.		C 23 0.42 35 -	C 22 0.29 18 65 47	C 23	C 22 0.25 13 105 92	C 25 0.60 51 -		C 25	A 8 0.27 29 160 131	A 6 0.04 5 80 75		A 8						B 19 0.38
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 31 0.27 16 130 114	C 28 0.33 23 -	C 28 0.00 0 120 120	C 29	D 36 0.72 43 150 107	B 14 0.15 15 -	B 15 0.09 9 225 217	C 26	B 19 0.01 3 80 77	B 19 0.19 23 -	C 24 0.37 30 60 30	C 23	D 36 0.33 12 80 68	B 12 0.07 9 -	B 13 0.01 0 50 50	C 21	C 25 0.42	
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	A 10 0.16 19 -	> > > >	A 10	< < < < <	A 9 0.02 8 -	> > > >	A 9	< < < < <	B 15 0.62 62 -	> > > >	B 15	< < < < <	A 10 0.25 20 -	> > > >	A 10	B 13	
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.					A 9 0.14 19 -		> > > >	A 9	A 9 0.39 23 -	A 0 0.05 18 15		A 9	A 8 0.05 16 -	A 0 0.16 12 15		A 8	A 9	
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	E 36 0.75 49 -	> > > >	E 36	< < < < <	F 100 0.53 18 -	> > > >	F 100	< < < < <	A 3 0.10 3 -	> > > >	A 3	< < < < <	A 1 0.02 1 -	> > > >	A 1	D 11	
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	F 54 0.92 58 55 -3	C 17 0.50 65 -		E 40		F 126 1.18 347 -	> > > >	F 126					B 12 0.18 39 25 -14		F 63 0.98 136 -	F 56	F 73	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 <- - Shared Left-turn
 >- - Shared Right-turn

TABLE 5.1C: WEEKDAY AM PEAK HOUR OPERATIONS (TOTAL-1/2)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 33 0.66 30 55 25	C 33 0.62 105 -	> > > >	C 33	B 18 0.59 4 155 151	B 17 0.73 139 -	C 32 0.20 21 -	C 20	C 31 0.07 10 115 105	C 30 0.08 14 -	C 31 0.13 17 -	C 31	C 28 0.48 60 130 70	C 26 0.11 17 -	> > > >	C 27	C 27 0.6	
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	D 48 0.41 9 50 41	C 24 0.72 148 -	C 32 0.26 70 -	C 27	C 34 0.74 49 80 32	D 42 0.91 239 -	> > > >	D 41	D 51 0.39 47 95 48	D 51 0.39 48 -	D 45 0.13 21 -	D 48	D 44 0.04 60 20 11	D 44 0.03 9 -	> > > >	D 44	D 36 0.62	
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 176 1.24 131 55 -76	D 39 0.79 133 -	> > > >	E 72	D 38 0.58 21 40 19	F 108 1.11 193 -	> > > >	F 103	F 198 1.32 196 15 -181	D 35 0.68 120 -	> > > >	F 121	D 37 0.65 43 30 -13	F 114 1.09 192 -	> > > >	F 92	F 95 1.26	
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	F 200 1.36 193 -	> > > >	F 200	< < < < <	E 59 1.00 147 -	> > > >	E 59	< < < < <	F 339 1.67 312 -	> > > >	F 339	C 22 0.46 39 20 -19	B 20 0.45 63 -	> > > >	C 20	F 164 1.57	
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	D 49 0.82 76 60 -16	C 26 0.42 79 -	C 21 0.01 0 50 50	C 32	C 32 0.02 4 25 21	D 48 0.79 137 -	C 35 0.21 23 80 57	D 44	< < < < <	D 42 0.29 46 -	> > > >	D 42	E 55 0.71 87 -	D 42 0.10 17 -	> > > >	D 52	D 41 0.65	
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.		C 23 0.43 36 -	C 22 0.31 19 65 46		C 23	C 23 0.29 15 105 90	C 25 0.60 51 -	C 25	A 8 0.27 29 160 131	A 6 0.04 5 80 75		A 8						B 19 0.38
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 31 0.27 16 130 114	C 28 0.34 24 -	C 27 0.00 0 120 120	C 29	D 38 0.76 46 150 104	B 14 0.16 15 -	B 15 0.09 9 225 217	C 27	B 20 0.01 3 80 77	B 20 0.19 23 60 29	C 25 0.38 32 60 29	C 23	D 36 0.33 12 80 68	B 12 0.07 10 -	B 13 0.01 0 50 50	C 21	C 25 0.44	
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	B 11 0.19 44 -	> > > >	B 11	< < < < <	A 10 0.02 11 -	> > > >	A 10	< < < < <	F 58 1.01 541 -	> > > >	F 58	< < < < <	B 15 0.55 26 -	> > > >	B 15	E 40	
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.					B 11 0.26 86 -		> > > >	B 11	C 19 0.75 281 -	A 0 0.12 26 15	C 19		B 12 0.06 16 -	A 0 0.44 17 15			B 12	C 16
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	F 154 1.21 142 -	> > > >	F 154	< < < < <	F 615 1.64 43 -	> > > >	F 615	< < < < <	A 5 0.20 6 -	> > > >	A 5	< < < < <	A 1 0.02 1 -	> > > >	A 1	E 50	
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	F 96 1.09 75 55 -20	C 17 0.50 217 -		F 70	F 125 1.18 540 -	> > > >	F 125						B 13 0.19 46 25 -21	F 114 1.15 304 -		F 101	F 97	

TABLE 5.1D: WEEKDAY AM PEAK HOUR OPERATIONS (TOTAL-2/2)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																													
				Eastbound				Westbound				Northbound				Southbound				Overall													
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach														
AM Peak Hour	12 - Street J and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					B 13 0.33 11 -					>				B 13					A 0 0.20 0 -					A 0 0.15 4 -					A 6 A 6	B 5
	13 - Street J and Internal Road	TWSC	LOS Delay V/C Q Ex Avail.		A 0 0.11 0 -		>	A 0 0.00 0 -					<				A 0					B 10 0.21 6 -										A 4	
	14 - Internal Road and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					B 13 0.10 3 -					>				B 13					A 0 0.22 0 -					A 0 0.00 0 -					A 0 A 0	A 1
	15 - Retail South Access and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					B 11 0.05 1 -					>				B 11					A 0 0.25 0 -					A 0 0.00 0 -					A 0 A 0	A 1
	16 - Street K and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					B 14 0.04 1					>				B 14					A 0 0.25 0					A 0 0.01 0					A 0 A 0	A 1
	17 - Street K and Retirement Home South Access	TWSC	LOS Delay V/C Q Ex Avail.	<	A 1 0.00 0 -		>	A 0 0.01 0 -					>				A 0									A 8 0.00 0					A 8 A 8	A 1	
	18 - Townhouse Access and Street J	TWSC	LOS Delay V/C Q Ex Avail.					A 9 0.03 1					>				A 9					A 0 0.01 0					A 0 0.00 0					A 0 A 0	A 5
	19 - Retirement Home North Access and Street J	TWSC	LOS Delay V/C Q Ex Avail.	A 9 0.04 1				A 9					<									A 1 0.00 0					A 0 0.01 0					A 0 A 0	A 4
	20 - Hotel West Access/Retail West Access and Internal Road	TWSC	LOS Delay V/C Q Ex Avail.	<	A 7 0.02 1 -		>	A 7					<				A 0					A 10 0.03 1					A 8 0.03 1					A 8 A 8	A 8
	21 - Hotel East Access/Retail East Access and Internal Road	TWSC	LOS Delay V/C Q Ex Avail.	<	B 13 0.17 5 -		>	B 13					<				A 9					A 0 0.00 0					A 5 0.06 2					A 5 A 5	A 8

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWS - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-turn
 > - Shared Right-turn

TABLE 5.2A: WEEKDAY PM PEAK HOUR OPERATIONS (BASE)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
PM Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	D 52 0.76 43 55 12	D 40 0.69 108 -- --	> > > > > >	D 41	D 51 0.84 38 155 118	C 31 0.88 157 -- --	C 25 0.20 19 -- --	C 32	C 28 0.14 14 115 101	C 30 0.20 40 -- --	C 31 0.28 34 -- --	C 30	C 22 0.45 56 130 74	C 23 0.17 26 -- --	> > > > > >	C 23	C 33 0.64	
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	C 28 0.32 5 50 45	D 35 0.88 180 -- --	C 25 0.38 76 -- --	C 32	E 63 0.88 74 80 6	D 38 0.79 164 -- --	> > > > > >	D 43	D 41 0.42 66 95 29	D 40 0.41 65 -- --	D 37 0.21 23 -- --	D 39	D 49 0.10 14 20 6	D 49 0.12 20 -- --	> > > > > >	D 49	D 38 0.6	
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	C 33 0.81 74 55 -19	C 23 0.52 105 -- --	> > > > > >	C 26	C 24 0.16 12 40 28	C 34 0.64 139 -- --	> > > > > >	C 33	F 160 1.19 101 15 -86	D 36 0.32 44 -- --	> > > > > >	F 112	C 32 0.33 30 30 0	D 54 0.80 100 -- --	> > > > > >	D 49	D 44 0.93	
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < < <	B 14 0.71 80 -- --	> > > > > >	B 14	< < < < < <	B 10 0.43 52 -- --	> > > > > >	B 10	< < < < < <	F 89 0.97 92 -- --	> > > > > >	F 89	D 38 0.54 50 20 -30	D 37 0.59 75 75 --	> > > > > >	D 38	C 25 0.81	
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	C 25 0.20 17 60 43	C 24 0.27 50 -- --	C 21 0.01 0 50 50	C 24	C 27 0.03 7 25 18	C 33 0.45 84 -- --	C 28 0.16 19 80 61	< < < < < <	C 31	< < < < < <	D 37 0.04 10 -- --	> > > > > >	D 37	E 55 0.71 87 -- --	D 41 0.08 16 -- --	> > > > > >	D 52	C 33 0.4
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.	< < < < < <	C 26 0.56 44 -- --	C 22 0.11 12 65 53	> > > > > >	C 25	C 23 0.18 9 105 96	C 25 0.49 39 -- --	> > > > > >	C 25	A 6 0.17 18 160 142	A 5 0.02 3 80 77	> > > > > >	A 6	< < < < < <	< < < < < <	< < < < < <	C 20 0.28	
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < < <	B 18 0.24 33 -- --	> > > > > >	B 18	< < < < < <	F 260 1.49 292 -- --	> > > > > >	F 260	< < < < < <	C 21 0.55 77 -- --	> > > > > >	C 21	< < < < < <	D 39 0.85 132 -- --	> > > > > >	D 39	F 126 1.15	
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < < <	A 9 0.13 15 -- --	> > > > > >	A 9	< < < < < <	A 8 0.02 9 -- --	> > > > > >	A 8	< < < < < <	A 9 0.25 21 -- --	> > > > > >	A 9	< < < < < <	A 9 0.25 19 -- --	> > > > > >	A 9	A 9	
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < < <	< < < < < <	> > > > > >	< < < < < <	A 8 0.11 19 -- --	> > > > > >	A 8 0.11 16 -- --	> > > > > >	A 8	A 8 0.11 16 -- --	> > > > > >	A 8	< < < < < <	A 8 0.17 12 -- --	> > > > > >	A 8	A 8	
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < < <	B 12 0.09 2 -- --	> > > > > >	B 12	< < < < < <	B 14 0.05 1 -- --	> > > > > >	B 14	< < < < < <	A 1 0.01 0 -- --	> > > > > >	A 1	< < < < < <	A 0 0.01 0 -- --	> > > > > >	A 0	A 2	
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	B 11 0.25 22 55 33	B 12 0.45 23 -- --	> > > > > >	B 12	B 12 0.35 23 -- --	> > > > > >	B 12	> > > > > >	B 12	< < < < < <	A 10 0.14 12 25 13	> > > > > >	A 10 0.14 12 25 13	< < < < < <	B 12 0.43 28 -- --	> > > > > >	B 11	B 12

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-turn
 > - Shared Right-turn

TABLE 5.2B: WEEKDAY PM PEAK HOUR OPERATIONS (BACKGROUND)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
PM Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	D 47 0.79 45 55 10	C 35 0.71 130 -	> > > >	D 36	D 51 0.83 45 155 110	D 37 0.84 196 -	C 23 0.27 18 -	D 36	D 37 0.22 20 115 96	D 38 0.17 25 -	D 50 0.62 86 -	D 46	E 60 0.91 136 130 -6	C 32 0.25 35 -	> > > >	D 47	D 39 0.87	
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	C 27 0.31 4 50 46	D 36 0.92 249 -	C 22 0.43 58 -	C 32	E 77 0.93 99 80 -19	C 23 0.75 179 -	> > > >	C 31	E 71 0.78 99 95 -4	E 70 0.77 97 -	D 52 0.39 46 -	E 62	E 59 0.21 18 20 2	E 59 0.19 23 -	> > > >	E 59	D 38 0.83	
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 172 1.24 148 55 -93	F 81 1.07 243 -	> > > >	F 99	E 56 0.76 99 40 5	F 89 1.07 202 -	> > > >	F 87	F 183 1.27 158 15 -143	D 35 0.46 71 -	> > > >	F 125	D 38 0.74 74 30 -44	F 120 1.11 203 -	> > > >	F 90	F 97 1.23	
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	F 420 3.03 301 -	> > > >	F 420	< < < < <	F 358 1.96 272 -	> > > >	F 358	< < < < <	F 567 2.16 195 -	> > > >	F 567	E 58 0.90 112 20 -92	C 32 0.71 118 -	> > > >	D 42	F 347 2.06	
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	D 37 0.70 38 60 23	C 25 0.53 103 -	B 18 0.02 0 50 50	C 26	C 28 0.09 10 25 15	D 42 0.79 172 -	C 30 0.30 38 80 42	D 39	< < < < <	D 50 0.27 34 -	> > > >	D 50	E 67 0.88 146 -	D 39 0.25 34 -	> > > >	E 56	D 38 0.73	
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.		C 22 0.58 52 -	C 20 0.39 18 65 47	C 21	C 21 0.38 16 105 89	C 21		C 21	B 11 0.38 49 160 111	A 8 0.04 6 80 74		B 10						B 18 0.46
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 33 0.16 11 130 119	C 33 0.41 31 0 -	C 31 0.00 120 120	C 33	D 38 0.79 68 82	B 13 0.19 19 -	B 14 0.06 6 225 219	C 28	C 26 0.02 4 80 76	C 26 0.19 22 60 23	C 32 0.41 37 60 23	C 31	D 40 0.53 34 80 46	B 16 0.16 24 5 45	B 17 0.04 5 50 45	C 25	C 29 0.52	
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	B 10 0.17 42 -	> > > >	B 10	< < < < <	A 9 0.02 12 -	> > > >	A 9	< < < < <	B 13 0.50 283 -	> > > >	B 13	< < < < <	C 16 0.65 22 -	> > > >	C 16	B 14	
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.					A 10 0.22 21 -			A 10	A 10 0.36 57 -	A 0 0.05 18 15		A 10	B 11 0.14 14 15	A 0 0.50 14 15			B 11	B 11
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	F 315 1.50 114 -	> > > >	F 315	< < < < <	F 1367 2.94 53 -	> > > >	F 1367	< < < < <	A 7 0.31 10 -	> > > >	A 7	< < < < <	A 0 0.01 0 -	> > > >	A 0	G 69	
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	F 131 1.19 62 55 -7	F 144 1.23 489 -		F 138	F 75 1.03 573 -			F 75					B 14 0.34 43 25 -18	F 90 1.08 188 -		F 74	F 105	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 <- - Shared Left-turn
 >- - Shared Right-turn



TABLE 5.2C: WEEKDAY PM PEAK HOUR OPERATIONS (TOTAL-1/2)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
PM Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	D 48 0.79 44 55 11	D 36 0.73 132 -	> > > >	D 37	E 63 0.89 53 155 102	C 34 0.85 193 -	B 20 0.29 15 -	C 35	D 37 0.22 20 115 96	D 38 0.17 25 -	D 53 0.68 99 -	D 48	E 72 0.96 155 130 -25	C 32 0.25 35 -	> > > >	D 54	D 41 0.91	
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	C 29 0.34 3 50 47	D 39 0.96 267 -	C 21 0.43 52 -	C 35	F 86 0.96 109 80 -29	C 23 0.78 193 -	> > > >	C 32	F 83 0.86 106 95 -11	F 81 0.84 104 -	E 59 0.54 63 -	E 71	E 59 0.21 18 20 2	E 59 0.19 23 -	> > > >	E 59	D 41 0.87	
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 264 1.46 159 55 -104	F 172 1.28 289 -	> > > >	F 189	E 56 0.76 35 40 5	F 87 1.06 193 -	> > > >	F 84	F 352 1.67 242 15 -227	D 42 0.72 119 -	> > > >	F 218	D 49 0.87 82 30 -52	F 137 1.16 227 -	> > > >	F 106	F 154 1.54	
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	F 477 3.10 314 -	> > > >	F 477	< < < < <	F 353 1.94 263 -	> > > >	F 353	< < < < <	F 677 2.41 221 -	> > > >	F 677	E 60 0.92 113 20 -93	C 32 0.76 134 -	> > > >	D 42	F 380 2.25	
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	D 37 0.74 46 60 14	C 24 0.52 104 -	B 17 0.02 0 50 50	C 26	C 28 0.09 11 25 14	D 41 0.76 170 -	C 30 0.28 36 80 44	D 38	< < < < <	E 58 0.37 36 -	> > > >	E 58	E 58 0.85 146 -	D 35 0.21 29 -	> > > >	D 50	D 37 0.75	
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.		C 21 0.56 46 -	B 20 0.42 16 65 49	C 20	C 32 0.68 30 105 76	B 20 0.47 38 -		C 22	B 11 0.40 55 160 105	A 9 0.04 7 80 73		B 11						B 18 0.51
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 33 0.16 11 130 119	C 33 0.42 33 -	C 31 0.00 0 120 120	C 33	D 38 0.80 71 150 79	B 13 0.20 19 -	B 13 0.06 6 225 219	C 28	C 26 0.02 4 80 76	C 33 0.19 43 60 17	C 31	D 41 0.56 35 80 45	B 17 0.17 24 -	B 17 0.04 5 50 45	> > > >	C 26	C 29 0.54	
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	B 12 0.21 50 -	> > > >	B 12	< < < < <	B 11 0.03 10 -	> > > >	B 11	< < < < <	F 70 1.05 581 -	> > > >	F 70	< < < < <	F 84 1.09 40 -	> > > >	F 84	F 73	
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.					B 14 0.38 140 -		> > > >	B 14	F 56 1.01 521 -	A 0 0.13 29 15	F 56	F 60 0.16 16 -	A 0 1.03 19 15	F 60	F 53			
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	F Err Err Err -	> > > >	F Err	< < < < <	F Err Err Err -	> > > >	F Err	< < < < <	B 11 0.45 19 -	> > > >	B 11	< < < < <	A 0 0.01 0 -	> > > >	A 0	H Err	
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	F 197 1.36 63 55 -8	F 144 1.23 484 -		F 171	F 77 1.04 608 -	> > > >	F 77	F 77					B 15 0.35 43 25 -18	F 137 1.22 546 -	F 113	F 133		

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 <- - Shared Left-turn
 >- - Shared Right-turn



TABLE 5.2D: WEEKDAY PM PEAK HOUR OPERATIONS (TOTAL-2/2)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall																	
				Eastbound				Westbound				Northbound				Southbound																					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach																		
PM Peak Hour	12 - Street J and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					F 81 1.01 98 -					>	>	>	>	F 81					A 0 0.18 0 -					<	<	<	<	A 6 0.27 9 -					A 6	E 26
	13 - Street J and Internal Road	TWSC	LOS Delay V/C Q Ex Avail.		A 0 0.20 0 -		>	>	>	>	>	A 0					A 0	B 14 0.46 20 -					>	>	>	>	B 14										A 7
	14 - Internal Road and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					B 14 0.35 12 -					>	>	>	>	B 14					A 0 0.21 0 -					<	<	<	<	A 0 0.00 0 -					A 0	A 3
	15 - Retail South Access and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					B 12 0.01 0 -					>	>	>	>	B 12					A 0 0.25 0 -					<	<	<	<	A 0 0.01 0 -					A 0	A 0
	16 - Street K and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					C 17 0.03 1					>	>	>	>	C 17					A 0 0.25 0					<	<	<	<	A 0 0.01 0					A 0	A 0
	17 - Street K and Retirement Home South Access	TWSC	LOS Delay V/C Q Ex Avail.	<	A 1 0.00 0 -		>					A 0				>	>	>	>	A 0									A 8 0.00 0		>	>	>	A 8	A 1		
	18 - Townhouse Access and Street J	TWSC	LOS Delay V/C Q Ex Avail.					A 9 0.01 0					>	>	>	>	A 9					A 0 0.02 0					<	<	<	<	A 0 0.00 0					A 0	A 3
	19 - Retirement Home North Access and Street J	TWSC	LOS Delay V/C Q Ex Avail.	A 9 0.02 1			>									A 9					<	A 2 0.00 0					<	A 0 0.01 0		>	>	>	A 0	A 4			
	20 - Hotel West Access/Retail West Access and Internal Road	TWSC	LOS Delay V/C Q Ex Avail.	<	A 2 0.03 1 -		>	<				A 0				>	>	>	>	A 0	<	B 11 0.24 8					<	B 11	<	A 8 0.03 1		>	>	>	A 8	A 7	
	21 - Hotel East Access/Retail East Access and Internal Road	TWSC	LOS Delay V/C Q Ex Avail.	<	E 38 0.45 17 -		>	<				A 10				>	>	>	>	A 10	<	A 0 0.00 0					<	A 0	<	A 6 0.16 4		>	>	>	A 6	A 12	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 <- - Shared Left-turn
 >- - Shared Right-turn

TABLE 5.3A: SAT PEAK HOUR OPERATIONS (BASE)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
Saturday Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	E 59 D 0.83 Q 48 Ex 55 Avail. 7	D 42 > 0.74 > 113 > -- > --	> > > > > > > >	D 44	F 82 E 0.96 C 61 D 125 R 24	C 27 C 0.78 C 125 C 24	D 41 > 0.16 > 24	D 37	C 27 C 0.15 C 16 C 115 C 99	C 29 > 0.18 > 36 > -- > --	C 29	C 22 C 0.40 C 49 C 130 C 81	C 23 > 0.17 > 28 > -- > --	C 23	D 36 0.61		
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	C 21 E 0.19 C 3 Ex 50 Avail. 47	C 28 > 0.78 > 140 > -- > --	D 47 > 0.36 > 99 > -- > --	C 34	E 61 C 0.88 C 80 C 148 R 0	C 34 > 0.71 > 148 > -- > --	D 39	D 42 D 0.46 D 74 D 95 D 21	D 40 > 0.46 > 23 > -- > --	D 40	D 48 D 0.05 D 9 D 20 D 11	D 48 > 0.06 > 13 > -- > --	D 48	D 37 0.59			
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	C 28 E 0.75 C 63 Ex 55 Avail. -8	C 22 > 0.49 > 101 > -- > --	D 24 > 0.36 > 99 > -- > --	C 24	C 23 E 0.18 C 14 C 132 R 40 R 26	C 32 > 0.60 > 132 > -- > --	C 31	F 96 D 1.00 D 77 D 15 D -62	D 31 > 0.32 > 44 > -- > --	E 70	C 33 D 0.29 D 27 D 30 D 3	D 52 > 0.79 > 97 > -- > --	D 48	D 37 0.82			
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < B 12 > 0.61 > 64 > -- > --	> > > > > > > >	B 12	< < A 10 > 0.39 > 48 > -- > --	> > > > > > > >	A 10	< < D 45 > 0.68 > 67 > -- > --	> > > > > > > >	D 45	D 36 D 0.49 D 45 D 20 D -25	D 34 > 0.47 > 59 > -- > --	C 35	B 19 0.65				
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	C 23 E 0.23 C 20 Ex 60 Avail. 40	C 22 > 0.27 > 53 > -- > --	B 19 > 0.00 > 0 > 50 > 50	C 22	C 25 C 0.03 C 7 C 93 R 25 R 19	C 31 > 0.46 > 20 > 80 > 60	C 29	< < D 37 > 0.04 > 10 > -- > --	D 37	D 54 D 0.63 D 70 D -- D --	D 44 > 0.09 > 16 > -- > --	D 51	C 31 0.38				
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.	< < B 21 > 0.46 > 0.07 > 41 > -- > --	> > > > > > > >	B 20	< < B 18 > 0.10 > 0.64 > 6 > 59 > 105 > 99	> > > > > > > >	C 23	< < A 8 > 0.08 > 11 > 160 > 149	> > > > > > > >	A 8	< < D 4 > 80 > 76	< < D 4 > 80 > 76	< < D 4 > 80 > 76	C 20 0.3				
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	< < B 18 > 0.24 > 33 > -- > --	> > > > > > > >	B 18	< < F 260 > 1.49 > 292 > -- > --	> > > > > > > >	F 260	< < C 21 > 0.55 > 77 > -- > --	> > > > > > > >	C 21	< < D 39 > 0.85 > 132 > -- > --	< < D 39 > 0.85 > 132 > -- > --	D 39	F 126 1.15				
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < A 8 > 0.07 > 14 > -- > --	> > > > > > > >	A 8	< < A 8 > 0.03 > 12 > -- > --	> > > > > > > >	A 8	< < A 9 > 0.21 > 19 > -- > --	> > > > > > > >	A 9	< < A 9 > 0.25 > 18 > -- > --	< < A 9 > 0.25 > 18 > -- > --	A 9	A 9				
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < B 10 > 0.06 > 1 > -- > --	> > > > > > > >	B 10	< < B 12 > 0.05 > 1 > -- > --	> > > > > > > >	B 12	< < A 1 > 0.01 > 0 > -- > --	> > > > > > > >	A 1	< < A 0 > 0.00 > 0 > -- > --	< < A 0 > 0.00 > 0 > -- > --	A 0	A 2				
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	A 9 A 0.21 A 17 Q 55 Ex 38	A 10 > 0.37 > 20 > -- > --	A 10	< < B 12 > 0.41 > 28 > -- > --	> > > > > > > >	B 12	< < A 9 > 0.09 > 10 > 25 > 15	> > > > > > > >	A 9	< < A 8 > 0.12 > 10 > -- > --	< < A 8 > 0.12 > 10 > -- > --	A 8	B 10				

MOE - Measure of Effectiveness
 LOS - Level of Service
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 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-turn
 > - Shared Right-turn



TABLE 5.3B: SAT PEAK HOUR OPERATIONS (BACKGROUND)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
Saturday Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	F 80 0.93 69 55 -14	D 50 0.90 172 -- --	> > > > >	D 53	E 57 0.86 54 155 101	D 41 0.85 164 -- --	C 31 0.25 14 -- --	D 41	C 33 0.21 20 115 95	C 32 0.13 21 -- --	D 37 0.35 38 -- --	D 35	D 36 0.75 99 130 31	C 27 0.22 34 -- --	> > > > >	C 32	D 43 0.81	
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	B 17 0.19 2 50 48	C 27 0.85 206 -- --	C 30 0.49 104 -- --	C 28	E 77 0.94 104 80 -24	B 20 0.68 156 -- --	> > > > >	C 30	E 76 0.84 114 95 -19	E 75 0.83 114 -- --	D 49 0.30 36 -- --	E 64	E 57 0.10 10 20 10	E 58 0.10 15 -- --	> > > > >	E 58	D 36 0.82	
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 106 1.06 128 55 -73	E 78 1.06 236 -- --	> > > > >	F 84	E 58 0.78 39 40 1	F 96 1.08 194 -- --	> > > > >	F 93	F 105 1.06 128 15 -113	D 35 0.46 71 -- --	> > > > >	E 75	C 34 0.69 68 30 -38	F 103 1.06 194 -- --	> > > > >	E 79	F 84 1.08	
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	F 299 1.87 262 -- --	> > > > >	F 299	< < < < <	F 234 1.45 236 -- --	> > > > >	F 234	< < < < <	F 382 1.75 215 -- --	> > > > >	F 382	D 54 0.86 102 20 -82	C 30 0.64 100 -- --	> > > > >	D 39	F 240 1.71	
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	D 45 0.77 46 60 14	C 26 0.54 110 -- --	B 18 0.02 0 50 50	C 28	C 29 0.10 11 25 14	D 44 0.82 186 -- --	C 32 0.31 40 80 40	< < < < <	D 41	< < < < <	D 46	D 57 0.78 108 -- --	D 42 0.27 35 -- --	> > > > >	D 50	D 38 0.69		
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.		B 18 0.52 50 -- --	B 16 0.33 15 65 50	B 17	B 16 0.30 13 105 92	C 21	B 21 0.70 73 -- --		C 21	B 12 0.27 32 160 128	B 11 0.05 7 80 73	B 12						B 18 0.47
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 33 0.16 11 130 119	C 33 0.41 31 0 -- --	C 31 0.00 0 120 120	C 33	D 36 0.77 65 150 85	B 13 0.19 18 -- --	B 13 0.06 6 225 220	C 27	C 27 0.02 4 80 76	C 26 0.20 23 60 8	C 33 0.41 52 60 8	C 31	D 39 0.51 34 80 46	B 17 0.16 25 -- --	B 17 0.04 5 50 45	C 25	C 29 0.52	
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	A 10 0.10 22 -- --	> > > > >	A 10	< < < < <	A 9 0.04 17 -- --	> > > > >	A 9	< < < < <	B 11 0.43 108 -- --	> > > > >	B 11	< < < < <	B 14 0.60 24 -- --	> > > > >	B 14	B 13	
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.					A 10 0.22 17 -- --	> > > > >	A 10	> > > > >	A 10	B 10 0.39 26 -- --	A 0 0.06 19 15	B 10	B 12 0.16 14 -- --	A 0 0.55 15 15	> > > > >	B 12	B 11	
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	F 58 0.78 46 -- --	> > > > >	F 58	< < < < <	F 352 1.22 41 -- --	> > > > >	F 352	< < < < <	A 6 0.25 8 -- --	> > > > >	A 6	< < < < <	A 0 0.00 0 -- --	> > > > >	A 0	F 21	
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	F 82 1.05 69 55 -14	F 81 1.06 562 -- --		F 82	F 95 1.10 665 -- --	> > > > >	F 95	> > > > >	F 95				B 13 0.27 21 25 4	C 19 0.60 30 -- --	C 17	F 72		

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-turn
 > - Shared Right-turn



TABLE 5.3C: SAT PEAK HOUR OPERATIONS (TOTAL-1/2)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall		
				Eastbound				Westbound				Northbound				Southbound						
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach			
Saturday Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	D 46 0.80 52 55 3	D 40 0.81 151 -- --	> > > >	D 41	E 62 0.89 60 155 95	C 31 0.74 144 -- --	C 28 0.24 11 -- --	C 35	D 39 0.26 22 115 93	D 38 0.16 23 -- --	D 46 0.49 59 -- --	D 43	E 68 0.94 142 130 -12	C 32 0.26 38 -- --	> > > >	D 52	D 41 0.88		
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	C 21 0.23 2 50 48	D 37 0.96 256 -- --	C 25 0.53 107 -- --	C 34	F 81 0.95 113 80 -33	C 22 0.74 180 -- --	> > > >	C 32	E 76 0.84 114 95 -19	E 75 0.83 114 -- --	D 51 0.38 45 -- --	E 64	E 57 0.10 10 20 10	E 58 0.10 15 -- --	> > > >	E 58	D 39 0.86		
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 256 1.44 149 55 -94	F 158 1.25 285 -- --	> > > >	F 175	E 61 0.80 40 40 0	E 56 0.93 165 -- --	> > > >	E 56	F 327 1.61 234 15 -219	D 47 0.80 143 -- --	> > > >	F 199	E 57 0.90 90 30 -60	F 143 1.18 231 -- --	> > > >	F 115	F 141 1.5		
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	F 361 1.94 277 -- --	> > > >	F 361	< < < < <	F 268 1.73 231 -- --	> > > >	F 268	F < < < < <	F 466 1.94 184 -- --	> > > >	F 466	D 52 0.86 102 20 -82	C 30 0.69 117 -- --	> > > >	D 38	F 283 1.88		
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	D 38 0.75 50 60 10	C 23 0.51 102 -- --	B 16 0.02 0 50	C 25	C 27 0.09 11 25 14	D 40 0.75 168 -- --	C 30 0.29 35 80 45	> > > >	D 37	< < < < <	D 53 0.30 35 -- --	> > > >	D 53	E 61 0.84 134 -- --	D 40 0.25 35 -- --	> > > >	D 53	D 36 0.72	
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.		B 18 0.53 50 -- --	B 17 0.36 15 65 50	B 18	C 33 0.71 39 105 66	C 20 0.67 67 -- --			C 22	B 12 0.26 32 160 128	B 11 0.05 7 80 73		B 12						B 18 0.46
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 33 0.16 11 130 119	C 33 0.43 33 -- --	C 31 0.00 0 120 120	C 33	D 37 0.79 69 150 81	B 13 0.19 5 -- --	B 13 0.06 225 -- 220	> > > >	C 27	C 27 0.02 4 80 76	C 27 0.20 23 60 --	C 34 0.44 56 60 5	C 32	D 40 0.53 36 80 44	B 17 0.17 25 -- --	B 18 0.04 5 50 45	C 26	C 29 0.54	
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	B 11 0.12 30 -- --	> > > >	B 11	< < < < <	B 10 0.05 18 -- --	> > > >	B 10	< < < < <	F 63 1.02 590 -- --	> > > >	F 63	< < < < <	F 97 1.13 33 -- --	> > > >	F 97	F 77		
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.					C 15 0.43 173 --	> > > >	C 15	> > > >	C 15	F 122 1.23 564 --	A 0 0.17 30 15		F 122	F 153 0.19 16 --	A 0 1.31 33 15	> > > >	F 153	F 123	
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	F Err Err Err --	> > > >	F Err	< < < < <	F 32.30 Err -- --	> > > >	F Err	< < < < <	A 9 0.41 16 --	> > > >	A 9	< < < < <	A 0 0.00 0 --	> > > >	A 0	H Err		
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	F 177 1.31 63 55 -8	F 99 1.11 474 -- --		F 140	F 118 1.17 726 -- --	> > > >	F 118	> > > >	F 118					B 13 0.29 27 25 -2	D 28 0.77 39 -- --	C 25	F 108		

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 <- - Shared Left-turn
 >- - Shared Right-turn

TABLE 5.3D: SAT PEAK HOUR OPERATIONS (TOTAL-2/2)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall											
				Eastbound				Westbound				Northbound				Southbound															
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach												
Saturday Peak Hour	12 - Street J and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					F 209 1.35 176 -					F 209					A 0 0.20 0 -					A 0 0.36 13 -					F 63			
	13 - Street J and Internal Road	TWSC	LOS Delay V/C Q Ex Avail.		A 0 0.26 0 -											A 0 0.00 0 -					C 16 0.57 29 -									B 8	
	14 - Internal Road and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					C 16 0.40 15 -													A 0 0.22 0 -					A 0 0.00 0 -					A 4
	15 - Retail South Access and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					B 12 0.02 1 -													A 0 0.28 0 -					A 0 0.01 0 -					A 0
	16 - Street K and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					C 19 0.03 1													A 0 0.29 0					A 0 0.01 0					A 0
	17 - Street K and Retirement Home South Access	TWSC	LOS Delay V/C Q Ex Avail.	<	A 1 <																			A 8 0.00 0					A 8 >		
	18 - Townhouse Access and Street J	TWSC	LOS Delay V/C Q Ex Avail.					A 9 0.01 0													A 0 0.02 0					A 0 0.00 0					A 2
	19 - Retirement Home North Access and Street J	TWSC	LOS Delay V/C Q Ex Avail.	A 9 0.02 1																				A 3 0.00 0					A 3 0.01 0		
	20 - Hotel West Access/Retail West Access and Internal Road	TWSC	LOS Delay V/C Q Ex Avail.	<	A 2 <																			B 12 0.28 9					A 8 0.03 1		
	21 - Hotel East Access/Retail East Access and Internal Road	TWSC	LOS Delay V/C Q Ex Avail.	<	F 84 0.69 30																			A 0 0.00 0					A 7 0.21 6		

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-turn
 > - Shared Right-turn

5.2.1 McLeod Road at Montrose Road

Base Year Operations:	Increased Delays	●
Background Operations:	Increased Delays	●
Total Operations:	Increased Delays	●

At the intersection of McLeod Road and Montrose Road, the individual movements during weekday peak hours are operating at LOS D or better with a v/c ratio of no greater than 0.88. However, during the Saturday peak hour, the eastbound and westbound left turn movements operate at LOS E-F with a v/c ratio greater than 0.83.

There will be an increase in delay for left turn movements under the Background horizon. The southbound left turn movement is projected to operate at LOS E with a v/c ratio greater than 0.90 during the weekday PM peak hour. During the Saturday peak hour, the eastbound and westbound left turn movements are projected to operate in the LOS E-F range with a v/c ratio greater than 0.85. All other movements during peak hours are expected to operate efficiently at LOS D or better with a v/c ratio of no greater than 0.85.

Under the Total horizon, the left turn movements would experience further delays. Specifically, the southbound movement would degrade to LOS E with a v/c ratio of 0.96 during the weekday PM peak hour.

5.2.2 McLeod Road at Oakwood Drive

Base Year Operations:	Increased Delays	●
Background Operations:	Increased Delays	●
Total Operations:	Increased Delays	●

At the intersection of McLeod Road and Oakwood Drive, individual movements are currently performing satisfactorily during the weekday AM peak hour, with a v/c ratio of no more than 0.68, achieving a level of at least LOS D. However, during the weekday PM and Saturday peak hour, the westbound left turn movement is operating at a slightly lower level of LOS E, with a v/c ratio of 0.88.




Looking ahead to the Background horizon, there are projected delays for several movements during weekday PM and Saturday peak hours. Specifically, the left turn movements of the westbound northbound and southbound approaches, as well as the through movements for the northbound and southbound approaches, are anticipated to operate at LOS E with a v/c ratio no greater than 0.94.

With the Total horizon, there are projected capacity issues for several movements. Specifically, during the weekday PM peak hour, the



westbound left turn movement and northbound left and through movements are expected to degrade to LOS F with a v/c ratio of 0.96. During the Saturday peak hour, similar operations as noted under the Background horizon are anticipated, with the westbound left turn movement degrading to LOS F with a v/c ratio of 0.96.

5.2.3 McLeod Road at Dorchester Road




Base Year Operations:	Increased Delays	
Background Operations:	Significant Delays	
Total Operations:	Significant Delays	

The left turn for northbound traffic at the intersection of McLeod Road and Dorchester Road operates at a moderate level of service (LOS E) during the weekday AM peak hour, with a v/c ratio of 0.83. Additionally, during the weekday PM peak hour and on Saturdays, it operates at a poor LOS F with a v/c ratio over 1.00.

Several other movements are expected to exceed capacity under the Background horizon. Specifically, the left turn movements for eastbound and northbound traffic are projected to operate at a poor level (LOS F) with a v/c ratio exceeding 1.00 during peak hours. The through movements for eastbound, westbound, and southbound traffic will operate at either LOS E or F during peak hours, with a v/c ratio exceeding 1.00. Lastly, the left turn movement for westbound traffic will operate at a moderate LOS E with a v/c ratio of 0.78 during the weekday PM and Saturday peak hours.

Under the Total horizon, the problematic movements identified previously are projected to operate with even greater delays and capacity constraints.

5.2.4 McLeod Road at Drummond Road

Base Year Operations:	Tolerable Delays	
Background Operations:	Significant Delays	
Total Operations:	Significant Delays	

The intersection of McLeod Road and Drummond Road experiences heavy traffic during peak hours. During the weekday AM and PM peak hours, the northbound approach has a v/c ratio of 0.97, resulting in a LOS F grade. However, during the Saturday peak hour, individual movements operate at LOS D or better with a v/c ratio not exceeding 0.68.




All approaches are expected to operate at LOS F with a v/c ratio over 1.00, exceeding capacity in the Background horizon. The only



exception is the southbound through movement, which is projected to operate at LOS C or better with a v/c ratio no greater than 0.71.

Under the Total horizon, the problematic movements identified in the Background horizon are expected to experience further delays and capacity constraints.

5.2.5 Marineland Parkway and Thundering Waters Boulevard




Base Year Operations:	Tolerable Delays	
Background Operations:	Increased Delays	
Total Operations:	Increased Delays	

There are minor traffic concerns at the intersection of Marineland Parkway and Thundering Waters Boulevard. In the weekday PM peak hour, the southbound left turn operates at LOS E with a v/c ratio of 0.71. However, during the weekday AM peak hour and Saturday peak hour, all movements operate at LOS D with a v/c ratio no greater than 0.63.

These conditions are expected to continue under the Background horizon, but the southbound left turn movement is projected to operate at LOS E with a v/c ratio of 0.88 during the weekday PM peak hour under the Total horizon.

Additionally, the northbound approach is also projected to degrade to LOS E during the weekday PM peak hour with a v/c ratio no greater than 0.37 under the Total horizon.

5.2.6 Marineland Parkway and Stanley Avenue

Base Year Operations:	Tolerable Delays	
Background Operations:	Tolerable Delays	
Total Operations:	Tolerable Delays	

The intersection at Marineland Parkway and Stanley Avenue operates with uninterrupted flow of traffic during peak hours on both weekdays and Saturdays. Presently, all movements are operating at Level of Service C or better, with a v/c ratio of no more than 0.64.

Looking ahead to the future, projections indicate that similar operations will persist under the Background horizon, with all movements operating at LOS C or better and a v/c ratio of no more than 0.58.

Similarly, under the Total horizon, projections reveal that all movements will operate at LOS C or better, with a v/c ratio of no more than 0.71 for weekday and Saturday peak hours.



5.2.7 Montrose Road and Lyons Creek Road/Biggar Road

Base Year Operations:	Significant Delays	●
Background Operations:	Tolerable Delays	●
Total Operations:	Tolerable Delays	●

The intersection of Montrose Road and Lyons Creek Road/Biggar Road is heavily congested during peak hours, particularly on the westbound approach. The westbound approach operates at a low level of service (LOS E) with a v/c ratio greater than 0.95 during the weekday AM peak hour. Additionally, during the weekday PM peak hour and Saturday peak hour, the northbound approach operates at an even lower level of service (LOS F) with a v/c ratio exceeding 1.00.

Fortunately, the planned intersection improvements will result in individual movements operating at a higher level of service (LOS D) or better with a v/c ratio no greater than 0.83 during the weekday and Saturday peak hours.

Furthermore, under the Total horizon, similar operations are expected with all movements projected to operate at a higher level of service (LOS D) or better with a v/c ratio no greater than 0.80 during the weekday and Saturday peak hours.

5.2.8 Dorchester Road at Jill Drive

Base Year Operations:	Tolerable Delays	●
Background Operations:	Tolerable Delays	●
Total Operations:	Significant Delays	●

The Dorchester Road and Jill Drive intersection runs well during weekday and Saturday peak hours, with each individual movement receiving an excellent LOS A rating. Presently, the degree of utilization is not more than 0.25.

Projections under the Background horizon indicate that a minor drop in level of service (LOS C or better) for each individual movement during weekday and Saturday peak hours, with the degree of utilization not exceeding 0.65.

With increased traffic under the Total horizon, there will be some delays for northbound and southbound approaches. During the weekday AM peak hour, the northbound approach will perform at LOS F. Similarly, during the weekday PM and Saturday peak hours, the southbound approach will operate at LOS F, with the degree of utilization exceeding 1.00.



5.2.9 Dorchester Road at Oldfield Road

Base Year Operations:	Tolerable Delays	●
Background Operations:	Tolerable Delays	●
Total Operations:	Significant Delays	●

Currently, at the intersection of Dorchester Road and Oldfield Road, all individual movements are functioning well with a LOS A rating during peak hours on weekdays and Saturdays. The utilization degree is reported to be no higher than 0.21.

Future projections under the Background horizon indicate that all individual movements will operate at a LOS B rating or better during peak hours on weekdays and Saturdays. The utilization degree is expected to remain under 0.55.

There will be a noticeable increase in delays for northbound and southbound approaches in the Total horizon. During the weekday PM and Saturday peak hours, the northbound and southbound approach are expected to function at a LOS F rating. It is crucial to note that the utilization degree will exceed 1.00.

5.2.10 Chippawa Parkway at Stanley Avenue

Base Year Operations:	Tolerable Delays	●
Background Operations:	Significant Delays	●
Total Operations:	Significant Delays	●

The intersection of Chippawa Parkway and Stanley Avenue is currently experiencing acceptable operations, as individual movements are operating with a v/c ratio of no greater than 0.09, and LOS B or better during peak hours on weekdays and Saturdays.

However, it is anticipated that during the Background horizon, the eastbound and westbound stop-controlled approaches will operate at LOS E and F, respectively, with a v/c ratio exceeding 1.00, indicating that they will be over capacity during peak hours.

The Total horizon predicts even more significant delays and capacity constraints for the identified problematic movements during the Background horizon.



5.2.11 Lyons Creek Road at Stanley Avenue

Base Year Operations:	Tolerable Delays	●
Background Operations:	Significant Delays	●
Total Operations:	Significant Delays	●

The all-way stop intersection of Lyons Creek Road and Stanley Avenue is currently operating well during peak hours on weekdays and Saturdays with a utilization degree below 0.45, resulting in individual movements operating at LOS B or better.

The projected traffic under the Background Horizon during all peak hours for all approaches is expected to be problematic, leading to Significant Delays and an LOS of E or F. The degree of utilization is expected to surpass 1.00.

The Total horizon indicates that the problematic movements identified under the Background horizon will continue to face delays and capacity constraints.

5.2.12 Dorchester Road at Street J

Total Operations:	Increased Delays	●
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It is anticipated that during the weekday PM peak hour and Saturday peak hour, the intersection of Dorchester Road and Street J will operate at Level of Service E and F, respectively, for the stop-controlled westbound approach. The volume-to-capacity ratio is nearly 1.00.

5.2.13 Street J at Internal Road

Total Operations:	Tolerable Delays	●
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The stop-controlled approach at the intersection of Street J and the Internal Road is projected to operate at LOS B with a v/c ratio no greater than 0.57 during the weekday and Saturday peak hours.

5.2.14 Dorchester Road at Internal Road

Total Operations:	Tolerable Delays	●
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The stop-controlled approach at the intersection of Dorchester Road and the Internal Road is projected to operate at LOS C or better with a v/c ratio no greater than 0.40 during the weekday and Saturday peak hours.



5.2.15 Dorchester Road at Retail South Access

| Total Operations: | Tolerable Delays | ● |

The stop-controlled approach at the intersection of Dorchester Road and the Retail South Access is projected to operate at LOS B or better with a v/c ratio no greater than 0.28 during the weekday and Saturday peak hours.

5.2.16 Dorchester Road at Street K

| Total Operations: | Tolerable Delays | ● |

The stop-controlled approach at the intersection of Dorchester Road and Street K is projected to operate at LOS C or better with a v/c ratio no greater than 0.01 during the weekday and Saturday peak hours.

5.2.17 Street K at Retirement Home South Access

| Total Operations: | Tolerable Delays | ● |

The stop-controlled approach at the intersection of Dorchester Road and Street K is projected to operate at LOS A with a v/c ratio of 0.00 during the weekday and Saturday peak hours.

5.2.18 Street J at Townhouse Access

| Total Operations: | Tolerable Delays | ● |

The stop-controlled approach at the intersection of Street K and the Townhouse Access is projected to operate at LOS A with a v/c ratio of 0.03 during the weekday and Saturday peak hours.

5.2.19 Street J at Retirement Home North Access

| Total Operations: | Tolerable Delays | ● |

The stop-controlled approach at the intersection of Street K and the Townhouse Access is projected to operate at LOS A with a v/c ratio of 0.04 during the weekday and Saturday peak hours.

5.2.20 Internal Road at Hotel/Retail West Access

| Total Operations: | Tolerable Delays | ● |

The stop-controlled approach at the intersection of Internal Road at Hotel/Retail West Access is projected to operate at LOS B or better with a v/c ratio no greater than 0.28 during the weekday and Saturday peak hours.



5.2.21 Internal Road at Hotel/Retail East Access

| Total Operations: | Tolerable Delays | ● |

The southbound approach at the intersection of Internal Road and Hotel/Retail East Access is expected to operate well during the busiest times on weekdays and Saturdays. The projections indicate a v/c ratio no higher than 0.21, achieving a LOS A rating or better. Similarly, the northbound approach is anticipated to perform well during weekday peak hours, with a LOS A or better rating.

However, we expect the eastbound approach to drop to a LOS E-F rating during weekday PM and Saturday peak hours. Nonetheless, the analysis **suggests** that the eastbound approach will have a v/c ratio no greater than 0.69.

5.3 Roadway Classification Review

For the purposes of this study, the public roads have been reviewed with regard to the appropriateness of the roadway classifications as related to their projected volumes. The key streets serving the proposed development would have the following characteristics:

▶ Street J:

- Collector road that will connect to Dorchester Road, loop around the east portion of the development and connect with Street K. This Road will serve the overall development and provide access to future phases of the Riverfront Community.
- This road could have daily two-way traffic volumes of 6,000 vehicles per day. These volumes are appropriate for a collector roadway (i.e., well below the TAC guideline of 8,000 vehicles per day).

▶ Street K:

- Local road that will connect to Dorchester Road that will provide access to the retirement and townhouse units. Street K will bisect with Street J at the eastern terminus.
- This road could have daily two-way traffic volumes of 450 vehicles per day. These volumes are appropriate for a local commercial roadway (i.e., well below the TAC guideline of 3,000 vehicles per day).

▶ Internal Road:

- Local road that will connect to Dorchester Road and Street J that will provide access to retail and hotel components.



- This road could have daily two-way traffic volumes of 2,100 vehicles per day. These volumes are appropriate for a local commercial roadway (i.e., well below the TAC guideline of 3,000 vehicles per day).

5.4 Planning Capacity Guidelines

Planning capacities have been reviewed to determine the number of lanes that should be provided for each new roadway within the proposed development. As a general guideline, the following lane capacity based on vehicles per hour per lane (vphpl) is noted⁵:

- ▶ Arterial (Dorchester Road) – An appropriate planning capacity for this type of facility would generally be 900 vphpl.
- ▶ Collector (Street J) - An appropriate planning capacity for this type of facility would generally be 650 vphpl.
- ▶ Local (Street K and Internal Road) - An appropriate planning capacity for this type of facility would generally be 500 vphpl.

The use of appropriate planning capacities is an essential assumption; if higher planning capacities are used than what could be tolerated in the field, an underestimation of infrastructure needs could occur. Based on this, the following is noted concerning the future traffic volumes:

- ▶ Peak hour peak direction traffic volumes on Dorchester Road between Oldfield Road and Street K are approximately 300 to 700. The projected volumes are within the planning capacities for a two-lane cross-section.
- ▶ Peak hour peak direction traffic volumes on Street J between Dorchester Road and Street K are approximately 150 to 375. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.
- ▶ Peak hour peak direction traffic volumes on Street K between Dorchester Road and Street J are approximately 10 to 45. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.
- ▶ Peak hour peak direction traffic volumes on the Internal Road between Dorchester Road and Street J are approximately 50 to 340. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.

⁵ Sustainable Transportation Master Plan, Niagara Falls, Travel Demand Modelling, October 2011



5.5 Access Arrangement

The external and internal access points will comprise collector and local roads under the jurisdiction of the City of Niagara Falls (i.e. public roads) and private roads facilitating property access within the blocks. The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads⁶ was reviewed to determine the appropriateness of the access arrangement.

Preceding the analysis noted below, it can be summarized that the road system has been reviewed for general feasibility and found to be satisfactory.

5.5.1 Arterial Intersection Spacing (Dorchester Road)

Per the Geometric Design Guide for Canadian Roads, published by the Transportation Association of Canada (TAC), dated June 2017, the recommended minimum intersection spacing along an Arterial Road is 200 metres (Section 9.4.2.1). Accordingly, the Ontario Traffic Manual states that for an intersection/driveway to be considered for future signalization, a minimum spacing of 215 metres for roads posted at 60 km/h or less and up to 350 m for roads posted at 80 km/h is recommended between adjacent signalized intersections.

Additionally, it is recognized that characteristics of land parcels may not lend themselves to this level of spacing. As a result, reduced spacing of 100 metres could be considered acceptable subject to restricted movements implemented (right in/out). However, a spacing of 30 metres to 60 metres can also be considered if the spacing is not conducive due to physical or economic reasons.

Based on the proposed connections to Dorchester Road, the following is noted concerning intersection spacing:

- ▶ Street J at Dorchester Road is approximately 1.2 kilometres south of Dorchester Road and Oldfield Road and meets the minimum spacing requirements to permit a full movement connection and future signalization (if required).
- ▶ Street K at Dorchester Road is proposed to be 450 metres south of Street J and meets the minimum spacing requirements to permit a full movement connection and future signalization (if required).
- ▶ Internal Road at Dorchester Road is proposed to be 140 metres south of Street J and 300 metres north of Street K and would

⁶ Geometric Design Guide for Canadian Roads, Transportation Association of Canada, 2017



not meet the minimum spacing requirements for a full movement connection. As a result, it is recommended that the Internal Road to Dorchester Road be restricted to right in/out operations with stop control for the minor approach.

5.5.2 Collector Intersection Spacing (Street J)

Per the Geometric Design Guide for Canadian Roads, published by TAC, dated June 2017, the recommended minimum intersection spacing along a Collector Road is 60 metres (Section 9.4.2.2).

Based on the proposed connections to Street J, the following is noted concerning intersection spacing:

- ▶ Internal Road at Street J is located 160 metres east of Dorchester Road and Street J and meets the minimum spacing requirement along a collector road to permit full movements, however, does not meet the minimum requirement for potential signalization.

5.5.3 Driveway Spacing

TAC-GDGCR Chapter 8.8 (Corner Clearances at Major Intersection), Section 8.8.1 (General) states, "Corner clearance is the distance from an intersection to the nearest access upstream or downstream of it. Corner clearance is measured from the nearest curb of the cross roadway to the near edge of the access throat. It consists of three components: the curb return radius at the intersection, a length of a tangent, and the curb return radius or flare dimension at the driveway. Inadequate corner clearance between accesses and intersections along a major road, such as a major arterial, can create operational issues."

TAC-GDGCR has been reviewed to determine the sufficiency of the corner clearance from a major intersection.

As Dorchester Road is classified as an arterial roadway, the proposed driveway connections should be located at least 70 metres (curb radii to curb radii) from a signalized intersection and 35 metres from an unsignalized intersection. Based on the proposed driveway connections to Dorchester Road, the following is noted concerning spacing:

- ▶ Retail South Access at Dorchester Road is located 90 metres north of Dorchester Road and Street K and 170 metres south of Dorchester Road and Internal Road and meets the minimum spacing requirement along an arterial.



As Street J is classified as a collector roadway, the proposed driveway connections should be located at least 55 metres (curb radii to curb radii) from a signalized intersection and 25 metres from an unsignalized intersection. Based on the proposed driveway connections to Street J, the following is noted concerning spacing:

- ▶ Retail East Loading Area is located 170 metres east of Street J and the Internal Road and 45 metres north of Retirement Home North Access and Street J and meets the minimum spacing requirement along a collector.
- ▶ Retirement Home North Access is located 45 metres south of the Retail Loading Area and 25 metres north of Townhouse Access and Street J and meets the minimum spacing requirements along a collector given the adjacent connections are not expected to require signalization.

As Street K and the Internal Road are classified as local roadways, the proposed driveway connections should be at least 15 metres (curb radii to curb radii) from a signalized and unsignalized intersection. Based on the proposed driveway connections to Street K and the Internal Road, the following is noted concerning spacing:

- ▶ Retail West Access/Hotel West Access is located 60 metres east of Internal Road and Dorchester Road intersection and 110 metres west of the Internal Road and Retail East Access/Hotel East Access and meets the minimum spacing requirement along a local road.
- ▶ Retail East Access/Hotel East Access is located 50 metres south of the Internal Road and Street J intersection and meets the minimum spacing requirement along a local road.
- ▶ Retirement Home South Access is located 360 metres east of the Street K and Dorchester Road intersection and meets the minimum spacing requirement along a local road.



5.5.4 Intersection Alignment

The current concept plan depicts an offset arrangement with respect to the driveway connection to Street J, providing access to the retirement and the townhouses units. The offset arrangement is noted to be reflective of a positive arrangement that would not result in any left-turn overlaps. The two driveways are also spaced approximately 30 metres apart, providing good separation.

Based on the following, the offset arrangement is considered supportable as operational issues and/or conflicts are not expected to occur. All other proposed connections appear aligned with opposing driveways/roadways on the opposite road site.

5.6 Left Turn Lanes

The proposed new unsignalized intersections within the study area were assessed to determine if the future traffic volumes warrant the installation of a left-turn lane along the major roadway.

The warrants for left-turn lanes follow the Ministry of Transportation's (MTO) Geometric Design Standards⁷ requirements. A design speed of 10 kilometres per hour over the posted and/or assumed speed limit has been utilized. The percentages of left-turning vehicles in the approaching volume were rounded to the nearest 5 percent, as nomographs are only provided for 5 percent increments. **Table 5.4** summarizes the results of the left-turn lane warrant analyses. The following is noted:

- ▶ A southbound left turn lane with 30 metres of storage along Dorchester Road at Street J is warranted.

⁷ MTO Design Supplement for TAC Geometric Design Guide for Canadian Road, 2017



TABLE 5.4: LEFT-TURN LANE WARRANT SUMMARY

		Dorchester Rd at Street J		Dorchester Rd at Internal Road		Dorchester Rd at Street K	
Approach Direction	Southbound		Southbound		Southbound		
Design Speed	70 km/h		70 km/h		70 km/h		
Horizon	2031 Total		2031 Total		2031 Total		
Peak Hour	AM	PM	AM	PM	AM	PM	
Advancing Volume	302	621	128	371	181	429	
Opposing Volumes	312	288	349	328	394	399	
Left Turning Traffic	174	314	0	0	7	13	
% of Left Turning Traffic	57.6%	50.6%	0.0%	0.0%	3.9%	3.0%	
Warranted	Yes	Yes	No	No	No	No	
Storage Length Required	15	30	-	-	-	-	
		Street J at Ret. North Access		Street J at Internal Road		Street J at Townhouse Access	
Approach Direction	Northbound		Westbound		Southbound		
Design Speed	60 km/h		60 km/h		60 km/h		
Horizon	2031 Total		2031 Total		2031 Total		
Peak Hour	AM	PM	AM	PM	AM	PM	
Advancing Volume	29	14	50	24	7	3	
Opposing Volumes	13	13	174	314	14	25	
Left Turning Traffic	4	5	0	0	0	0	
% of Left Turning Traffic	13.8%	35.7%	0.0%	0.0%	0.0%	0.0%	
Warranted	No	No	N/A	N/A	N/A	N/A	
Storage Length Required	-	-	-	-	-	-	
		Internal Road at Retail/Hotel West Access				Street K at Ret. South Access	
Approach Direction	Eastbound		Westbound		Eastbound		
Design Speed	60 km/h		60 km/h		60 km/h		
Horizon	2031 Total		2031 Total		2031 Total		
Peak Hour	AM	PM	AM	PM	AM	PM	
Advancing Volume	37	166	0	0	15	27	
Opposing Volumes	0	0	37	166	15	6	
Left Turning Traffic	37	40	0	0	1	2	
% of Left Turning Traffic	100.0%	24.1%	0.0%	0.0%	6.7%	7.4%	
Warranted	No	No	N/A	N/A	No	No	
Storage Length Required	-	-	-	-	-	-	
		Internal Road at Retail/Hotel East Access				Dorchester Rd at Retail South Access	
Approach Direction	Northbound		Southbound		Southbound		
Design Speed	60 km/h		60 km/h		70 km/h		
Horizon	2031 Total		2031 Total		2031 Total		
Peak Hour	AM	PM	AM	PM	AM	PM	
Advancing Volume	0	0	161	301	179	436	
Opposing Volumes	161	301	0	0	386	385	
Left Turning Traffic	0	0	96	233	5	8	
% of Left Turning Traffic	0.0%	0.0%	59.6%	77.4%	2.8%	1.8%	
Warranted	N/A	N/A	No	No	N/A	N/A	
Storage Length Required	-	-	-	-	-	-	



6 Mitigation

The following section discusses the potential remedial measures that could be considered to better accommodate the forecast traffic volumes in the study area.

6.1 Assessment of Impacts

Based on the analyses, congestion is currently and/or forecast to occur at several study area intersections. A summary of the findings at each intersection is further discussed.

6.1.1 McLeod Road at Dorchester Road

During peak hours, several movements are expected to exceed the capacity under the **Background horizon**. Eastbound and northbound traffic's left turn movements will operate poorly, with a v/c ratio exceeding 1.00. The through movements for eastbound, westbound, and southbound traffic will operate with a v/c ratio exceeding 1.00.

To accommodate projected traffic volumes, adjustments to the roadway geometry are necessary. Some possible upgrades include implementing the following:

- ▶ Double left turn lane for northbound traffic that is fully protected
- ▶ Separate right turn lanes for southbound traffic
- ▶ Optimizing the timing of traffic signals

Niagara Region has completed an Environmental Assessment of the McLeod Road corridor and the recommendations include a southbound right-turn lane. However, the City and Region have noted that although eastbound left-turn operations are forecast to be congested, double eastbound left-turn lanes are not possible at Dorchester Road. In addition, although dedicated right-turns for northbound/eastbound/westbound approaches would improve traffic operations, they are not to be considered as to prevent pedestrian conflicts.

Appendix G illustrates a preliminary concept for the southbound dual-left turn lanes on the McLeod Road Environmental Assessment design. The preliminary concept shows that an additional widening of the northbound approach of 1.5m plus curb width would be required to fit the dual left-turn lanes. The receiving leg lane and on the north leg would also need to be widened 1.2m to align with the northbound through lane.



6.1.2 McLeod Road at Drummond Road

Most approaches will be over capacity with a v/c ratio of 1.00 or higher under the **Background horizon**, except for southbound through traffic which is projected to operate at a v/c ratio of no more than 0.71.

To accommodate projected traffic volumes, adjustments to the roadway geometry are necessary. Some possible upgrades include implementing the following:

- ▶ Separate left turn lane for eastbound, westbound, northbound and southbound traffic
- ▶ Optimizing the timing of traffic signals

6.1.3 Dorchester Road at Jill Drive

Traffic under the **Total horizon** is projected to experience a significant increase, resulting in delays for both northbound and southbound approaches. During the weekday AM peak hour, the northbound approach will exceed a degree of utilization of 1.00. Additionally, during the weekday PM and Saturday peak hours, the southbound approach will exceed a degree of utilization of 1.00.

A signal warrant analysis was conducted to determine if the projected traffic conditions would warrant improvements to the existing form of traffic control. The signal warrant is based on the Ontario Traffic Manual (OTM) Justification 7⁸. The signal warrant analysis is provided in **Appendix H**.

The signal warrant analysis indicates traffic control signals are not warranted under the 2031 horizon. Even though the signal criteria have not been met, the installation of unwarranted traffic control signals would improve operations.

6.1.4 Dorchester Road at Oldfield Road

The City is currently undergoing an EA for improvements to this intersection; it is understood that the all-way stop control was selected as the preferred improvement option with a separate right turn lane for the northbound approach and a separate left turn lane for the southbound approach.

Under the **Total Horizon**, during weekday PM and Saturday peak hour, drivers traveling northbound and southbound may experience longer wait times with an all-way stop control. The northbound and

⁸ Ontario Traffic Manual (OTM) Book 12 – Traffic Signals, July 2011.



southbound approach will be heavily utilized, exceeding a degree of utilization of 1.00 during Saturday peak hours.

The proposed development's traffic demands may not be fully resolved by the EA's preferred improvement plan. A signal warrant analysis was conducted to determine if the projected traffic conditions would warrant improvements to the existing form of traffic control. The signal warrant is based on the Ontario Traffic Manual (OTM) Justification 7. The signal warrant analysis is provided in **Appendix H**.

The signal warrant analysis indicates traffic control signals are not warranted under the 2031 horizon. Even though the signal criteria have not been met, the installation of unwarranted traffic control signals would improve operations.

6.1.5 Chippawa Parkway at Stanley Avenue

It is anticipated that during the peak hours under the **Background horizon**, the eastbound and westbound stop-controlled approaches will become overwhelmed and unable to handle the anticipated traffic volume. This will result in the two approaches operating with the v/c ratio exceeding 1.00.

An analysis was conducted to assess whether the projected traffic conditions would require improvements to the current form of traffic control. The results of the analysis, indicate that traffic control signals are close to being warranted under the 2031 to accommodate projected traffic volumes.

Adjustments to the roadway geometry and traffic control are necessary to accommodate projected traffic volumes. Some possible upgrades include implementing the following:

- ▶ Traffic control signals with actuated uncoordinated control
- ▶ Separate left turn lane for eastbound, westbound, northbound and southbound traffic
- ▶ Separate right turn lanes for southbound traffic

6.1.6 Lyons Creek Road at Stanley Avenue

During peak hours for all approaches, excessive delays will occur due to the high traffic projected under the **Background Horizon**. The utilization degree is expected to exceed 1.00, exceeding the overall capacity offered by an all-way stop control.

An analysis was conducted to assess whether the projected traffic conditions would require improvements to the current form of traffic



control. The results of the analysis, indicate that traffic control signals are warranted by 2031 to accommodate projected traffic volumes.

Adjustments to the roadway geometry and traffic control are necessary to accommodate projected traffic volumes. Some possible upgrades include implementing the following:

- ▶ Traffic control signals with actuated uncoordinated control
- ▶ Double left turn lane for eastbound traffic that is fully protected

6.1.7 Dorchester Road at Street J

It is anticipated that during the weekday PM peak hour and Saturday peak hour, the intersection of Dorchester Road and Street J will operate with high delays and a v/c ratio nearing 1.00 during the **Total horizon**.

A signal warrant analysis was conducted to determine if the projected traffic conditions would warrant improvements to the existing form of traffic control. The result of the analysis indicates traffic control signals are not warranted under the 2031 horizon.

Even though the signal criteria have not been met, the installation of unwarranted traffic control signals would improve operations.

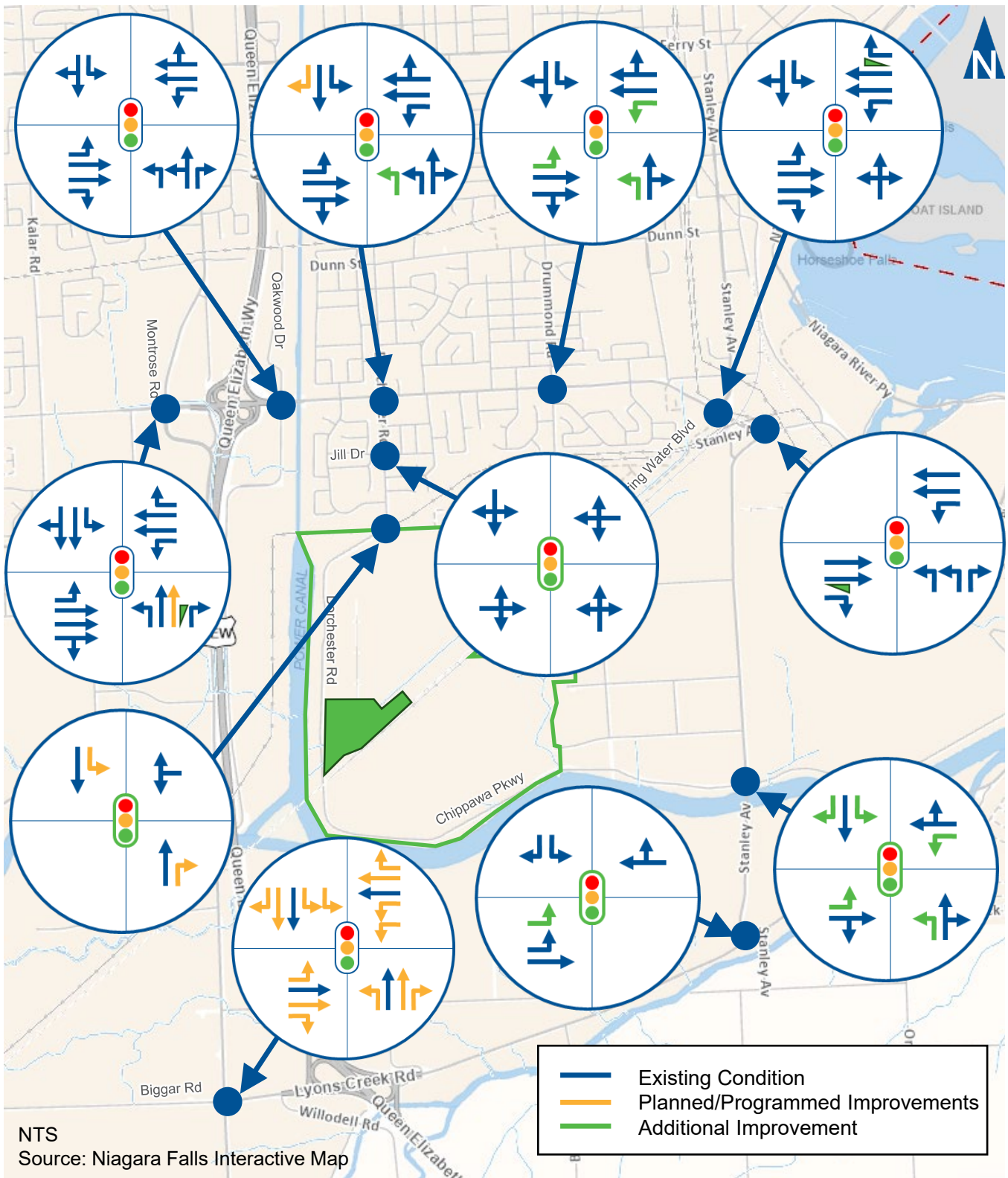
Dorchester Road at Internal Road would not meet the minimum spacing requirements for a full movement connection. It is recommended that the Internal Road to Dorchester Road be restricted to right in/out operations with stop control for the minor approach. Westbound left-turn volumes are expected to redistribute to Street J. As a result of the additional volumes, separate westbound left and right turn lanes may be considered.

6.2 Sensitivity Analysis

A sensitivity analysis to assess the identified improvements noted above at the study area intersections have been undertaken for the 2031 Total traffic conditions. **Figure 6.1** illustrates the proposed future lane configurations and traffic controls.

Table 6.1 summarizes the results of the sensitivity analysis. **Appendix I** contains the detailed Synchro reports. Overall, the intersections within the study area are expected to operate with considerable improvements.





Proposed Lane Configuration and Traffic Control

TABLE 6.1A: WEEKDAY AM PEAK HOUR OPERATIONS (SENSITIVITY)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	E 71 0.94 121 55 -66	C 30 0.67 124 - -	> > > > >	D 40	C 31 0.42 20 40 20	F 83 1.04 188 - -	> > > > >	F 79	F 98 1.02 96 15 -81	D 54 0.85 138 - -	> > > > >	F 77	E 59 0.85 55 30 -25	D 39 0.41 54 - -	D 39 0.38 42 15 -27	D 44	F 60 0.99
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	D 40 0.82 55 15 -40	C 30 0.71 95 - -	> > > > >	C 32	C 28 0.52 14 15 1	D 46 0.90 122 - -	> > > > >	D 44	E 68 0.98 90 15 -75	D 46 0.85 139 - -	> > > > >	D 55	C 29 0.62 29 20 -9	D 43 0.76 99 - -	> > > > >	D 39	D 42 0.92
	8 - Jill Drive and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	C 21 0.40 15 - -	> > > > >	C 21	< < < < <	B 19 0.02 3 - -	> > > > >	B 19	< < < < <	A 10 0.69 70 - -	> > > > >	A 10	< < < < <	A 5 0.35 27 - -	> > > > >	A 5	A 9 0.62
	9 - Oldfield Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.					B 20 0.32 16 - -	> > > > >	B 20		A 6 0.43 47 - -	A 3 0.07 6 15	> > > > >	A 5		A 4 0.08 5 - -	A 4 0.24 24 15	A 4	A 7 0.41
	10 - Chippawa Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.	C 31 0.04 3 160 157	C 35 0.45 10 - -	> > > > >	C 35	C 33 0.16 5 75 70	> > > > >	C 32	A 6 0.39 19 160 141	A 8 0.64 92 - -	> > > > >	A 8	A 7 0.05 5 75 70	B 13 0.53 66 - -	A 7 0.05 2 80 78	B 12	B 15 0.64	
	11 - Lyons Creek Road and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.	D 43 0.81 64 55 -9	A 6 0.21 21 - -		C 30		C 29 0.81 126 - -	> > > > >	C 29					C 29 0.26 28 35 8		D 36 0.50 30 - -	C 35	C 31 0.72
	12 - Street J and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.					B 18 0.21 11 - -		B 18 0.16 13 - -	> > > > >	B 18		A 4 0.30 25 - -	> > > > >	A 4	< < < < <	A 6 0.44 31 - -	A 6	A 9 0.39
	14 - Internal Road and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.							A 0 0.10 0 - -	> > > > >	A 0		A 0 0.22 0 - -	> > > > >	A 0		A 0 0.08 0 - -	A 0	A 0

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

Ex. - Existing Available Storage

Avail. - Available Storage

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

RBT - Roundabout

< - Shared Left-turn

> - Shared Right-turn



TABLE 6.1B: WEEKDAY PM PEAK HOUR OPERATIONS (SENSITIVITY)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
PM Peak Hour	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 139 1.12 165 55 -110	F 95 1.11 270 -- --	> > > > >	F 103	D 50 0.72 35 40 5	F 107 1.11 199 -- --	> > > > >	F 102	F 184 1.25 118 15 -103	E 58 0.86 134 -- --	> > > > >	F 129	F 128 1.13 124 30 -94	D 39 0.50 71 -- --	D 37 0.35 39 15 -24	F 69	F 101 1.13	
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	F 122 1.11 112 15 -97	D 52 0.97 193 -- --	> > > > >	E 65	E 77 0.94 60 15 -45	E 71 1.03 190 -- --	> > > > >	E 71	F 134 1.12 91 15 -76	E 59 0.85 123 -- --	> > > > >	F 89	F 89 1.02 108 20 -88	F 123 1.13 207 -- --	> > > > >	F 111	E 79 1.12	
	8 - Jill Drive and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	C 21 0.38 17 -- --	> > > > >	C 21	< < < < <	B 19 0.03 4 -- --	> > > > >	B 19	< < < < <	A 8 0.64 84 -- --	> > > > >	A 8	< < < < <	A 9 0.66 94 -- --	> > > > >	A 9	A 9 0.6	
	9 - Oldfield Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.					B 19 0.40 24 -- --					B 19	A 8 0.55 64 -- --	A 4 0.07 6 15 --		A 6 0.23 12 -- --	A 8 0.56 67 15 --		A 8	A 9 0.52
	10 - Chippawa Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.	D 39 0.05 5 160 155	D 42 0.37 29 -- --	> > > > >	D 42	D 41 0.23 9 75 66	D 40 0.17 15 -- --	> > > > >	D 40	C 29 0.81 49 160 111	A 4 0.48 45 -- --	> > > > >	B 13	A 7 0.03 4 75 72	C 21 0.82 196 -- --	A 6 0.08 6 80 74	B 19	C 20 0.76	
	11 - Lyons Creek Road and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.	D 45 0.88 101 55 -46	A 8 0.50 64 -- --		C 27		C 29 0.77 114 -- --							C 31 0.38 50 35 -15		C 33 0.44 41 -- --	C 32	C 29 0.7	
	12 - Street J and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.					C 31 0.55 36 -- --	C 28 0.22 21 -- --					A 4 0.25 28 -- --	> > > > >	A 4	< < < < <	B 14 0.80 157 -- --		B 14	B 17 0.75
	14 - Internal Road and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.							B 11 0.18 5 -- --				A 0 0.21 0 -- --	> > > > >	A 0		A 0 0.24 0 -- --		A 0	A 2

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

Ex. - Existing Available Storage

Avail. - Available Storage

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

RBT - Roundabout

< - Shared Left-turn

> - Shared Right-turn



TABLE 6.1C: SAT PEAK HOUR OPERATIONS (SENSITIVITY)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
Saturday Peak Hour	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 135 1.11 152 55 -97	F 101 1.12 269 - -	> > > > >	F 107	E 60 0.79 40 40 0	F 81 1.03 179 - -	> > > > >	F 79	F 166 1.21 114 15 -99	E 64 0.90 153 - -	> > > > >	F 120	F 106 1.06 115 30 -85	D 39 0.53 79 - -	D 35 0.26 28 15 -13	F 60	F 94 1.1	
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	E 69 0.94 84 15 -69	D 45 0.92 174 - -	> > > > >	D 49	E 54 0.83 49 15 -34	> > > > >	E 56	E 69 0.92 73 15 -58	D 49 0.75 110 - -	> > > > >	E 57	D 44 0.85 75 20 -55	E 75 0.98 176 - -	> > > > >	E 64	E 55 0.99		
	8 - Jill Drive and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	< 28 < < <	C 8 0.49 13 -	> > > > >	C 28	< 24 < < <	C 24	> > > > >	C 24	< 9 < < <	A 10 0.64 114 -	> > > > >	A 9	< 10 < < <	A 10 0.70 134 -	> > > > >	A 10	B 10 0.68	
	9 - Oldfield Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.					C 23					B 15 0.74 95 -	A 6 0.11 9 15			B 12 0.40 17 -	B 17 0.79 118 15	B 16	B 16 0.73	
	10 - Chippawa Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.	C 34 0.01 2 160 158	D 37 0.34 24 -	> > > > >	D 37	D 36 0.20 8 75 67	D 35 0.19 16 -	> > > > >	D 36	B 11 0.67 33 160 127	A 5 0.46 63 -	> > > > >	A 7	A 8 0.00 2 75 74	B 14 0.58 128 -	A 9 0.09 9 80 71	B 13	B 15 0.61	
	11 - Lyons Creek Road and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.	D 52 0.91 105 55 -50	A 7 0.46 60 -		C 30		C 31								C 32	C 31 0.26 28 -	C 32	C 31 0.71	
	12 - Street J and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.					D 38 0.61 44 -		C 32 0.26 25 -				A 4 0.26 30 -	> > > >	A 4	< 31 < < <	C 0.95 222 -		C 31	C 27 0.89
	14 - Internal Road and Dorchester Road	TWSC	LOS Delay V/C Q Ex Avail.					B 11 0.18 5 -							A 0 0.21 0 -	> > > >	A 0	< 0 < < <	A 0	A 2	

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

Q - 95th Percentile Queue Length

Ex. - Existing Available Storage

Avail. - Available Storage

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

RBT - Roundabout

< - Shared Left-turn

> - Shared Right-turn



6.3 Assessment of Potential Watercourse Crossings

6.3.1 Overview

A sensitivity analysis has been conducted for a potential Hydro (OPG) Canale crossing as a potential solution to the future roadway capacity challenges. The watercourse crossing could provide additional road network capacity and offer an alternative means to the congested McLeod Road corridor to access the QEW and locations to the west. The watercourse crossing could also provide greater network flexibility/redundancy, improved access for emergency services, and opportunities for further transit, cycling and pedestrian linkages.

The Thundering Waters Transportation Master Plan (July 2016, Paradigm) assessed three watercourse crossing options, which are described as follows:

- ▶ **Location 1** – The Oldfield Road extension from Dorchester Road to Oakwood Drive across the OPG Canal to the west;
- ▶ **Location 2** – Along the alignment/parallel to the existing CP Rail bridge across the OPG Canal to the southwest; and
- ▶ **Location 3** – Across the Welland River to the south.

Figure 6.2 illustrates the three potential watercourse crossing locations.

This sensitivity analysis assesses the Location 1 option due to the following benefits documented in the Thundering Waters Transportation Master Plan (July 2016, Paradigm):

- ▶ Less circuitousness to access from the Thundering Waters lands;
- ▶ Better addresses road network capacity constraints based on operational analyses;
- ▶ Less impact on natural environmental features;
- ▶ Shorter connection;
- ▶ More compatible with the Thundering Waters Secondary Plan; and
- ▶ Identified in Niagara Falls Sustainable Transportation Master Plan.

Location 1 would traverse the OPG Canal to the northwest of Riverfront Phase 2 lands, connecting to Dorchester Road at Oakwood Drive. Vehicles attempting to access or across the QEW could travel



north to McLeod Road via Oakwood Drive, or south via Oakwood Drive to Biggar Road/Lyons Creek Road.

The Niagara Falls Sustainable Transportation Master Plan identifies a further extension of this crossing over the QEW, which is not being considered for this assessment.

6.3.2 Traffic Redistribution

The sensitivity analysis was conducted for the 2031 total traffic conditions. Riverfront Phase 1 and Phase 2 site traffic are redistributed to reflect new travel patterns as a result of the OPG watercourse crossing.

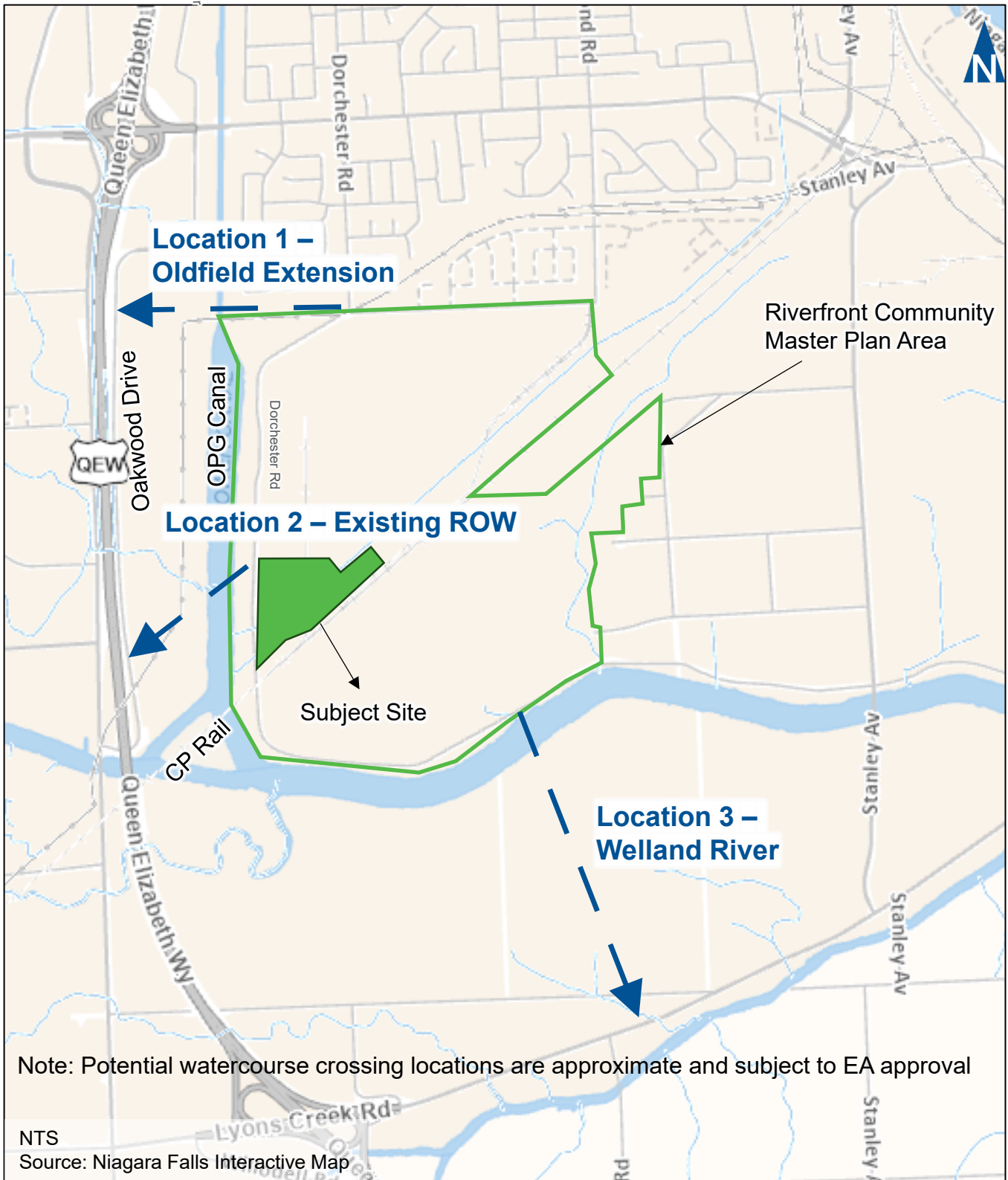
The following assumptions are made for trip redistribution:

- ▶ Given the proximity of Oakwood Drive and Dorchester Road as well as the forecast congestion along Dorchester Road, it was assumed 50% of the outbound northbound left-turn vehicles at McLeod Road and Dorchester Road would divert to McLeod Road and Oakwood Drive via the OPG watercourse crossing. This redistribution was applied to both Phase 1 and Phase 2 site traffic;
- ▶ It was assumed 50% of the inbound eastbound right turn vehicles at McLeod Road and Dorchester Road would divert to McLeod Road and Oakwood Drive. This redistribution was applied to both Phase 1 and Phase 2 site traffic; and
- ▶ For site traffic to/from the south, it was assumed 50% of the trips would travel via the OPG watercourse crossing and the remaining trips would travel via the Stanley Avenue to/from the south. This redistribution was applied to Phase 2 site traffic only, assuming Phase 1 site traffic to/from the south would continue to use Stanley Avenue.

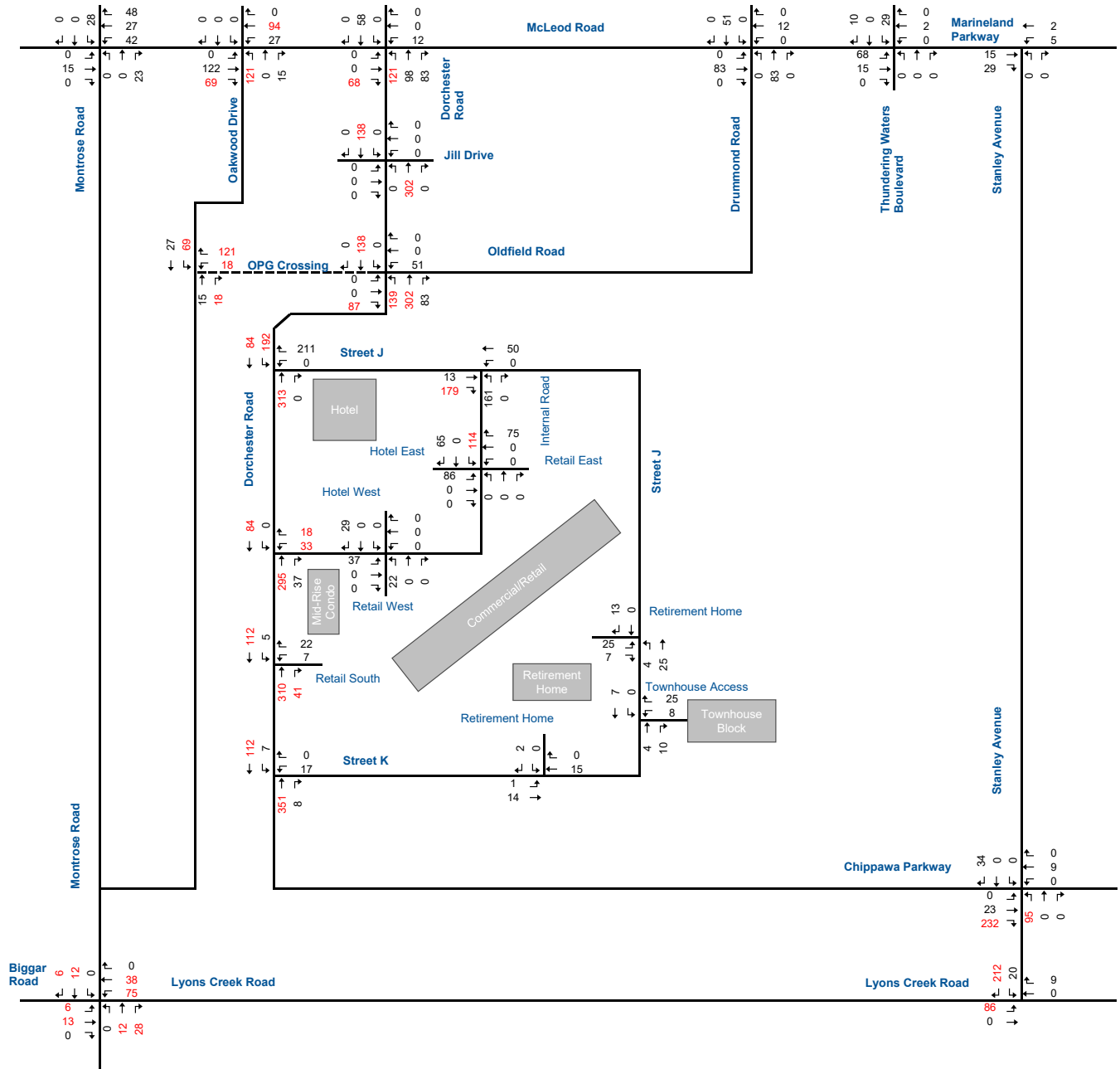
Figure 6.3 illustrates the redistributed Riverfront Phase 1 and Phase 2 site traffic.

Figure 6.4 illustrates the redistributed 2031 total traffic forecasts.





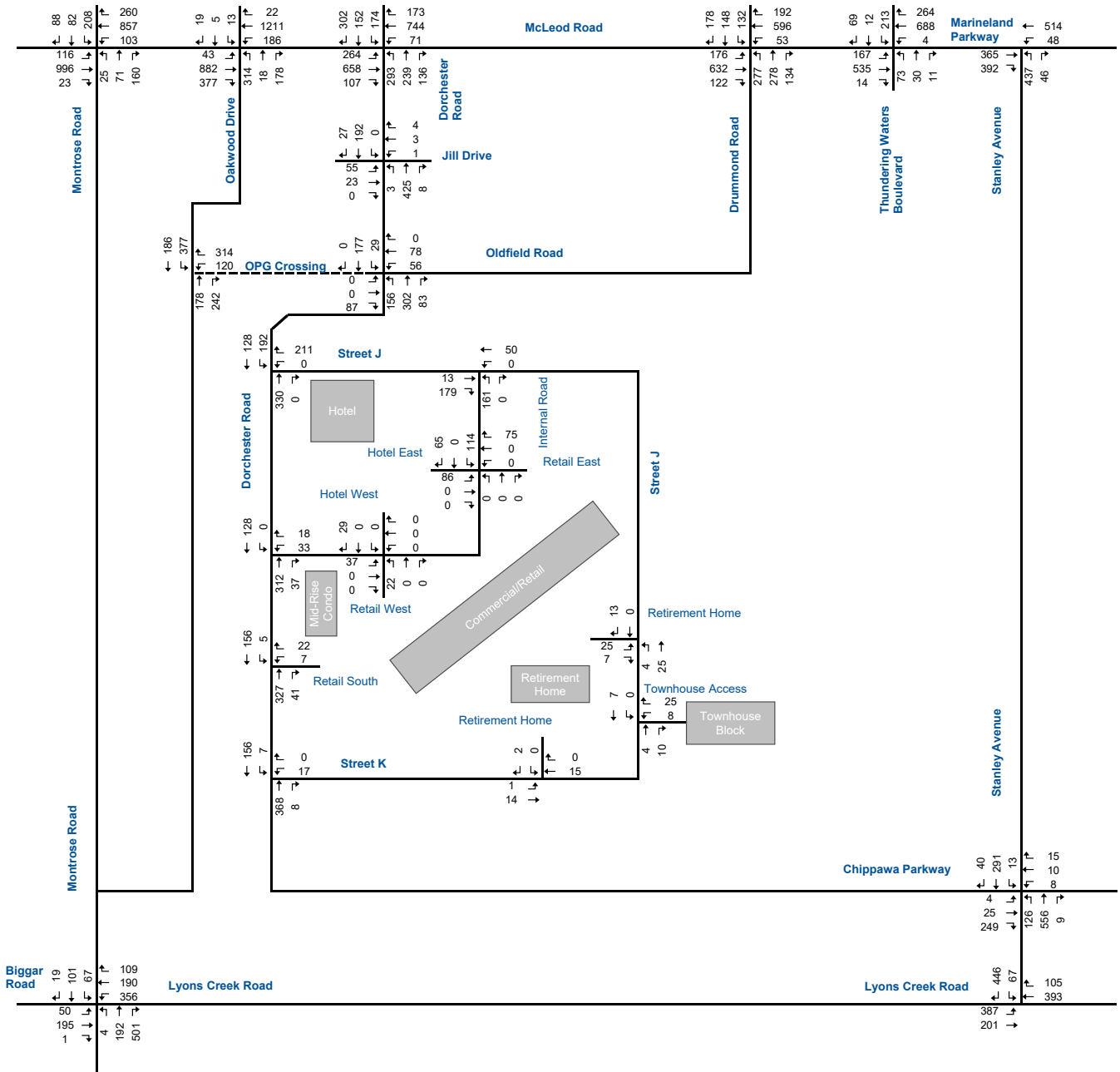
Potential Watercourse Crossing Locations



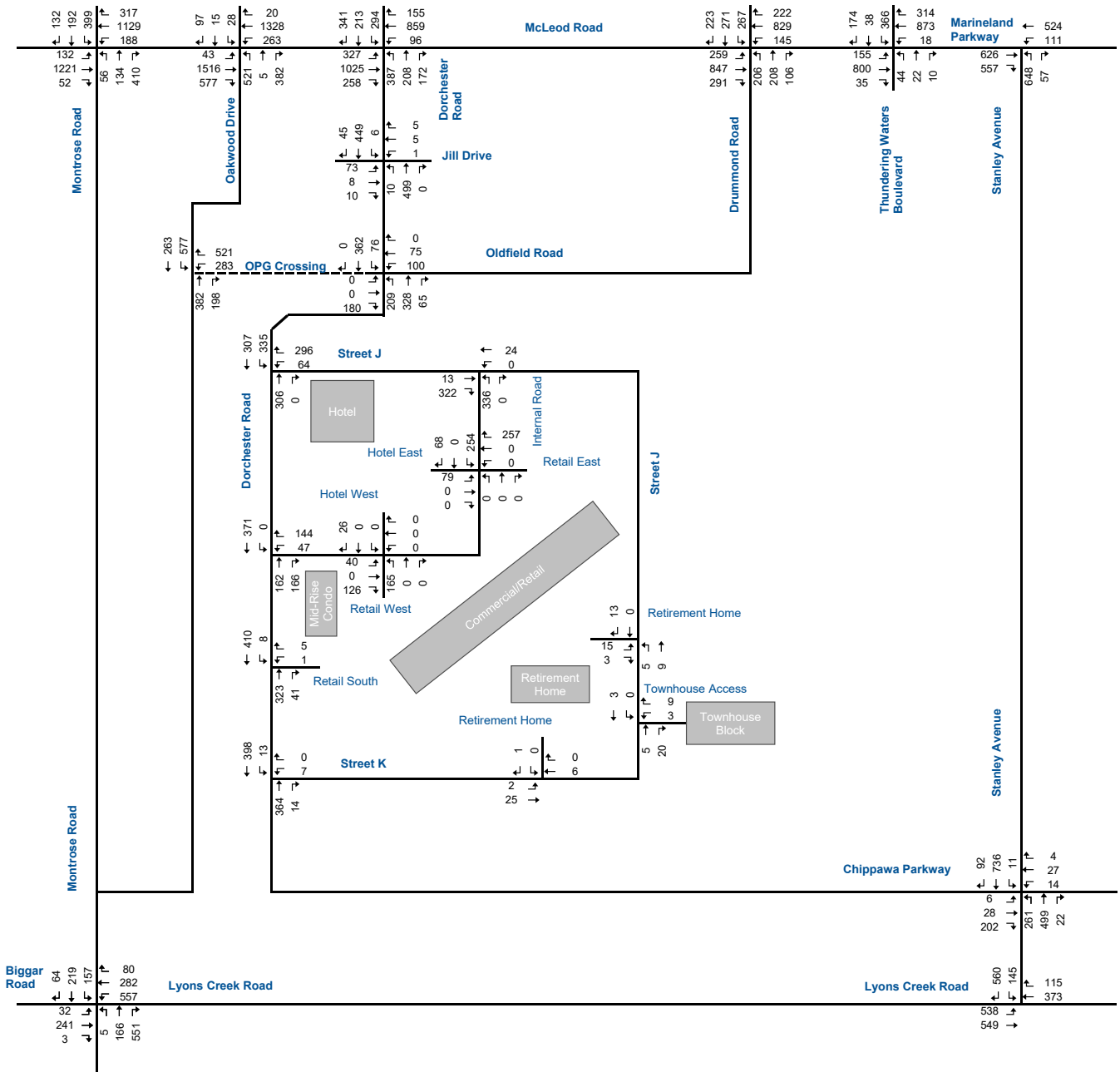
Red volumes represents revised traffic movements



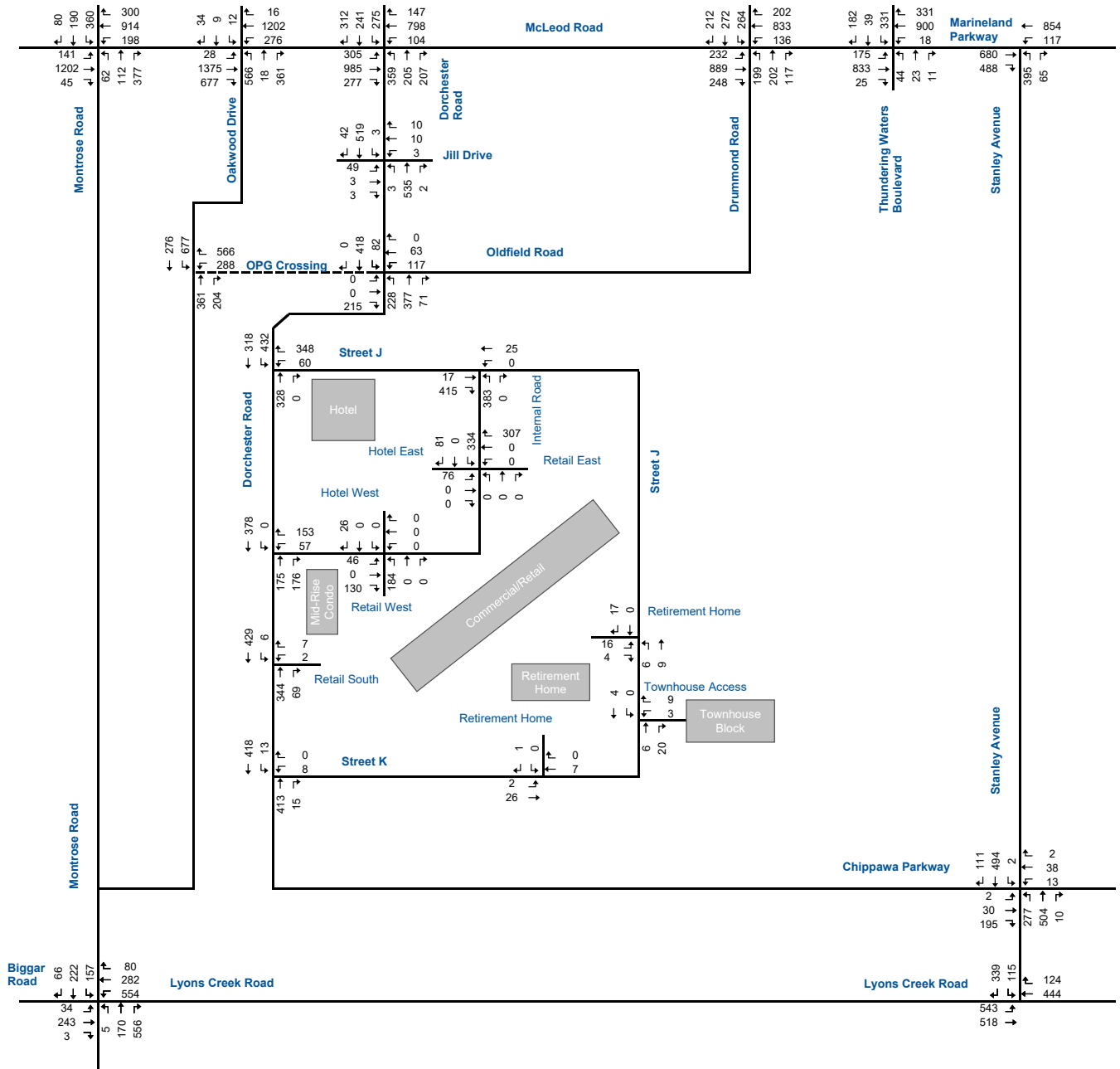
Riverfront Phase 1 and Phase 2 Redistributed Site Generated Traffic Volumes – Weekday AM Peak Hour



Redistributed Future Total Traffic Volumes – Weekday AM Peak Hour



Redistributed Future Total Traffic Volumes – Weekday PM Peak Hour



Redistributed Future Total Traffic Volumes – Saturday Peak Hour

6.3.3 Traffic Operations

Table 6.2 summarizes the capacity analyses for the impacted intersections for the 2031 total traffic conditions under the weekday AM, PM, and Saturday peak hours. **Appendix I** includes the capacity analysis results.

Northbound movements at McLeod Road and Oakwood Drive are expected to increase as a result of the additional traffic. During the weekday peak hours, the northbound approach is forecast to operate in the LOS E range with a v/c ratio below 0.90. During the Saturday peak hour, the northbound left and through movements are forecast to operate in the LOS F range with v/c ratios greater than 0.90.

With Phase 1 and Phase 2 traffic diverting to use the OPG watercourse crossing, delays at McLeod Road and Dorchester Road are forecast to decrease by up to 180 seconds during the peak hours. However, all approaches are forecast to operate with delays in the LOS range and v/c ratios exceeding 1.00 during the weekday and Saturday peak hours.

With the extension of Oldfield Road to the OPG watercourse crossing, it is assumed Oldfield Road at Dorchester Road will be signalized. Despite the additional diverted traffic through the intersection, the signalized intersection is forecast to operate with delays in the LOS B range or better.

The delays at Jill Drive at Dorchester are forecast to improve from LOS F to LOS D or better during the weekday and Saturday peak hours.

This sensitivity analysis indicates that a crossing of the OPG Canal may help decrease the capacity constraints at certain intersection in the study area, such as Jill Drive at Dorchester Road. However, capacity constraints are still forecast throughout the study area and will require mitigation measures. In particular, movements along McLeod Road are forecast to experience to significant delay. At McLeod Road and Dorchester Road, the proposed mitigation measures in **Section 6.1.1** will still be required with the OPG watercourse crossing.



TABLE 6.2A: WEEKDAY AM PEAK HOUR OPERATIONS (WATER CROSSING)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	D 41 0.39 9 50 41	C 24 0.72 148 -	D 42 0.32 88 -	C 30	C 34 0.74 49 80 32	D 35 0.83 192 -	>	D 35	E 60 0.63 72 95 23	E 59 0.61 71 -	D 45 0.13 21 -	D 54	D 44 0.04 9 20 11	D 44 0.03 9 -	>	D 44	D 36 0.43
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 121 1.10 123 55 -68	C 33 0.68 115 -	>	E 56	C 31 0.42 20 40 20	F 92 1.07 188 -	>	F 87	F 115 1.09 132 15 -117	D 43 0.77 139 -	>	E 75	D 40 0.72 46 30 -16	F 114 1.09 192 -	>	F 93	E 76 1.09
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 32 0.30 17 130 113	C 28 0.33 24 -	C 28 0.00 0 120 120	C 29	D 37 0.74 45 150 105	B 14 0.15 15 8 -	B 15 0.09 8 225 217	>	C 27	B 20 0.01 3 80 77	B 20 0.20 24 31 -	C 23	D 36 0.33 12 80 68	B 12 0.08 11 -	B 13 0.02 0 50 50	C 21	C 25 0.43
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	B 11 0.18 44 -	>	E 44	< < < <	A 9 0.02 11 -	>	B 11	< < < <	C 21 0.76 541 -	>	F 541	< < < <	B 11 0.40 26 -	>	D 26	C 17
	9 - Oldfield Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	B 17 0.06 0 -	>	B 17	< < < <	B 20 0.48 25 -	>	B 20	A 5 0.23 19 15 -4	A 6 0.40 42 -	>	A 6	A 4 0.08 5 15 10	A 5 0.18 19 -	>	A 5	A 8 0.42
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	F 117 1.11 118 -	>	F 117	< < < <	F 402 1.25 38 -	>	F 402	< < < <	A 4 0.17 5 -	>	A 4	< < < <	A 1 0.02 1 -	>	A 1	E 37
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	F 81 1.04 75 55 -20	C 17 0.50 217 -	>	F 59	F 125 1.18 540 -	>	F 125						B 13 0.19 46 25 -21	F 99 1.11 304 -	>	F 88	F 89

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-turn
 > - Shared Right-turn

TABLE 6.2B: WEEKDAY PM PEAK HOUR OPERATIONS (WATER CROSSING)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	C 24 0.31 4 50 46	D 49 1.00 274 -	C 29 0.62 118 -	D 43	F 104 1.02 116 80 -36	C 24 0.75 178 -	>	D 37	E 77 0.87 125 95 -30	E 80 0.89 130 -	D 53 0.53 64 -	E 68	E 61 0.23 18 20 2	E 60 0.20 23 -	>	E 60	D 46 0.91
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 264 1.46 159 55 -104	F 108 1.13 244 -	>	F 139	E 56 0.76 35 40 5	F 87 1.06 193 -	>	F 84	F 190 1.29 175 15 -160	D 42 0.72 119 -	>	F 117	D 49 0.87 82 30 -52	F 137 1.16 227 -	>	F 106	F 115 1.34
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 34 0.21 14 130 116	C 33 0.41 32 -	C 31 0.00 0 120 120	C 33	D 38 0.80 69 150 81	B 13 0.19 19 -	B 13 0.06 6 225 219	C 28	C 26 0.02 4 80 76	C 26 0.21 40 -	C 32 0.42 60 20	C 31	D 40 0.55 35 80 45	B 17 0.17 25 -	B 17 0.05 6 50 44	C 25	C 29 0.53
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	<	B 11 0.20 44 -	>	E 44	<	A 10 0.02 11 -	>	B 11	<	D 28 0.83 541 -	>	F 541	<	D 26 0.81 26 -	>	D 26	D 25
	9 - Oldfield Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	<	B 15 0.12 0 -	>	B 15	<	B 19 0.56 34 -	>	B 19	A 10 0.46 34 15 -19	A 8 0.46 48 -	>	A 9	A 7 0.21 12 15 3	A 8 0.42 45 -	>	A 8	B 11 0.49
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	<	F Err Err Err -	>	F Err	<	F Err Err -	>	F Err	<	B 10 0.42 17 -	>	B 10	<	A 0 0.01 0 -	>	A 0	H Err
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	F 177 1.31 75 55 -20	F 144 1.23 217 -		F 160	F 77 1.04 540 -	F 77	>	F 77					B 15 0.35 46 25 -21	F 123 1.18 304 -	F 101	F 124	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-turn
 > - Shared Right-turn

TABLE 6.2C: SAT PEAK HOUR OPERATIONS (WATER CROSSING)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
Saturday Peak Hour	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	C 23 0.22 2 50 48	E 75 1.08 281 -	D 43 0.84 174 -	E 64	F 84 0.96 116 80 -36	C 25 0.72 169 -	>	D 36	F 85 0.93 147 95 -52	F 81 0.91 143 -	D 45 0.26 30 -	E 68	D 54 0.08 10 20 10	D 54 0.08 15 -	>	D 54	E 55 0.91
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 256 1.44 149 55 -94	F 89 1.08 234 -	>	F 122	E 61 0.80 40 0	E 56 0.93 165 -	>	E 56	F 148 1.19 157 15 -142	D 47 0.80 143 -	>	F 94	E 57 0.90 90 30 -60	F 143 1.18 231 -	>	F 115	F 99 1.29
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 34 0.22 14 130 116	C 33 0.41 32 -	C 31 0.00 0 120 120	C 33	D 36 0.78 67 150 83	B 13 0.19 18 -	B 13 0.06 5 225 220	C 27	C 27 0.02 4 80 76	C 27 0.22 25 60 -	C 33 0.42 54 -	C 32	D 40 0.53 35 80 45	B 17 0.18 27 -	B 17 0.05 7 50 43	C 25	C 29 0.53
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	<	B 11 0.11 44 -	>	E 44	<	A 10 0.05 11 -	>	B 11	<	D 25 0.80 541 -	>	F 541	<	D 26 0.82 26 -	>	D 26	C 25
	9 - Oldfield Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	<	B 15 0.15 7 -	>	B 15	<	C 21 0.63 39 -	>	C 21	B 17 0.64 56 15 -41	B 11 0.58 57 -	>	B 13	A 9 0.31 14 15 1	B 10 0.54 53 -	>	B 10	B 13 0.64
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	<	F Err Err Err -	>	F Err	<	F Err 5.30 Err -	>	F Err	<	A 8 0.37 14 -	>	A 8	<	A 0 0.00 0 -	>	A 0	G Err
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	F 146 1.24 75 55 -20	F 94 1.10 217 -		F 121	F 113 1.15 540 -	>	F 113						B 13 0.29 46 25 -21	C 25 0.72 304 -	C 22	F 97	

MOE - Measure of Effectiveness
 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 < - Shared Left-turn
 > - Shared Right-turn

7 Riverfront Impacts

The Ministry of Ontario has released a guideline called "A Guideline for Highway Improvements Associated with Development"⁹ to clarify who is responsible for making roadway improvements when land use development requires it. This guide outlines the steps municipalities, and stakeholders must follow when constructing improvements to a roadway, whether directly or indirectly. Although this guide is primarily intended for roads under Provincial jurisdiction, it provides valuable insight into the responsibilities involved in these projects.

7.1 Primary Impacts

Section 3A of the guideline outlines the following:

"Where a proposed Development will gain access to a provincial highway either directly by private entrance or by a new municipal road, the Proponent is responsible (financially or otherwise) for all warranted Highway Improvements, identified in the approved Traffic Impact Study. The Proponent is also responsible for any Highway Improvements that are not required immediately but that have been identified as being warranted in the future as a result of the Development. Any such future Highway Improvements are the responsibility (financially or otherwise) of the Proponent and must be addressed to MTO's satisfaction before MTO permits will be issued."

Section 3C of the guideline outlines the following:

"Based upon MTO's review of a Proponent's Traffic Impact Study, it identifies a warrant for Highway Improvements based on existing and/or projected background traffic volumes. The Proponent would be responsible (financially or otherwise) for any additional Highway Improvements required over and above the existing and/or projected background traffic volumes, in order to accommodate the proposed Development traffic."

Based on the above, the Applicant will be responsible for the costs related to the new roadway connection to Dorchester Road (Street J), which includes a southbound left turn lane and potentially unwarranted traffic control signals. Moreover, the Applicant will bear the cost of potentially unwarranted traffic control signals due to the deterioration of operations at the intersection of Dorchester Road at Jill Drive and Dorchester Road at Oldfield Road, caused by the build-out of the

⁹ A Guideline for Highway Improvements Associated with Development, MTO, May 2005.



development. This is reflected based on the capacity of the intersections projected to operate over capacity with build-out of the development as compared to operating within capacity under the no-build scenario (background horizon).

7.2 Secondary Impacts

The analysis provided herein has also determined that several improvements are required at the study area intersections as noted under the Background Horizon (no-build scenario) because of cumulative background developments. As the McLeod Road corridor is projected to have significant growth unrelated to the proposed development, it is difficult to identify what specific improvements the development would trigger (if any) at these congested intersections.

As the Applicant is looking to develop in the relative short term, the uncertainty of site-specific developments proposed for the area provide uncertainty given the various proposal could not materialize as currently envisioned or ever. As a result, an additional scenario has been reviewed that isolates the direct impacts with build-out of Phase 1 and Phase 2 of the development solely and consists of traffic estimates comprised of base year traffic plus development traffic. **Appendix J** contains the isolated projections.

Based on a review of the isolated projections, the following geometric improvement would likely be required to improve operations at the study area intersections with build out of the development:

- ▶ McLeod Road at Dorchester Road – Installation of northbound dual left-turn lanes. A dual left-turn lane is typically considered when the volume of left-turn exceeds 300 vph. The existing traffic volumes identify the northbound left-turn lane currently has a peak left turn movement of 234 vph. With additional traffic generated solely by the proposed development, the northbound left-turn movement is projected to have a peak of 461 vph.

To confirm the proposed mitigation measure would provide for satisfactory operation, an operational assessment has been completed for the isolated scenario. This scenario assumes signal timing splits are optimized and the intersection of McLeod Road and Dorchester Road is provided with northbound dual left-turn lanes. Protected phases are also assuming for the northbound and southbound left-turn movements at McLeod Road and Dorchester Road.



Table 7.1 summarizes the results of the operations with the isolated projections. **Appendix K** contains the detailed Synchro reports. Overall, the intersections within the study area are expected to operate with acceptable operations.



TABLE 7.1A: WEEKDAY AM PEAK HOUR OPERATIONS (ISOLATED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall	
				Eastbound				Westbound				Northbound				Southbound					
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 26 0.48 26 55 29	C 31 0.51 84 -- --	> > > > >	C 30	A 6 0.47 4 155 151	B 16 0.60 111 -- --	C 35 0.15 26 -- --	B 19	C 31 0.06 9 115 106	C 29 0.06 12 -- --	C 30 0.11 16 -- --	C 30	C 26 0.36 45 130 85	C 25 0.09 15 -- --	> > > > >	C 26	C 25 0.47	
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	B 19 0.27 7 50 43	B 17 0.54 109 -- --	C 34 0.20 59 -- --	C 22	C 23 0.57 36 80 44	C 31 0.74 160 -- --	> > > > >	C 30	D 50 0.34 41 95 54	D 49 0.33 41 -- --	D 45 0.11 20 -- --	D 47	D 44 0.04 8 20 12	D 44 0.03 9 -- --	> > > > >	D 44	C 29 0.51	
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	D 49 0.86 82 55 -27	C 23 0.47 76 -- --	> > > > >	C 30	D 43 0.40 30 40 10	D 44 0.76 110 -- --	> > > > >	D 44	E 71 0.90 83 15 -68	D 37 0.68 113 -- --	> > > > >	E 55	E 75 0.76 53 30 -23	E 69 0.93 154 -- --	> > > > >	E 70	D 47 0.88	
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	C 23 0.70 84 -- --	> > > > >	C 23	< < < < <	B 18 0.38 47 -- --	> > > > >	B 18	< < < < <	C 31	> > > > >	C 31	B 20 0.23 23 20 -3	C 22 0.39 53 -- --	> > > > >	C 21	C 23 0.72	
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	C 23 0.29 31 60 29	C 21 0.22 42 -- --	B 19 0.00 0 50 50	C 21	C 26 0.01 3 25 22	C 31 0.35 64 -- --	C 28 0.14 19 80 62	C 30	< < < < <	D 37 0.04 10 -- --	> > > > >	D 37	D 54 0.62 67 -- --	D 44 0.05 11 -- --	> > > > >	D 52	C 31 0.32	
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.		C 25 0.35 27 -- --	C 24 0.17 16 65 49	> > > > >	C 25	C 24 0.11 8 105 97	C 27 0.54 42 -- --	C 27	A 5 0.09 9 160 151		A 5 0.02 3 80 77		A 5					C 22 0.21
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 32 0.26 15 130 115	C 29 0.29 21 -- --	C 28 0.00 0 120 120	C 29	C 35 0.67 39 150 111	B 15 0.14 14 -- --	B 16 0.08 8 225 217	C 26	B 18 0.01 3 80 77	B 18 0.16 21 26 60 34	C 22 0.32 26 60 34	C 21	D 36 0.31 11 80 69	B 11 0.06 9 -- --	B 12 0.01 0 50 50	> > > > >	C 21	C 24 0.37
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	B 11 0.18 49 -- --	> > > > >	E 49	< < < < <	A 10 0.02 11 -- --	> > > > >	B 11	< < < < <	F 51 0.98 459 -- --	> > > > >	F 459	< < < < <	B 14 0.54 28 -- --	> > > > >	D 28	E 36	
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.					B 11 0.24 52 -- --	> > > > >	B 11	> > > > >	B 11	C 19 0.75 152 -- --	A 19 0.12 25 15	C 19	B 11 0.06 16 -- --	A 11 0.43 16 15	> > > > >	B 11	C 16	
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	C 18 0.60 32 -- --	> > > > >	C 18	< < < < <	D 29 0.20 6 -- --	> > > > >	D 29	< < < < <	A 4 0.13 4 -- --	> > > > >	A 4	< < < < <	A 1 0.01 0 -- --	> > > > >	A 1	B 9	
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	C 24 0.70 73 55 -18	B 10 0.23 130 -- --		C 21	C 16 0.52 632 -- --	> > > > >	C 16	> > > > >	C 16				B 10 0.09 46 25 -21	C 24 0.72 268 -- --	> > > > >	C 23	C 20	

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 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 <- Shared Left-turn
 >- Shared Right-turn

TABLE 7.1B: WEEKDAY PM PEAK HOUR OPERATIONS (ISOLATED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall						
				Eastbound				Westbound				Northbound				Southbound										
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach							
PM Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 29 0.59 26 55 29	C 30 0.57 103 -- --	> > > > >	C 30	C C 31 0.73 0.70 32 156 17	C C 31 0.30 0.19	C C 30 0.31	C C 30 0.31	C C 30 0.31	C C 30 0.31	D 37 0.18 17 115 98	D 37 0.15 22 -- --	D 44 0.46 59 -- --	D 42	D 36 0.67 85 130 45	C 31 0.21 30 -- --	> > > > >	C 34	C 33 0.7				
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	B 17 0.20 4 50 46	C 21 0.69 170 -- --	C 28 0.29 64 -- --	C 23	D 39 0.81 57 80 23	B 18 0.63 134 -- --	> > > > >	C 22	E 69 0.73 84 95 11	E 68 0.72 82 -- --	D 50 0.23 30 -- --	E 60	E 58 0.17 15 20 5	E 58 0.16 22 -- --	> > > > >	E 58	E 58 0.16 22 -- --	> > > > >	E 58	C 30 0.72			
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	F 100 1.05 115 55 -60	C 30 0.71 122 -- --	> > > > >	D 45	F 116 0.93 58 40 -18	D 46 0.78 112 -- --	> > > > >	D 54	F 83 0.97 96 15 -81	C 34 0.60 102 -- --	> > > > >	E 62	E 73 0.76 56 30 -26	F 94 1.03 192 -- --	> > > > >	F 90	F 94 1.03 192 -- --	> > > > >	F 90	E 58 1.02			
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	C 32 0.90 133 -- --	> > > > >	C 32	< < < < <	B 16 0.50 67 -- --	> > > > >	B 16	< < < < <	E 56 0.87 107 -- --	> > > > >	E 56	C 28 0.45 44 20 -24	C 32 0.65 99 -- --	> > > > >	C 31	C 32 0.65 99 -- --	> > > > >	C 31	C 29 0.92			
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	B 18 0.28 27 60 33	B 16 0.23 45 -- --	B 14 0.01 0 50 50	B 16	C 20 0.03 7 25 18	C 24 0.34 72 -- --	C 22 0.16 18 62	C 24	< < < < <	D 52 0.07 12 -- --	> > > > >	D 52	D 52 0.71 92 -- --	D 39 0.11 17 -- --	> > > > >	D 48	D 39 0.11 17 -- --	> > > > >	D 48	C 27 0.42			
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.		C 26 0.55 44 -- --	C 22 0.14 13 65 52	C 25	C 28 0.53 23 105 82	C 24 0.43 34 -- --	C 25	A 6 0.17 19 160 141	A 6 0.02 3 80 77	A 6		A 6											C 20 0.28
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	D 35 0.17 11 130 119	C 34 0.32 24 -- --	C 33 0.00 0 120 120	C 34	D 37 0.75 60 150 90	B 15 0.19 16 -- --	B 16 0.06 6 225 220	C 28	C 24 0.02 4 80 76	C 23 0.16 20 -- --	C 27 0.29 28 60 32	C 26	D 39 0.47 24 80 56	B 14 0.14 21 -- --	B 15 0.04 4 50 46	> > > > >	C 23	C 27 0.44					
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	B 12 0.19 67 -- --	> > > > >	F 67	< < < < <	B 10 0.03 12 -- --	> > > > >	B 12	< < < < <	F 61 1.02 569 -- --	> > > > >	F 569	< < < < <	F 73 1.06 29 -- --	> > > > >	D 29	D 29	> > > > >	F 63				
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.					B 14 0.37 120 -- --	> > > > >	B 14	F 51	F 51 0.99 409 -- --	A 0 0.13 27 15	F 51	F 60 0.15 16 -- --	A 0 1.02 19 15	> > > > >	F 60	F 60	> > > > >	F 60	F 50				
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	D 29 0.66 36 -- --	> > > > >	D 29	< < < < <	F 91 0.54 19 -- --	> > > > >	F 91	< < < < <	A 7 0.28 9 -- --	> > > > >	A 7	< < < < <	A 0 0.01 0 -- --	> > > > >	A 0	A 0	> > > > >	D 12				
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	D 32 0.79 63 55 -8	C 16 0.52 461 -- --		D 25	C 16 0.46 677 -- --	> > > > >	C 16						B 11 0.19 42 25 -17	D 28 0.79 570 -- --	D 25	D 25	> > > > >	D 25	C 24				

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 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 <- - Shared Left-turn
 >- - Shared Right-turn

TABLE 7.1C: SAT PEAK HOUR OPERATIONS (ISOLATED)

Analysis Period	Intersection	Control Type	MOE	Direction / Movement / Approach																Overall		
				Eastbound				Westbound				Northbound				Southbound						
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach			
Saturday Peak Hour	1 - McLeod Road & Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	C 28 0.58 29 55 26	C 34 0.65 117 -- --	> > > > >	C 33	C 34 0.76 42 155 114	C 30 0.62 128 -- --	D 35 0.19 13 -- --	C 31	D 38 0.21 20 115 96	D 37 0.13 20 -- --	D 40 0.27 27 -- --	D 39	D 36 0.65 79 130 51	C 31 0.22 32 -- --	> > > > >	C 34	C 34 0.69		
	2 - McLeod Road & Oakwood Drive	TCS	LOS Delay V/C Q Ex Avail.	B 14 0.13 3 50 48	C 21 0.67 164 -- --	D 36 0.36 92 -- --	C 25	D 39 0.82 61 80 19	B 18 0.60 129 -- --	> > > > >	C 22	E 64 0.72 90 95 5	E 64 0.71 90 -- --	D 47 0.23 28 -- --	E 56	E 57 0.09 14 20 11	E 57 0.09 14 -- --	> > > > >	E 57	C 30 0.72		
	3 - McLeod Road and Dorchester Road	TCS	LOS Delay V/C Q Ex Avail.	E 76 0.98 93 55 -38	C 29 0.69 117 -- --	> > > > >	D 38	F 124 0.97 61 40 -21	D 39 0.67 100 -- --	> > > > >	D 50	F 89 0.99 96 15 -81	D 35 0.65 112 -- --	> > > > >	E 64	E 74 0.75 52 30 -22	F 93 1.03 195 -- --	> > > > >	F 90	E 56 0.99		
	4 - McLeod Road and Drummond Road	TCS	LOS Delay V/C Q Ex Avail.	< < < < <	C 21 0.76 94 -- --	> > > > >	C 21	< < < < <	B 14 0.44 59 -- --	> > > > >	B 14	< < < < <	D 40 0.73 87 -- --	> > > > >	D 40	C 28 0.43 41 20 -21	C 31 0.60 90 -- --	> > > > >	C 30	C 23 0.77		
	5 - Marineland Parkway and Thundering Waters Boulevard	TCS	LOS Delay V/C Q Ex Avail.	B 18 0.32 30 60 30	B 16 0.24 46 -- --	B 14 0.00 0 50 50	B 17	C 21 0.03 6 25 19	C 25 0.37 77 -- --	C 23 0.18 18 80 62	> > > > >	C 24	< < < < <	D 48 0.06 11 -- --	> > > > >	D 48	D 54 0.68 84 -- --	D 42 0.11 19 -- --	> > > > >	D 50	C 27 0.4	
	6 - Marineland Parkway and Stanley Avenue	TCS	LOS Delay V/C Q Ex Avail.		C 22 0.49 43 -- --	B 19 0.10 10 65 55	C 21	C 24 0.51 23 105 82	C 24 0.62 56 -- --	> > > > >	C 24	A 8 0.08 11 160 149	A 7 0.02 4 80 76	> > > > >	A 8							C 21 0.28
	7 - Lyons Creek Road/Biggar Road and Montrose Road	TCS	LOS Delay V/C Q Ex Avail.	D 35 0.17 11 130 119	C 34 0.33 24 -- --	C 33 0.00 0 120 120	C 34	D 37 0.75 60 150 90	B 15 0.19 19 -- --	B 15 0.06 5 225 220	> > > > >	C 28	C 24 0.02 4 80 76	C 24 0.16 21 -- --	C 28	C 27	D 38 0.45 24 80 56	B 14 0.14 21 -- --	B 15 0.04 4 50 46	> > > > >	C 23	C 27 0.44
	8 - Jill Drive and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.	< < < < <	B 11 0.11 48 -- --	> > > > >	E 48	< < < < <	B 10 0.04 17 -- --	> > > > >	C 17	< < < < <	F 55 1.00 567 -- --	> > > > >	F 567	< < < < <	F 90 1.11 39 -- --	> > > > >	E 39	F 71		
	9 - Oldfield Road and Dorchester Road	AWSC	LOS Delay V/C Q Ex Avail.					B 15 0.42 227 --	> > > > >	B 15 0.16 541 31 15	> > > > >	F 114	F 114 1.21 541 31 15	A 0 0.16 31 15	> > > > >	F 114	F 146 0.18 18 -- --	A 0 1.29 25 15	> > > > >	F 146	F 117	
	10 - Chippawa Parkway and Stanley Avenue	TWSC	LOS Delay V/C Q Ex Avail.	< < < < <	C 18 0.51 23 -- --	> > > > >	C 18	< < < < <	F 59 0.47 17 -- --	> > > > >	F 59	< < < < <	A 7 0.27 9 -- --	> > > > >	A 7	< < < < <	A 0 0.00 0 -- --	> > > > >	A 0	C 11		
	11 - Lyons Creek Road and Stanley Avenue	AWSC	LOS Delay V/C Q Ex Avail.	D 26 0.75 63 55 -8	B 12 0.43 459 -- --		C 21	C 16 0.54 711 -- --	> > > > >	C 16						B 11 0.14 27 25 -2		B 14 0.47 40 -- --	> > > > >	B 13	C 18	

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 LOS - Level of Service
 Delay - Average Delay per Vehicle in Seconds
 Q - 95th Percentile Queue Length
 Ex. - Existing Available Storage
 Avail. - Available Storage
 TCS - Traffic Control Signal
 TWSC - Two-Way Stop Control
 AWSC - All-Way Stop Control
 RBT - Roundabout
 <- Shared Left-turn
 >- Shared Right-turn

7.3 Improvement Timelines

It is difficult to predict with certainty when and if the proposed improvements identified herein will materialize due to various uncertainties around development phases, travel behavior assumptions, infrastructure improvements timing, and other development activities in the area. However, with respect to improvements triggered by the proposed development, the following is noted:

- ▶ Dorchester Road at Street J – Southbound left turn lane and potentially unwarranted traffic control signals
- ▶ Dorchester Road at Jill Drive – Unwarranted traffic control signals.
- ▶ Dorchester Road at Oldfield Road – Unwarranted traffic control signals.
- ▶ McLeod Road at Dorchester Road – Addition of northbound dual left-turn lanes as well as protective signal heads for the northbound and southbound left turn movements.

It is recommended that the implementation timing and necessity of the infrastructure improvements outlined above be monitored and phased as development progresses. This strategy would enable the development to progress in the short term, utilizing available capacity, while ensuring that it does not surpass the available roadway capacity. It would be beneficial to conduct a traffic monitoring study throughout build-out of the development to measure the traffic generation characteristics and impacts along McLeod Road and Dorchester Road. This information will assist in making informed decisions about the road network. The monitoring program would examine the following:

- ▶ Traffic volumes on major roads and at critical intersections, based on periodic traffic counts in the area;
- ▶ Travel characteristics of employees, residents and visitors, including vehicle occupancy, modal split, trip distribution and peak hours of travel;
- ▶ Traffic volumes and transit ridership in the context of available capacity;
- ▶ Existing, planned and proposed development;
- ▶ Traffic infiltration in adjacent residential areas; and
- ▶ The performance of the TDM measures and the extent to which the objectives are being achieved.



The findings of the transportation monitoring program would be used primarily to gauge the need for, and timing of major infrastructure improvements as described previously, and may also identify future development constraints that must be addressed.



8 Transportation Demand Management

Transportation Demand Management (TDM) planning is intended to encourage sustainable transportation modes and minimize single-occupant vehicle trips as part of a community transportation management strategy. The design of the concept block plan will provide the framework for TDM and facilitate establishing a higher priority for sustainable modes of transportation over single-occupant vehicles where appropriate. This relates to the internal road system, which is being designed to create TDM-supportive opportunities for the placement of buildings and public amenity spaces along the streets and at their intersections, desirable locations for building entrances and vehicular access, and well-defined pedestrian circulation routes and safer road crossings.

A key TDM strategy will be the introduction of public transit to this area. As noted previously, this will require extending a Niagara Region Transit route along Dorchester Road and Chippawa Parkway and possibly within and through the subject lands following the completion of the collector road network.

The phase two lands also lend themselves to TDM benefits associated with mixed or multi-use development. This form of development supports sustainability initiatives by promoting complementary land uses in close proximity.⁴ The primary effect is to allow locally generated trips to be made by foot, bike, public transit (including privately operated shuttles, taxis, uber, etc.), or private vehicle (car) while only travelling on the internal sidewalk, path, or road networks (“internal capture trips”).⁵ Since car trips with local origins and destinations would not leave the Riverfront Community, the potential traffic impact on the surrounding arterial road network (“external trips”) would be reduced.

There would be an opportunity to conduct monitoring surveys to determine transportation characteristics related to peak hour trip generation, mode split, directional travel patterns, the effects of TDM planning or specific strategies, and intersection. Operations with initial build-out of the lands. This information would be used to determine the potential need for implementing additional transportation system improvements and for planning subsequent development.






9 Conclusions and Recommendations

9.1 Conclusions

Detailed traffic analysis was conducted for each of the study area intersections under Base (2023) and 2031 traffic conditions. The capacity analysis showed that deficiencies currently exist and are projected to occur at certain locations within the study area with anticipated growth in traffic, including the proposed development. The following capacity constraints at the study area intersections are identified.

McLeod Road and Dorchester Road

Base Year Operations:	Increased Delays	
Background Operations:	Significant Delays	
Total Operations:	Significant Delays	

McLeod Road and Dorchester Road operates well currently however the northbound left turn movement performs moderately during weekday AM peak hour, but poorly during weekday PM and Saturdays. It is expected that several movements will face capacity issues under the Background and Total horizon. Specifically, left turn movements for eastbound and northbound traffic are projected to operate with a v/c ratio exceeding 1.00. The through movements for eastbound, westbound, and southbound traffic will also face challenges, operating with a v/c ratio exceeding 1.00. Additionally, the left turn movement for westbound traffic will operate at moderately with a v/c ratio of 0.78 during the weekday PM and Saturday peak hours.

To accommodate projected traffic volumes from the proposed development, adjustments to the roadway geometry are likely required and include the following:

- ▶ Double left turn lane for northbound traffic that is fully protected.
- ▶ Optimizing the timing of traffic signals

In addition, with traffic generated from other area developments and generally growth in the future, it is expected that additional geometric improvements will be required. Some possible upgrades include implementing the following:

- ▶ Separate right turn lanes for southbound, traffic
- ▶ Optimizing the timing of traffic signals



McLeod Road and Drummond Road

Base Year Operations:	Tolerable Delays	●
Background Operations:	Significant Delays	●
Total Operations:	Significant Delays	●

Presently faces heavy traffic during weekday AM and PM peak hours but performs well on Saturdays. It is expected that there will be a significant increase in traffic volume under the Background horizon, with all approaches operating with a v/c ratio over, the exception being the southbound through movement that will operate with a v/c ratio no greater than 0.71.

In terms of accommodating traffic generated from the proposed development, no specific improvements have been identified other than optimizing the timings of traffic signals.

To accommodate traffic generated from other area developments and general growth in the future, it is expected that geometric improvements will be required. Some possible upgrades include implementing the following:

- ▶ Separate left turn lane for eastbound, westbound and northbound traffic
- ▶ Optimizing the timing of traffic signals

Montrose Road and Lyons Creek Road/Biggar Road

Base Year Operations:	Significant Delays	●
Background Operations:	Tolerable Delays	●
Total Operations:	Tolerable Delays	●

Currently experiences significant traffic during peak hours, particularly on the northbound approach. This results in a high level of delay and the intersection exceeding capacity during the weekday PM and Saturday peak hours. Intersection improvements that are being planned by the Region will lead to better operation under Background and Total horizon, with a v/c ratio no greater than 0.85.



Lyons Creek Road and Stanley Avenue

Base Year Operations:	Tolerable Delays	●
Background Operations:	Significant Delays	●
Total Operations:	Significant Delays	●

Operates currently acceptably during peak hours on weekdays and Saturdays. Under the Background and Total horizon, during peak hours for all approaches, there will be significant traffic that could cause delays and result in poor operations under all-way stop control. The utilization rate is projected to exceed 1.00.

In terms of accommodating traffic generated from the proposed development, no specific improvements have been identified.

To accommodate traffic generated from other area developments and general growth in the future, it is expected that geometric improvements will be required. Some possible upgrades include implementing the following:

- ▶ Traffic control signals with actuated uncoordinated control
- ▶ Double left turn lane for eastbound traffic that is fully protected

Dorchester Road and Jill Drive

Base Year Operations:	Tolerable Delays	●
Background Operations:	Tolerable Delays	●
Total Operations:	Significant Delays	●

Currently operates well during weekdays and Saturday peak hours. Based on the Background horizon projections, there may be a slight decrease in quality of service for each movement during weekday and Saturday peak hours, but utilization levels should not exceed 0.65. However, with increased traffic under the Total horizon, northbound and southbound approaches may experience significant delay with utilization levels exceeding 1.00.

A signal warrant analysis was conducted to determine if the projected traffic conditions would warrant improvements to the existing form of traffic control. The signal warrant analysis indicates traffic control signals are not warranted under the 2031 horizon.

Even though the signal criteria have not been met, the installation of unwarranted traffic control signals would improve operations.



To accommodate projected traffic volumes from the proposed development, adjustments to traffic control are likely required and include the following:

- ▶ Traffic control signals with actuated uncoordinated control

Dorchester Road and Oldfield Road

Base Year Operations:	Tolerable Delays	●
Background Operations:	Tolerable Delays	●
Total Operations:	Significant Delays	●

Currently operates well during weekdays and Saturday peak hours. Under the Background Horizon, it is expected that individual movements will operate well during peak hours on weekdays and Saturdays. The utilization degree is predicted to stay under 0.55. However, delays are expected to increase in the Total horizon for both northbound and southbound approaches. During the weekday PM and Saturday peak hour, the northbound and southbound approach is forecasted to operate poorly under all-way stop control with the degree of utilization exceeding 1.00.

The proposed development's traffic demands may not be fully resolved by the EA's preferred improvement plan. While it's possible that traffic growth may not occur as predicted, additional roadway capacity or alternative traffic control may be required to enhance operations at the intersection of Dorchester Road and Oldfield Road.

To accommodate projected traffic volumes from the proposed development, adjustments to traffic control are likely required and include the following:

- ▶ Traffic control signals with actuated uncoordinated control

Chippawa Parkway and Stanley Avenue

Base Year Operations:	Tolerable Delays	●
Background Operations:	Significant Delays	●
Total Operations:	Significant Delays	●

Currently is operating well on weekdays and Saturdays. Under the Background and Total horizon, it is expected that the stop-controlled approaches in the eastbound and westbound directions will be operating beyond capacity during peak hours, with a v/c ratio of over 1.00.

In terms of accommodating traffic generated from the proposed development, no specific improvements have been identified.



To accommodate traffic generated from other area developments and general growth in the future, it is expected that geometric improvements will be required. Some possible upgrades include implementing the following:

- ▶ Traffic control signals with actuated uncoordinated control
- ▶ Separate left turn lane for eastbound, westbound, northbound and southbound traffic
- ▶ Separate right turn lanes for southbound traffic

Dorchester Road at Street J

| Total Operations: | Increased Delays | ● |

During the weekday PM peak hour and Saturday peak hour the intersection is projected to operate with high delays and a v/c ratio nearing 1.00 for the westbound approach. A signal warrant analysis was conducted to determine if the projected traffic conditions would warrant improvements to the existing form of traffic control. The signal warrant analysis indicates traffic control signals are not warranted under the 2031 horizon.

Even though the signal criteria have not been met, the installation of unwarranted traffic control signals would improve operations.

A southbound left turn lane with 30 metres of storage along Dorchester Road at Street J is warranted.

To accommodate projected traffic volumes from the proposed development, adjustments to traffic control are likely required and include the following:

- ▶ Traffic control signals with actuated uncoordinated control
- ▶ Southbound left turn lane

Access Review

- ▶ Internal Road at Dorchester Road would not meet the minimum spacing requirements for a full movement connection. As a result, it is recommended that the Internal Road to Dorchester Road be restricted to right in/out operations with stop control for the minor approach.

Roadway Classification and Capacity Guidelines

- ▶ Street J will be classified as a collector road and could have daily two-way traffic volumes of 6,000 vehicles per day. These



volumes are appropriate for a collector roadway. Peak hour peak direction traffic volumes on Street J between Dorchester Road and Street K are approximately 150 to 375. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.

- ▶ Street K will be classified as a local road and could have daily two-way traffic volumes of 450 vehicles per day. These volumes are appropriate for a local commercial roadway. Peak hour peak direction traffic volumes on Street K between Dorchester Road and Street J are approximately 10 to 45. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.
- ▶ Internal Road will be classified as a local road and could have daily two-way traffic volumes of 2,100 vehicles per day. These volumes are appropriate for a local commercial roadway. Peak hour peak direction traffic volumes on the Internal Road between Dorchester Road and Street J are approximately 50 to 340. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.
- ▶ Peak hour peak direction traffic volumes on Dorchester Road between Oldfield Road and Street K are approximately 300 to 700. The projected volumes are noted to be within the planning capacities for a two-lane cross-section.

Commercial Parking Review

- ▶ Based on the general by-law, the commercial land uses require 750 parking spaces. The proposed parking supply of 715 spaces is 35 spaces below the required amount.
- ▶ Consideration of shared parking opportunities is common within retail facilities. Paradigm used and adapted a shared parking model using inputs from the ULI to model this activity. The model started with a baseline demand of 750 spaces calculated based on the Zoning By-law requirements. After adjusting for shared parking, the peak demand is approximately 653 spaces.
- ▶ Considering shared parking, the proposed supply of 715 spaces is sufficient to accommodate the projected demand of the commercial uses.



9.2 Recommendations

Based on the findings of this study, the following is recommended:

- ▶ The Internal Road at Dorchester Road is recommended to be restricted to right in/out operations with stop control for the minor approach given insufficient spacing requirements along Dorchester Road.
- ▶ The Applicant be responsible for costs related to the new roadway connection to Dorchester Road (Street J), which includes a southbound left turn lane and potentially unwarranted traffic control signals.
- ▶ The Applicant will bear the cost of potentially unwarranted traffic control signals due to the deterioration of operations at the intersection of Dorchester Road and Jill Drive, caused by the build-out of the development.
- ▶ The Applicant will bear the cost of potentially unwarranted traffic control signals due to the deterioration of operations at the intersection of Dorchester Road and Oldfield Road caused by the build-out of the development.
- ▶ The Applicant will bear the cost of potentially constructing double left-turn lanes for the northbound approach at McLeod Road and Dorchester Road along with protected signal phasing for the northbound and southbound left turn movements.
- ▶ As the increase in traffic at some of the study area intersections as a result of other development applications and overall general growth, the City and Region are recommended to coordinate the improvement plan for additional improvements to the following intersections:
 - McLeod Road at Dorchester Road
 - McLeod Road at Drummond Road
 - Chippawa Parkway at Stanley Avenue
 - Lyons Creek Road at Stanley Avenue
- ▶ The City support the proposed reduction in parking proposed for the commercial area based on the shared parking methodology.



Appendix A

Terms of Reference



Greg Lue

From: John Grubich <jgrubich@niagarafalls.ca>
Sent: April 24, 2023 9:40 AM
To: Greg Lue
Cc: Adam Makarewicz; Dunsmore, Susan; Mathew Bilodeau
Subject: RE: 220542 - Riverfront Community Phase 2, Niagara Falls - Transportation Impact Study - Terms of Reference
Attachments: Marina Homes Site Trips.pdf

Greg;

Thank you for forwarding your terms of reference. There was a follow up meeting with the applicant on Friday to discuss a few matters. There were some changes made to their concept plans.

City Staff comments are embedded below in blue.

Please advise if you need further information.

John Grubich, C.E.T. | Traffic Planning Supervisor | Municipal Works - Transportation Services | City of Niagara Falls
8208 Heartland Forest Road | Niagara Falls, ON L2H 0L7 | (905) 356-7521 ext 5214 | Fax 905-356-5576 | jgrubich@niagarafalls.ca

From: Dunsmore, Susan <Susan.Dunsmore@niagararegion.ca>
Sent: April 19, 2023 10:06 AM
To: Greg Lue <glue@ptsl.com>; John Grubich <jgrubich@niagarafalls.ca>
Cc: Adam Makarewicz <amakarewicz@ptsl.com>
Subject: RE: 220542 - Riverfront Community Phase 2, Niagara Falls - Transportation Impact Study - Terms of Reference

Hello Greg

Transportation planning staff have reviewed the terms of reference for the lands within the Riverfront Community their comments are below in red. For Regional transportation data please use the following link: <https://www.niagararegion.ca/living/roads/permits/traffic-data-requests.aspx>. If any improvements are required to Regional infrastructure, functional designs are to be included in the TIS.

If you require anything further please contact me at your convenience.

Thank you

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

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



From: Greg Lue <glue@ptsl.com>

Sent: Tuesday, April 11, 2023 1:55 PM

To: John Grubich <jgrubich@niagarafalls.ca>; Dunsmore, Susan <Susan.Dunsmore@niagararegion.ca>

Cc: Adam Makarewicz <amakarewicz@ptsl.com>

Subject: 220542 - Riverfront Community Phase 2, Niagara Falls - Transportation Impact Study - Terms of Reference

CAUTION EXTERNAL EMAIL: This email originated from outside of the Niagara Region email system. Use caution when clicking links or opening attachments unless you recognize the sender and know the content is safe.

Hi all,

Paradigm Transportations Solutions Limited has been retained to conduct a Transportation Impact Analysis for the Phase 2 of the Riverfront project in Niagara Falls. This phase of the Riverfront Community development comprises a mix of commercial, residential, and employment use. The Gross Floor Area (GFA) and the unit count is currently not available; however, the proposed draft plan of subdivision is noted to be a “large-scale” development. The commercial area and residential uses are located within the western limit of the lands and will have access provided through a new internal roadway network that will connect to Dorchester Road. Several driveway connections are also proposed to provide access to Dorchester Road. The employment uses are located within the eastern limit of the lands and will have access provided through an extension of the road network proposed within Phase 1 (i.e., Street F). Through this roadway extension, the employment uses will have direct access to Chippawa Parkway.

Two separate Transportation Impact Assessments will be provided: one for A01-A06 north of the railway and one for the block BL22 south of the railway.

Proposed Terms of Reference

Study Area Intersections

- Chippawa Parkway and Stanley Avenue
- Dorchester Road and Oldfield Road
- Dorchester Road and Jill Drive (All-Way Stop)
- McLeod Road and Oakwood Drive - TMC available Nov 2021
- McLeod Road and Dorchester Road - TMC available Nov 2021
- Montrose Road and Lyons Creek Road/Biggar Road
- McLeod Road and Montrose Road - TMC available Nov 2021
- McLeod Road and Drummond Road - TMC available Nov 2021
- Stanley Avenue and Lyons Creek Road
- Stanley Avenue and Marineland Parkway - TMC available Aug 2022
- Marineland Parkway and Thundering Waters Blvd
- Seven (7) new access points – City Staff recommends the only connections onto Dorchester Road are the two public roads, and all driveways branch off the internal roads, unless the traffic study identifies that additional access points onto Dorchester Road are warranted. Please assess if left/right turn lanes and if traffic signals are warranted at the new public road connections onto Dorchester Road/Chippawa Parkway.

- The concept plan shows Street J as a four-lane road. Please identify through your analyses that 4 lanes are required.
- For future road improvements along Montrose Road, please review the Montrose Road (Regional Road 98) and Lyons Creek Road (Regional Road 47) / Biggar Road MCEA found in the Region's website (<https://niagararegion.ca/projects/montrose-lyons-creek-ea/>)

Existing Data

- New traffic counts will be collected

Horizon Years

- 2023 Base Year
- 5-years from full occupancy
- Please provide anticipated build-out time frame. If the development is phased, the TIS to include an estimated timeframe for the build-out of the various phases and analyze the study area at each phase.

Analysis Periods

- Weekday AM peak hour
- Weekday PM peak hour
- Saturday Peak Hour

Analysis

- Synchro 10
- HCM 2000
- SimTraffic Queuing (five 60-min iterations)

Background Traffic

- Generalized growth rate 1% per annum - Based on the Region's Travel Forecast Demand Model (EMME), the forecasted growth rate ranges from 1%- 4% on regional roads within the study area. As such, the region request an average of 2% annual growth rate.
- Traffic generated by any in stream developments in the area. Please include the estimated traffic volumes from Riverfront Phase 1 and the proposed Block 12 condominium.
- Please include estimated traffic:
 - For a proposed subdivision north of Lyons Creek Road & Stanley Avenue -> <https://niagarafalls.ca/city-hall/planning/current-planning-applications/37-8970-9015-stanley-avenue-and-lands-to-south.pda>
 - Niagara Village Subdivision (formal application received to amend the City's Official Plan and Zoning By-law) - <https://www.dropbox.com/sh/nzkqmc969q1cvso/AAD4QWVYcnpAo58QxYFL0eiLa?dl=0>
 - 5500 Marineland Parkway (Marina Homes) – 292 condominium units – approved – site trip diagram attached
 - Portage Road, north of Marineland Parkway – 2 residential towers – zoning application submitted, Paradigm prepared the TIS
- The City is finalizing an EA for the Dorchester Road/Oldfield intersection - <https://letstalk.niagarafalls.ca/dorchester-and-oldfield-road-intersection-improvements>. This EA recommends the all-way stop control remain, but with a NE left turn lane and a SB right turn lane. Please include these improvements in future horizon years and identify if the recommended storage/taper lengths are adequate for the proposal.
- The City recently reconstructed Dorchester Road between McLeod Road and Oldfield Road. It remains a 2-lane cross-section with a bike lane in each direction.

Site Traffic Estimates

- ITE Trip Generation Data 11th Edition
- No modal split reductions

Site Traffic Distribution

- Existing travel patterns/TTS data

Access and Circulation Review

- ACR will be conducted to ensure compliance of the proposed development plan with review agency requirements and applicable industry guidelines
- Please identify the setback of Street K to the rail line and if it meets applicable guidelines and is appropriately located per your analysis.

Report

- We will document the study methodologies, findings, and conclusions in a report with appendices containing the detailed analysis results and any data collected

General Comments:

- The Consultant is to follow Niagara Region Guidelines for TIS (2012) for traffic analysis software settings, intersections capacity thresholds and other requirements.
- For the ideal saturation flows, there are currently new saturation flow rates that will be a part of the new TIS Guidelines. The Consultant can use either the new saturation values or 1750 across the board for all movements.

Variable	Saturation Flow Rate (pc/h/ln) - Niagara Falls
T	1,579
L	1,454
LT	1,178
LL	2,144
R	1,301
RT	1,338
LTR	1,433

Thanks,

Greg Lue, M.A.Sc., P.Eng.

Project Manager

(he/him)



Paradigm Transportation Solutions Limited

5A-150 Pinebush Road, Cambridge ON N1R 8J8

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**** Paradigm is now operating on a 4-day workweek. Our offices are closed Fridays. ****

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Appendix B

Traffic Data





Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Montrose Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 1

Turning Movement Data

Start Time	McLeod Road Eastbound						McLeod Road Westbound						Montrose Road Northbound						Montrose Road Southbound						Int. Total	
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total		
7:00 AM	7	105	0	0	0	112	5	88	21	0	0	114	3	9	23	0	1	35	14	8	10	0	0	32	293	
7:15 AM	10	136	0	0	0	146	2	114	17	0	0	133	6	9	13	0	0	28	14	7	10	0	0	31	338	
7:30 AM	13	178	1	0	1	192	5	153	26	0	0	184	5	15	24	0	0	44	19	9	19	0	0	47	467	
7:45 AM	19	196	0	0	1	215	8	179	42	0	0	229	2	14	18	0	0	34	18	19	34	0	0	71	549	
Hourly Total	49	615	1	0	2	665	20	534	106	0	0	660	16	47	78	0	1	141	65	43	73	0	0	181	1647	
8:00 AM	19	206	7	0	0	232	5	172	28	0	0	205	5	15	27	0	0	47	15	14	18	0	0	47	531	
8:15 AM	25	190	4	0	0	219	10	173	52	0	0	235	1	14	25	0	0	40	32	12	17	0	0	61	555	
8:30 AM	25	224	3	0	2	252	14	161	38	0	0	213	5	16	32	0	0	53	30	10	13	0	0	53	571	
8:45 AM	28	199	4	0	0	231	16	207	39	0	0	262	7	14	23	0	0	44	31	31	25	0	0	87	624	
Hourly Total	97	819	18	0	2	934	45	713	157	0	0	915	18	59	107	0	0	184	108	67	73	0	0	248	2281	
9:00 AM	21	208	9	0	0	238	12	153	28	0	0	193	8	17	37	0	0	62	35	17	20	0	0	72	565	
9:15 AM	32	163	6	0	0	201	8	161	37	0	0	206	3	21	40	0	0	64	31	25	15	0	1	71	542	
9:30 AM	22	175	4	0	0	201	6	142	37	0	1	185	6	21	44	0	0	71	37	18	17	0	1	72	529	
9:45 AM	19	187	3	0	3	209	9	156	56	0	0	221	6	21	58	0	0	85	28	24	16	0	0	68	583	
Hourly Total	94	733	22	0	3	849	35	612	158	0	1	805	23	80	179	0	0	282	131	84	68	0	2	283	2219	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	35	162	6	0	1	203	18	164	40	0	1	222	14	28	74	1	0	117	31	34	19	0	0	84	626	
11:45 AM	33	184	10	0	4	227	41	181	43	0	1	265	17	24	64	2	0	107	40	32	17	0	0	89	688	
Hourly Total	68	346	16	0	5	430	59	345	83	0	2	487	31	52	138	3	0	224	71	66	36	0	0	173	1314	
12:00 PM	32	195	10	1	1	238	29	185	43	0	0	257	15	34	74	1	0	124	41	32	26	0	0	99	718	
12:15 PM	35	216	7	0	0	258	24	151	52	0	1	227	13	27	67	0	0	107	37	36	17	0	0	90	682	
12:30 PM	33	196	9	0	3	238	20	186	49	1	0	256	14	23	57	1	0	95	48	38	27	0	4	113	702	
12:45 PM	29	192	5	0	5	226	34	180	56	0	0	270	14	27	57	2	1	100	42	45	26	0	0	113	709	
Hourly Total	129	799	31	1	9	960	107	702	200	1	1	1010	56	111	255	4	1	426	168	151	96	0	4	415	2811	
1:00 PM	36	220	7	0	3	263	41	175	41	0	0	257	12	18	67	2	1	99	35	27	29	1	4	92	711	
1:15 PM	33	238	8	0	0	279	13	181	40	0	1	234	14	19	60	0	1	93	56	36	24	0	2	116	722	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	69	458	15	0	3	542	54	356	81	0	1	491	26	37	127	2	2	192	91	63	53	1	6	208	1433	
4:00 PM	26	238	16	1	2	281	16	223	51	0	0	290	14	24	94	0	0	132	60	32	33	0	0	125	828	
4:15 PM	30	236	6	0	5	272	40	251	60	0	0	351	9	29	67	0	0	105	46	49	28	0	2	123	851	
4:30 PM	31	235	10	0	2	276	38	231	51	0	1	320	15	35	93	0	0	143	74	51	34	0	0	159	898	
4:45 PM	26	270	12	0	4	308	40	227	54	0	0	321	10	26	61	0	1	97	51	32	18	0	0	101	827	
Hourly Total	113	979	44	1	13	1137	134	932	216	0	1	1282	48	114	315	0	1	477	231	164	113	0	2	508	3404	
5:00 PM	27	223	7	0	1	257	28	218	47	0	0	293	20	27	82	0	0	129	55	32	18	0	2	105	784	
5:15 PM	36	256	9	1	4	302	41	245	55	2	1	343	9	21	68	0	1	98	41	32	24	0	5	97	840	

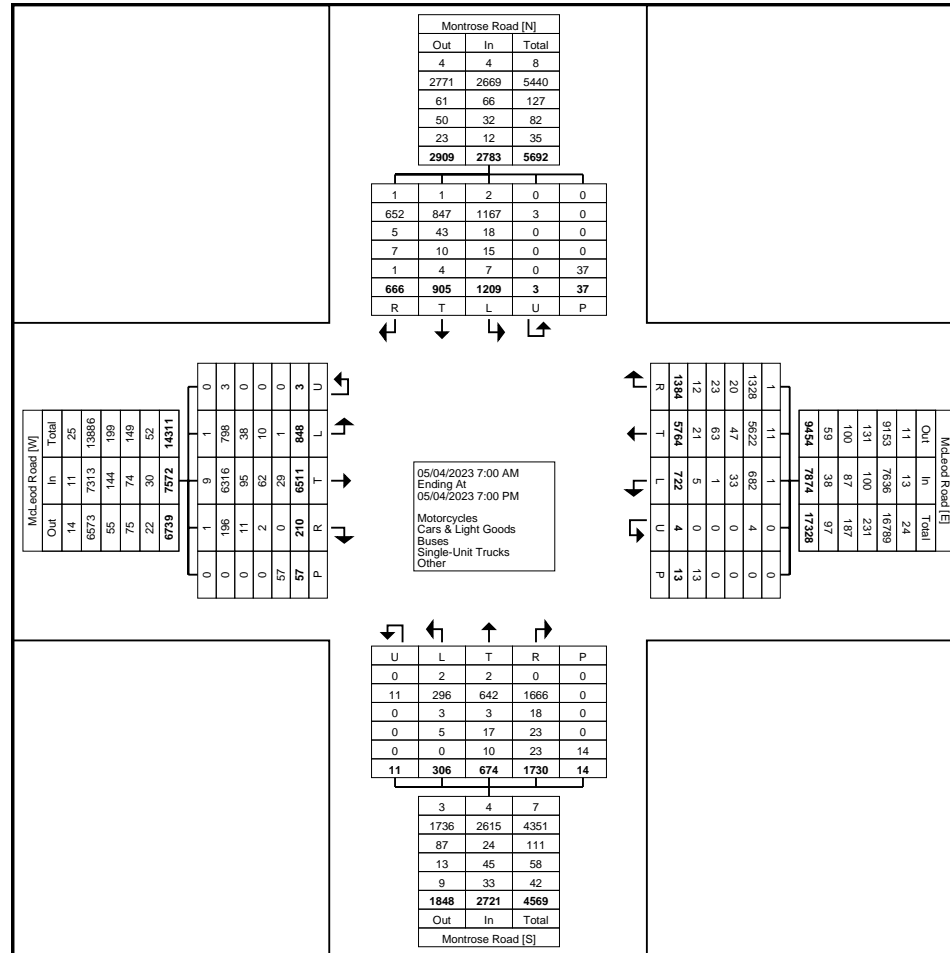
5:30 PM	23	244	10	0	2	277	34	228	57	0	1	319	13	16	77	0	0	106	48	39	17	0	3	104	806
5:45 PM	25	233	12	0	3	270	28	210	57	0	0	295	9	28	62	0	0	99	40	33	16	0	0	89	753
Hourly Total	111	956	38	1	10	1106	131	901	216	2	2	1250	51	92	289	0	1	432	184	136	75	0	10	395	3183
6:00 PM	38	204	10	0	4	252	26	180	38	0	0	244	12	18	66	0	0	96	42	29	17	0	2	88	680
6:15 PM	18	204	6	0	2	228	34	178	35	1	0	248	11	20	63	0	2	94	40	36	20	0	5	96	666
6:30 PM	26	218	7	0	4	251	38	157	39	0	5	234	7	23	57	2	5	89	38	36	19	2	5	95	669
6:45 PM	36	180	2	0	0	218	39	154	55	0	0	248	7	21	56	0	1	84	40	30	23	0	1	93	643
Hourly Total	118	806	25	0	10	949	137	669	167	1	5	974	37	82	242	2	8	363	160	131	79	2	13	372	2658
Grand Total	848	6511	210	3	57	7572	722	5764	1384	4	13	7874	306	674	1730	11	14	2721	1209	905	666	3	37	2783	20950
Approach %	11.2	86.0	2.8	0.0	-	-	9.2	73.2	17.6	0.1	-	-	11.2	24.8	63.6	0.4	-	-	43.4	32.5	23.9	0.1	-	-	-
Total %	4.0	31.1	1.0	0.0	-	36.1	3.4	27.5	6.6	0.0	-	37.6	1.5	3.2	8.3	0.1	-	13.0	5.8	4.3	3.2	0.0	-	13.3	-
Motorcycles	1	9	1	0	-	11	1	11	1	0	-	13	2	2	0	0	-	4	2	1	1	0	-	4	32
% Motorcycles	0.1	0.1	0.5	0.0	-	0.1	0.1	0.2	0.1	0.0	-	0.2	0.7	0.3	0.0	0.0	-	0.1	0.2	0.1	0.2	0.0	-	0.1	0.2
Cars & Light Goods	798	6316	196	3	-	7313	682	5622	1328	4	-	7636	296	642	1666	11	-	2615	1167	847	652	3	-	2669	20233
% Cars & Light Goods	94.1	97.0	93.3	100.0	-	96.6	94.5	97.5	96.0	100.0	-	97.0	96.7	95.3	96.3	100.0	-	96.1	96.5	93.6	97.9	100.0	-	95.9	96.6
Buses	38	95	11	0	-	144	33	47	20	0	-	100	3	3	18	0	-	24	18	43	5	0	-	66	334
% Buses	4.5	1.5	5.2	0.0	-	1.9	4.6	0.8	1.4	0.0	-	1.3	1.0	0.4	1.0	0.0	-	0.9	1.5	4.8	0.8	0.0	-	2.4	1.6
Single-Unit Trucks	10	62	2	0	-	74	1	63	23	0	-	87	5	17	23	0	-	45	15	10	7	0	-	32	238
% Single-Unit Trucks	1.2	1.0	1.0	0.0	-	1.0	0.1	1.1	1.7	0.0	-	1.1	1.6	2.5	1.3	0.0	-	1.7	1.2	1.1	1.1	0.0	-	1.1	1.1
Articulated Trucks	1	27	0	0	-	28	5	19	10	0	-	34	0	10	23	0	-	33	6	3	1	0	-	10	105
% Articulated Trucks	0.1	0.4	0.0	0.0	-	0.4	0.7	0.3	0.7	0.0	-	0.4	0.0	1.5	1.3	0.0	-	1.2	0.5	0.3	0.2	0.0	-	0.4	0.5
Bicycles on Road	0	2	0	0	-	2	0	2	2	0	-	4	0	0	0	0	-	0	1	1	0	0	-	2	8
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.1	0.0	-	0.1	0.0	0.0	0.0	0.0	-	0.0	0.1	0.1	0.0	0.0	-	0.1	0.0
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	1.8	-	-	-	-	-	15.4	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	56	-	-	-	-	-	11	-	-	-	-	-	14	-	-	-	-	-	37	-	-
% Pedestrians	-	-	-	-	98.2	-	-	-	-	-	84.6	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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5A-150 Pinebush Rd

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Count Name: McLeod Road & Montrose Road
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Turning Movement Data Plot



Paradigm Transportation Solutions Limited
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Count Name: McLeod Road & Montrose Road
Site Code: 220542
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Turning Movement Peak Hour Data (8:15 AM)

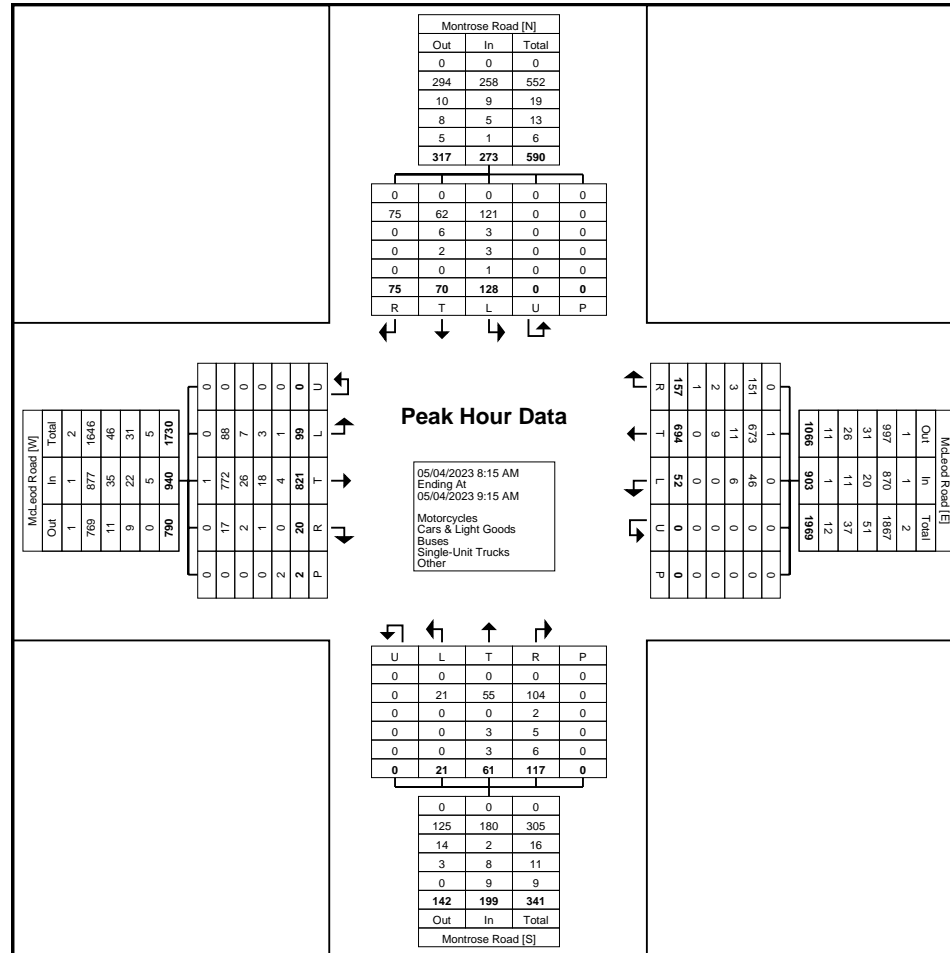
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Montrose Road Northbound						Montrose Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:15 AM	25	190	4	0	0	219	10	173	52	0	0	235	1	14	25	0	0	40	32	12	17	0	0	61	555
8:30 AM	25	224	3	0	2	252	14	161	38	0	0	213	5	16	32	0	0	53	30	10	13	0	0	53	571
8:45 AM	28	199	4	0	0	231	16	207	39	0	0	262	7	14	23	0	0	44	31	31	25	0	0	87	624
9:00 AM	21	208	9	0	0	238	12	153	28	0	0	193	8	17	37	0	0	62	35	17	20	0	0	72	565
Total	99	821	20	0	2	940	52	694	157	0	0	903	21	61	117	0	0	199	128	70	75	0	0	273	2315
Approach %	10.5	87.3	2.1	0.0	-	-	5.8	76.9	17.4	0.0	-	-	10.6	30.7	58.8	0.0	-	-	46.9	25.6	27.5	0.0	-	-	-
Total %	4.3	35.5	0.9	0.0	-	40.6	2.2	30.0	6.8	0.0	-	39.0	0.9	2.6	5.1	0.0	-	8.6	5.5	3.0	3.2	0.0	-	11.8	-
PHF	0.884	0.916	0.556	0.000	-	0.933	0.813	0.838	0.755	0.000	-	0.862	0.656	0.897	0.791	0.000	-	0.802	0.914	0.565	0.750	0.000	-	0.784	0.927
Motorcycles	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	2
% Motorcycles	0.0	0.1	0.0	-	-	0.1	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	88	772	17	0	-	877	46	673	151	0	-	870	21	55	104	0	-	180	121	62	75	0	-	258	2185
% Cars & Light Goods	88.9	94.0	85.0	-	-	93.3	88.5	97.0	96.2	-	-	96.3	100.0	90.2	88.9	-	-	90.5	94.5	88.6	100.0	-	-	94.5	94.4
Buses	7	26	2	0	-	35	6	11	3	0	-	20	0	0	2	0	-	2	3	6	0	0	-	9	66
% Buses	7.1	3.2	10.0	-	-	3.7	11.5	1.6	1.9	-	-	2.2	0.0	0.0	1.7	-	-	1.0	2.3	8.6	0.0	-	-	3.3	2.9
Single-Unit Trucks	3	18	1	0	-	22	0	9	2	0	-	11	0	3	5	0	-	8	3	2	0	0	-	5	46
% Single-Unit Trucks	3.0	2.2	5.0	-	-	2.3	0.0	1.3	1.3	-	-	1.2	0.0	4.9	4.3	-	-	4.0	2.3	2.9	0.0	-	-	1.8	2.0
Articulated Trucks	1	4	0	0	-	5	0	0	1	0	-	1	0	3	6	0	-	9	1	0	0	0	-	1	16
% Articulated Trucks	1.0	0.5	0.0	-	-	0.5	0.0	0.0	0.6	-	-	0.1	0.0	4.9	5.1	-	-	4.5	0.8	0.0	0.0	-	-	0.4	0.7
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Turning Movement Peak Hour Data Plot (8:15 AM)



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Count Name: McLeod Road & Montrose Road
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Turning Movement Peak Hour Data (12:30 PM)

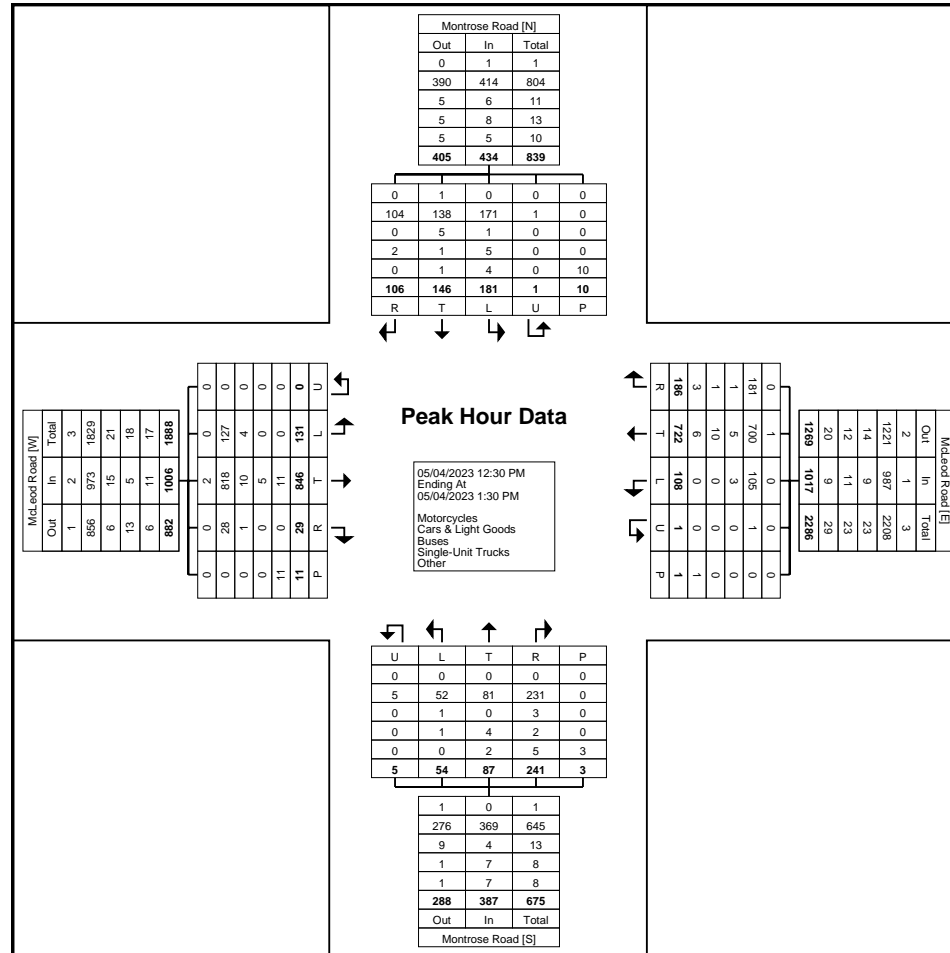
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Montrose Road Northbound						Montrose Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:30 PM	33	196	9	0	3	238	20	186	49	1	0	256	14	23	57	1	0	95	48	38	27	0	4	113	702
12:45 PM	29	192	5	0	5	226	34	180	56	0	0	270	14	27	57	2	1	100	42	45	26	0	0	113	709
1:00 PM	36	220	7	0	3	263	41	175	41	0	0	257	12	18	67	2	1	99	35	27	29	1	4	92	711
1:15 PM	33	238	8	0	0	279	13	181	40	0	1	234	14	19	60	0	1	93	56	36	24	0	2	116	722
Total	131	846	29	0	11	1006	108	722	186	1	1	1017	54	87	241	5	3	387	181	146	106	1	10	434	2844
Approach %	13.0	84.1	2.9	0.0	-	-	10.6	71.0	18.3	0.1	-	-	14.0	22.5	62.3	1.3	-	-	41.7	33.6	24.4	0.2	-	-	-
Total %	4.6	29.7	1.0	0.0	-	35.4	3.8	25.4	6.5	0.0	-	35.8	1.9	3.1	8.5	0.2	-	13.6	6.4	5.1	3.7	0.0	-	15.3	-
PHF	0.910	0.889	0.806	0.000	-	0.901	0.659	0.970	0.830	0.250	-	0.942	0.964	0.806	0.899	0.625	-	0.968	0.808	0.811	0.914	0.250	-	0.935	0.985
Motorcycles	0	2	0	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	4
% Motorcycles	0.0	0.2	0.0	-	-	0.2	0.0	0.1	0.0	0.0	-	0.1	0.0	0.0	0.0	0.0	-	0.0	0.0	0.7	0.0	0.0	-	0.2	0.1
Cars & Light Goods	127	818	28	0	-	973	105	700	181	1	-	987	52	81	231	5	-	369	171	138	104	1	-	414	2743
% Cars & Light Goods	96.9	96.7	96.6	-	-	96.7	97.2	97.0	97.3	100.0	-	97.1	96.3	93.1	95.9	100.0	-	95.3	94.5	94.5	98.1	100.0	-	95.4	96.4
Buses	4	10	1	0	-	15	3	5	1	0	-	9	1	0	3	0	-	4	1	5	0	0	-	6	34
% Buses	3.1	1.2	3.4	-	-	1.5	2.8	0.7	0.5	0.0	-	0.9	1.9	0.0	1.2	0.0	-	1.0	0.6	3.4	0.0	0.0	-	1.4	1.2
Single-Unit Trucks	0	5	0	0	-	5	0	10	1	0	-	11	1	4	2	0	-	7	5	1	2	0	-	8	31
% Single-Unit Trucks	0.0	0.6	0.0	-	-	0.5	0.0	1.4	0.5	0.0	-	1.1	1.9	4.6	0.8	0.0	-	1.8	2.8	0.7	1.9	0.0	-	1.8	1.1
Articulated Trucks	0	11	0	0	-	11	0	6	3	0	-	9	0	2	5	0	-	7	4	0	0	0	-	4	31
% Articulated Trucks	0.0	1.3	0.0	-	-	1.1	0.0	0.8	1.6	0.0	-	0.9	0.0	2.3	2.1	0.0	-	1.8	2.2	0.0	0.0	0.0	-	0.9	1.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.7	0.0	0.0	-	0.2	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	11	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-	10	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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



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Count Name: McLeod Road & Montrose Road
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Turning Movement Peak Hour Data (4:00 PM)

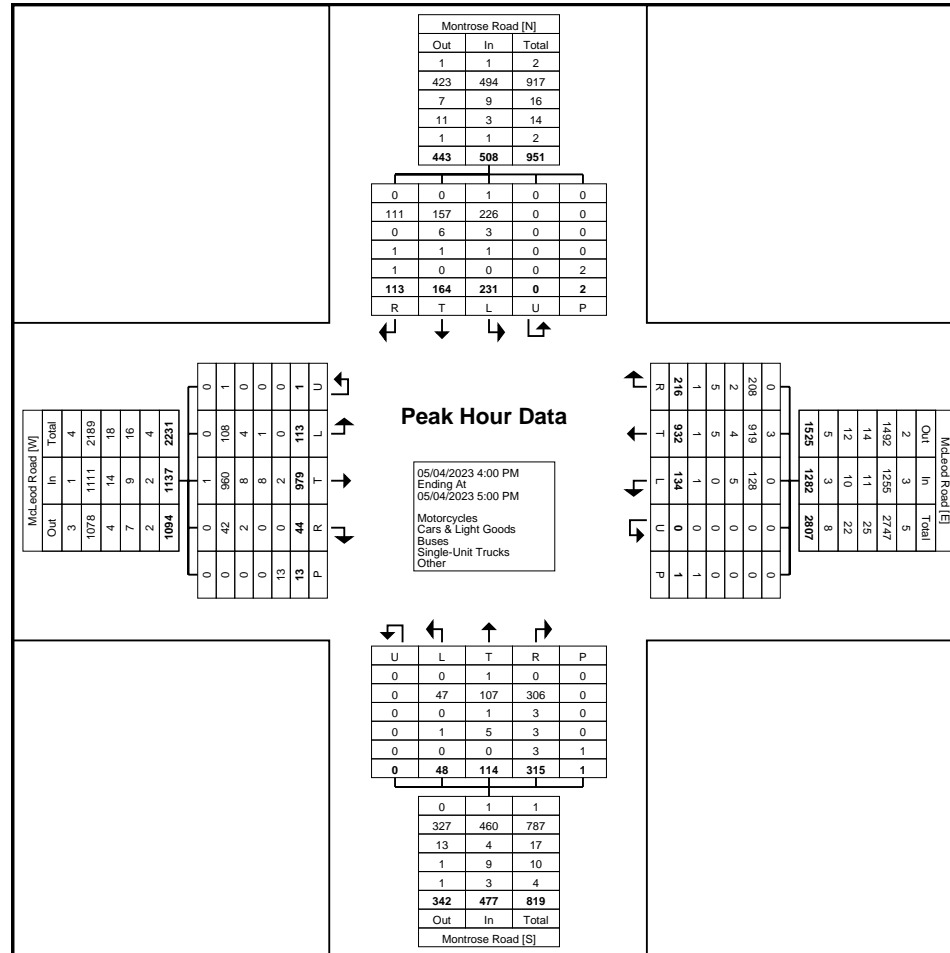
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Montrose Road Northbound						Montrose Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	26	238	16	1	2	281	16	223	51	0	0	290	14	24	94	0	0	132	60	32	33	0	0	125	828
4:15 PM	30	236	6	0	5	272	40	251	60	0	0	351	9	29	67	0	0	105	46	49	28	0	2	123	851
4:30 PM	31	235	10	0	2	276	38	231	51	0	1	320	15	35	93	0	0	143	74	51	34	0	0	159	898
4:45 PM	26	270	12	0	4	308	40	227	54	0	0	321	10	26	61	0	1	97	51	32	18	0	0	101	827
Total	113	979	44	1	13	1137	134	932	216	0	1	1282	48	114	315	0	1	477	231	164	113	0	2	508	3404
Approach %	9.9	86.1	3.9	0.1	-	-	10.5	72.7	16.8	0.0	-	-	10.1	23.9	66.0	0.0	-	-	45.5	32.3	22.2	0.0	-	-	-
Total %	3.3	28.8	1.3	0.0	-	33.4	3.9	27.4	6.3	0.0	-	37.7	1.4	3.3	9.3	0.0	-	14.0	6.8	4.8	3.3	0.0	-	14.9	-
PHF	0.911	0.906	0.688	0.250	-	0.923	0.838	0.928	0.900	0.000	-	0.913	0.800	0.814	0.838	0.000	-	0.834	0.780	0.804	0.831	0.000	-	0.799	0.948
Motorcycles	0	1	0	0	-	1	0	3	0	0	-	3	0	1	0	0	-	1	1	0	0	0	-	1	6
% Motorcycles	0.0	0.1	0.0	0.0	-	0.1	0.0	0.3	0.0	-	-	0.2	0.0	0.9	0.0	-	-	0.2	0.4	0.0	0.0	-	-	0.2	0.2
Cars & Light Goods	108	960	42	1	-	1111	128	919	208	0	-	1255	47	107	306	0	-	460	226	157	111	0	-	494	3320
% Cars & Light Goods	95.6	98.1	95.5	100.0	-	97.7	95.5	98.6	96.3	-	-	97.9	97.9	93.9	97.1	-	-	96.4	97.8	95.7	98.2	-	-	97.2	97.5
Buses	4	8	2	0	-	14	5	4	2	0	-	11	0	1	3	0	-	4	3	6	0	0	-	9	38
% Buses	3.5	0.8	4.5	0.0	-	1.2	3.7	0.4	0.9	-	-	0.9	0.0	0.9	1.0	-	-	0.8	1.3	3.7	0.0	-	-	1.8	1.1
Single-Unit Trucks	1	8	0	0	-	9	0	5	5	0	-	10	1	5	3	0	-	9	1	1	1	0	-	3	31
% Single-Unit Trucks	0.9	0.8	0.0	0.0	-	0.8	0.0	0.5	2.3	-	-	0.8	2.1	4.4	1.0	-	-	1.9	0.4	0.6	0.9	-	-	0.6	0.9
Articulated Trucks	0	1	0	0	-	1	1	1	1	0	-	3	0	0	3	0	-	3	0	0	1	0	-	1	8
% Articulated Trucks	0.0	0.1	0.0	0.0	-	0.1	0.7	0.1	0.5	-	-	0.2	0.0	0.0	1.0	-	-	0.6	0.0	0.0	0.9	-	-	0.2	0.2
Bicycles on Road	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.1	0.0	0.0	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	13	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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519-896-3163 cbowness@ptsl.com

Count Name: McLeod Road & Montrose Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Montrose Road -
Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 1

Turning Movement Data

Start Time	McLeod Road Eastbound						McLeod Road Westbound						Montrose Road Northbound						Montrose Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
10:00 AM	27	200	5	0	0	232	18	192	31	0	0	241	3	19	39	0	0	61	36	27	18	0	0	81	615
10:15 AM	25	220	7	0	0	252	30	169	39	0	1	238	9	21	45	0	0	75	29	33	29	0	0	91	656
10:30 AM	31	258	10	0	0	299	23	154	43	0	0	220	13	19	62	0	0	94	47	29	24	0	0	100	713
10:45 AM	29	228	2	0	1	259	29	190	42	0	0	261	8	30	61	0	0	99	43	34	26	0	0	103	722
Hourly Total	112	906	24	0	1	1042	100	705	155	0	1	960	33	89	207	0	0	329	155	123	97	0	0	375	2706
11:00 AM	27	214	7	0	3	248	31	175	46	0	3	252	8	20	63	1	7	92	48	29	23	1	0	101	693
11:15 AM	30	231	4	0	0	265	30	167	53	1	0	251	5	20	55	0	0	80	41	40	14	0	0	95	691
11:30 AM	37	208	9	0	6	254	30	148	51	0	0	229	17	17	48	0	4	82	48	39	18	0	0	105	670
11:45 AM	45	262	12	0	2	319	44	196	28	0	0	268	14	27	65	1	0	107	45	39	31	1	0	116	810
Hourly Total	139	915	32	0	11	1086	135	686	178	1	3	1000	44	84	231	2	11	361	182	147	86	2	0	417	2864
12:00 PM	28	213	15	0	4	256	52	157	40	0	1	249	17	18	66	0	0	101	46	32	25	0	1	103	709
12:15 PM	18	234	8	0	1	260	33	155	47	0	1	235	12	21	68	0	4	101	34	34	25	0	0	93	689
12:30 PM	31	215	9	0	1	255	37	155	47	0	1	239	17	28	71	0	3	116	43	36	23	2	1	104	714
12:45 PM	27	207	8	0	3	242	45	169	42	0	8	256	12	25	51	1	4	89	48	35	19	0	0	102	689
Hourly Total	104	869	40	0	9	1013	167	636	176	0	11	979	58	92	256	1	11	407	171	137	92	2	2	402	2801
1:00 PM	28	231	10	0	4	269	33	208	45	0	0	286	15	27	72	0	0	114	49	36	16	0	5	101	770
1:15 PM	29	248	10	0	1	287	36	176	53	0	3	265	13	25	84	0	0	122	57	39	17	1	6	114	788
1:30 PM	31	256	10	0	2	297	43	180	51	0	3	274	10	18	54	1	1	83	41	46	15	0	0	102	756
1:45 PM	32	224	8	0	5	264	27	185	51	0	0	263	15	26	69	0	1	110	44	41	20	1	7	106	743
Hourly Total	120	959	38	0	12	1117	139	749	200	0	6	1088	53	96	279	1	2	429	191	162	68	2	18	423	3057
2:00 PM	37	206	12	0	0	255	40	179	42	0	1	261	12	24	71	2	0	109	32	38	10	0	1	80	705
2:15 PM	34	203	11	0	1	248	44	170	40	0	0	254	17	19	69	0	0	105	34	33	17	2	3	86	693
2:30 PM	31	225	8	0	4	264	31	161	40	0	2	232	13	15	81	1	0	110	42	35	17	2	1	96	702
2:45 PM	32	264	7	0	2	303	30	208	36	0	2	274	13	19	76	0	0	108	41	39	18	0	3	98	783
Hourly Total	134	898	38	0	7	1070	145	718	158	0	5	1021	55	77	297	3	0	432	149	145	62	4	8	360	2883
3:00 PM	24	191	12	1	1	228	52	171	52	0	7	275	13	31	72	2	6	118	41	32	22	3	0	98	719
3:15 PM	28	214	6	0	7	248	31	166	49	0	0	246	8	16	71	0	5	95	50	36	16	0	1	102	691
3:30 PM	26	242	5	0	0	273	41	166	45	0	0	252	5	22	76	0	1	103	49	37	21	0	2	107	735
3:45 PM	32	216	10	0	1	258	37	173	39	1	0	250	20	21	77	0	0	118	47	27	21	0	3	95	721
Hourly Total	110	863	33	1	9	1007	161	676	185	1	7	1023	46	90	296	2	12	434	187	132	80	3	6	402	2866
4:00 PM	33	205	13	0	3	251	45	186	43	0	1	274	10	26	64	0	0	100	32	38	26	1	2	97	722
4:15 PM	24	247	7	0	4	278	36	195	44	0	2	275	7	18	62	1	0	88	40	42	17	0	1	99	740
4:30 PM	25	208	12	1	3	246	34	162	24	0	0	220	10	30	68	0	1	108	48	33	18	0	2	99	673
4:45 PM	31	200	10	0	0	241	30	174	42	1	4	247	6	15	50	0	2	71	47	29	16	0	0	92	651
Hourly Total	113	860	42	1	10	1016	145	717	153	1	7	1016	33	89	244	1	3	367	167	142	77	1	5	387	2786

5:00 PM	22	187	9	0	2	218	40	193	35	1	0	269	11	20	65	1	3	97	32	25	17	0	0	74	658
5:15 PM	23	176	9	0	2	208	39	174	36	0	2	249	17	31	73	0	1	121	43	25	13	0	1	81	659
5:30 PM	32	198	4	1	2	235	24	176	47	0	0	247	9	17	79	0	0	105	28	19	10	1	1	58	645
5:45 PM	16	230	7	1	0	254	18	182	30	0	0	230	13	22	62	0	1	97	30	33	15	1	0	79	660
Hourly Total	93	791	29	2	6	915	121	725	148	1	2	995	50	90	279	1	5	420	133	102	55	2	2	292	2622
Grand Total	925	7061	276	4	65	8266	1113	5612	1353	4	42	8082	372	707	2089	11	44	3179	1335	1090	617	16	41	3058	22585
Approach %	11.2	85.4	3.3	0.0	-	-	13.8	69.4	16.7	0.0	-	-	11.7	22.2	65.7	0.3	-	-	43.7	35.6	20.2	0.5	-	-	-
Total %	4.1	31.3	1.2	0.0	-	36.6	4.9	24.8	6.0	0.0	-	35.8	1.6	3.1	9.2	0.0	-	14.1	5.9	4.8	2.7	0.1	-	13.5	-
Motorcycles	6	15	1	0	-	22	13	28	2	0	-	43	4	5	13	0	-	22	2	15	7	0	-	24	111
% Motorcycles	0.6	0.2	0.4	0.0	-	0.3	1.2	0.5	0.1	0.0	-	0.5	1.1	0.7	0.6	0.0	-	0.7	0.1	1.4	1.1	0.0	-	0.8	0.5
Cars & Light Goods	885	6973	263	4	-	8125	1061	5551	1328	4	-	7944	367	697	2051	11	-	3126	1317	1039	603	16	-	2975	22170
% Cars & Light Goods	95.7	98.8	95.3	100.0	-	98.3	95.3	98.9	98.2	100.0	-	98.3	98.7	98.6	98.2	100.0	-	98.3	98.7	95.3	97.7	100.0	-	97.3	98.2
Buses	28	47	12	0	-	87	35	8	12	0	-	55	0	1	15	0	-	16	10	28	1	0	-	39	197
% Buses	3.0	0.7	4.3	0.0	-	1.1	3.1	0.1	0.9	0.0	-	0.7	0.0	0.1	0.7	0.0	-	0.5	0.7	2.6	0.2	0.0	-	1.3	0.9
Single-Unit Trucks	6	17	0	0	-	23	3	16	4	0	-	23	1	3	8	0	-	12	5	0	5	0	-	10	68
% Single-Unit Trucks	0.6	0.2	0.0	0.0	-	0.3	0.3	0.3	0.3	0.0	-	0.3	0.3	0.4	0.4	0.0	-	0.4	0.4	0.0	0.8	0.0	-	0.3	0.3
Articulated Trucks	0	4	0	0	-	4	1	5	4	0	-	10	0	0	2	0	-	2	1	3	1	0	-	5	21
% Articulated Trucks	0.0	0.1	0.0	0.0	-	0.0	0.1	0.1	0.3	0.0	-	0.1	0.0	0.0	0.1	0.0	-	0.1	0.1	0.3	0.2	0.0	-	0.2	0.1
Bicycles on Road	0	5	0	0	-	5	0	4	3	0	-	7	0	1	0	0	-	1	0	5	0	0	-	5	18
% Bicycles on Road	0.0	0.1	0.0	0.0	-	0.1	0.0	0.1	0.2	0.0	-	0.1	0.0	0.1	0.0	0.0	-	0.0	0.0	0.5	0.0	0.0	-	0.2	0.1
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	-	9	-	-	-	-	-	1	-	-	-	-	-	5	-	-
% Bicycles on Crosswalk	-	-	-	-	3.1	-	-	-	-	-	21.4	-	-	-	-	-	2.3	-	-	-	-	-	12.2	-	-
Pedestrians	-	-	-	-	63	-	-	-	-	-	33	-	-	-	-	-	43	-	-	-	-	-	36	-	-
% Pedestrians	-	-	-	-	96.9	-	-	-	-	-	78.6	-	-	-	-	-	97.7	-	-	-	-	-	87.8	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: McLeod Road & Montrose Road -
Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 4

Turning Movement Peak Hour Data (1:00 PM)

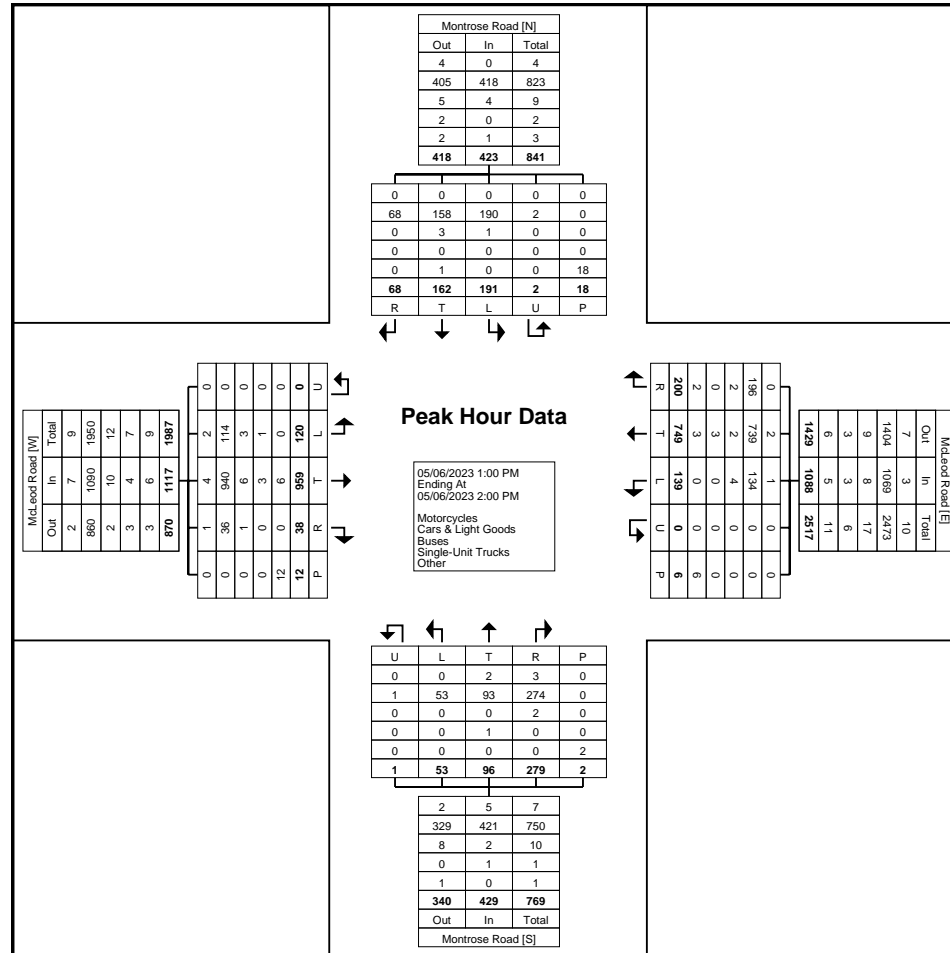
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Montrose Road Northbound						Montrose Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
1:00 PM	28	231	10	0	4	269	33	208	45	0	0	286	15	27	72	0	0	114	49	36	16	0	5	101	770
1:15 PM	29	248	10	0	1	287	36	176	53	0	3	265	13	25	84	0	0	122	57	39	17	1	6	114	788
1:30 PM	31	256	10	0	2	297	43	180	51	0	3	274	10	18	54	1	1	83	41	46	15	0	0	102	756
1:45 PM	32	224	8	0	5	264	27	185	51	0	0	263	15	26	69	0	1	110	44	41	20	1	7	106	743
Total	120	959	38	0	12	1117	139	749	200	0	6	1088	53	96	279	1	2	429	191	162	68	2	18	423	3057
Approach %	10.7	85.9	3.4	0.0	-	-	12.8	68.8	18.4	0.0	-	-	12.4	22.4	65.0	0.2	-	-	45.2	38.3	16.1	0.5	-	-	-
Total %	3.9	31.4	1.2	0.0	-	36.5	4.5	24.5	6.5	0.0	-	35.6	1.7	3.1	9.1	0.0	-	14.0	6.2	5.3	2.2	0.1	-	13.8	-
PHF	0.938	0.937	0.950	0.000	-	0.940	0.808	0.900	0.943	0.000	-	0.951	0.883	0.889	0.830	0.250	-	0.879	0.838	0.880	0.850	0.500	-	0.928	0.970
Motorcycles	2	4	1	0	-	7	1	2	0	0	-	3	0	2	3	0	-	5	0	0	0	0	-	0	15
% Motorcycles	1.7	0.4	2.6	-	-	0.6	0.7	0.3	0.0	-	-	0.3	0.0	2.1	1.1	0.0	-	1.2	0.0	0.0	0.0	0.0	-	0.0	0.5
Cars & Light Goods	114	940	36	0	-	1090	134	739	196	0	-	1069	53	93	274	1	-	421	190	158	68	2	-	418	2998
% Cars & Light Goods	95.0	98.0	94.7	-	-	97.6	96.4	98.7	98.0	-	-	98.3	100.0	96.9	98.2	100.0	-	98.1	99.5	97.5	100.0	100.0	-	98.8	98.1
Buses	3	6	1	0	-	10	4	2	2	0	-	8	0	0	2	0	-	2	1	3	0	0	-	4	24
% Buses	2.5	0.6	2.6	-	-	0.9	2.9	0.3	1.0	-	-	0.7	0.0	0.0	0.7	0.0	-	0.5	0.5	1.9	0.0	0.0	-	0.9	0.8
Single-Unit Trucks	1	3	0	0	-	4	0	3	0	0	-	3	0	1	0	0	-	1	0	0	0	0	-	0	8
% Single-Unit Trucks	0.8	0.3	0.0	-	-	0.4	0.0	0.4	0.0	-	-	0.3	0.0	1.0	0.0	0.0	-	0.2	0.0	0.0	0.0	0.0	-	0.0	0.3
Articulated Trucks	0	2	0	0	-	2	0	0	1	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	4
% Articulated Trucks	0.0	0.2	0.0	-	-	0.2	0.0	0.0	0.5	-	-	0.1	0.0	0.0	0.0	0.0	-	0.0	0.0	0.6	0.0	0.0	-	0.2	0.1
Bicycles on Road	0	4	0	0	-	4	0	3	1	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	8
% Bicycles on Road	0.0	0.4	0.0	-	-	0.4	0.0	0.4	0.5	-	-	0.4	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.3
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	5	-	-
% Bicycles on Crosswalk	-	-	-	-	8.3	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	27.8	-	-
Pedestrians	-	-	-	-	11	-	-	-	-	-	6	-	-	-	-	-	2	-	-	-	-	-	13	-	-
% Pedestrians	-	-	-	-	91.7	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	72.2	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: McLeod Road & Montrose Road - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 5



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



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Oakwood Drive
Site Code: 220542
Start Date: 05/04/2023
Page No: 1

Turning Movement Data

Start Time	McLeod Road Eastbound						McLeod Road Westbound						Oakwood Drive Northbound						Oakwood Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	12	70	33	0	0	115	21	121	3	0	0	145	26	4	15	0	1	45	2	0	1	0	0	3	308
7:15 AM	12	95	41	0	2	148	30	181	1	0	0	212	28	0	28	0	0	56	1	0	3	0	2	4	420
7:30 AM	8	108	31	0	0	147	31	214	4	0	0	249	33	1	33	0	2	67	0	0	4	0	1	4	467
7:45 AM	14	129	55	0	0	198	35	194	4	0	0	233	36	5	36	0	1	77	0	0	3	0	0	3	511
Hourly Total	46	402	160	0	2	608	117	710	12	0	0	839	123	10	112	0	4	245	3	0	11	0	3	14	1706
8:00 AM	12	141	42	0	1	195	22	190	1	0	0	213	28	9	37	0	0	74	2	1	2	0	1	5	487
8:15 AM	9	131	53	1	1	194	31	196	4	0	0	231	33	3	36	0	0	72	1	2	3	0	1	6	503
8:30 AM	5	150	65	0	0	220	33	228	2	0	0	263	35	7	33	0	0	75	4	0	5	0	0	9	567
8:45 AM	13	133	56	0	0	202	26	258	6	0	0	290	34	6	34	0	0	74	1	1	3	0	1	5	571
Hourly Total	39	555	216	1	2	811	112	872	13	0	0	997	130	25	140	0	0	295	8	4	13	0	3	25	2128
9:00 AM	15	164	73	0	0	252	36	190	2	0	0	228	45	1	37	0	0	83	2	3	3	0	1	8	571
9:15 AM	4	130	69	0	1	203	41	189	9	0	0	239	51	1	35	0	0	87	4	0	5	0	1	9	538
9:30 AM	10	154	61	0	0	225	38	185	6	0	0	229	45	2	40	0	2	87	5	2	7	0	2	14	555
9:45 AM	14	134	61	2	2	211	41	168	5	0	0	214	50	1	37	1	0	89	6	2	6	0	1	14	528
Hourly Total	43	582	264	2	3	891	156	732	22	0	0	910	191	5	149	1	2	346	17	7	21	0	5	45	2192
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	10	180	65	0	0	255	52	205	3	0	0	260	56	4	47	0	7	107	3	1	12	0	1	16	638
11:45 AM	6	156	79	0	0	241	54	183	3	0	0	240	78	7	60	0	4	145	4	8	10	0	1	22	648
Hourly Total	16	336	144	0	0	496	106	388	6	0	0	500	134	11	107	0	11	252	7	9	22	0	2	38	1286
12:00 PM	5	149	94	1	1	249	57	185	3	0	0	245	56	2	63	0	2	121	6	6	9	0	2	21	636
12:15 PM	9	165	90	0	3	264	56	210	1	0	0	267	75	4	60	0	1	139	2	0	9	0	4	11	681
12:30 PM	8	150	71	2	0	231	53	177	7	1	0	238	80	2	72	0	1	154	3	4	9	0	3	16	639
12:45 PM	11	155	99	0	11	265	47	161	5	0	0	213	73	2	57	1	4	133	5	2	11	0	10	18	629
Hourly Total	33	619	354	3	15	1009	213	733	16	1	0	963	284	10	252	1	8	547	16	12	38	0	19	66	2585
1:00 PM	9	177	80	1	0	267	67	219	11	0	2	297	72	1	63	0	5	136	5	3	8	0	2	16	716
1:15 PM	15	171	83	0	2	269	47	192	6	0	0	245	62	0	71	0	5	133	3	2	10	0	0	15	662
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	24	348	163	1	2	536	114	411	17	0	2	542	134	1	134	0	10	269	8	5	18	0	2	31	1378
4:00 PM	14	241	90	1	2	346	41	220	6	0	0	267	87	0	78	0	4	165	3	7	28	0	2	38	816
4:15 PM	18	219	82	0	1	319	64	261	4	0	0	329	85	5	67	0	4	157	4	3	11	0	5	18	823
4:30 PM	8	221	83	1	4	313	52	253	7	0	0	312	91	0	77	0	3	168	7	4	24	0	5	35	828
4:45 PM	8	238	100	0	3	346	59	247	3	0	0	309	82	2	86	0	1	170	6	1	17	0	2	24	849
Hourly Total	48	919	355	2	10	1324	216	981	20	0	0	1217	345	7	308	0	12	660	20	15	80	0	14	115	3316
5:00 PM	8	210	90	0	2	308	51	258	2	0	0	311	95	1	67	0	2	163	4	7	29	0	4	40	822
5:15 PM	13	266	84	1	0	364	46	259	5	0	0	310	79	1	71	0	5	151	7	1	13	0	0	21	846

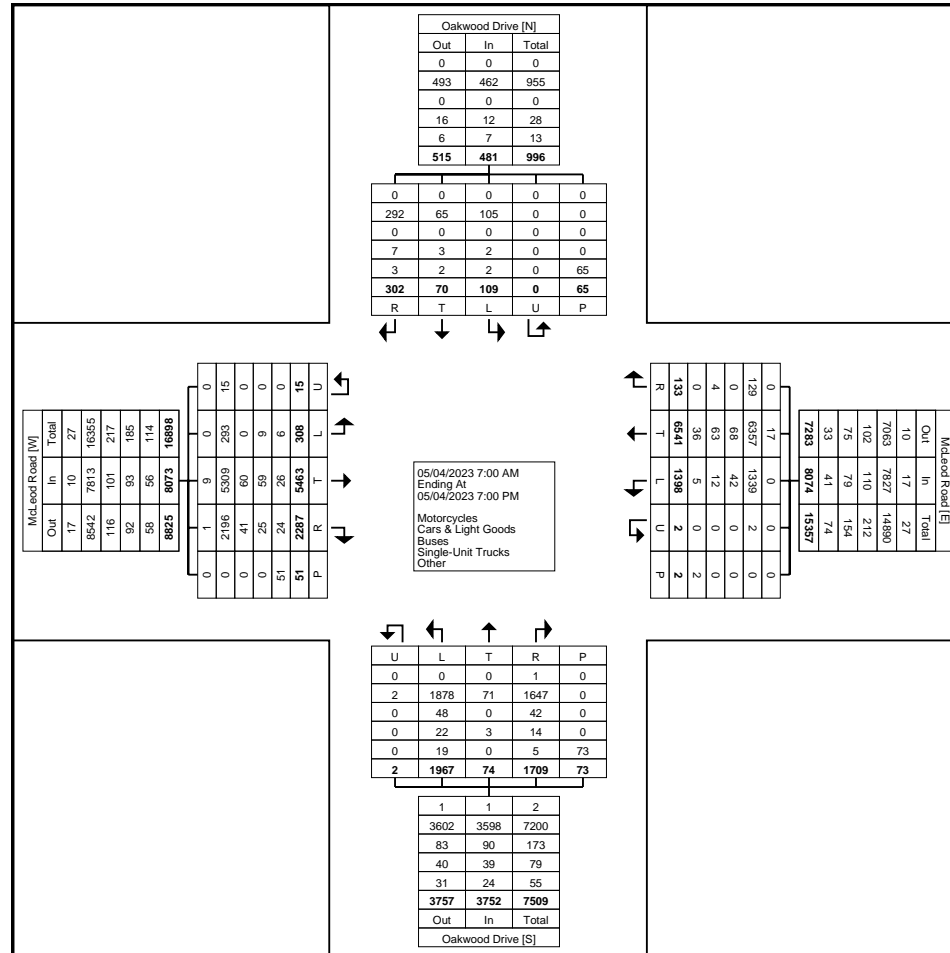
5:30 PM	5	227	69	1	1	302	47	218	2	1	0	268	94	1	74	0	1	169	4	2	10	0	2	16	755
5:45 PM	8	223	73	0	1	304	45	207	4	0	0	256	69	1	69	0	3	139	3	1	6	0	0	10	709
Hourly Total	34	926	316	2	4	1278	189	942	13	1	0	1145	337	4	281	0	11	622	18	11	58	0	6	87	3132
6:00 PM	7	204	84	0	2	295	42	187	4	0	0	233	71	0	51	0	7	122	4	1	10	0	4	15	665
6:15 PM	10	197	76	2	4	285	54	212	1	0	0	267	73	1	65	0	3	139	1	5	10	0	2	16	707
6:30 PM	6	188	79	1	5	274	39	192	8	0	0	239	69	0	47	0	1	116	6	1	14	0	2	21	650
6:45 PM	2	187	76	1	2	266	40	181	1	0	0	222	76	0	63	0	4	139	1	0	7	0	3	8	635
Hourly Total	25	776	315	4	13	1120	175	772	14	0	0	961	289	1	226	0	15	516	12	7	41	0	11	60	2657
Grand Total	308	5463	2287	15	51	8073	1398	6541	133	2	2	8074	1967	74	1709	2	73	3752	109	70	302	0	65	481	20380
Approach %	3.8	67.7	28.3	0.2	-	-	17.3	81.0	1.6	0.0	-	-	52.4	2.0	45.5	0.1	-	-	22.7	14.6	62.8	0.0	-	-	-
Total %	1.5	26.8	11.2	0.1	-	39.6	6.9	32.1	0.7	0.0	-	39.6	9.7	0.4	8.4	0.0	-	18.4	0.5	0.3	1.5	0.0	-	2.4	-
Motorcycles	0	9	1	0	-	10	0	17	0	0	-	17	0	0	1	0	-	1	0	0	0	0	-	0	28
% Motorcycles	0.0	0.2	0.0	0.0	-	0.1	0.0	0.3	0.0	0.0	-	0.2	0.0	0.0	0.1	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	293	5309	2196	15	-	7813	1339	6357	129	2	-	7827	1878	71	1647	2	-	3598	105	65	292	0	-	462	19700
% Cars & Light Goods	95.1	97.2	96.0	100.0	-	96.8	95.8	97.2	97.0	100.0	-	96.9	95.5	95.9	96.4	100.0	-	95.9	96.3	92.9	96.7	-	-	96.0	96.7
Buses	0	60	41	0	-	101	42	68	0	0	-	110	48	0	42	0	-	90	0	0	0	0	-	0	301
% Buses	0.0	1.1	1.8	0.0	-	1.3	3.0	1.0	0.0	0.0	-	1.4	2.4	0.0	2.5	0.0	-	2.4	0.0	0.0	0.0	-	-	0.0	1.5
Single-Unit Trucks	9	59	25	0	-	93	12	63	4	0	-	79	22	3	14	0	-	39	2	3	7	0	-	12	223
% Single-Unit Trucks	2.9	1.1	1.1	0.0	-	1.2	0.9	1.0	3.0	0.0	-	1.0	1.1	4.1	0.8	0.0	-	1.0	1.8	4.3	2.3	-	-	2.5	1.1
Articulated Trucks	3	26	23	0	-	52	5	34	0	0	-	39	19	0	1	0	-	20	1	0	1	0	-	2	113
% Articulated Trucks	1.0	0.5	1.0	0.0	-	0.6	0.4	0.5	0.0	0.0	-	0.5	1.0	0.0	0.1	0.0	-	0.5	0.9	0.0	0.3	-	-	0.4	0.6
Bicycles on Road	3	0	1	0	-	4	0	2	0	0	-	2	0	0	4	0	-	4	1	2	2	0	-	5	15
% Bicycles on Road	1.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.2	0.0	-	0.1	0.9	2.9	0.7	-	-	1.0	0.1
Bicycles on Crosswalk	-	-	-	-	11	-	-	-	-	0	-	-	-	-	-	-	7	-	-	-	-	-	11	-	-
% Bicycles on Crosswalk	-	-	-	-	21.6	-	-	-	-	0.0	-	-	-	-	-	-	9.6	-	-	-	-	-	16.9	-	-
Pedestrians	-	-	-	-	40	-	-	-	-	2	-	-	-	-	-	-	66	-	-	-	-	-	54	-	-
% Pedestrians	-	-	-	-	78.4	-	-	-	-	100.0	-	-	-	-	-	-	90.4	-	-	-	-	-	83.1	-	-



Paradigm Transportation Solutions Limited
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Count Name: McLeod Road & Oakwood Drive
Site Code: 220542
Start Date: 05/04/2023
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Turning Movement Peak Hour Data (8:30 AM)

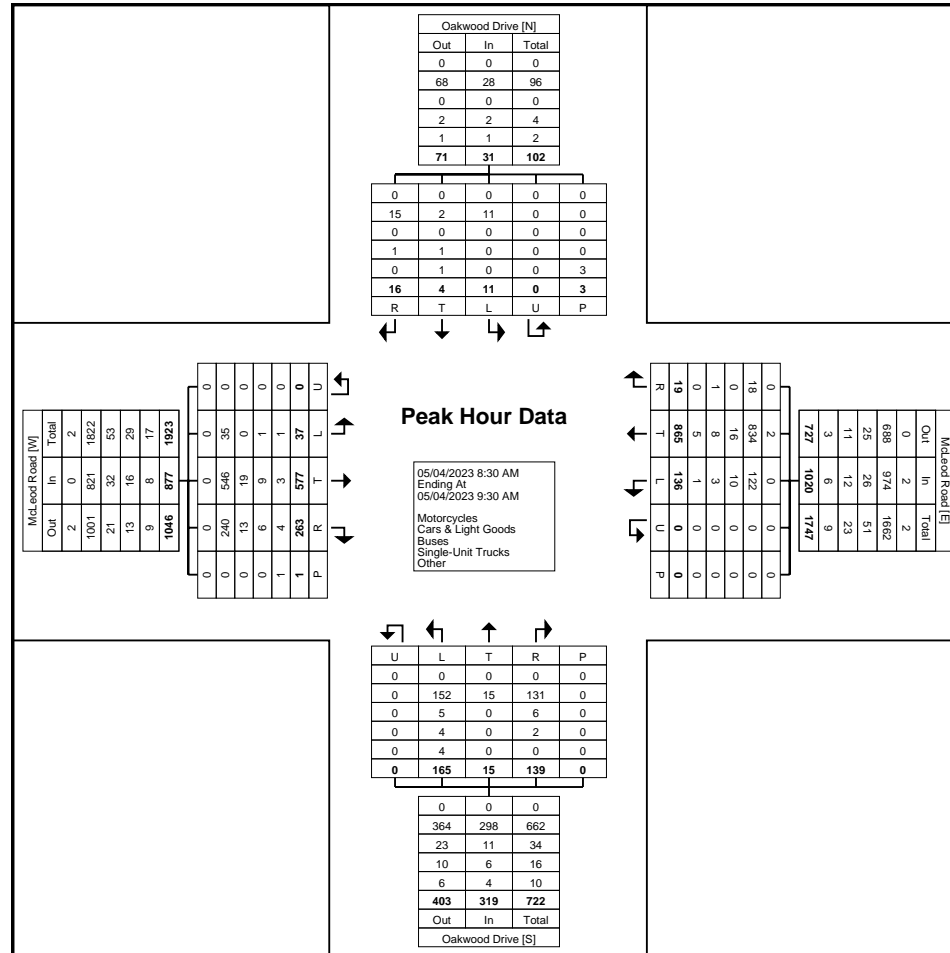
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Oakwood Drive Northbound						Oakwood Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:30 AM	5	150	65	0	0	220	33	228	2	0	0	263	35	7	33	0	0	75	4	0	5	0	0	9	567
8:45 AM	13	133	56	0	0	202	26	258	6	0	0	290	34	6	34	0	0	74	1	1	3	0	1	5	571
9:00 AM	15	164	73	0	0	252	36	190	2	0	0	228	45	1	37	0	0	83	2	3	3	0	1	8	571
9:15 AM	4	130	69	0	1	203	41	189	9	0	0	239	51	1	35	0	0	87	4	0	5	0	1	9	538
Total	37	577	263	0	1	877	136	865	19	0	0	1020	165	15	139	0	0	319	11	4	16	0	3	31	2247
Approach %	4.2	65.8	30.0	0.0	-	-	13.3	84.8	1.9	0.0	-	-	51.7	4.7	43.6	0.0	-	-	35.5	12.9	51.6	0.0	-	-	-
Total %	1.6	25.7	11.7	0.0	-	39.0	6.1	38.5	0.8	0.0	-	45.4	7.3	0.7	6.2	0.0	-	14.2	0.5	0.2	0.7	0.0	-	1.4	-
PHF	0.617	0.880	0.901	0.000	-	0.870	0.829	0.838	0.528	0.000	-	0.879	0.809	0.536	0.939	0.000	-	0.917	0.688	0.333	0.800	0.000	-	0.861	0.984
Motorcycles	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	2
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.2	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	35	546	240	0	-	821	122	834	18	0	-	974	152	15	131	0	-	298	11	2	15	0	-	28	2121
% Cars & Light Goods	94.6	94.6	91.3	-	-	93.6	89.7	96.4	94.7	-	-	95.5	92.1	100.0	94.2	-	-	93.4	100.0	50.0	93.8	-	-	90.3	94.4
Buses	0	19	13	0	-	32	10	16	0	0	-	26	5	0	6	0	-	11	0	0	0	0	-	0	69
% Buses	0.0	3.3	4.9	-	-	3.6	7.4	1.8	0.0	-	-	2.5	3.0	0.0	4.3	-	-	3.4	0.0	0.0	0.0	-	-	0.0	3.1
Single-Unit Trucks	1	9	6	0	-	16	3	8	1	0	-	12	4	0	2	0	-	6	0	1	1	0	-	2	36
% Single-Unit Trucks	2.7	1.6	2.3	-	-	1.8	2.2	0.9	5.3	-	-	1.2	2.4	0.0	1.4	-	-	1.9	0.0	25.0	6.3	-	-	6.5	1.6
Articulated Trucks	1	3	4	0	-	8	1	5	0	0	-	6	4	0	0	0	-	4	0	0	0	0	-	0	18
% Articulated Trucks	2.7	0.5	1.5	-	-	0.9	0.7	0.6	0.0	-	-	0.6	2.4	0.0	0.0	-	-	1.3	0.0	0.0	0.0	-	-	0.0	0.8
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	25.0	0.0	-	-	3.2	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33.3	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66.7	-	-



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Turning Movement Peak Hour Data Plot (8:30 AM)



Paradigm Transportation Solutions Limited
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Count Name: McLeod Road & Oakwood Drive
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Turning Movement Peak Hour Data (12:15 PM)

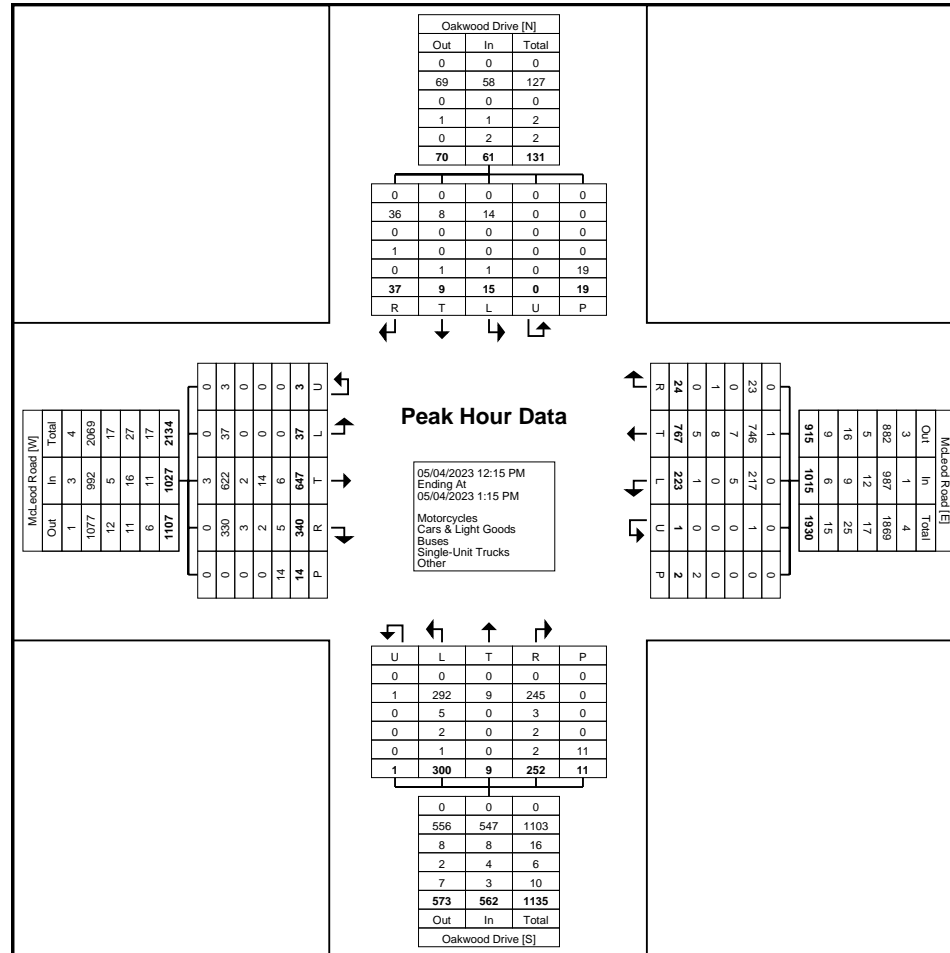
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Oakwood Drive Northbound						Oakwood Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:15 PM	9	165	90	0	3	264	56	210	1	0	0	267	75	4	60	0	1	139	2	0	9	0	4	11	681
12:30 PM	8	150	71	2	0	231	53	177	7	1	0	238	80	2	72	0	1	154	3	4	9	0	3	16	639
12:45 PM	11	155	99	0	11	265	47	161	5	0	0	213	73	2	57	1	4	133	5	2	11	0	10	18	629
1:00 PM	9	177	80	1	0	267	67	219	11	0	2	297	72	1	63	0	5	136	5	3	8	0	2	16	716
Total	37	647	340	3	14	1027	223	767	24	1	2	1015	300	9	252	1	11	562	15	9	37	0	19	61	2665
Approach %	3.6	63.0	33.1	0.3	-	-	22.0	75.6	2.4	0.1	-	-	53.4	1.6	44.8	0.2	-	-	24.6	14.8	60.7	0.0	-	-	-
Total %	1.4	24.3	12.8	0.1	-	38.5	8.4	28.8	0.9	0.0	-	38.1	11.3	0.3	9.5	0.0	-	21.1	0.6	0.3	1.4	0.0	-	2.3	-
PHF	0.841	0.914	0.859	0.375	-	0.962	0.832	0.876	0.545	0.250	-	0.854	0.938	0.563	0.875	0.250	-	0.912	0.750	0.563	0.841	0.000	-	0.847	0.931
Motorcycles	0	3	0	0	-	3	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	4
% Motorcycles	0.0	0.5	0.0	0.0	-	0.3	0.0	0.1	0.0	0.0	-	0.1	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Cars & Light Goods	37	622	330	3	-	992	217	746	23	1	-	987	292	9	245	1	-	547	14	8	36	0	-	58	2584
% Cars & Light Goods	100.0	96.1	97.1	100.0	-	96.6	97.3	97.3	95.8	100.0	-	97.2	97.3	100.0	97.2	100.0	-	97.3	93.3	88.9	97.3	-	-	95.1	97.0
Buses	0	2	3	0	-	5	5	7	0	0	-	12	5	0	3	0	-	8	0	0	0	0	-	0	25
% Buses	0.0	0.3	0.9	0.0	-	0.5	2.2	0.9	0.0	0.0	-	1.2	1.7	0.0	1.2	0.0	-	1.4	0.0	0.0	0.0	-	-	0.0	0.9
Single-Unit Trucks	0	14	2	0	-	16	0	8	1	0	-	9	2	0	2	0	-	4	0	0	1	0	-	1	30
% Single-Unit Trucks	0.0	2.2	0.6	0.0	-	1.6	0.0	1.0	4.2	0.0	-	0.9	0.7	0.0	0.8	0.0	-	0.7	0.0	0.0	2.7	-	-	1.6	1.1
Articulated Trucks	0	6	5	0	-	11	1	5	0	0	-	6	1	0	0	0	-	1	1	0	0	0	-	1	19
% Articulated Trucks	0.0	0.9	1.5	0.0	-	1.1	0.4	0.7	0.0	0.0	-	0.6	0.3	0.0	0.0	0.0	-	0.2	6.7	0.0	0.0	-	-	1.6	0.7
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	2	0	-	2	0	1	0	0	-	1	3
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.8	0.0	-	0.4	0.0	11.1	0.0	-	-	1.6	0.1
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	7.1	-	-	-	-	-	0.0	-	-	-	-	-	18.2	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	13	-	-	-	-	-	2	-	-	-	-	-	9	-	-	-	-	-	19	-	-
% Pedestrians	-	-	-	-	92.9	-	-	-	-	-	100.0	-	-	-	-	-	81.8	-	-	-	-	-	100.0	-	-



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Turning Movement Peak Hour Data Plot (12:15 PM)



Paradigm Transportation Solutions Limited
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Count Name: McLeod Road & Oakwood Drive
Site Code: 220542
Start Date: 05/04/2023
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Turning Movement Peak Hour Data (4:30 PM)

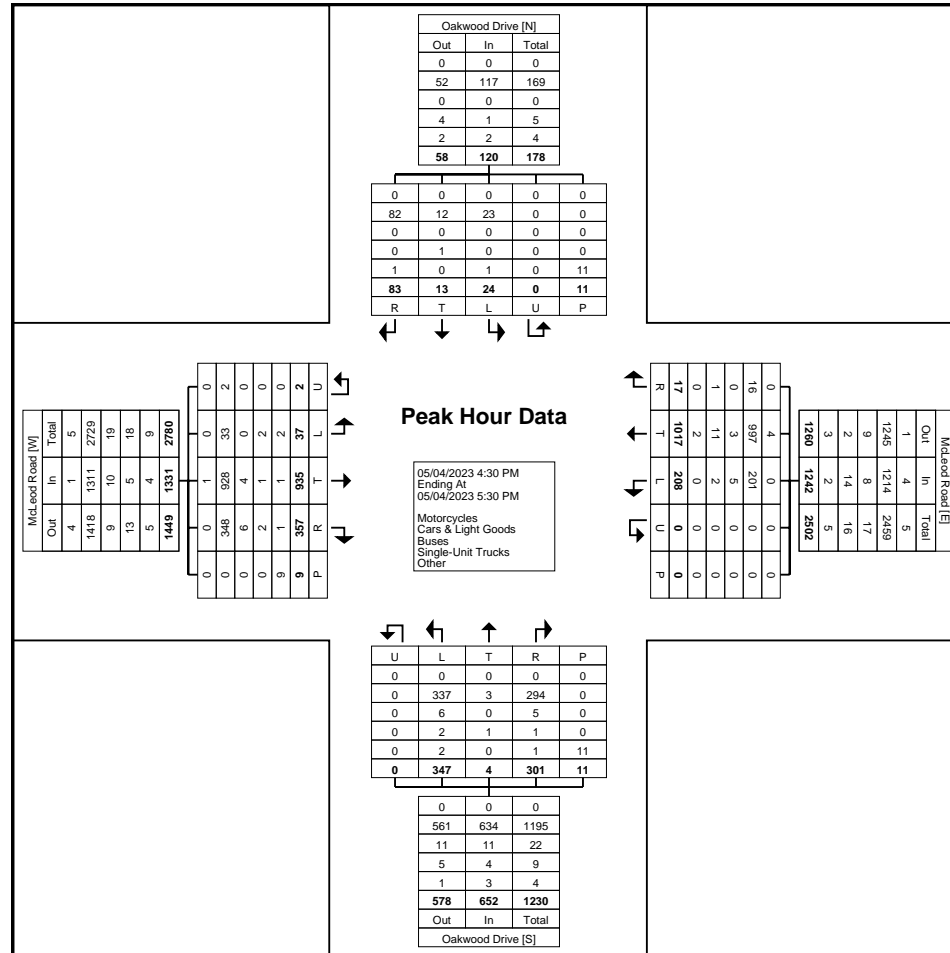
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Oakwood Drive Northbound						Oakwood Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:30 PM	8	221	83	1	4	313	52	253	7	0	0	312	91	0	77	0	3	168	7	4	24	0	5	35	828
4:45 PM	8	238	100	0	3	346	59	247	3	0	0	309	82	2	86	0	1	170	6	1	17	0	2	24	849
5:00 PM	8	210	90	0	2	308	51	258	2	0	0	311	95	1	67	0	2	163	4	7	29	0	4	40	822
5:15 PM	13	266	84	1	0	364	46	259	5	0	0	310	79	1	71	0	5	151	7	1	13	0	0	21	846
Total	37	935	357	2	9	1331	208	1017	17	0	0	1242	347	4	301	0	11	652	24	13	83	0	11	120	3345
Approach %	2.8	70.2	26.8	0.2	-	-	16.7	81.9	1.4	0.0	-	-	53.2	0.6	46.2	0.0	-	-	20.0	10.8	69.2	0.0	-	-	-
Total %	1.1	28.0	10.7	0.1	-	39.8	6.2	30.4	0.5	0.0	-	37.1	10.4	0.1	9.0	0.0	-	19.5	0.7	0.4	2.5	0.0	-	3.6	-
PHF	0.712	0.879	0.893	0.500	-	0.914	0.881	0.982	0.607	0.000	-	0.995	0.913	0.500	0.875	0.000	-	0.959	0.857	0.464	0.716	0.000	-	0.750	0.985
Motorcycles	0	1	0	0	-	1	0	4	0	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	5
% Motorcycles	0.0	0.1	0.0	0.0	-	0.1	0.0	0.4	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	33	928	348	2	-	1311	201	997	16	0	-	1214	337	3	294	0	-	634	23	12	82	0	-	117	3276
% Cars & Light Goods	89.2	99.3	97.5	100.0	-	98.5	96.6	98.0	94.1	-	-	97.7	97.1	75.0	97.7	-	-	97.2	95.8	92.3	98.8	-	-	97.5	97.9
Buses	0	4	6	0	-	10	5	3	0	0	-	8	6	0	5	0	-	11	0	0	0	0	-	0	29
% Buses	0.0	0.4	1.7	0.0	-	0.8	2.4	0.3	0.0	-	-	0.6	1.7	0.0	1.7	0	-	1.7	0.0	0.0	0.0	-	-	0.0	0.9
Single-Unit Trucks	2	1	2	0	-	5	2	11	1	0	-	14	2	1	1	0	-	4	0	1	0	0	-	1	24
% Single-Unit Trucks	5.4	0.1	0.6	0.0	-	0.4	1.0	1.1	5.9	-	-	1.1	0.6	25.0	0.3	-	-	0.6	0.0	7.7	0.0	-	-	0.8	0.7
Articulated Trucks	0	1	1	0	-	2	0	2	0	0	-	2	2	0	0	0	-	2	0	0	0	0	-	0	6
% Articulated Trucks	0.0	0.1	0.3	0.0	-	0.2	0.0	0.2	0.0	-	-	0.2	0.6	0.0	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Road	2	0	0	0	-	2	0	0	0	0	-	0	0	0	1	0	-	1	1	0	1	0	-	2	5
% Bicycles on Road	5.4	0.0	0.0	0.0	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.3	-	-	0.2	4.2	0.0	1.2	-	-	1.7	0.1
Bicycles on Crosswalk	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	2	-	-
% Bicycles on Crosswalk	-	-	-	-	33.3	-	-	-	-	-	-	-	-	-	-	-	18.2	-	-	-	-	-	18.2	-	-
Pedestrians	-	-	-	-	6	-	-	-	-	-	0	-	-	-	-	-	9	-	-	-	-	-	9	-	-
% Pedestrians	-	-	-	-	66.7	-	-	-	-	-	-	-	-	-	-	-	81.8	-	-	-	-	-	81.8	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Oakwood Drive
Site Code: 220542
Start Date: 05/04/2023
Page No: 9



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



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Oakwood Drive-
Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 1

Turning Movement Data

Start Time	McLeod Road Eastbound						McLeod Road Westbound						Oakwood Drive Northbound						Oakwood Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
10:00 AM	8	160	82	0	2	250	59	201	10	0	0	270	54	1	37	0	4	92	10	8	12	0	7	30	642
10:15 AM	3	162	87	2	2	254	69	177	6	0	0	252	59	4	56	0	7	119	4	2	6	0	0	12	637
10:30 AM	9	179	78	0	4	266	50	189	2	0	0	241	59	3	73	0	3	135	2	3	8	0	4	13	655
10:45 AM	13	181	100	0	0	294	55	207	9	0	0	271	64	5	62	0	6	131	4	3	8	0	1	15	711
Hourly Total	33	682	347	2	8	1064	233	774	27	0	0	1034	236	13	228	0	20	477	20	16	34	0	12	70	2645
11:00 AM	7	180	90	0	4	277	64	216	5	0	0	285	74	5	57	0	3	136	10	4	15	0	3	29	727
11:15 AM	11	181	78	1	3	271	64	246	5	0	0	315	88	4	63	0	2	155	3	4	11	0	3	18	759
11:30 AM	9	153	83	0	1	245	57	205	2	0	0	264	88	2	72	0	8	162	4	4	11	0	3	19	690
11:45 AM	21	196	79	0	2	296	49	226	9	0	0	284	82	1	61	0	12	144	4	3	13	0	1	20	744
Hourly Total	48	710	330	1	10	1089	234	893	21	0	0	1148	332	12	253	0	25	597	21	15	50	0	10	86	2920
12:00 PM	10	156	106	1	4	273	55	218	8	0	1	281	82	4	66	0	2	152	8	10	20	0	6	38	744
12:15 PM	2	186	86	3	1	277	57	222	4	0	2	283	63	3	60	0	4	126	6	1	4	0	1	11	697
12:30 PM	2	195	101	0	0	298	50	231	1	0	0	282	105	2	67	0	3	174	4	3	6	0	2	13	767
12:45 PM	16	194	99	0	1	309	65	274	6	0	2	345	76	4	65	0	3	145	5	1	11	0	1	17	816
Hourly Total	30	731	392	4	6	1157	227	945	19	0	5	1191	326	13	258	0	12	597	23	15	41	0	10	79	3024
1:00 PM	1	188	104	1	2	294	47	224	6	0	2	277	86	2	73	0	6	161	0	2	9	0	5	11	743
1:15 PM	5	209	113	1	0	328	55	199	1	0	0	255	106	7	75	0	8	188	1	2	3	0	4	6	777
1:30 PM	6	176	96	1	4	279	50	207	4	0	3	261	96	1	87	0	11	184	7	2	5	0	8	14	738
1:45 PM	26	182	94	0	6	302	48	225	22	0	0	295	89	6	61	0	3	156	3	3	17	0	7	23	776
Hourly Total	38	755	407	3	12	1203	200	855	33	0	5	1088	377	16	296	0	28	689	11	9	34	0	24	54	3034
2:00 PM	15	170	100	0	0	285	53	215	9	0	0	277	93	1	70	0	4	164	13	5	35	0	0	53	779
2:15 PM	6	191	97	1	5	295	53	220	4	0	0	277	70	1	83	0	10	154	2	2	11	0	4	15	741
2:30 PM	9	167	92	0	1	268	52	206	3	0	0	261	91	2	84	0	5	177	4	3	10	0	2	17	723
2:45 PM	7	239	118	1	5	365	59	218	9	0	0	286	96	1	69	0	3	166	3	1	10	0	10	14	831
Hourly Total	37	767	407	2	11	1213	217	859	25	0	0	1101	350	5	306	0	22	661	22	11	66	0	16	99	3074
3:00 PM	3	189	83	1	1	276	62	225	4	0	2	291	82	0	70	0	17	152	3	2	9	0	3	14	733
3:15 PM	5	189	92	0	2	286	64	213	5	0	0	282	81	0	56	0	0	137	1	4	9	0	3	14	719
3:30 PM	13	211	91	0	4	315	46	224	3	0	2	273	95	1	71	0	0	167	2	3	8	0	4	13	768
3:45 PM	21	210	82	0	1	313	50	240	7	0	0	297	87	0	62	0	0	149	1	0	9	0	4	10	769
Hourly Total	42	799	348	1	8	1190	222	902	19	0	4	1143	345	1	259	0	17	605	7	9	35	0	14	51	2989
4:00 PM	14	199	71	0	3	284	51	224	7	0	1	282	77	2	82	0	10	161	11	1	37	0	3	49	776
4:15 PM	14	191	76	0	1	281	52	203	2	0	0	257	74	0	66	0	7	140	3	2	15	0	3	20	698
4:30 PM	3	207	74	0	1	284	50	216	1	0	0	267	93	0	77	0	5	170	6	1	11	0	1	18	739
4:45 PM	4	189	81	2	2	276	49	273	2	0	0	324	63	0	67	0	2	130	2	0	5	0	1	7	737
Hourly Total	35	786	302	2	7	1125	202	916	12	0	1	1130	307	2	292	0	24	601	22	4	68	0	8	94	2950

5:00 PM	3	209	86	0	2	298	50	245	0	0	0	295	68	0	65	0	3	133	0	2	5	0	3	7	733
5:15 PM	4	213	92	0	1	309	71	229	4	0	0	304	80	0	72	0	1	152	0	0	2	0	1	2	767
5:30 PM	5	196	83	0	5	284	44	222	4	0	0	270	77	0	77	0	3	154	1	1	6	0	6	8	716
5:45 PM	6	205	93	3	1	307	47	219	1	0	0	267	76	1	55	0	12	132	3	1	4	0	1	8	714
Hourly Total	18	823	354	3	9	1198	212	915	9	0	0	1136	301	1	269	0	19	571	4	4	17	0	11	25	2930
Grand Total	281	6053	2887	18	71	9239	1747	7059	165	0	15	8971	2574	63	2161	0	167	4798	130	83	345	0	105	558	23566
Approach %	3.0	65.5	31.2	0.2	-	-	19.5	78.7	1.8	0.0	-	-	53.6	1.3	45.0	0.0	-	-	23.3	14.9	61.8	0.0	-	-	-
Total %	1.2	25.7	12.3	0.1	-	39.2	7.4	30.0	0.7	0.0	-	38.1	10.9	0.3	9.2	0.0	-	20.4	0.6	0.4	1.5	0.0	-	2.4	-
Motorcycles	2	23	0	0	-	25	13	73	2	0	-	88	2	0	12	0	-	14	1	0	1	0	-	2	129
% Motorcycles	0.7	0.4	0.0	0.0	-	0.3	0.7	1.0	1.2	-	-	1.0	0.1	0.0	0.6	-	-	0.3	0.8	0.0	0.3	-	-	0.4	0.5
Cars & Light Goods	277	5971	2841	18	-	9107	1695	6919	158	0	-	8772	2523	61	2109	0	-	4693	128	81	341	0	-	550	23122
% Cars & Light Goods	98.6	98.6	98.4	100.0	-	98.6	97.0	98.0	95.8	-	-	97.8	98.0	96.8	97.6	-	-	97.8	98.5	97.6	98.8	-	-	98.6	98.1
Buses	0	26	33	0	-	59	34	32	0	0	-	66	35	0	34	0	-	69	0	0	0	0	-	0	194
% Buses	0.0	0.4	1.1	0.0	-	0.6	1.9	0.5	0.0	-	-	0.7	1.4	0.0	1.6	-	-	1.4	0.0	0.0	0.0	-	-	0.0	0.8
Single-Unit Trucks	2	25	7	0	-	34	3	27	2	0	-	32	8	0	3	0	-	11	1	2	2	0	-	5	82
% Single-Unit Trucks	0.7	0.4	0.2	0.0	-	0.4	0.2	0.4	1.2	-	-	0.4	0.3	0.0	0.1	-	-	0.2	0.8	2.4	0.6	-	-	0.9	0.3
Articulated Trucks	0	4	5	0	-	9	0	4	0	0	-	4	5	0	0	0	-	5	0	0	0	0	-	0	18
% Articulated Trucks	0.0	0.1	0.2	0.0	-	0.1	0.0	0.1	0.0	-	-	0.0	0.2	0.0	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	4	1	0	-	5	2	4	3	0	-	9	1	2	3	0	-	6	0	0	1	0	-	1	21
% Bicycles on Road	0.0	0.1	0.0	0.0	-	0.1	0.1	0.1	1.8	-	-	0.1	0.0	3.2	0.1	-	-	0.1	0.0	0.0	0.3	-	-	0.2	0.1
Bicycles on Crosswalk	-	-	-	-	6	-	-	-	-	-	5	-	-	-	-	-	12	-	-	-	-	-	24	-	-
% Bicycles on Crosswalk	-	-	-	-	8.5	-	-	-	-	-	33.3	-	-	-	-	-	7.2	-	-	-	-	-	22.9	-	-
Pedestrians	-	-	-	-	65	-	-	-	-	-	10	-	-	-	-	-	155	-	-	-	-	-	81	-	-
% Pedestrians	-	-	-	-	91.5	-	-	-	-	-	66.7	-	-	-	-	-	92.8	-	-	-	-	-	77.1	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Oakwood Drive-
Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 4

Turning Movement Peak Hour Data (12:30 PM)

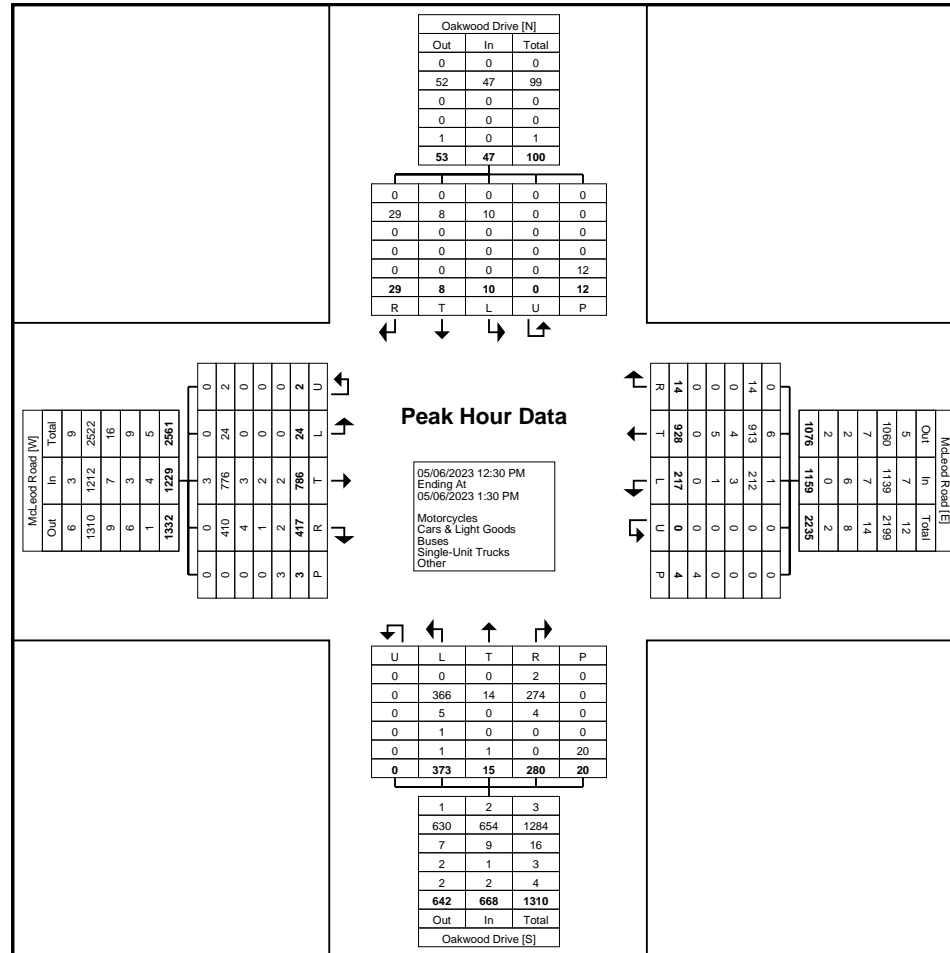
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Oakwood Drive Northbound						Oakwood Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:30 PM	2	195	101	0	0	298	50	231	1	0	0	282	105	2	67	0	3	174	4	3	6	0	2	13	767
12:45 PM	16	194	99	0	1	309	65	274	6	0	2	345	76	4	65	0	3	145	5	1	11	0	1	17	816
1:00 PM	1	188	104	1	2	294	47	224	6	0	2	277	86	2	73	0	6	161	0	2	9	0	5	11	743
1:15 PM	5	209	113	1	0	328	55	199	1	0	0	255	106	7	75	0	8	188	1	2	3	0	4	6	777
Total	24	786	417	2	3	1229	217	928	14	0	4	1159	373	15	280	0	20	668	10	8	29	0	12	47	3103
Approach %	2.0	64.0	33.9	0.2	-	-	18.7	80.1	1.2	0.0	-	-	55.8	2.2	41.9	0.0	-	-	21.3	17.0	61.7	0.0	-	-	-
Total %	0.8	25.3	13.4	0.1	-	39.6	7.0	29.9	0.5	0.0	-	37.4	12.0	0.5	9.0	0.0	-	21.5	0.3	0.3	0.9	0.0	-	1.5	-
PHF	0.375	0.940	0.923	0.500	-	0.937	0.835	0.847	0.583	0.000	-	0.840	0.880	0.536	0.933	0.000	-	0.888	0.500	0.667	0.659	0.000	-	0.691	0.951
Motorcycles	0	3	0	0	-	3	1	6	0	0	-	7	0	0	2	0	-	2	0	0	0	0	-	0	12
% Motorcycles	0.0	0.4	0.0	0.0	-	0.2	0.5	0.6	0.0	-	-	0.6	0.0	0.0	0.7	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.4
Cars & Light Goods	24	776	410	2	-	1212	212	913	14	0	-	1139	366	14	274	0	-	654	10	8	29	0	-	47	3052
% Cars & Light Goods	100.0	98.7	98.3	100.0	-	98.6	97.7	98.4	100.0	-	-	98.3	98.1	93.3	97.9	-	-	97.9	100.0	100.0	100.0	-	-	100.0	98.4
Buses	0	3	4	0	-	7	3	4	0	0	-	7	5	0	4	0	-	9	0	0	0	0	-	0	23
% Buses	0.0	0.4	1.0	0.0	-	0.6	1.4	0.4	0.0	-	-	0.6	1.3	0.0	1.4	-	-	1.3	0.0	0.0	0.0	-	-	0.0	0.7
Single-Unit Trucks	0	2	1	0	-	3	1	5	0	0	-	6	1	0	0	0	-	1	0	0	0	0	-	0	10
% Single-Unit Trucks	0.0	0.3	0.2	0.0	-	0.2	0.5	0.5	0.0	-	-	0.5	0.3	0.0	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.3
Articulated Trucks	0	2	1	0	-	3	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	4
% Articulated Trucks	0.0	0.3	0.2	0.0	-	0.2	0.0	0.0	0.0	-	-	0.0	0.3	0.0	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	1	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.2	0.0	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	6.7	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	4	-	-	-	-	-	2	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	50.0	-	-	-	-	-	20.0	-	-	-	-	-	16.7	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	2	-	-	-	-	-	16	-	-	-	-	-	10	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	50.0	-	-	-	-	-	80.0	-	-	-	-	-	83.3	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Oakwood Drive-
Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 5



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



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Dochester Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 1

Turning Movement Data

Start Time	McLeod Road Eastbound						McLeod Road Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total	
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total		
7:00 AM	17	56	9	0	1	82	8	89	8	0	0	105	23	4	3	0	1	30	9	14	28	0	0	51	268	
7:15 AM	20	78	6	0	0	104	14	125	10	0	0	149	37	19	9	0	2	65	10	18	21	0	3	49	367	
7:30 AM	32	87	10	0	3	129	19	122	7	0	0	148	47	22	8	0	1	77	8	8	42	0	0	58	412	
7:45 AM	42	126	5	0	2	173	10	140	9	0	0	159	31	14	13	0	0	58	13	12	37	0	1	62	452	
Hourly Total	111	347	30	0	6	488	51	476	34	0	0	561	138	59	33	0	4	230	40	52	128	0	4	220	1499	
8:00 AM	44	110	9	0	4	163	9	117	20	0	3	146	33	15	5	0	4	53	18	7	37	0	1	62	424	
8:15 AM	50	119	6	0	4	175	13	135	12	0	11	160	33	26	11	0	10	70	17	11	48	0	0	76	481	
8:30 AM	55	116	10	0	3	181	11	128	30	0	12	169	36	41	11	0	0	88	24	27	66	0	3	117	555	
8:45 AM	60	111	8	0	0	179	14	142	29	0	13	185	42	33	11	0	5	86	35	24	88	0	0	147	597	
Hourly Total	209	456	33	0	11	698	47	522	91	0	39	660	144	115	38	0	19	297	94	69	239	0	4	402	2057	
9:00 AM	60	120	9	0	4	189	12	141	26	0	8	179	36	20	12	0	6	68	19	18	56	0	4	93	529	
9:15 AM	44	100	13	0	1	157	9	113	16	0	0	138	32	17	11	0	0	60	22	22	75	0	0	119	474	
9:30 AM	42	117	10	0	0	169	6	100	22	0	6	128	34	25	9	0	5	68	22	14	65	0	1	101	466	
9:45 AM	62	92	11	0	1	165	14	131	14	0	4	159	38	22	8	0	1	68	25	13	50	0	1	88	480	
Hourly Total	208	429	43	0	6	680	41	485	78	0	18	604	140	84	40	0	12	264	88	67	246	0	6	401	1949	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	63	144	15	0	4	222	6	156	23	0	5	185	36	19	11	0	6	66	26	21	49	0	2	96	569	
11:45 AM	58	137	17	0	2	212	14	115	14	0	1	143	46	19	12	0	3	77	17	15	68	0	4	100	532	
Hourly Total	121	281	32	0	6	434	20	271	37	0	6	328	82	38	23	0	9	143	43	36	117	0	6	196	1101	
12:00 PM	65	111	9	0	4	185	19	122	16	0	4	157	52	16	12	0	0	80	30	34	65	0	3	129	551	
12:15 PM	63	154	13	0	4	230	18	149	17	0	1	184	22	22	9	0	6	53	29	18	60	0	4	107	574	
12:30 PM	49	145	12	0	5	206	12	115	21	0	3	148	39	17	14	0	3	70	27	14	73	0	3	114	538	
12:45 PM	58	140	12	0	7	210	14	142	23	0	6	179	34	26	13	0	7	73	27	27	51	0	6	105	567	
Hourly Total	235	550	46	0	20	831	63	528	77	0	14	668	147	81	48	0	16	276	113	93	249	0	16	455	2230	
1:00 PM	51	143	13	0	9	207	11	128	10	0	6	149	42	22	6	0	10	70	19	16	66	0	1	101	527	
1:15 PM	60	140	18	0	16	218	15	141	27	0	1	183	37	16	7	0	5	60	26	19	61	0	11	106	567	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	111	283	31	0	25	425	26	269	37	0	7	332	79	38	13	0	15	130	45	35	127	0	12	207	1094	
4:00 PM	65	166	14	0	7	245	7	164	20	0	5	191	60	22	6	0	2	88	30	21	78	0	1	129	653	
4:15 PM	69	175	20	0	8	264	12	179	20	0	3	211	48	20	5	0	6	73	27	24	74	0	4	125	673	
4:30 PM	71	175	27	0	4	273	12	176	20	0	2	208	59	32	12	0	4	103	35	23	64	0	2	122	706	
4:45 PM	71	173	23	0	4	267	4	169	19	0	2	192	66	25	9	0	1	100	30	22	69	0	6	121	680	
Hourly Total	276	689	84	0	23	1049	35	688	79	0	12	802	233	99	32	0	13	364	122	90	285	0	13	497	2712	
5:00 PM	68	168	15	0	7	251	14	158	20	0	15	192	61	37	8	0	13	106	22	28	84	0	3	134	683	
5:15 PM	68	188	19	0	4	275	18	165	19	0	1	202	50	21	12	0	1	83	17	19	69	0	4	105	665	

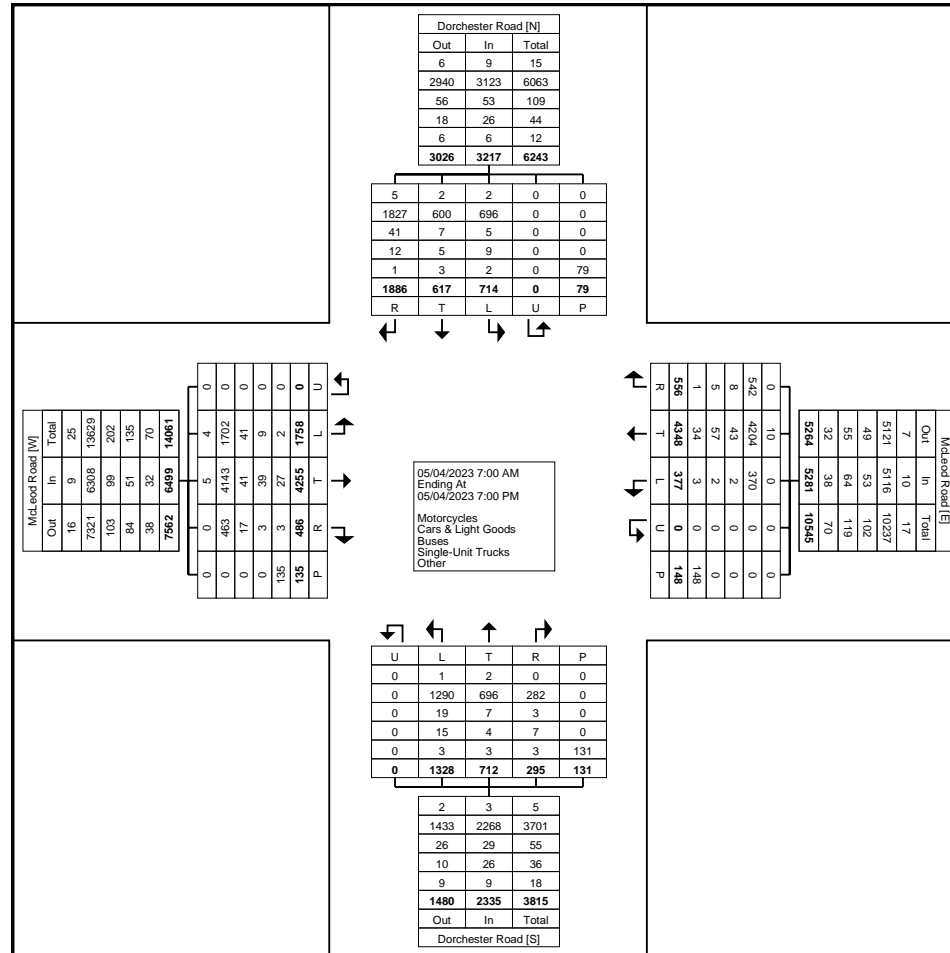
5:30 PM	69	150	34	0	10	253	12	113	15	0	5	140	64	25	9	0	5	98	20	33	54	0	0	107	598
5:45 PM	50	175	35	0	1	260	5	141	14	0	6	160	44	24	10	0	10	78	17	14	60	0	2	91	589
Hourly Total	255	681	103	0	22	1039	49	577	68	0	27	694	219	107	39	0	29	365	76	94	267	0	9	437	2535
6:00 PM	56	150	19	0	3	225	8	147	14	0	3	169	37	27	8	0	3	72	25	17	47	0	2	89	555
6:15 PM	53	134	28	0	5	215	15	136	14	0	5	165	39	20	4	0	5	63	26	18	60	0	3	104	547
6:30 PM	60	128	18	0	6	206	10	130	17	0	9	157	34	21	8	0	4	63	18	20	61	0	2	99	525
6:45 PM	63	127	19	0	2	209	12	119	10	0	8	141	36	23	9	0	2	68	24	26	60	0	2	110	528
Hourly Total	232	539	84	0	16	855	45	532	55	0	25	632	146	91	29	0	14	266	93	81	228	0	9	402	2155
Grand Total	1758	4255	486	0	135	6499	377	4348	556	0	148	5281	1328	712	295	0	131	2335	714	617	1886	0	79	3217	17332
Approach %	27.1	65.5	7.5	0.0	-	-	7.1	82.3	10.5	0.0	-	-	56.9	30.5	12.6	0.0	-	-	22.2	19.2	58.6	0.0	-	-	-
Total %	10.1	24.5	2.8	0.0	-	37.5	2.2	25.1	3.2	0.0	-	30.5	7.7	4.1	1.7	0.0	-	13.5	4.1	3.6	10.9	0.0	-	18.6	-
Motorcycles	4	5	0	0	-	9	0	10	0	0	-	10	1	2	0	0	-	3	2	2	5	0	-	9	31
% Motorcycles	0.2	0.1	0.0	-	-	0.1	0.0	0.2	0.0	-	-	0.2	0.1	0.3	0.0	-	-	0.1	0.3	0.3	0.3	-	-	0.3	0.2
Cars & Light Goods	1702	4143	463	0	-	6308	370	4204	542	0	-	5116	1290	696	282	0	-	2268	696	600	1827	0	-	3123	16815
% Cars & Light Goods	96.8	97.4	95.3	-	-	97.1	98.1	96.7	97.5	-	-	96.9	97.1	97.8	95.6	-	-	97.1	97.5	97.2	96.9	-	-	97.1	97.0
Buses	41	41	17	0	-	99	2	43	8	0	-	53	19	7	3	0	-	29	5	7	41	0	-	53	234
% Buses	2.3	1.0	3.5	-	-	1.5	0.5	1.0	1.4	-	-	1.0	1.4	1.0	1.0	-	-	1.2	0.7	1.1	2.2	-	-	1.6	1.4
Single-Unit Trucks	9	39	3	0	-	51	2	57	5	0	-	64	15	4	7	0	-	26	9	5	12	0	-	26	167
% Single-Unit Trucks	0.5	0.9	0.6	-	-	0.8	0.5	1.3	0.9	-	-	1.2	1.1	0.6	2.4	-	-	1.1	1.3	0.8	0.6	-	-	0.8	1.0
Articulated Trucks	0	24	3	0	-	27	2	32	1	0	-	35	3	1	3	0	-	7	1	1	1	0	-	3	72
% Articulated Trucks	0.0	0.6	0.6	-	-	0.4	0.5	0.7	0.2	-	-	0.7	0.2	0.1	1.0	-	-	0.3	0.1	0.2	0.1	-	-	0.1	0.4
Bicycles on Road	2	3	0	0	-	5	1	2	0	0	-	3	0	2	0	0	-	2	1	2	0	0	-	3	13
% Bicycles on Road	0.1	0.1	0.0	-	-	0.1	0.3	0.0	0.0	-	-	0.1	0.0	0.3	0.0	-	-	0.1	0.1	0.3	0.0	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	8	-	-	-	-	-	7	-	-	-	-	-	15	-	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	-	5.9	-	-	-	-	-	4.7	-	-	-	-	-	11.5	-	-	-	-	-	3.8	-	-
Pedestrians	-	-	-	-	127	-	-	-	-	-	141	-	-	-	-	-	116	-	-	-	-	-	76	-	-
% Pedestrians	-	-	-	-	94.1	-	-	-	-	-	95.3	-	-	-	-	-	88.5	-	-	-	-	-	96.2	-	-



Paradigm Transportation Solutions Limited
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Count Name: McLeod Road & Dochester Road
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Turning Movement Data Plot



Paradigm Transportation Solutions Limited
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Count Name: McLeod Road & Dochester Road
Site Code: 220542
Start Date: 05/04/2023
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Turning Movement Peak Hour Data (8:15 AM)

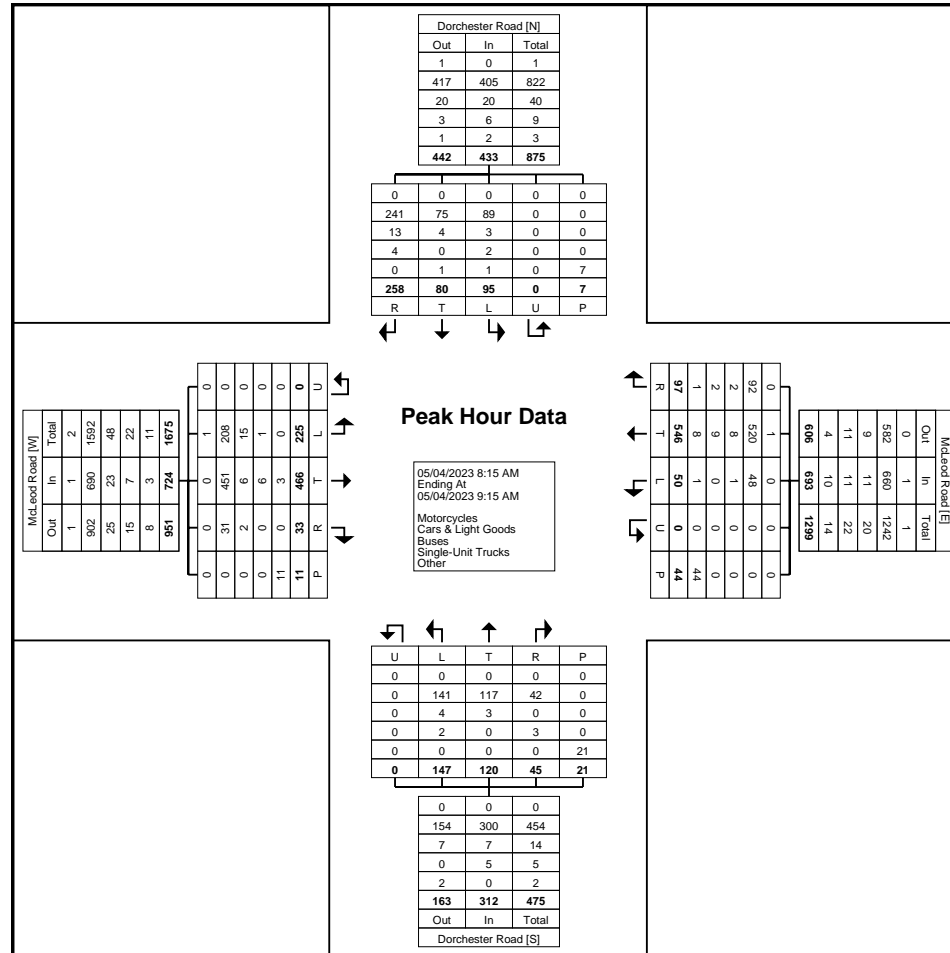
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:15 AM	50	119	6	0	4	175	13	135	12	0	11	160	33	26	11	0	10	70	17	11	48	0	0	76	481
8:30 AM	55	116	10	0	3	181	11	128	30	0	12	169	36	41	11	0	0	88	24	27	66	0	3	117	555
8:45 AM	60	111	8	0	0	179	14	142	29	0	13	185	42	33	11	0	5	86	35	24	88	0	0	147	597
9:00 AM	60	120	9	0	4	189	12	141	26	0	8	179	36	20	12	0	6	68	19	18	56	0	4	93	529
Total	225	466	33	0	11	724	50	546	97	0	44	693	147	120	45	0	21	312	95	80	258	0	7	433	2162
Approach %	31.1	64.4	4.6	0.0	-	-	7.2	78.8	14.0	0.0	-	-	47.1	38.5	14.4	0.0	-	-	21.9	18.5	59.6	0.0	-	-	-
Total %	10.4	21.6	1.5	0.0	-	33.5	2.3	25.3	4.5	0.0	-	32.1	6.8	5.6	2.1	0.0	-	14.4	4.4	3.7	11.9	0.0	-	20.0	-
PHF	0.938	0.971	0.825	0.000	-	0.958	0.893	0.961	0.808	0.000	-	0.936	0.875	0.732	0.938	0.000	-	0.886	0.679	0.741	0.733	0.000	-	0.736	0.905
Motorcycles	1	0	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	2
% Motorcycles	0.4	0.0	0.0	-	-	0.1	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	208	451	31	0	-	690	48	520	92	0	-	660	141	117	42	0	-	300	89	75	241	0	-	405	2055
% Cars & Light Goods	92.4	96.8	93.9	-	-	95.3	96.0	95.2	94.8	-	-	95.2	95.9	97.5	93.3	-	-	96.2	93.7	93.8	93.4	-	-	93.5	95.1
Buses	15	6	2	0	-	23	1	8	2	0	-	11	4	3	0	0	-	7	3	4	13	0	-	20	61
% Buses	6.7	1.3	6.1	-	-	3.2	2.0	1.5	2.1	-	-	1.6	2.7	2.5	0.0	-	-	2.2	3.2	5.0	5.0	-	-	4.6	2.8
Single-Unit Trucks	1	6	0	0	-	7	0	9	2	0	-	11	2	0	3	0	-	5	2	0	4	0	-	6	29
% Single-Unit Trucks	0.4	1.3	0.0	-	-	1.0	0.0	1.6	2.1	-	-	1.6	1.4	0.0	6.7	-	-	1.6	2.1	0.0	1.6	-	-	1.4	1.3
Articulated Trucks	0	3	0	0	-	3	1	8	1	0	-	10	0	0	0	0	-	0	1	0	0	0	-	1	14
% Articulated Trucks	0.0	0.6	0.0	-	-	0.4	2.0	1.5	1.0	-	-	1.4	0.0	0.0	0.0	-	-	0.0	1.1	0.0	0.0	-	-	0.2	0.6
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.3	0.0	-	-	0.2	0.0
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	9.1	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	10	-	-	-	-	-	44	-	-	-	-	-	21	-	-	-	-	-	7	-	-
% Pedestrians	-	-	-	-	90.9	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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Count Name: McLeod Road & Dochester Road
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Turning Movement Peak Hour Data Plot (8:15 AM)



Paradigm Transportation Solutions Limited
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Count Name: McLeod Road & Dochester Road
Site Code: 220542
Start Date: 05/04/2023
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Turning Movement Peak Hour Data (12:00 PM)

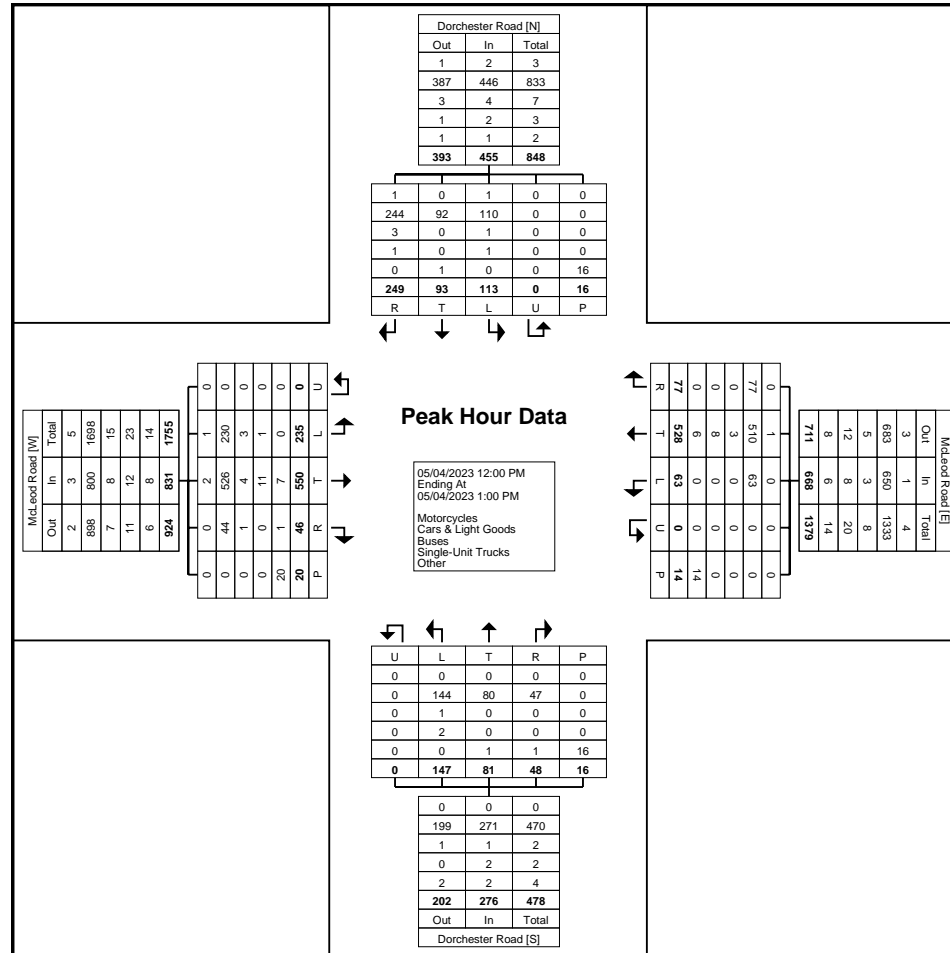
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	65	111	9	0	4	185	19	122	16	0	4	157	52	16	12	0	0	80	30	34	65	0	3	129	551
12:15 PM	63	154	13	0	4	230	18	149	17	0	1	184	22	22	9	0	6	53	29	18	60	0	4	107	574
12:30 PM	49	145	12	0	5	206	12	115	21	0	3	148	39	17	14	0	3	70	27	14	73	0	3	114	538
12:45 PM	58	140	12	0	7	210	14	142	23	0	6	179	34	26	13	0	7	73	27	27	51	0	6	105	567
Total	235	550	46	0	20	831	63	528	77	0	14	668	147	81	48	0	16	276	113	93	249	0	16	455	2230
Approach %	28.3	66.2	5.5	0.0	-	-	9.4	79.0	11.5	0.0	-	-	53.3	29.3	17.4	0.0	-	-	24.8	20.4	54.7	0.0	-	-	-
Total %	10.5	24.7	2.1	0.0	-	37.3	2.8	23.7	3.5	0.0	-	30.0	6.6	3.6	2.2	0.0	-	12.4	5.1	4.2	11.2	0.0	-	20.4	-
PHF	0.904	0.893	0.885	0.000	-	0.903	0.829	0.886	0.837	0.000	-	0.908	0.707	0.779	0.857	0.000	-	0.863	0.942	0.684	0.853	0.000	-	0.882	0.971
Motorcycles	1	2	0	0	-	3	0	1	0	0	-	1	0	0	0	0	-	0	1	0	1	0	-	2	6
% Motorcycles	0.4	0.4	0.0	-	-	0.4	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.9	0.0	0.4	-	-	0.4	0.3
Cars & Light Goods	230	526	44	0	-	800	63	510	77	0	-	650	144	80	47	0	-	271	110	92	244	0	-	446	2167
% Cars & Light Goods	97.9	95.6	95.7	-	-	96.3	100.0	96.6	100.0	-	-	97.3	98.0	98.8	97.9	-	-	98.2	97.3	98.9	98.0	-	-	98.0	97.2
Buses	3	4	1	0	-	8	0	3	0	0	-	3	1	0	0	0	-	1	1	0	3	0	-	4	16
% Buses	1.3	0.7	2.2	-	-	1.0	0.0	0.6	0.0	-	-	0.4	0.7	0.0	0.0	-	-	0.4	0.9	0.0	1.2	-	-	0.9	0.7
Single-Unit Trucks	1	11	0	0	-	12	0	8	0	0	-	8	2	0	0	0	-	2	1	0	1	0	-	2	24
% Single-Unit Trucks	0.4	2.0	0.0	-	-	1.4	0.0	1.5	0.0	-	-	1.2	1.4	0.0	0.0	-	-	0.7	0.9	0.0	0.4	-	-	0.4	1.1
Articulated Trucks	0	6	1	0	-	7	0	6	0	0	-	6	0	0	1	0	-	1	0	1	0	0	-	1	15
% Articulated Trucks	0.0	1.1	2.2	-	-	0.8	0.0	1.1	0.0	-	-	0.9	0.0	0.0	2.1	-	-	0.4	0.0	1.1	0.0	-	-	0.2	0.7
Bicycles on Road	0	1	0	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	1.2	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	5.0	-	-	-	-	-	7.1	-	-	-	-	-	25.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	19	-	-	-	-	-	13	-	-	-	-	-	12	-	-	-	-	-	16	-	-
% Pedestrians	-	-	-	-	95.0	-	-	-	-	-	92.9	-	-	-	-	-	75.0	-	-	-	-	-	100.0	-	-



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



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Count Name: McLeod Road & Dochester Road
Site Code: 220542
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Turning Movement Peak Hour Data (4:15 PM)

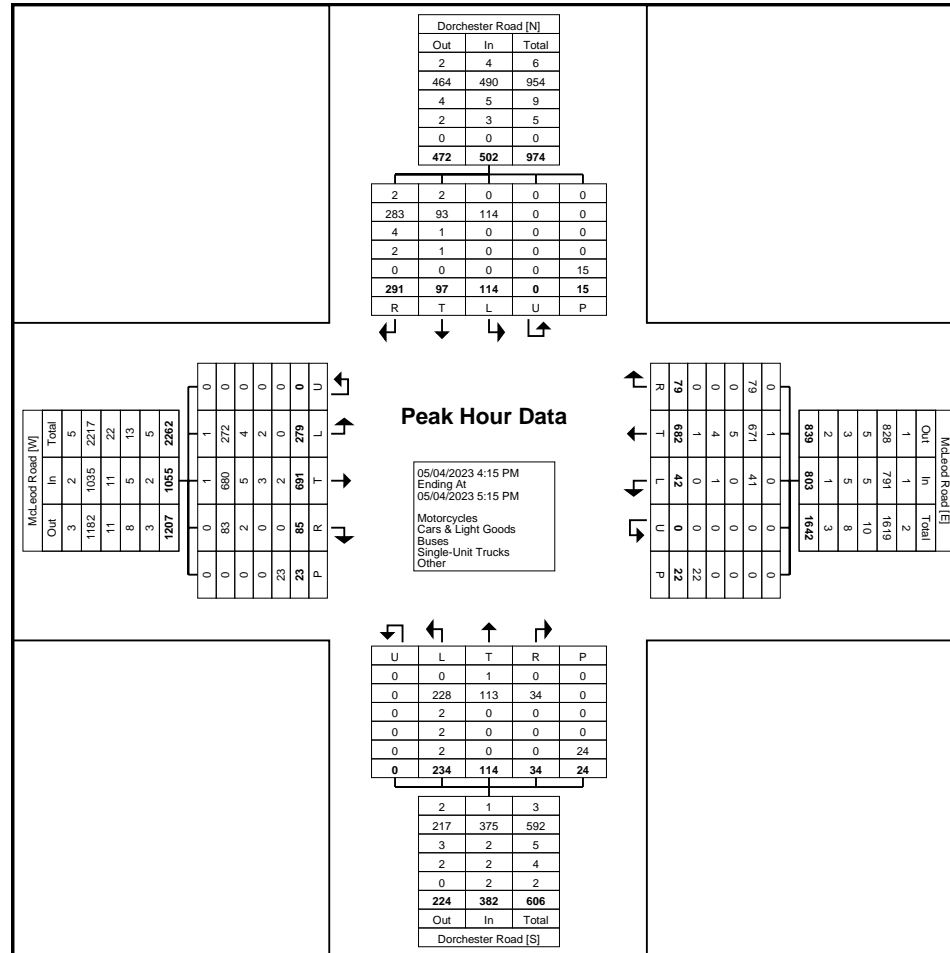
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:15 PM	69	175	20	0	8	264	12	179	20	0	3	211	48	20	5	0	6	73	27	24	74	0	4	125	673
4:30 PM	71	175	27	0	4	273	12	176	20	0	2	208	59	32	12	0	4	103	35	23	64	0	2	122	706
4:45 PM	71	173	23	0	4	267	4	169	19	0	2	192	66	25	9	0	1	100	30	22	69	0	6	121	680
5:00 PM	68	168	15	0	7	251	14	158	20	0	15	192	61	37	8	0	13	106	22	28	84	0	3	134	683
Total	279	691	85	0	23	1055	42	682	79	0	22	803	234	114	34	0	24	382	114	97	291	0	15	502	2742
Approach %	26.4	65.5	8.1	0.0	-	-	5.2	84.9	9.8	0.0	-	-	61.3	29.8	8.9	0.0	-	-	22.7	19.3	58.0	0.0	-	-	-
Total %	10.2	25.2	3.1	0.0	-	38.5	1.5	24.9	2.9	0.0	-	29.3	8.5	4.2	1.2	0.0	-	13.9	4.2	3.5	10.6	0.0	-	18.3	-
PHF	0.982	0.987	0.787	0.000	-	0.966	0.750	0.953	0.988	0.000	-	0.951	0.886	0.770	0.708	0.000	-	0.901	0.814	0.866	0.866	0.000	-	0.937	0.971
Motorcycles	1	1	0	0	-	2	0	1	0	0	-	1	0	1	0	0	-	1	0	2	2	0	-	4	8
% Motorcycles	0.4	0.1	0.0	-	-	0.2	0.0	0.1	0.0	-	-	0.1	0.0	0.9	0.0	-	-	0.3	0.0	2.1	0.7	-	-	0.8	0.3
Cars & Light Goods	272	680	83	0	-	1035	41	671	79	0	-	791	228	113	34	0	-	375	114	93	283	0	-	490	2691
% Cars & Light Goods	97.5	98.4	97.6	-	-	98.1	97.6	98.4	100.0	-	-	98.5	97.4	99.1	100.0	-	-	98.2	100.0	95.9	97.3	-	-	97.6	98.1
Buses	4	5	2	0	-	11	0	5	0	0	-	5	2	0	0	0	-	2	0	1	4	0	-	5	23
% Buses	1.4	0.7	2.4	-	-	1.0	0.0	0.7	0.0	-	-	0.6	0.9	0.0	0.0	-	-	0.5	0.0	1.0	1.4	-	-	1.0	0.8
Single-Unit Trucks	2	3	0	0	-	5	1	4	0	0	-	5	2	0	0	0	-	2	0	1	2	0	-	3	15
% Single-Unit Trucks	0.7	0.4	0.0	-	-	0.5	2.4	0.6	0.0	-	-	0.6	0.9	0.0	0.0	-	-	0.5	0.0	1.0	0.7	-	-	0.6	0.5
Articulated Trucks	0	2	0	0	-	2	0	1	0	0	-	1	2	0	0	0	-	2	0	0	0	0	-	0	5
% Articulated Trucks	0.0	0.3	0.0	-	-	0.2	0.0	0.1	0.0	-	-	0.1	0.9	0.0	0.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	3	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	8.7	-	-	-	-	-	9.1	-	-	-	-	-	12.5	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	21	-	-	-	-	-	20	-	-	-	-	-	21	-	-	-	-	-	15	-	-
% Pedestrians	-	-	-	-	91.3	-	-	-	-	-	90.9	-	-	-	-	-	87.5	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Dochester Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 9



Turning Movement Peak Hour Data Plot (4:15 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Dorchester Road
- Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 1

Turning Movement Data

Start Time	McLeod Road Eastbound						McLeod Road Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
10:00 AM	41	123	24	0	3	188	13	133	17	0	2	163	45	31	11	0	2	87	21	22	55	0	5	98	536
10:15 AM	57	127	31	0	2	215	13	138	18	0	3	169	44	30	12	0	2	86	22	18	64	0	3	104	574
10:30 AM	70	139	20	0	6	229	18	131	25	0	6	174	46	24	13	0	3	83	24	34	38	0	6	96	582
10:45 AM	64	143	20	0	3	227	13	136	16	0	2	165	58	25	9	0	3	92	18	26	58	0	2	102	586
Hourly Total	232	532	95	0	14	859	57	538	76	0	13	671	193	110	45	0	10	348	85	100	215	0	16	400	2278
11:00 AM	69	147	26	0	6	242	12	145	20	0	3	177	46	23	10	0	3	79	21	27	76	0	3	124	622
11:15 AM	50	130	23	0	5	203	15	169	19	0	4	203	60	34	10	0	1	104	28	24	65	0	7	117	627
11:30 AM	61	165	19	0	5	245	10	158	22	0	2	190	60	31	10	0	1	101	26	17	66	0	2	109	645
11:45 AM	63	124	10	0	8	197	13	153	27	0	6	193	43	29	20	0	10	92	26	20	75	0	4	121	603
Hourly Total	243	566	78	0	24	887	50	625	88	0	15	763	209	117	50	0	15	376	101	88	282	0	16	471	2497
12:00 PM	50	165	23	0	5	238	16	153	11	0	3	180	41	24	9	0	12	74	11	23	67	0	0	101	593
12:15 PM	45	162	31	0	6	238	14	162	22	0	9	198	41	22	7	0	5	70	26	26	53	0	1	105	611
12:30 PM	56	151	28	0	3	235	12	153	19	0	10	184	39	25	9	0	6	73	27	40	83	0	3	150	642
12:45 PM	56	157	19	0	2	232	14	185	15	0	5	214	56	27	7	0	4	90	32	29	73	0	4	134	670
Hourly Total	207	635	101	0	16	943	56	653	67	0	27	776	177	98	32	0	27	307	96	118	276	0	8	490	2516
1:00 PM	62	159	22	0	2	243	11	188	20	0	3	219	43	29	14	0	4	86	21	27	63	0	2	111	659
1:15 PM	69	178	25	0	3	272	9	130	31	0	3	170	48	20	15	0	1	83	24	20	62	0	4	106	631
1:30 PM	73	179	11	0	3	263	15	151	17	1	5	184	50	30	10	0	4	90	23	30	68	0	5	121	658
1:45 PM	61	167	17	0	6	245	5	176	19	0	3	200	54	27	11	0	4	92	31	23	61	0	2	115	652
Hourly Total	265	683	75	0	14	1023	40	645	87	1	14	773	195	106	50	0	13	351	99	100	254	0	13	453	2600
2:00 PM	72	137	11	0	11	220	14	134	31	0	1	179	54	40	10	0	7	104	21	29	64	0	5	114	617
2:15 PM	58	161	16	0	5	235	11	140	21	0	3	172	53	28	8	0	7	89	21	24	51	0	0	96	592
2:30 PM	63	152	16	0	1	231	13	162	18	0	11	193	35	24	7	0	12	66	20	26	70	0	1	116	606
2:45 PM	70	190	15	0	2	275	12	157	29	0	4	198	45	32	7	0	4	84	28	18	73	0	2	119	676
Hourly Total	263	640	58	0	19	961	50	593	99	0	19	742	187	124	32	0	30	343	90	97	258	0	8	445	2491
3:00 PM	78	148	27	0	6	253	10	151	15	0	6	176	37	28	11	0	2	76	27	15	63	0	3	105	610
3:15 PM	59	131	13	0	2	203	16	145	19	0	3	180	42	35	12	0	3	89	37	28	63	0	5	128	600
3:30 PM	64	153	20	0	2	237	9	173	15	0	2	197	43	29	10	0	8	82	25	35	52	0	4	112	628
3:45 PM	64	197	20	0	7	281	23	143	15	0	6	181	35	30	10	0	2	75	20	24	71	0	4	115	652
Hourly Total	265	629	80	0	17	974	58	612	64	0	17	734	157	122	43	0	15	322	109	102	249	0	16	460	2490
4:00 PM	57	169	43	0	1	269	10	184	17	0	2	211	39	27	11	0	3	77	19	24	54	0	4	97	654
4:15 PM	60	161	22	0	2	243	12	142	18	0	3	172	43	33	13	0	2	89	20	11	49	0	2	80	584
4:30 PM	79	181	17	0	5	277	11	152	17	0	3	180	43	25	6	0	4	74	30	26	51	0	3	107	638
4:45 PM	50	177	16	0	2	243	13	204	23	0	4	240	49	20	6	0	2	75	27	22	53	0	2	102	660
Hourly Total	246	688	98	0	10	1032	46	682	75	0	12	803	174	105	36	0	11	315	96	83	207	0	11	386	2536

5:00 PM	55	176	18	0	3	249	15	185	24	0	8	224	47	24	8	0	3	79	23	24	49	0	2	96	648
5:15 PM	66	146	23	0	0	235	15	191	16	0	1	222	33	30	6	0	3	69	33	17	62	0	0	112	638
5:30 PM	59	170	27	0	8	256	13	180	10	0	2	203	39	17	9	0	6	65	21	16	48	0	5	85	609
5:45 PM	52	152	15	0	7	219	12	169	17	0	4	198	24	30	14	0	1	68	21	22	69	0	2	112	597
Hourly Total	232	644	83	0	18	959	55	725	67	0	15	847	143	101	37	0	13	281	98	79	228	0	9	405	2492
Grand Total	1953	5017	668	0	132	7638	412	5073	623	1	132	6109	1435	883	325	0	134	2643	774	767	1969	0	97	3510	19900
Approach %	25.6	65.7	8.7	0.0	-	-	6.7	83.0	10.2	0.0	-	-	54.3	33.4	12.3	0.0	-	-	22.1	21.9	56.1	0.0	-	-	-
Total %	9.8	25.2	3.4	0.0	-	38.4	2.1	25.5	3.1	0.0	-	30.7	7.2	4.4	1.6	0.0	-	13.3	3.9	3.9	9.9	0.0	-	17.6	-
Motorcycles	13	30	4	0	-	47	1	52	8	0	-	61	3	12	2	0	-	17	9	10	16	0	-	35	160
% Motorcycles	0.7	0.6	0.6	-	-	0.6	0.2	1.0	1.3	0.0	-	1.0	0.2	1.4	0.6	-	-	0.6	1.2	1.3	0.8	-	-	1.0	0.8
Cars & Light Goods	1907	4939	646	0	-	7492	407	4966	613	1	-	5987	1410	862	322	0	-	2594	765	749	1921	0	-	3435	19508
% Cars & Light Goods	97.6	98.4	96.7	-	-	98.1	98.8	97.9	98.4	100.0	-	98.0	98.3	97.6	99.1	-	-	98.1	98.8	97.7	97.6	-	-	97.9	98.0
Buses	27	20	11	0	-	58	2	30	0	0	-	32	12	1	0	0	-	13	0	0	29	0	-	29	132
% Buses	1.4	0.4	1.6	-	-	0.8	0.5	0.6	0.0	0.0	-	0.5	0.8	0.1	0.0	-	-	0.5	0.0	0.0	1.5	-	-	0.8	0.7
Single-Unit Trucks	5	21	6	0	-	32	1	18	2	0	-	21	9	1	1	0	-	11	0	4	3	0	-	7	71
% Single-Unit Trucks	0.3	0.4	0.9	-	-	0.4	0.2	0.4	0.3	0.0	-	0.3	0.6	0.1	0.3	-	-	0.4	0.0	0.5	0.2	-	-	0.2	0.4
Articulated Trucks	0	3	0	0	-	3	1	4	0	0	-	5	1	1	0	0	-	2	0	1	0	0	-	1	11
% Articulated Trucks	0.0	0.1	0.0	-	-	0.0	0.2	0.1	0.0	0.0	-	0.1	0.1	0.1	0.0	-	-	0.1	0.0	0.1	0.0	-	-	0.0	0.1
Bicycles on Road	1	4	1	0	-	6	0	3	0	0	-	3	0	6	0	0	-	6	0	3	0	0	-	3	18
% Bicycles on Road	0.1	0.1	0.1	-	-	0.1	0.0	0.1	0.0	0.0	-	0.0	0.0	0.7	0.0	-	-	0.2	0.0	0.4	0.0	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	10	-	-	-	-	-	13	-	-	-	-	-	23	-	-	-	-	-	13	-	-
% Bicycles on Crosswalk	-	-	-	-	7.6	-	-	-	-	-	9.8	-	-	-	-	-	17.2	-	-	-	-	-	13.4	-	-
Pedestrians	-	-	-	-	122	-	-	-	-	-	119	-	-	-	-	-	111	-	-	-	-	-	84	-	-
% Pedestrians	-	-	-	-	92.4	-	-	-	-	-	90.2	-	-	-	-	-	82.8	-	-	-	-	-	86.6	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: McLeod Road & Dorchester Road
- Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 4

Turning Movement Peak Hour Data (12:45 PM)

Start Time	McLeod Road Eastbound						McLeod Road Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:45 PM	56	157	19	0	2	232	14	185	15	0	5	214	56	27	7	0	4	90	32	29	73	0	4	134	670
1:00 PM	62	159	22	0	2	243	11	188	20	0	3	219	43	29	14	0	4	86	21	27	63	0	2	111	659
1:15 PM	69	178	25	0	3	272	9	130	31	0	3	170	48	20	15	0	1	83	24	20	62	0	4	106	631
1:30 PM	73	179	11	0	3	263	15	151	17	1	5	184	50	30	10	0	4	90	23	30	68	0	5	121	658
Total	260	673	77	0	10	1010	49	654	83	1	16	787	197	106	46	0	13	349	100	106	266	0	15	472	2618
Approach %	25.7	66.6	7.6	0.0	-	-	6.2	83.1	10.5	0.1	-	-	56.4	30.4	13.2	0.0	-	-	21.2	22.5	56.4	0.0	-	-	-
Total %	9.9	25.7	2.9	0.0	-	38.6	1.9	25.0	3.2	0.0	-	30.1	7.5	4.0	1.8	0.0	-	13.3	3.8	4.0	10.2	0.0	-	18.0	-
PHF	0.890	0.940	0.770	0.000	-	0.928	0.817	0.870	0.669	0.250	-	0.898	0.879	0.883	0.767	0.000	-	0.969	0.781	0.883	0.911	0.000	-	0.881	0.977
Motorcycles	3	4	1	0	-	8	1	7	0	0	-	8	0	1	1	0	-	2	0	3	1	0	-	4	22
% Motorcycles	1.2	0.6	1.3	-	-	0.8	2.0	1.1	0.0	0.0	-	1.0	0.0	0.9	2.2	-	-	0.6	0.0	2.8	0.4	-	-	0.8	0.8
Cars & Light Goods	253	657	73	0	-	983	47	635	83	1	-	766	194	103	45	0	-	342	100	101	262	0	-	463	2554
% Cars & Light Goods	97.3	97.6	94.8	-	-	97.3	95.9	97.1	100.0	100.0	-	97.3	98.5	97.2	97.8	-	-	98.0	100.0	95.3	98.5	-	-	98.1	97.6
Buses	3	2	1	0	-	6	0	5	0	0	-	5	2	0	0	0	-	2	0	0	3	0	-	3	16
% Buses	1.2	0.3	1.3	-	-	0.6	0.0	0.8	0.0	0.0	-	0.6	1.0	0.0	0.0	-	-	0.6	0.0	0.0	1.1	-	-	0.6	0.6
Single-Unit Trucks	1	5	2	0	-	8	0	4	0	0	-	4	1	0	0	0	-	1	0	1	0	0	-	1	14
% Single-Unit Trucks	0.4	0.7	2.6	-	-	0.8	0.0	0.6	0.0	0.0	-	0.5	0.5	0.0	0.0	-	-	0.3	0.0	0.9	0.0	-	-	0.2	0.5
Articulated Trucks	0	2	0	0	-	2	1	2	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	5
% Articulated Trucks	0.0	0.3	0.0	-	-	0.2	2.0	0.3	0.0	0.0	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Road	0	3	0	0	-	3	0	1	0	0	-	1	0	2	0	0	-	2	0	1	0	0	-	1	7
% Bicycles on Road	0.0	0.4	0.0	-	-	0.3	0.0	0.2	0.0	0.0	-	0.1	0.0	1.9	0.0	-	-	0.6	0.0	0.9	0.0	-	-	0.2	0.3
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	10.0	-	-	-	-	-	6.3	-	-	-	-	-	30.8	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	9	-	-	-	-	-	15	-	-	-	-	-	9	-	-	-	-	-	15	-	-
% Pedestrians	-	-	-	-	90.0	-	-	-	-	-	93.8	-	-	-	-	-	69.2	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Drummond Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 1

Turning Movement Data

Start Time	McLeod Road Eastbound						McLeod Road Westbound						Drummond Road Northbound						Drummond Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	15	41	8	0	0	64	4	67	17	0	1	88	16	10	1	0	0	27	18	5	17	0	0	40	219
7:15 AM	17	69	7	0	0	93	3	68	9	0	6	80	29	10	6	0	0	45	22	13	27	0	2	62	280
7:30 AM	33	68	6	0	0	107	3	73	13	0	3	89	35	19	3	0	1	57	19	9	34	0	0	62	315
7:45 AM	28	98	13	0	0	139	4	58	20	0	1	82	37	18	3	0	0	58	24	10	26	0	0	60	339
Hourly Total	93	276	34	0	0	403	14	266	59	0	11	339	117	57	13	0	1	187	83	37	104	0	2	224	1153
8:00 AM	34	74	12	0	0	120	4	78	26	0	0	108	31	21	3	0	3	55	15	11	25	0	2	51	334
8:15 AM	42	85	9	0	0	136	1	73	26	0	6	100	27	39	6	0	0	72	18	15	39	0	0	72	380
8:30 AM	36	92	9	0	4	137	2	81	37	0	3	120	26	23	7	0	2	56	14	21	42	0	1	77	390
8:45 AM	29	107	24	0	0	160	4	114	30	0	1	148	29	31	2	0	1	62	28	9	33	0	0	70	440
Hourly Total	141	358	54	0	4	553	11	346	119	0	10	476	113	114	18	0	6	245	75	56	139	0	3	270	1544
9:00 AM	43	83	14	0	0	140	2	91	21	0	3	114	22	23	2	0	0	47	18	18	38	0	6	74	375
9:15 AM	45	73	12	0	0	130	1	60	32	0	3	93	29	12	4	0	0	45	17	16	36	0	1	69	337
9:30 AM	36	85	18	0	0	139	2	82	24	0	1	108	15	26	1	0	1	42	23	13	38	0	2	74	363
9:45 AM	35	72	19	0	1	126	5	96	22	0	4	123	18	17	1	0	3	36	15	8	30	0	0	53	338
Hourly Total	159	313	63	0	1	535	10	329	99	0	11	438	84	78	8	0	4	170	73	55	142	0	9	270	1413
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	49	91	16	0	1	156	2	98	27	0	0	127	22	17	3	0	2	42	25	12	47	0	2	84	409
11:45 AM	46	97	14	0	1	157	1	85	25	0	1	111	29	14	5	0	0	48	25	13	39	0	0	77	393
Hourly Total	95	188	30	0	2	313	3	183	52	0	1	238	51	31	8	0	2	90	50	25	86	0	2	161	802
12:00 PM	44	94	11	0	0	149	6	102	36	0	0	144	18	14	5	0	0	37	33	18	43	0	2	94	424
12:15 PM	33	121	17	0	1	171	4	118	34	0	1	156	28	12	6	0	1	46	29	25	44	0	0	98	471
12:30 PM	42	113	20	0	0	175	7	100	20	0	1	127	14	17	8	0	2	39	40	19	42	0	2	101	442
12:45 PM	44	109	21	0	1	174	2	93	35	0	3	130	19	23	3	0	1	45	29	14	60	0	1	103	452
Hourly Total	163	437	69	0	2	669	19	413	125	0	5	557	79	66	22	0	4	167	131	76	189	0	5	396	1789
1:00 PM	39	88	18	0	1	145	1	100	17	0	1	118	8	14	1	0	1	23	24	21	48	0	1	93	379
1:15 PM	43	94	17	0	0	154	2	95	25	0	6	122	21	16	4	0	0	41	16	14	44	0	3	74	391
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	82	182	35	0	1	299	3	195	42	0	7	240	29	30	5	0	1	64	40	35	92	0	4	167	770
4:00 PM	74	118	32	0	3	224	4	140	40	0	2	184	23	30	5	0	0	58	35	27	54	0	3	116	582
4:15 PM	53	93	23	0	0	169	8	126	26	0	6	160	28	19	6	0	1	53	46	26	41	0	1	113	495
4:30 PM	49	109	26	0	5	184	2	151	45	0	0	198	17	21	5	0	5	43	27	28	54	0	2	109	534
4:45 PM	45	110	27	0	2	182	4	146	28	0	0	178	19	16	4	0	1	39	32	22	41	0	2	95	494
Hourly Total	221	430	108	0	10	759	18	563	139	0	8	720	87	86	20	0	7	193	140	103	190	0	8	433	2105
5:00 PM	43	89	26	0	2	158	2	115	33	0	0	150	18	20	6	0	0	44	29	32	59	0	2	120	472
5:15 PM	51	115	40	0	3	206	4	100	34	0	0	138	26	18	3	0	1	47	35	27	50	0	1	112	503

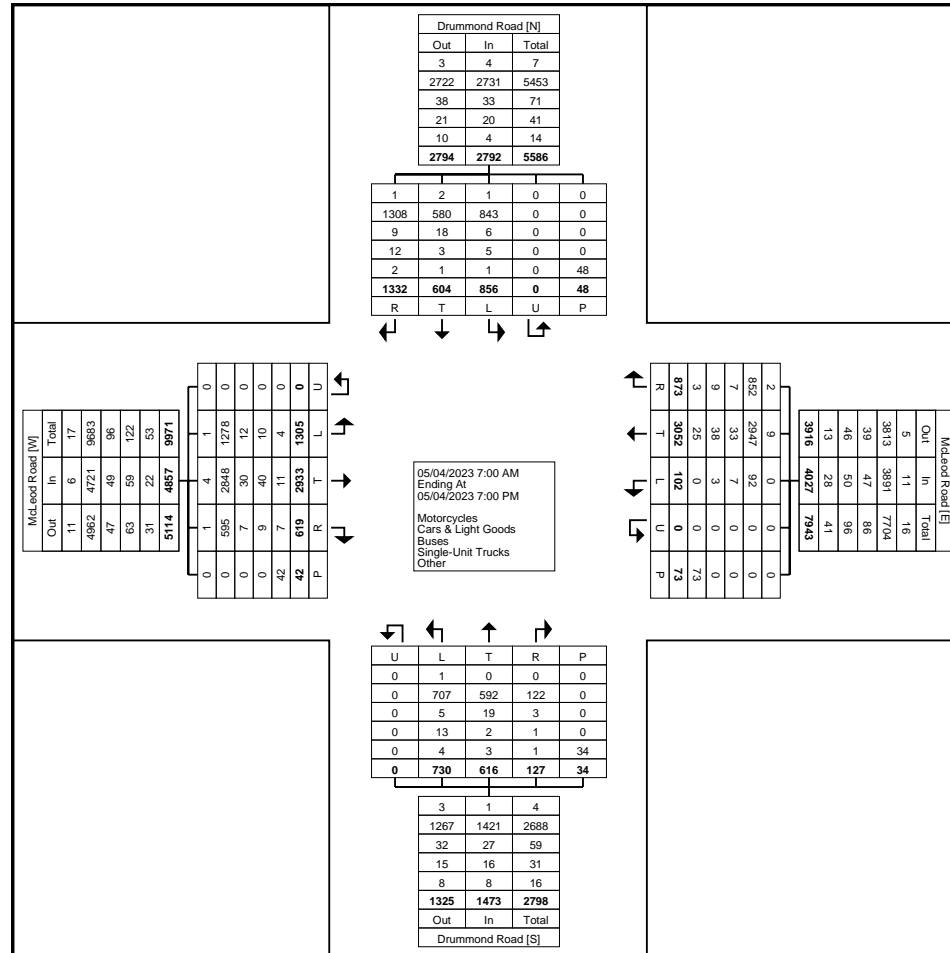
5:30 PM	50	88	24	0	6	162	3	94	26	0	0	123	24	17	3	0	3	44	30	36	51	0	0	117	446
5:45 PM	34	113	31	0	5	178	1	79	26	0	0	106	22	17	6	0	1	45	36	28	46	0	1	110	439
Hourly Total	178	405	121	0	16	704	10	388	119	0	0	517	90	72	18	0	5	180	130	123	206	0	4	459	1860
6:00 PM	51	96	26	0	4	173	5	91	38	0	12	134	16	15	7	0	0	38	41	25	50	0	5	116	461
6:15 PM	40	83	29	0	2	152	3	97	16	0	4	116	23	23	2	0	4	48	42	24	43	0	5	109	425
6:30 PM	43	89	20	0	0	152	4	102	32	0	2	138	21	22	2	0	0	45	28	22	47	0	1	97	432
6:45 PM	39	76	30	0	0	145	2	79	33	0	2	114	20	22	4	0	0	46	23	23	44	0	0	90	395
Hourly Total	173	344	105	0	6	622	14	369	119	0	20	502	80	82	15	0	4	177	134	94	184	0	11	412	1713
Grand Total	1305	2933	619	0	42	4857	102	3052	873	0	73	4027	730	616	127	0	34	1473	856	604	1332	0	48	2792	13149
Approach %	26.9	60.4	12.7	0.0	-	-	2.5	75.8	21.7	0.0	-	-	49.6	41.8	8.6	0.0	-	-	30.7	21.6	47.7	0.0	-	-	-
Total %	9.9	22.3	4.7	0.0	-	36.9	0.8	23.2	6.6	0.0	-	30.6	5.6	4.7	1.0	0.0	-	11.2	6.5	4.6	10.1	0.0	-	21.2	-
Motorcycles	1	4	1	0	-	6	0	9	2	0	-	11	1	0	0	0	-	1	1	2	1	0	-	4	22
% Motorcycles	0.1	0.1	0.2	-	-	0.1	0.0	0.3	0.2	-	-	0.3	0.1	0.0	0.0	-	-	0.1	0.1	0.3	0.1	-	-	0.1	0.2
Cars & Light Goods	1278	2848	595	0	-	4721	92	2947	852	0	-	3891	707	592	122	0	-	1421	843	580	1308	0	-	2731	12764
% Cars & Light Goods	97.9	97.1	96.1	-	-	97.2	90.2	96.6	97.6	-	-	96.6	96.8	96.1	96.1	-	-	96.5	98.5	96.0	98.2	-	-	97.8	97.1
Buses	12	30	7	0	-	49	7	33	7	0	-	47	5	19	3	0	-	27	6	18	9	0	-	33	156
% Buses	0.9	1.0	1.1	-	-	1.0	6.9	1.1	0.8	-	-	1.2	0.7	3.1	2.4	-	-	1.8	0.7	3.0	0.7	-	-	1.2	1.2
Single-Unit Trucks	10	40	9	0	-	59	3	38	9	0	-	50	13	2	1	0	-	16	5	3	12	0	-	20	145
% Single-Unit Trucks	0.8	1.4	1.5	-	-	1.2	2.9	1.2	1.0	-	-	1.2	1.8	0.3	0.8	-	-	1.1	0.6	0.5	0.9	-	-	0.7	1.1
Articulated Trucks	4	10	6	0	-	20	0	25	1	0	-	26	4	1	0	0	-	5	1	1	2	0	-	4	55
% Articulated Trucks	0.3	0.3	1.0	-	-	0.4	0.0	0.8	0.1	-	-	0.6	0.5	0.2	0.0	-	-	0.3	0.1	0.2	0.2	-	-	0.1	0.4
Bicycles on Road	0	1	1	0	-	2	0	0	2	0	-	2	0	2	1	0	-	3	0	0	0	0	-	0	7
% Bicycles on Road	0.0	0.0	0.2	-	-	0.0	0.0	0.0	0.2	-	-	0.0	0.0	0.3	0.8	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	12	-	-	-	-	-	3	-	-	-	-	-	6	-	-	-	-	-	4	-	-
% Bicycles on Crosswalk	-	-	-	-	28.6	-	-	-	-	-	4.1	-	-	-	-	-	17.6	-	-	-	-	-	8.3	-	-
Pedestrians	-	-	-	-	30	-	-	-	-	-	70	-	-	-	-	-	28	-	-	-	-	-	44	-	-
% Pedestrians	-	-	-	-	71.4	-	-	-	-	-	95.9	-	-	-	-	-	82.4	-	-	-	-	-	91.7	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: McLeod Road & Drummond Road
Site Code: 220542
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Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: McLeod Road & Drummond Road
Site Code: 220542
Start Date: 05/04/2023
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Turning Movement Peak Hour Data (8:15 AM)

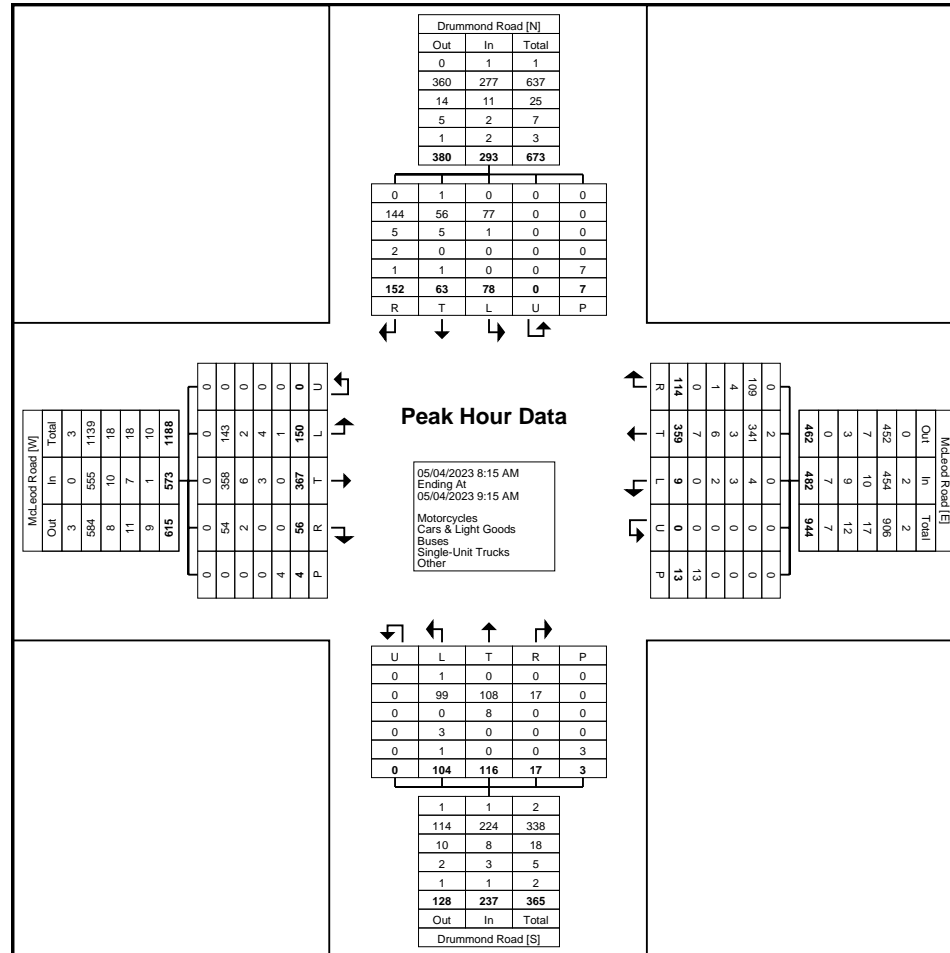
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Drummond Road Northbound						Drummond Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:15 AM	42	85	9	0	0	136	1	73	26	0	6	100	27	39	6	0	0	72	18	15	39	0	0	72	380
8:30 AM	36	92	9	0	4	137	2	81	37	0	3	120	26	23	7	0	2	56	14	21	42	0	1	77	390
8:45 AM	29	107	24	0	0	160	4	114	30	0	1	148	29	31	2	0	1	62	28	9	33	0	0	70	440
9:00 AM	43	83	14	0	0	140	2	91	21	0	3	114	22	23	2	0	0	47	18	18	38	0	6	74	375
Total	150	367	56	0	4	573	9	359	114	0	13	482	104	116	17	0	3	237	78	63	152	0	7	293	1585
Approach %	26.2	64.0	9.8	0.0	-	-	1.9	74.5	23.7	0.0	-	-	43.9	48.9	7.2	0.0	-	-	26.6	21.5	51.9	0.0	-	-	-
Total %	9.5	23.2	3.5	0.0	-	36.2	0.6	22.6	7.2	0.0	-	30.4	6.6	7.3	1.1	0.0	-	15.0	4.9	4.0	9.6	0.0	-	18.5	-
PHF	0.872	0.857	0.583	0.000	-	0.895	0.563	0.787	0.770	0.000	-	0.814	0.897	0.744	0.607	0.000	-	0.823	0.696	0.750	0.905	0.000	-	0.951	0.901
Motorcycles	0	0	0	0	-	0	0	2	0	0	-	2	1	0	0	0	-	1	0	1	0	0	-	1	4
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.4	1.0	0.0	0.0	-	-	0.4	0.0	1.6	0.0	-	-	0.3	0.3
Cars & Light Goods	143	358	54	0	-	555	4	341	109	0	-	454	99	108	17	0	-	224	77	56	144	0	-	277	1510
% Cars & Light Goods	95.3	97.5	96.4	-	-	96.9	44.4	95.0	95.6	-	-	94.2	95.2	93.1	100.0	-	-	94.5	98.7	88.9	94.7	-	-	94.5	95.3
Buses	2	6	2	0	-	10	3	3	4	0	-	10	0	8	0	0	-	8	1	5	5	0	-	11	39
% Buses	1.3	1.6	3.6	-	-	1.7	33.3	0.8	3.5	-	-	2.1	0.0	6.9	0.0	-	-	3.4	1.3	7.9	3.3	-	-	3.8	2.5
Single-Unit Trucks	4	3	0	0	-	7	2	6	1	0	-	9	3	0	0	0	-	3	0	0	2	0	-	2	21
% Single-Unit Trucks	2.7	0.8	0.0	-	-	1.2	22.2	1.7	0.9	-	-	1.9	2.9	0.0	0.0	-	-	1.3	0.0	0.0	1.3	-	-	0.7	1.3
Articulated Trucks	1	0	0	0	-	1	0	7	0	0	-	7	1	0	0	0	-	1	0	1	1	0	-	2	11
% Articulated Trucks	0.7	0.0	0.0	-	-	0.2	0.0	1.9	0.0	-	-	1.5	1.0	0.0	0.0	-	-	0.4	0.0	1.6	0.7	-	-	0.7	0.7
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	13	-	-	-	-	-	3	-	-	-	-	-	7	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: McLeod Road & Drummond Road
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Turning Movement Peak Hour Data Plot (8:15 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Drummond Road
Site Code: 220542
Start Date: 05/04/2023
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Turning Movement Peak Hour Data (12:00 PM)

Start Time	McLeod Road Eastbound						McLeod Road Westbound						Drummond Road Northbound						Drummond Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	44	94	11	0	0	149	6	102	36	0	0	144	18	14	5	0	0	37	33	18	43	0	2	94	424
12:15 PM	33	121	17	0	1	171	4	118	34	0	1	156	28	12	6	0	1	46	29	25	44	0	0	98	471
12:30 PM	42	113	20	0	0	175	7	100	20	0	1	127	14	17	8	0	2	39	40	19	42	0	2	101	442
12:45 PM	44	109	21	0	1	174	2	93	35	0	3	130	19	23	3	0	1	45	29	14	60	0	1	103	452
Total	163	437	69	0	2	669	19	413	125	0	5	557	79	66	22	0	4	167	131	76	189	0	5	396	1789
Approach %	24.4	65.3	10.3	0.0	-	-	3.4	74.1	22.4	0.0	-	-	47.3	39.5	13.2	0.0	-	-	33.1	19.2	47.7	0.0	-	-	-
Total %	9.1	24.4	3.9	0.0	-	37.4	1.1	23.1	7.0	0.0	-	31.1	4.4	3.7	1.2	0.0	-	9.3	7.3	4.2	10.6	0.0	-	22.1	-
PHF	0.926	0.903	0.821	0.000	-	0.956	0.679	0.875	0.868	0.000	-	0.893	0.705	0.717	0.688	0.000	-	0.908	0.819	0.760	0.788	0.000	-	0.961	0.950
Motorcycles	0	1	1	0	-	2	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	3
% Motorcycles	0.0	0.2	1.4	-	-	0.3	0.0	0.0	0.8	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Cars & Light Goods	163	418	64	0	-	645	18	401	120	0	-	539	77	65	21	0	-	163	130	73	187	0	-	390	1737
% Cars & Light Goods	100.0	95.7	92.8	-	-	96.4	94.7	97.1	96.0	-	-	96.8	97.5	98.5	95.5	-	-	97.6	99.2	96.1	98.9	-	-	98.5	97.1
Buses	0	3	0	0	-	3	0	5	0	0	-	5	0	1	0	0	-	1	0	1	0	0	-	1	10
% Buses	0.0	0.7	0.0	-	-	0.4	0.0	1.2	0.0	-	-	0.9	0.0	1.5	0.0	-	-	0.6	0.0	1.3	0.0	-	-	0.3	0.6
Single-Unit Trucks	0	11	1	0	-	12	1	3	4	0	-	8	0	0	1	0	-	1	1	2	2	0	-	5	26
% Single-Unit Trucks	0.0	2.5	1.4	-	-	1.8	5.3	0.7	3.2	-	-	1.4	0.0	0.0	4.5	-	-	0.6	0.8	2.6	1.1	-	-	1.3	1.5
Articulated Trucks	0	4	3	0	-	7	0	4	0	0	-	4	2	0	0	0	-	2	0	0	0	0	-	0	13
% Articulated Trucks	0.0	0.9	4.3	-	-	1.0	0.0	1.0	0.0	-	-	0.7	2.5	0.0	0.0	-	-	1.2	0.0	0.0	0.0	-	-	0.0	0.7
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	50.0	-	-	-	-	-	20.0	-	-	-	-	-	25.0	-	-	-	-	-	20.0	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	3	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	50.0	-	-	-	-	-	80.0	-	-	-	-	-	75.0	-	-	-	-	-	80.0	-	-



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Count Name: McLeod Road & Drummond Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 8

Turning Movement Peak Hour Data (4:00 PM)

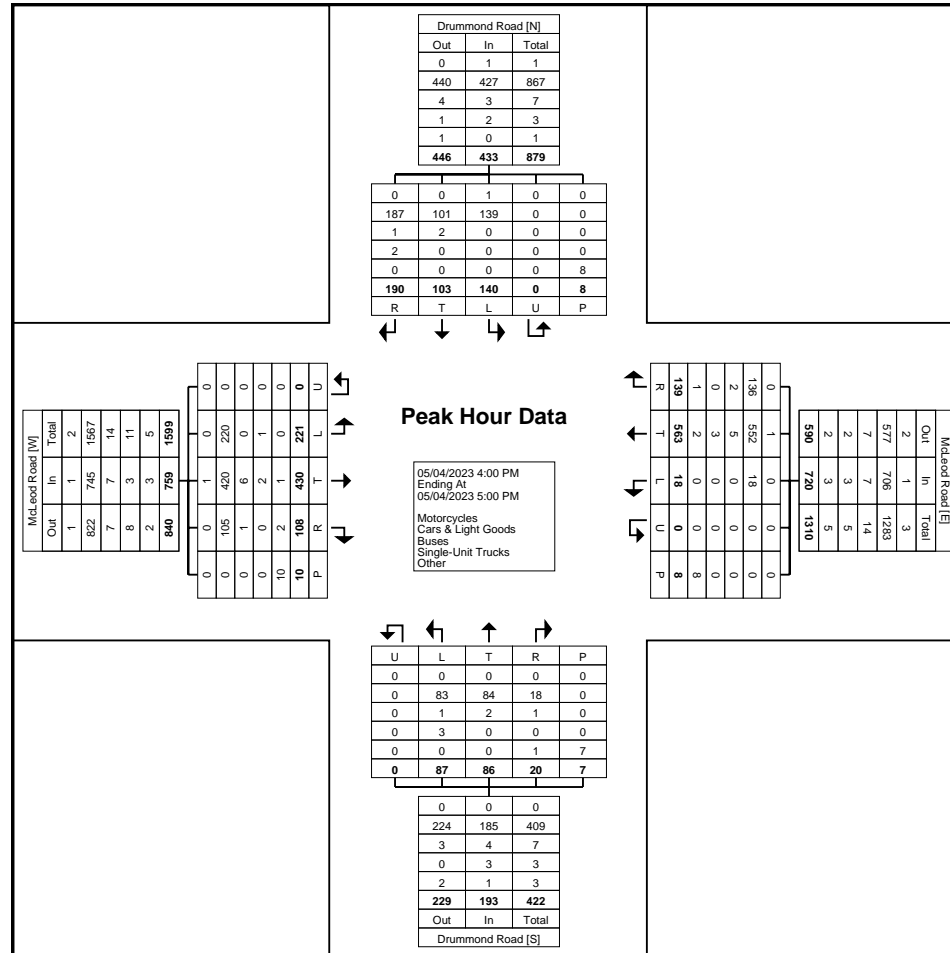
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Drummond Road Northbound						Drummond Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	74	118	32	0	3	224	4	140	40	0	2	184	23	30	5	0	0	58	35	27	54	0	3	116	582
4:15 PM	53	93	23	0	0	169	8	126	26	0	6	160	28	19	6	0	1	53	46	26	41	0	1	113	495
4:30 PM	49	109	26	0	5	184	2	151	45	0	0	198	17	21	5	0	5	43	27	28	54	0	2	109	534
4:45 PM	45	110	27	0	2	182	4	146	28	0	0	178	19	16	4	0	1	39	32	22	41	0	2	95	494
Total	221	430	108	0	10	759	18	563	139	0	8	720	87	86	20	0	7	193	140	103	190	0	8	433	2105
Approach %	29.1	56.7	14.2	0.0	-	-	2.5	78.2	19.3	0.0	-	-	45.1	44.6	10.4	0.0	-	-	32.3	23.8	43.9	0.0	-	-	-
Total %	10.5	20.4	5.1	0.0	-	36.1	0.9	26.7	6.6	0.0	-	34.2	4.1	4.1	1.0	0.0	-	9.2	6.7	4.9	9.0	0.0	-	20.6	-
PHF	0.747	0.911	0.844	0.000	-	0.847	0.563	0.932	0.772	0.000	-	0.909	0.777	0.717	0.833	0.000	-	0.832	0.761	0.920	0.880	0.000	-	0.933	0.904
Motorcycles	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	1	0	0	0	-	1	3
% Motorcycles	0.0	0.2	0.0	-	-	0.1	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.7	0.0	0.0	-	-	0.2	0.1
Cars & Light Goods	220	420	105	0	-	745	18	552	136	0	-	706	83	84	18	0	-	185	139	101	187	0	-	427	2063
% Cars & Light Goods	99.5	97.7	97.2	-	-	98.2	100.0	98.0	97.8	-	-	98.1	95.4	97.7	90.0	-	-	95.9	99.3	98.1	98.4	-	-	98.6	98.0
Buses	0	6	1	0	-	7	0	5	2	0	-	7	1	2	1	0	-	4	0	2	1	0	-	3	21
% Buses	0.0	1.4	0.9	-	-	0.9	0.0	0.9	1.4	-	-	1.0	1.1	2.3	5.0	-	-	2.1	0.0	1.9	0.5	-	-	0.7	1.0
Single-Unit Trucks	1	2	0	0	-	3	0	3	0	0	-	3	3	0	0	0	-	3	0	0	2	0	-	2	11
% Single-Unit Trucks	0.5	0.5	0.0	-	-	0.4	0.0	0.5	0.0	-	-	0.4	3.4	0.0	0.0	-	-	1.6	0.0	0.0	1.1	-	-	0.5	0.5
Articulated Trucks	0	1	1	0	-	2	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	4
% Articulated Trucks	0.0	0.2	0.9	-	-	0.3	0.0	0.4	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Road	0	0	1	0	-	1	0	0	1	0	-	1	0	0	1	0	-	1	0	0	0	0	-	0	3
% Bicycles on Road	0.0	0.0	0.9	-	-	0.1	0.0	0.0	0.7	-	-	0.1	0.0	0.0	5.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	20.0	-	-	-	-	-	0.0	-	-	-	-	-	14.3	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	8	-	-	-	-	-	6	-	-	-	-	-	8	-	-
% Pedestrians	-	-	-	-	80.0	-	-	-	-	-	100.0	-	-	-	-	-	85.7	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Drummond Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Drummond Road
- Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 1

Turning Movement Data

Start Time	McLeod Road Eastbound						McLeod Road Westbound						Drummond Road Northbound						Drummond Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
10:00 AM	44	76	12	0	0	132	2	85	26	0	0	113	34	19	7	0	0	60	27	16	42	0	1	85	390
10:15 AM	54	74	16	0	0	144	2	97	21	0	0	120	23	23	8	0	1	54	23	20	44	0	4	87	405
10:30 AM	34	134	18	0	2	186	1	91	25	0	0	117	20	22	6	0	0	48	30	20	50	0	1	100	451
10:45 AM	57	89	20	0	0	166	3	101	39	0	3	143	31	20	3	0	3	54	33	13	39	0	0	85	448
Hourly Total	189	373	66	0	2	628	8	374	111	0	3	493	108	84	24	0	4	216	113	69	175	0	6	357	1694
11:00 AM	41	96	22	0	5	159	3	129	23	0	0	155	27	23	8	0	1	58	29	18	52	0	3	99	471
11:15 AM	41	103	19	0	5	163	1	107	41	0	4	149	26	23	10	0	6	59	39	18	58	0	2	115	486
11:30 AM	72	98	22	0	0	192	1	115	30	0	0	146	20	30	7	0	0	57	43	22	47	0	1	112	507
11:45 AM	51	86	24	0	2	161	4	113	35	0	1	152	20	22	6	0	2	48	40	26	53	0	0	119	480
Hourly Total	205	383	87	0	12	675	9	464	129	0	5	602	93	98	31	0	9	222	151	84	210	0	6	445	1944
12:00 PM	42	100	27	0	0	169	3	102	34	0	2	139	21	18	5	0	1	44	25	16	59	0	7	100	452
12:15 PM	54	107	13	0	0	174	4	116	29	0	1	149	15	18	3	0	0	36	29	15	46	0	1	90	449
12:30 PM	39	122	18	0	0	179	4	123	33	0	4	160	25	19	4	0	6	48	24	21	48	0	0	93	480
12:45 PM	48	99	16	0	0	163	1	119	34	0	0	154	26	11	7	0	0	44	33	18	60	0	1	111	472
Hourly Total	183	428	74	0	0	685	12	460	130	0	7	602	87	66	19	0	7	172	111	70	213	0	9	394	1853
1:00 PM	45	105	27	0	1	177	3	120	36	0	6	159	26	18	4	0	2	48	26	17	58	0	2	101	485
1:15 PM	51	131	21	0	0	203	2	103	25	0	5	130	21	27	9	0	2	57	40	22	49	0	1	111	501
1:30 PM	62	117	22	0	0	201	4	119	35	0	1	158	24	30	7	0	1	61	25	28	49	0	0	102	522
1:45 PM	48	97	28	0	1	173	1	111	41	0	1	153	22	24	5	0	2	51	29	20	51	0	1	100	477
Hourly Total	206	450	98	0	2	754	10	453	137	0	13	600	93	99	25	0	7	217	120	87	207	0	4	414	1985
2:00 PM	40	99	16	0	2	155	1	118	38	0	5	157	23	17	4	0	1	44	39	24	45	0	7	108	464
2:15 PM	57	106	18	0	3	181	3	106	29	0	9	138	20	20	8	0	4	48	40	32	48	0	8	120	487
2:30 PM	50	100	26	0	0	176	3	114	36	0	4	153	31	24	8	0	1	63	38	22	43	0	4	103	495
2:45 PM	53	131	29	0	0	213	2	125	34	0	0	161	19	16	6	0	0	41	26	25	49	0	0	100	515
Hourly Total	200	436	89	0	5	725	9	463	137	0	18	609	93	77	26	0	6	196	143	103	185	0	19	431	1961
3:00 PM	44	110	22	0	6	176	5	124	37	0	3	166	20	17	5	0	0	42	33	29	51	0	0	113	497
3:15 PM	34	102	19	0	4	155	6	147	40	0	10	193	15	21	7	0	1	43	32	14	42	0	0	88	479
3:30 PM	52	93	25	0	3	170	3	137	43	0	4	183	21	19	3	0	3	43	27	27	55	0	1	109	505
3:45 PM	48	144	18	0	2	210	3	144	34	0	7	181	15	18	7	0	0	40	23	24	49	0	2	96	527
Hourly Total	178	449	84	0	15	711	17	552	154	0	24	723	71	75	22	0	4	168	115	94	197	0	3	406	2008
4:00 PM	51	131	21	0	5	203	2	146	30	0	2	178	21	14	8	0	3	43	33	20	44	0	5	97	521
4:15 PM	52	105	21	0	6	178	4	115	34	0	12	153	23	25	3	0	4	51	30	21	44	0	7	95	477
4:30 PM	51	114	23	0	2	188	2	158	31	0	5	191	20	14	8	0	2	42	29	23	45	0	2	97	518
4:45 PM	46	134	16	0	3	196	6	137	42	0	3	185	27	21	6	0	0	54	36	16	45	0	5	97	532
Hourly Total	200	484	81	0	16	765	14	556	137	0	22	707	91	74	25	0	9	190	128	80	178	0	19	386	2048

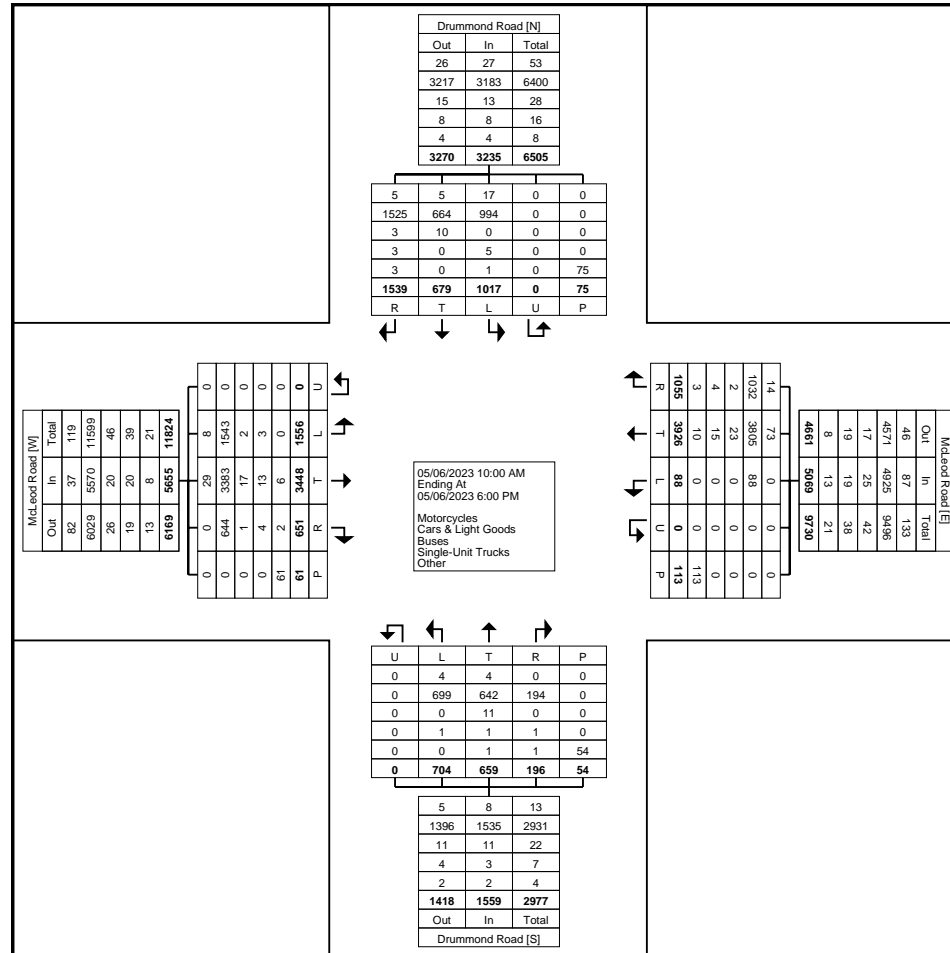
5:00 PM	51	106	19	0	4	176	2	155	34	0	2	191	18	20	11	0	0	49	28	28	49	0	5	105	521
5:15 PM	50	112	14	0	1	176	0	151	23	0	13	174	16	21	4	0	1	41	45	23	42	0	1	110	501
5:30 PM	55	114	23	0	3	192	3	128	36	0	6	167	25	21	5	0	5	51	26	18	39	0	3	83	493
5:45 PM	39	113	16	0	1	168	4	170	27	0	0	201	9	24	4	0	2	37	37	23	44	0	0	104	510
Hourly Total	195	445	72	0	9	712	9	604	120	0	21	733	68	86	24	0	8	178	136	92	174	0	9	402	2025
Grand Total	1556	3448	651	0	61	5655	88	3926	1055	0	113	5069	704	659	196	0	54	1559	1017	679	1539	0	75	3235	15518
Approach %	27.5	61.0	11.5	0.0	-	-	1.7	77.5	20.8	0.0	-	-	45.2	42.3	12.6	0.0	-	-	31.4	21.0	47.6	0.0	-	-	-
Total %	10.0	22.2	4.2	0.0	-	36.4	0.6	25.3	6.8	0.0	-	32.7	4.5	4.2	1.3	0.0	-	10.0	6.6	4.4	9.9	0.0	-	20.8	-
Motorcycles	8	29	0	0	-	37	0	73	14	0	-	87	4	4	0	0	-	8	17	5	5	0	-	27	159
% Motorcycles	0.5	0.8	0.0	-	-	0.7	0.0	1.9	1.3	-	-	1.7	0.6	0.6	0.0	-	-	0.5	1.7	0.7	0.3	-	-	0.8	1.0
Cars & Light Goods	1543	3383	644	0	-	5570	88	3805	1032	0	-	4925	699	642	194	0	-	1535	994	664	1525	0	-	3183	15213
% Cars & Light Goods	99.2	98.1	98.9	-	-	98.5	100.0	96.9	97.8	-	-	97.2	99.3	97.4	99.0	-	-	98.5	97.7	97.8	99.1	-	-	98.4	98.0
Buses	2	17	1	0	-	20	0	23	2	0	-	25	0	11	0	0	-	11	0	10	3	0	-	13	69
% Buses	0.1	0.5	0.2	-	-	0.4	0.0	0.6	0.2	-	-	0.5	0.0	1.7	0.0	-	-	0.7	0.0	1.5	0.2	-	-	0.4	0.4
Single-Unit Trucks	3	13	4	0	-	20	0	15	4	0	-	19	1	1	1	0	-	3	5	0	3	0	-	8	50
% Single-Unit Trucks	0.2	0.4	0.6	-	-	0.4	0.0	0.4	0.4	-	-	0.4	0.1	0.2	0.5	-	-	0.2	0.5	0.0	0.2	-	-	0.2	0.3
Articulated Trucks	0	3	1	0	-	4	0	2	0	0	-	2	0	0	0	0	-	0	0	0	1	0	-	1	7
% Articulated Trucks	0.0	0.1	0.2	-	-	0.1	0.0	0.1	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.1	-	-	0.0	0.0
Bicycles on Road	0	3	1	0	-	4	0	8	3	0	-	11	0	1	1	0	-	2	1	0	2	0	-	3	20
% Bicycles on Road	0.0	0.1	0.2	-	-	0.1	0.0	0.2	0.3	-	-	0.2	0.0	0.2	0.5	-	-	0.1	0.1	0.0	0.1	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	12	-	-	-	-	-	11	-	-	-	-	-	13	-	-	-	-	-	15	-	-
% Bicycles on Crosswalk	-	-	-	-	19.7	-	-	-	-	-	9.7	-	-	-	-	-	24.1	-	-	-	-	-	20.0	-	-
Pedestrians	-	-	-	-	49	-	-	-	-	-	102	-	-	-	-	-	41	-	-	-	-	-	60	-	-
% Pedestrians	-	-	-	-	80.3	-	-	-	-	-	90.3	-	-	-	-	-	75.9	-	-	-	-	-	80.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Drummond Road
- Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Drummond Road
- Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 4

Turning Movement Peak Hour Data (4:30 PM)

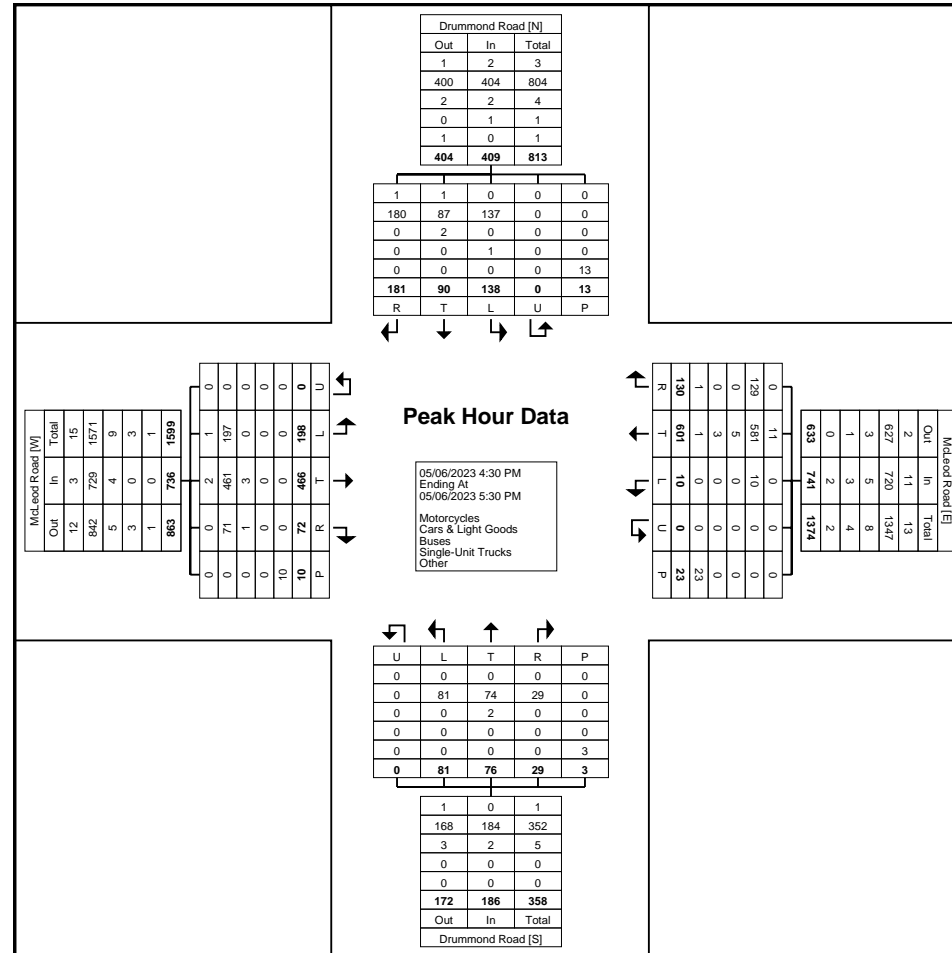
Start Time	McLeod Road Eastbound						McLeod Road Westbound						Drummond Road Northbound						Drummond Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:30 PM	51	114	23	0	2	188	2	158	31	0	5	191	20	14	8	0	2	42	29	23	45	0	2	97	518
4:45 PM	46	134	16	0	3	196	6	137	42	0	3	185	27	21	6	0	0	54	36	16	45	0	5	97	532
5:00 PM	51	106	19	0	4	176	2	155	34	0	2	191	18	20	11	0	0	49	28	28	49	0	5	105	521
5:15 PM	50	112	14	0	1	176	0	151	23	0	13	174	16	21	4	0	1	41	45	23	42	0	1	110	501
Total	198	466	72	0	10	736	10	601	130	0	23	741	81	76	29	0	3	186	138	90	181	0	13	409	2072
Approach %	26.9	63.3	9.8	0.0	-	-	1.3	81.1	17.5	0.0	-	-	43.5	40.9	15.6	0.0	-	-	33.7	22.0	44.3	0.0	-	-	-
Total %	9.6	22.5	3.5	0.0	-	35.5	0.5	29.0	6.3	0.0	-	35.8	3.9	3.7	1.4	0.0	-	9.0	6.7	4.3	8.7	0.0	-	19.7	-
PHF	0.971	0.869	0.783	0.000	-	0.939	0.417	0.951	0.774	0.000	-	0.970	0.750	0.905	0.659	0.000	-	0.861	0.767	0.804	0.923	0.000	-	0.930	0.974
Motorcycles	1	2	0	0	-	3	0	11	0	0	-	11	0	0	0	0	-	0	0	1	1	0	-	2	16
% Motorcycles	0.5	0.4	0.0	-	-	0.4	0.0	1.8	0.0	-	-	1.5	0.0	0.0	0.0	-	-	0.0	0.0	1.1	0.6	-	-	0.5	0.8
Cars & Light Goods	197	461	71	0	-	729	10	581	129	0	-	720	81	74	29	0	-	184	137	87	180	0	-	404	2037
% Cars & Light Goods	99.5	98.9	98.6	-	-	99.0	100.0	96.7	99.2	-	-	97.2	100.0	97.4	100.0	-	-	98.9	99.3	96.7	99.4	-	-	98.8	98.3
Buses	0	3	1	0	-	4	0	5	0	0	-	5	0	2	0	0	-	2	0	2	0	0	-	2	13
% Buses	0.0	0.6	1.4	-	-	0.5	0.0	0.8	0.0	-	-	0.7	0.0	2.6	0.0	-	-	1.1	0.0	2.2	0.0	-	-	0.5	0.6
Single-Unit Trucks	0	0	0	0	-	0	0	3	0	0	-	3	0	0	0	0	-	0	1	0	0	0	-	1	4
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.5	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.7	0.0	0.0	-	-	0.2	0.2
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	1	1	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.2	0.8	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	20.0	-	-	-	-	-	4.3	-	-	-	-	-	33.3	-	-	-	-	-	7.7	-	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	22	-	-	-	-	-	2	-	-	-	-	-	12	-	-
% Pedestrians	-	-	-	-	80.0	-	-	-	-	-	95.7	-	-	-	-	-	66.7	-	-	-	-	-	92.3	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: McLeod Road & Drummond Road
- Saturday
Site Code: 220542
Start Date: 05/06/2023
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Turning Movement Peak Hour Data Plot (4:30 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Marineland Parkway & Thundering Waters Blvd
Site Code: 220542
Start Date: 05/04/2023
Page No: 1

Turning Movement Data

Start Time	Marineland Parkway Eastbound						Marineland Parkway Westbound						Thundering Waters Blvd Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	5	32	0	0	0	37	0	70	35	0	0	105	0	1	0	0	0	1	22	1	10	0	0	33	176
7:15 AM	7	68	0	0	0	75	0	56	43	0	0	99	1	2	1	0	0	4	34	2	7	0	0	43	221
7:30 AM	6	66	0	0	3	72	0	69	35	0	0	104	1	1	2	0	0	4	30	1	9	0	0	40	220
7:45 AM	6	93	0	0	0	99	0	70	40	0	0	110	2	2	0	0	0	4	32	1	10	0	0	43	256
Hourly Total	24	259	0	0	3	283	0	265	153	0	0	418	4	6	3	0	0	13	118	5	36	0	0	159	873
8:00 AM	5	63	0	0	0	68	1	89	42	0	0	132	1	3	2	0	0	6	34	0	5	0	0	39	245
8:15 AM	7	67	1	0	0	75	0	71	44	0	0	115	0	2	2	0	0	4	27	1	7	1	0	36	230
8:30 AM	7	73	3	0	0	83	0	91	45	0	0	136	1	3	1	0	0	5	39	2	8	0	0	49	273
8:45 AM	7	76	1	0	0	84	1	109	45	0	0	155	1	3	1	0	0	5	32	1	9	0	1	42	286
Hourly Total	26	279	5	0	0	310	2	360	176	0	0	538	3	11	6	0	0	20	132	4	29	1	1	166	1034
9:00 AM	8	66	0	0	0	74	1	92	32	0	0	125	1	0	1	0	0	2	26	0	7	0	0	33	234
9:15 AM	9	60	1	0	1	70	0	77	43	0	0	120	0	3	1	0	0	4	31	0	5	0	0	36	230
9:30 AM	12	66	3	0	0	81	3	80	44	0	0	127	2	4	3	0	0	9	29	2	5	0	0	36	253
9:45 AM	4	61	0	0	1	65	1	67	35	0	0	103	2	1	1	0	0	4	40	1	4	0	0	45	217
Hourly Total	33	253	4	0	2	290	5	316	154	0	0	475	5	8	6	0	0	19	126	3	21	0	0	150	934
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	14	77	0	0	0	91	0	84	34	0	0	118	2	4	0	0	0	6	31	3	14	1	0	49	264
11:45 AM	11	63	2	0	0	76	2	76	36	0	0	114	0	6	3	0	0	9	21	2	13	0	0	36	235
Hourly Total	25	140	2	0	0	167	2	160	70	0	0	232	2	10	3	0	0	15	52	5	27	1	0	85	499
12:00 PM	9	99	1	0	0	109	2	108	46	0	0	156	4	2	1	0	0	7	33	1	9	0	0	43	315
12:15 PM	16	89	2	0	1	107	1	96	31	0	0	128	2	3	2	0	0	7	43	0	12	0	1	55	297
12:30 PM	9	96	1	0	1	106	3	90	43	0	0	136	1	0	2	0	0	3	36	4	14	0	1	54	299
12:45 PM	5	104	1	0	1	110	1	86	37	0	0	124	1	2	1	0	0	4	26	2	11	0	0	39	277
Hourly Total	39	388	5	0	3	432	7	380	157	0	0	544	8	7	6	0	0	21	138	7	46	0	2	191	1188
1:00 PM	3	71	3	0	1	77	0	85	43	0	0	128	3	1	1	0	0	5	38	2	13	0	1	53	263
1:15 PM	11	76	2	0	0	89	0	89	25	0	1	114	0	2	1	0	0	3	32	2	6	0	1	40	246
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	14	147	5	0	1	166	0	174	68	0	1	242	3	3	2	0	0	8	70	4	19	0	2	93	509
4:00 PM	13	98	4	0	0	115	1	132	56	0	0	189	2	5	0	0	0	7	62	4	16	1	0	83	394
4:15 PM	10	103	0	0	0	113	4	122	49	0	0	175	1	2	0	0	0	3	59	3	13	0	1	75	366
4:30 PM	9	90	2	0	1	101	4	142	59	0	0	205	0	0	2	0	0	2	55	2	14	0	0	71	379
4:45 PM	15	79	3	0	0	97	1	123	57	0	0	181	0	3	4	0	0	7	50	4	14	0	0	68	353
Hourly Total	47	370	9	0	1	426	10	519	221	0	0	750	3	10	6	0	0	19	226	13	57	1	1	297	1492
5:00 PM	5	80	1	0	1	86	5	111	56	0	0	172	2	4	0	0	0	6	45	2	12	0	0	59	323
5:15 PM	8	107	1	0	3	116	0	81	38	0	0	119	0	1	2	0	1	3	47	3	16	0	0	66	304

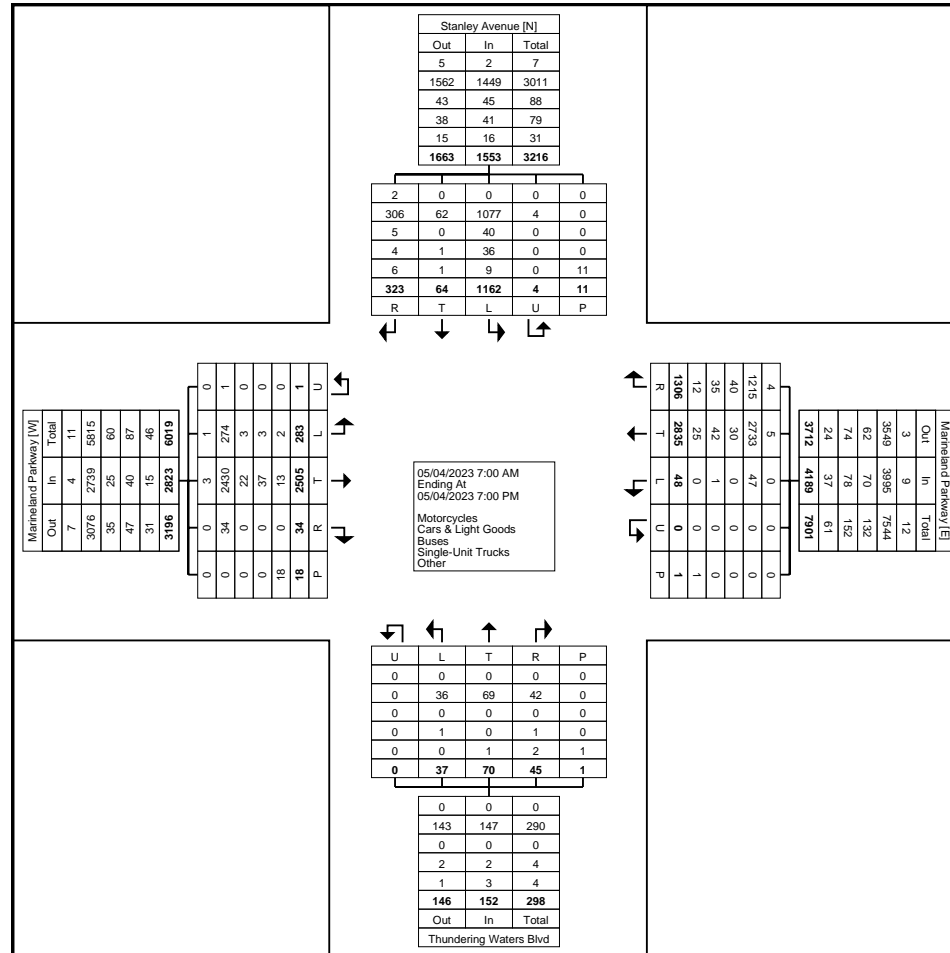
5:30 PM	9	86	0	1	1	96	4	88	37	0	0	129	3	3	3	0	0	9	43	5	11	0	1	59	293
5:45 PM	11	79	0	0	1	90	3	72	50	0	0	125	1	4	5	0	0	10	35	5	3	0	1	43	268
Hourly Total	33	352	2	1	6	388	12	352	181	0	0	545	6	12	10	0	1	28	170	15	42	0	2	227	1188
6:00 PM	7	92	0	0	1	99	1	81	27	0	0	109	0	0	3	0	0	3	48	1	18	0	0	67	278
6:15 PM	13	87	0	0	1	100	5	68	26	0	0	99	1	2	0	0	0	3	34	1	11	1	1	47	249
6:30 PM	12	71	1	0	0	84	1	76	39	0	0	116	1	1	0	0	0	2	21	1	12	0	2	34	236
6:45 PM	10	67	1	0	0	78	3	84	34	0	0	121	1	0	0	0	0	1	27	5	5	0	0	37	237
Hourly Total	42	317	2	0	2	361	10	309	126	0	0	445	3	3	3	0	0	9	130	8	46	1	3	185	1000
Grand Total	283	2505	34	1	18	2823	48	2835	1306	0	1	4189	37	70	45	0	1	152	1162	64	323	4	11	1553	8717
Approach %	10.0	88.7	1.2	0.0	-	-	1.1	67.7	31.2	0.0	-	-	24.3	46.1	29.6	0.0	-	-	74.8	4.1	20.8	0.3	-	-	-
Total %	3.2	28.7	0.4	0.0	-	32.4	0.6	32.5	15.0	0.0	-	48.1	0.4	0.8	0.5	0.0	-	1.7	13.3	0.7	3.7	0.0	-	17.8	-
Motorcycles	1	3	0	0	-	4	0	5	4	0	-	9	0	0	0	0	-	0	0	0	2	0	-	2	15
% Motorcycles	0.4	0.1	0.0	0.0	-	0.1	0.0	0.2	0.3	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.6	0.0	-	0.1	0.2
Cars & Light Goods	274	2430	34	1	-	2739	47	2733	1215	0	-	3995	36	69	42	0	-	147	1077	62	306	4	-	1449	8330
% Cars & Light Goods	96.8	97.0	100.0	100.0	-	97.0	97.9	96.4	93.0	-	-	95.4	97.3	98.6	93.3	-	-	96.7	92.7	96.9	94.7	100.0	-	93.3	95.6
Buses	3	22	0	0	-	25	0	30	40	0	-	70	0	0	0	0	-	0	40	0	5	0	-	45	140
% Buses	1.1	0.9	0.0	0.0	-	0.9	0.0	1.1	3.1	-	-	1.7	0.0	0.0	0.0	-	-	0.0	3.4	0.0	1.5	0.0	-	2.9	1.6
Single-Unit Trucks	3	37	0	0	-	40	1	42	35	0	-	78	1	0	1	0	-	2	36	1	4	0	-	41	161
% Single-Unit Trucks	1.1	1.5	0.0	0.0	-	1.4	2.1	1.5	2.7	-	-	1.9	2.7	0.0	2.2	-	-	1.3	3.1	1.6	1.2	0.0	-	2.6	1.8
Articulated Trucks	2	13	0	0	-	15	0	25	11	0	-	36	0	1	2	0	-	3	8	0	3	0	-	11	65
% Articulated Trucks	0.7	0.5	0.0	0.0	-	0.5	0.0	0.9	0.8	-	-	0.9	0.0	1.4	4.4	-	-	2.0	0.7	0.0	0.9	0.0	-	0.7	0.7
Bicycles on Road	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	-	0	1	1	3	0	-	5	6
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.1	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1	1.6	0.9	0.0	-	0.3	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	6	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	54.5	-	-
Pedestrians	-	-	-	-	18	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	45.5	-	-



Paradigm Transportation Solutions Limited
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Count Name: Marineland Parkway & Thundering Waters Blvd
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Turning Movement Data Plot



Paradigm Transportation Solutions Limited
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Count Name: Marineland Parkway & Thundering Waters Blvd
Site Code: 220542
Start Date: 05/04/2023
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Turning Movement Peak Hour Data (8:00 AM)

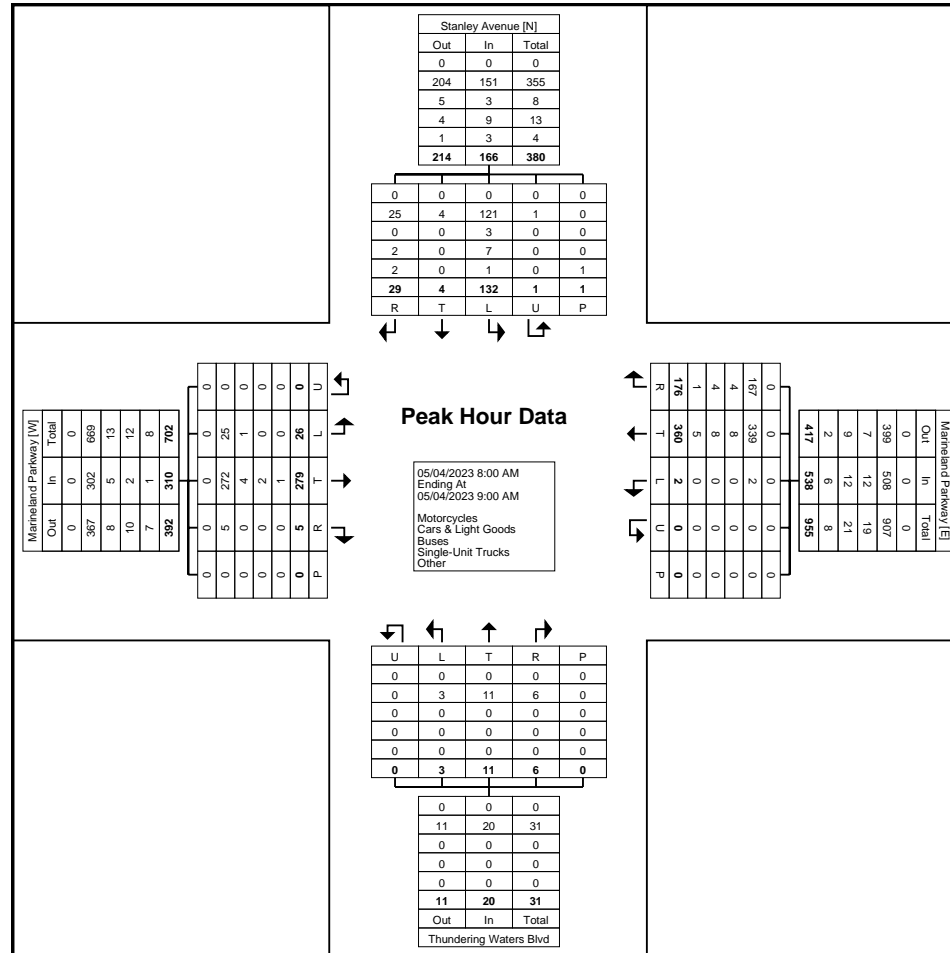
Start Time	Marineland Parkway Eastbound						Marineland Parkway Westbound						Thundering Waters Blvd Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:00 AM	5	63	0	0	0	68	1	89	42	0	0	132	1	3	2	0	0	6	34	0	5	0	0	39	245
8:15 AM	7	67	1	0	0	75	0	71	44	0	0	115	0	2	2	0	0	4	27	1	7	1	0	36	230
8:30 AM	7	73	3	0	0	83	0	91	45	0	0	136	1	3	1	0	0	5	39	2	8	0	0	49	273
8:45 AM	7	76	1	0	0	84	1	109	45	0	0	155	1	3	1	0	0	5	32	1	9	0	1	42	286
Total	26	279	5	0	0	310	2	360	176	0	0	538	3	11	6	0	0	20	132	4	29	1	1	166	1034
Approach %	8.4	90.0	1.6	0.0	-	-	0.4	66.9	32.7	0.0	-	-	15.0	55.0	30.0	0.0	-	-	79.5	2.4	17.5	0.6	-	-	-
Total %	2.5	27.0	0.5	0.0	-	30.0	0.2	34.8	17.0	0.0	-	52.0	0.3	1.1	0.6	0.0	-	1.9	12.8	0.4	2.8	0.1	-	16.1	-
PHF	0.929	0.918	0.417	0.000	-	0.923	0.500	0.826	0.978	0.000	-	0.868	0.750	0.917	0.750	0.000	-	0.833	0.846	0.500	0.806	0.250	-	0.847	0.904
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	25	272	5	0	-	302	2	339	167	0	-	508	3	11	6	0	-	20	121	4	25	1	-	151	981
% Cars & Light Goods	96.2	97.5	100.0	-	-	97.4	100.0	94.2	94.9	-	-	94.4	100.0	100.0	100.0	-	-	100.0	91.7	100.0	86.2	100.0	-	91.0	94.9
Buses	1	4	0	0	-	5	0	8	4	0	-	12	0	0	0	0	-	0	3	0	0	0	-	3	20
% Buses	3.8	1.4	0.0	-	-	1.6	0.0	2.2	2.3	-	-	2.2	0.0	0.0	0.0	-	-	0.0	2.3	0.0	0.0	0.0	-	1.8	1.9
Single-Unit Trucks	0	2	0	0	-	2	0	8	4	0	-	12	0	0	0	0	-	0	7	0	2	0	-	9	23
% Single-Unit Trucks	0.0	0.7	0.0	-	-	0.6	0.0	2.2	2.3	-	-	2.2	0.0	0.0	0.0	-	-	0.0	5.3	0.0	6.9	0.0	-	5.4	2.2
Articulated Trucks	0	1	0	0	-	1	0	5	1	0	-	6	0	0	0	0	-	0	1	0	2	0	-	3	10
% Articulated Trucks	0.0	0.4	0.0	-	-	0.3	0.0	1.4	0.6	-	-	1.1	0.0	0.0	0.0	-	-	0.0	0.8	0.0	6.9	0.0	-	1.8	1.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
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Turning Movement Peak Hour Data Plot (8:00 AM)



Paradigm Transportation Solutions Limited
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Count Name: Marineland Parkway & Thundering Waters Blvd
Site Code: 220542
Start Date: 05/04/2023
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Turning Movement Peak Hour Data (12:00 PM)

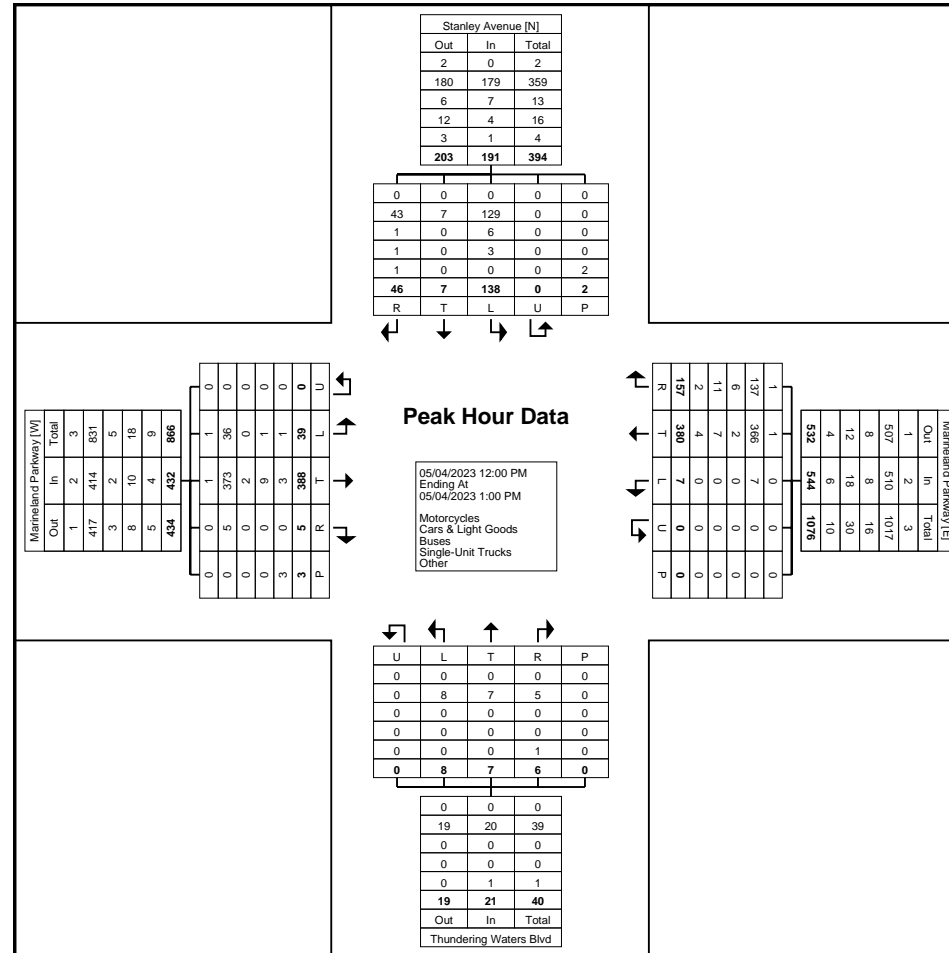
Start Time	Marineland Parkway Eastbound						Marineland Parkway Westbound						Thundering Waters Blvd Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	9	99	1	0	0	109	2	108	46	0	0	156	4	2	1	0	0	7	33	1	9	0	0	43	315
12:15 PM	16	89	2	0	1	107	1	96	31	0	0	128	2	3	2	0	0	7	43	0	12	0	1	55	297
12:30 PM	9	96	1	0	1	106	3	90	43	0	0	136	1	0	2	0	0	3	36	4	14	0	1	54	299
12:45 PM	5	104	1	0	1	110	1	86	37	0	0	124	1	2	1	0	0	4	26	2	11	0	0	39	277
Total	39	388	5	0	3	432	7	380	157	0	0	544	8	7	6	0	0	21	138	7	46	0	2	191	1188
Approach %	9.0	89.8	1.2	0.0	-	-	1.3	69.9	28.9	0.0	-	-	38.1	33.3	28.6	0.0	-	-	72.3	3.7	24.1	0.0	-	-	-
Total %	3.3	32.7	0.4	0.0	-	36.4	0.6	32.0	13.2	0.0	-	45.8	0.7	0.6	0.5	0.0	-	1.8	11.6	0.6	3.9	0.0	-	16.1	-
PHF	0.609	0.933	0.625	0.000	-	0.982	0.583	0.880	0.853	0.000	-	0.872	0.500	0.583	0.750	0.000	-	0.750	0.802	0.438	0.821	0.000	-	0.868	0.943
Motorcycles	1	1	0	0	-	2	0	1	1	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	4
% Motorcycles	2.6	0.3	0.0	-	-	0.5	0.0	0.3	0.6	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.3
Cars & Light Goods	36	373	5	0	-	414	7	366	137	0	-	510	8	7	5	0	-	20	129	7	43	0	-	179	1123
% Cars & Light Goods	92.3	96.1	100.0	-	-	95.8	100.0	96.3	87.3	-	-	93.8	100.0	100.0	83.3	-	-	95.2	93.5	100.0	93.5	-	-	93.7	94.5
Buses	0	2	0	0	-	2	0	2	6	0	-	8	0	0	0	0	-	0	6	0	1	0	-	7	17
% Buses	0.0	0.5	0.0	-	-	0.5	0.0	0.5	3.8	-	-	1.5	0.0	0.0	0.0	-	-	0.0	4.3	0.0	2.2	-	-	3.7	1.4
Single-Unit Trucks	1	9	0	0	-	10	0	7	11	0	-	18	0	0	0	0	-	0	3	0	1	0	-	4	32
% Single-Unit Trucks	2.6	2.3	0.0	-	-	2.3	0.0	1.8	7.0	-	-	3.3	0.0	0.0	0.0	-	-	0.0	2.2	0.0	2.2	-	-	2.1	2.7
Articulated Trucks	1	3	0	0	-	4	0	4	2	0	-	6	0	0	1	0	-	1	0	0	1	0	-	1	12
% Articulated Trucks	2.6	0.8	0.0	-	-	0.9	0.0	1.1	1.3	-	-	1.1	0.0	0.0	16.7	-	-	4.8	0.0	0.0	2.2	-	-	0.5	1.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0	-	-



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



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Count Name: Marineland Parkway & Thundering Waters Blvd
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Turning Movement Peak Hour Data (4:00 PM)

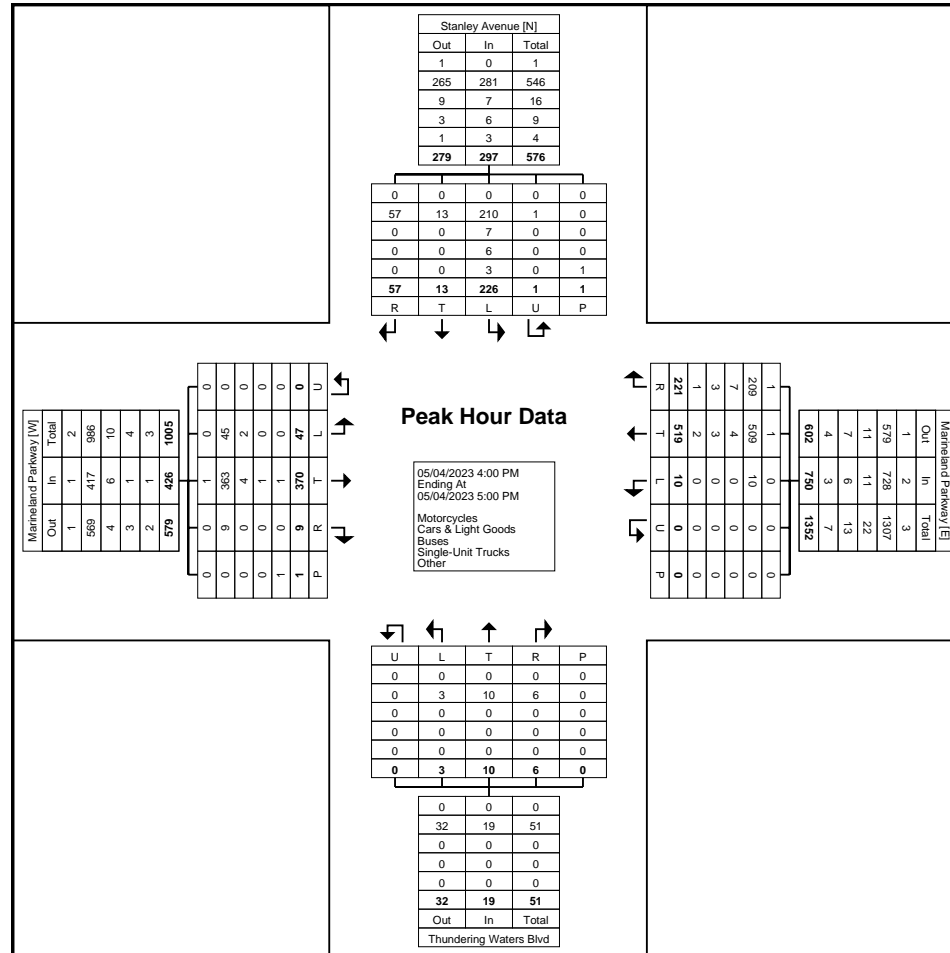
Start Time	Marineland Parkway Eastbound						Marineland Parkway Westbound						Thundering Waters Blvd Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	13	98	4	0	0	115	1	132	56	0	0	189	2	5	0	0	0	7	62	4	16	1	0	83	394
4:15 PM	10	103	0	0	0	113	4	122	49	0	0	175	1	2	0	0	0	3	59	3	13	0	1	75	366
4:30 PM	9	90	2	0	1	101	4	142	59	0	0	205	0	0	2	0	0	2	55	2	14	0	0	71	379
4:45 PM	15	79	3	0	0	97	1	123	57	0	0	181	0	3	4	0	0	7	50	4	14	0	0	68	353
Total	47	370	9	0	1	426	10	519	221	0	0	750	3	10	6	0	0	19	226	13	57	1	1	297	1492
Approach %	11.0	86.9	2.1	0.0	-	-	1.3	69.2	29.5	0.0	-	-	15.8	52.6	31.6	0.0	-	-	76.1	4.4	19.2	0.3	-	-	-
Total %	3.2	24.8	0.6	0.0	-	28.6	0.7	34.8	14.8	0.0	-	50.3	0.2	0.7	0.4	0.0	-	1.3	15.1	0.9	3.8	0.1	-	19.9	-
PHF	0.783	0.898	0.563	0.000	-	0.926	0.625	0.914	0.936	0.000	-	0.915	0.375	0.500	0.375	0.000	-	0.679	0.911	0.813	0.891	0.250	-	0.895	0.947
Motorcycles	0	1	0	0	-	1	0	1	1	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	3
% Motorcycles	0.0	0.3	0.0	-	-	0.2	0.0	0.2	0.5	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.2
Cars & Light Goods	45	363	9	0	-	417	10	509	209	0	-	728	3	10	6	0	-	19	210	13	57	1	-	281	1445
% Cars & Light Goods	95.7	98.1	100.0	-	-	97.9	100.0	98.1	94.6	-	-	97.1	100.0	100.0	100.0	-	-	100.0	92.9	100.0	100.0	100.0	-	94.6	96.8
Buses	2	4	0	0	-	6	0	4	7	0	-	11	0	0	0	0	-	0	7	0	0	0	-	7	24
% Buses	4.3	1.1	0.0	-	-	1.4	0.0	0.8	3.2	-	-	1.5	0.0	0.0	0.0	-	-	0.0	3.1	0.0	0.0	0.0	-	2.4	1.6
Single-Unit Trucks	0	1	0	0	-	1	0	3	3	0	-	6	0	0	0	0	-	0	6	0	0	0	-	6	13
% Single-Unit Trucks	0.0	0.3	0.0	-	-	0.2	0.0	0.6	1.4	-	-	0.8	0.0	0.0	0.0	-	-	0.0	2.7	0.0	0.0	0.0	-	2.0	0.9
Articulated Trucks	0	1	0	0	-	1	0	2	1	0	-	3	0	0	0	0	-	0	3	0	0	0	-	3	7
% Articulated Trucks	0.0	0.3	0.0	-	-	0.2	0.0	0.4	0.5	-	-	0.4	0.0	0.0	0.0	-	-	0.0	1.3	0.0	0.0	0.0	-	1.0	0.5
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Marineland Parkway & Thundering Waters Blvd
Site Code: 220542
Start Date: 05/04/2023
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Marineland Parkway & Thundering Waters Blvd - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 1

Turning Movement Data

Start Time	Marineland Parkway Eastbound						Marineland Parkway Westbound						Thundering Waters Blvd Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
10:00 AM	8	84	1	0	2	93	0	101	22	1	0	124	0	3	0	0	1	3	40	2	12	0	0	54	274
10:15 AM	9	76	3	0	0	88	1	85	44	0	0	130	1	2	3	0	0	6	26	3	9	0	0	38	262
10:30 AM	8	132	2	0	0	142	2	83	37	0	0	122	3	2	2	0	0	7	24	5	11	0	1	40	311
10:45 AM	15	97	0	0	0	112	1	110	39	0	0	150	3	3	1	0	0	7	38	3	8	0	1	49	318
Hourly Total	40	389	6	0	2	435	4	379	142	1	0	526	7	10	6	0	1	23	128	13	40	0	2	181	1165
11:00 AM	13	75	1	0	0	89	1	96	49	0	0	146	8	4	3	0	0	15	41	1	10	0	0	52	302
11:15 AM	14	88	1	0	1	103	1	122	38	0	0	161	0	1	3	0	1	4	36	3	7	0	0	46	314
11:30 AM	10	90	2	0	0	102	2	90	39	0	0	131	1	6	1	0	0	8	42	3	6	0	0	51	292
11:45 AM	7	112	2	0	1	121	0	103	39	0	0	142	0	5	0	0	0	5	37	0	6	1	0	44	312
Hourly Total	44	365	6	0	2	415	4	411	165	0	0	580	9	16	7	0	1	32	156	7	29	1	0	193	1220
12:00 PM	9	84	1	0	1	94	1	96	36	0	0	133	1	3	5	0	0	9	41	3	11	0	0	55	291
12:15 PM	7	80	0	0	0	87	1	105	43	0	0	149	2	4	0	0	0	6	29	0	11	0	2	40	282
12:30 PM	7	94	1	0	0	102	2	120	40	0	0	162	0	0	3	0	0	3	37	1	14	0	1	52	319
12:45 PM	13	105	2	0	0	120	0	93	46	0	0	139	4	3	2	0	0	9	38	4	12	0	1	54	322
Hourly Total	36	363	4	0	1	403	4	414	165	0	0	583	7	10	10	0	0	27	145	8	48	0	4	201	1214
1:00 PM	12	90	0	0	0	102	2	112	43	0	0	157	1	5	3	0	0	9	41	4	19	0	2	64	332
1:15 PM	15	109	1	0	0	125	0	94	46	0	0	140	2	2	2	0	1	6	47	2	13	1	1	63	334
1:30 PM	12	110	2	0	0	124	3	111	41	0	0	155	0	2	4	0	1	6	48	5	12	1	2	66	351
1:45 PM	9	89	3	0	1	101	2	114	38	0	0	154	3	2	5	0	1	10	41	3	18	3	0	65	330
Hourly Total	48	398	6	0	1	452	7	431	168	0	0	606	6	11	14	0	3	31	177	14	62	5	5	258	1347
2:00 PM	10	102	5	0	0	117	2	121	49	0	0	172	2	3	4	0	0	9	47	6	12	0	2	65	363
2:15 PM	17	111	4	0	0	132	0	92	50	0	0	142	4	2	1	0	0	7	46	1	12	1	0	60	341
2:30 PM	17	90	3	0	0	110	4	109	39	0	0	152	3	3	4	0	0	10	48	2	12	0	0	62	334
2:45 PM	19	103	2	0	0	124	0	119	56	0	0	175	2	4	0	0	0	6	38	1	9	0	3	48	353
Hourly Total	63	406	14	0	0	483	6	441	194	0	0	641	11	12	9	0	0	32	179	10	45	1	5	235	1391
3:00 PM	15	101	1	0	1	117	5	138	53	0	0	196	0	4	2	0	1	6	38	4	15	0	0	57	376
3:15 PM	9	92	3	0	0	104	3	121	41	0	0	165	2	3	2	0	0	7	43	2	16	0	4	61	337
3:30 PM	9	78	1	0	0	88	1	147	74	0	0	222	2	5	0	0	0	7	48	2	11	0	1	61	378
3:45 PM	21	106	1	0	0	128	2	125	53	0	0	180	0	1	0	0	0	1	41	0	13	0	0	54	363
Hourly Total	54	377	6	0	1	437	11	531	221	0	0	763	4	13	4	0	1	21	170	8	55	0	5	233	1454
4:00 PM	18	98	3	0	0	119	1	143	52	0	0	196	2	2	1	0	0	5	58	2	21	0	1	81	401
4:15 PM	13	89	5	0	0	107	2	129	58	0	0	189	1	5	1	0	0	7	44	4	11	0	1	59	362
4:30 PM	23	87	0	0	1	110	2	152	64	0	0	218	2	2	4	0	0	8	44	8	18	0	1	70	406
4:45 PM	14	110	0	0	0	124	4	142	66	0	0	212	1	5	2	0	1	8	48	1	14	0	0	63	407
Hourly Total	68	384	8	0	1	460	9	566	240	0	0	815	6	14	8	0	1	28	194	15	64	0	3	273	1576

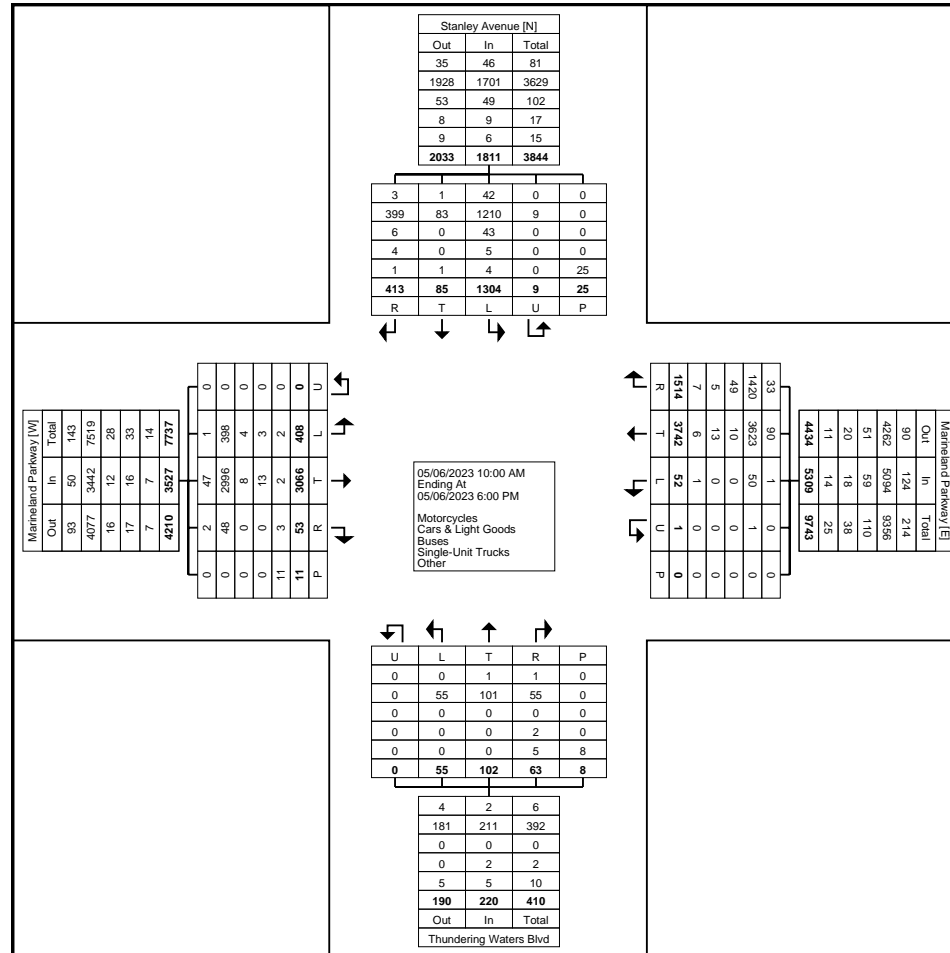
5:00 PM	14	97	0	0	0	111	4	155	55	0	0	214	0	3	0	0	1	3	49	2	18	0	0	69	397
5:15 PM	9	109	1	0	2	119	0	132	55	0	0	187	0	1	1	0	0	2	44	3	14	0	0	61	369
5:30 PM	15	87	1	0	1	103	1	132	58	0	0	191	4	3	2	0	0	9	35	2	18	0	1	55	358
5:45 PM	17	91	1	0	0	109	2	150	51	0	0	203	1	9	2	0	0	12	27	3	20	2	0	52	376
Hourly Total	55	384	3	0	3	442	7	569	219	0	0	795	5	16	5	0	1	26	155	10	70	2	1	237	1500
Grand Total	408	3066	53	0	11	3527	52	3742	1514	1	0	5309	55	102	63	0	8	220	1304	85	413	9	25	1811	10867
Approach %	11.6	86.9	1.5	0.0	-	-	1.0	70.5	28.5	0.0	-	-	25.0	46.4	28.6	0.0	-	-	72.0	4.7	22.8	0.5	-	-	-
Total %	3.8	28.2	0.5	0.0	-	32.5	0.5	34.4	13.9	0.0	-	48.9	0.5	0.9	0.6	0.0	-	2.0	12.0	0.8	3.8	0.1	-	16.7	-
Motorcycles	1	47	2	0	-	50	1	90	33	0	-	124	0	1	1	0	-	2	42	1	3	0	-	46	222
% Motorcycles	0.2	1.5	3.8	-	-	1.4	1.9	2.4	2.2	0.0	-	2.3	0.0	1.0	1.6	-	-	0.9	3.2	1.2	0.7	0.0	-	2.5	2.0
Cars & Light Goods	398	2996	48	0	-	3442	50	3623	1420	1	-	5094	55	101	55	0	-	211	1210	83	399	9	-	1701	10448
% Cars & Light Goods	97.5	97.7	90.6	-	-	97.6	96.2	96.8	93.8	100.0	-	96.0	100.0	99.0	87.3	-	-	95.9	92.8	97.6	96.6	100.0	-	93.9	96.1
Buses	4	8	0	0	-	12	0	10	49	0	-	59	0	0	0	0	-	0	43	0	6	0	-	49	120
% Buses	1.0	0.3	0.0	-	-	0.3	0.0	0.3	3.2	0.0	-	1.1	0.0	0.0	0.0	-	-	0.0	3.3	0.0	1.5	0.0	-	2.7	1.1
Single-Unit Trucks	3	13	0	0	-	16	0	13	5	0	-	18	0	0	2	0	-	2	5	0	4	0	-	9	45
% Single-Unit Trucks	0.7	0.4	0.0	-	-	0.5	0.0	0.3	0.3	0.0	-	0.3	0.0	0.0	3.2	-	-	0.9	0.4	0.0	1.0	0.0	-	0.5	0.4
Articulated Trucks	0	1	0	0	-	1	1	0	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	1.9	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Road	2	1	3	0	-	6	0	6	7	0	-	13	0	0	5	0	-	5	4	1	1	0	-	6	30
% Bicycles on Road	0.5	0.0	5.7	-	-	0.2	0.0	0.2	0.5	0.0	-	0.2	0.0	0.0	7.9	-	-	2.3	0.3	1.2	0.2	0.0	-	0.3	0.3
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	0	-	-	-	-	-	-	5	-	-	-	-	-	15	-	-
% Bicycles on Crosswalk	-	-	-	-	9.1	-	-	-	-	-	-	-	-	-	-	-	62.5	-	-	-	-	-	60.0	-	-
Pedestrians	-	-	-	-	10	-	-	-	-	0	-	-	-	-	-	-	3	-	-	-	-	-	10	-	-
% Pedestrians	-	-	-	-	90.9	-	-	-	-	-	-	-	-	-	-	-	37.5	-	-	-	-	-	40.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Marineland Parkway & Thundering Waters Blvd - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Marineland Parkway & Thundering Waters Blvd - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 4

Turning Movement Peak Hour Data (4:30 PM)

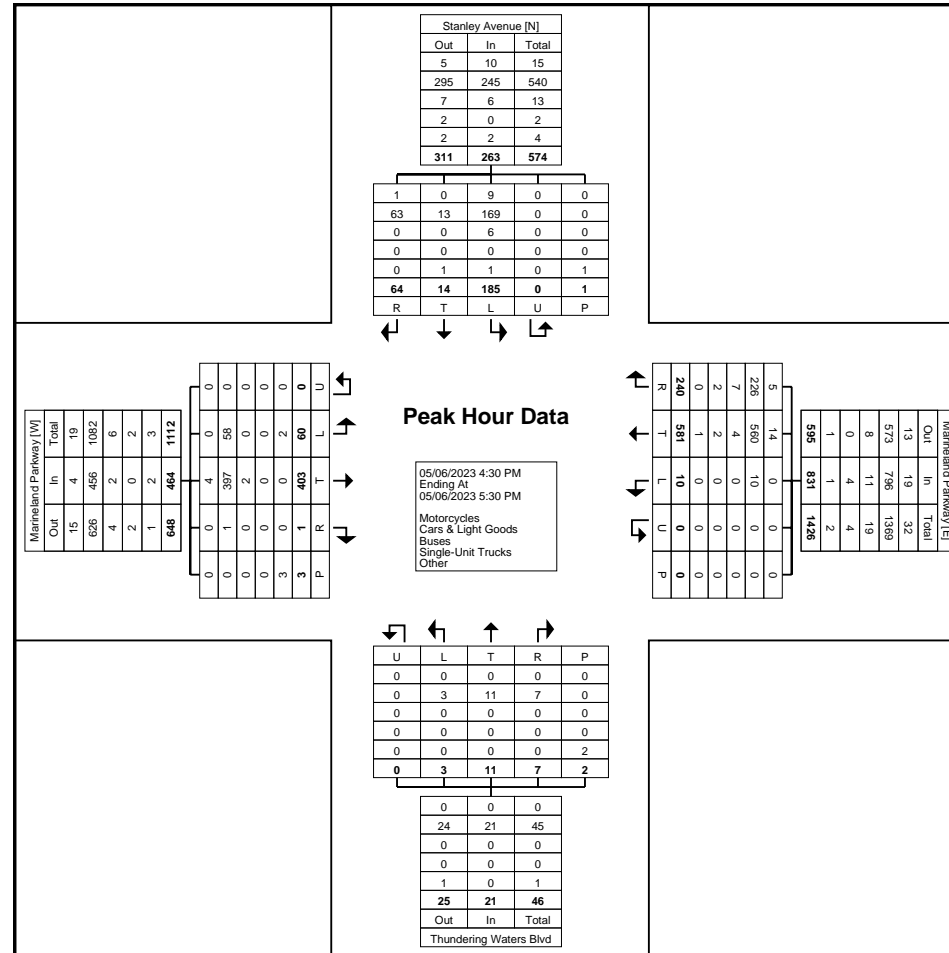
Start Time	Marineland Parkway Eastbound						Marineland Parkway Westbound						Thundering Waters Blvd Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:30 PM	23	87	0	0	1	110	2	152	64	0	0	218	2	2	4	0	0	8	44	8	18	0	1	70	406
4:45 PM	14	110	0	0	0	124	4	142	66	0	0	212	1	5	2	0	1	8	48	1	14	0	0	63	407
5:00 PM	14	97	0	0	0	111	4	155	55	0	0	214	0	3	0	0	1	3	49	2	18	0	0	69	397
5:15 PM	9	109	1	0	2	119	0	132	55	0	0	187	0	1	1	0	0	2	44	3	14	0	0	61	369
Total	60	403	1	0	3	464	10	581	240	0	0	831	3	11	7	0	2	21	185	14	64	0	1	263	1579
Approach %	12.9	86.9	0.2	0.0	-	-	1.2	69.9	28.9	0.0	-	-	14.3	52.4	33.3	0.0	-	-	70.3	5.3	24.3	0.0	-	-	-
Total %	3.8	25.5	0.1	0.0	-	29.4	0.6	36.8	15.2	0.0	-	52.6	0.2	0.7	0.4	0.0	-	1.3	11.7	0.9	4.1	0.0	-	16.7	-
PHF	0.652	0.916	0.250	0.000	-	0.935	0.625	0.937	0.909	0.000	-	0.953	0.375	0.550	0.438	0.000	-	0.656	0.944	0.438	0.889	0.000	-	0.939	0.970
Motorcycles	0	4	0	0	-	4	0	14	5	0	-	19	0	0	0	0	-	0	9	0	1	0	-	10	33
% Motorcycles	0.0	1.0	0.0	-	-	0.9	0.0	2.4	2.1	-	-	2.3	0.0	0.0	0.0	-	-	0.0	4.9	0.0	1.6	-	-	3.8	2.1
Cars & Light Goods	58	397	1	0	-	456	10	560	226	0	-	796	3	11	7	0	-	21	169	13	63	0	-	245	1518
% Cars & Light Goods	96.7	98.5	100.0	-	-	98.3	100.0	96.4	94.2	-	-	95.8	100.0	100.0	100.0	-	-	100.0	91.4	92.9	98.4	-	-	93.2	96.1
Buses	0	2	0	0	-	2	0	4	7	0	-	11	0	0	0	0	-	0	6	0	0	0	-	6	19
% Buses	0.0	0.5	0.0	-	-	0.4	0.0	0.7	2.9	-	-	1.3	0.0	0.0	0.0	-	-	0.0	3.2	0.0	0.0	-	-	2.3	1.2
Single-Unit Trucks	0	0	0	0	-	0	0	2	2	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	4
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.3	0.8	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.3
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	2	0	0	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	1	1	0	0	-	2	5
% Bicycles on Road	3.3	0.0	0.0	-	-	0.4	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.5	7.1	0.0	-	-	0.8	0.3
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	50.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	50.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Marineland Parkway & Thundering Waters Blvd - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 5



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



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stanley Avenue & Marineland
Parkway
Site Code: 220542
Start Date: 05/04/2023
Page No: 1

Turning Movement Data

Start Time	Marineland Parkway Eastbound					Marineland Parkway Westbound					Stanley Avenue Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	19	32	0	0	51	1	52	0	0	53	54	3	0	0	57	161
7:15 AM	40	69	0	0	109	4	65	0	0	69	38	5	0	0	43	221
7:30 AM	39	57	0	0	96	4	61	0	0	65	42	5	0	0	47	208
7:45 AM	48	80	0	0	128	1	70	0	0	71	42	9	0	0	51	250
Hourly Total	146	238	0	0	384	10	248	0	0	258	176	22	0	0	198	840
8:00 AM	40	58	0	0	98	5	94	0	0	99	36	2	0	0	38	235
8:15 AM	55	41	0	0	96	3	83	0	0	86	36	10	0	0	46	228
8:30 AM	70	39	0	0	109	3	93	0	0	96	42	6	0	0	48	253
8:45 AM	70	43	0	0	113	4	116	0	1	120	34	5	0	0	39	272
Hourly Total	235	181	0	0	416	15	386	0	1	401	148	23	0	0	171	988
9:00 AM	67	25	0	0	92	2	81	0	0	83	38	2	0	0	40	215
9:15 AM	56	34	0	0	90	2	86	0	0	88	31	6	0	0	37	215
9:30 AM	71	29	0	0	100	1	86	0	0	87	41	3	0	0	44	231
9:45 AM	65	36	0	0	101	3	80	0	0	83	22	4	0	0	26	210
Hourly Total	259	124	0	0	383	8	333	0	0	341	132	15	0	0	147	871
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	81	30	0	0	111	4	77	0	0	81	35	5	0	0	40	232
11:45 AM	70	18	0	0	88	1	78	0	0	79	38	5	0	0	43	210
Hourly Total	151	48	0	0	199	5	155	0	0	160	73	10	0	0	83	442
12:00 PM	95	41	0	0	136	7	82	0	1	89	67	3	0	0	70	295
12:15 PM	83	55	0	0	138	7	85	0	0	92	41	3	0	0	44	274
12:30 PM	90	40	0	0	130	6	92	0	1	98	43	2	0	0	45	273
12:45 PM	104	40	0	0	144	5	90	0	0	95	40	2	0	0	42	281
Hourly Total	372	176	0	0	548	25	349	0	2	374	191	10	0	0	201	1123
1:00 PM	83	30	0	0	113	2	75	0	1	77	46	6	0	0	52	242
1:15 PM	69	39	0	0	108	1	86	0	1	87	27	5	0	0	32	227
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	152	69	0	0	221	3	161	0	2	164	73	11	0	0	84	469
4:00 PM	128	40	0	0	168	2	112	0	0	114	73	7	0	0	80	362
4:15 PM	115	49	0	0	164	6	87	0	0	93	84	6	0	0	90	347
4:30 PM	102	36	0	0	138	9	97	0	0	106	97	5	0	0	102	346
4:45 PM	112	27	0	0	139	10	106	0	0	116	67	6	0	0	73	328
Hourly Total	457	152	0	0	609	27	402	0	0	429	321	24	0	0	345	1383
5:00 PM	89	41	0	0	130	10	100	0	0	110	76	7	0	0	83	323
5:15 PM	126	28	0	0	154	2	87	0	0	89	33	3	0	0	36	279
5:30 PM	98	35	0	0	133	6	91	0	2	97	37	2	0	0	39	269

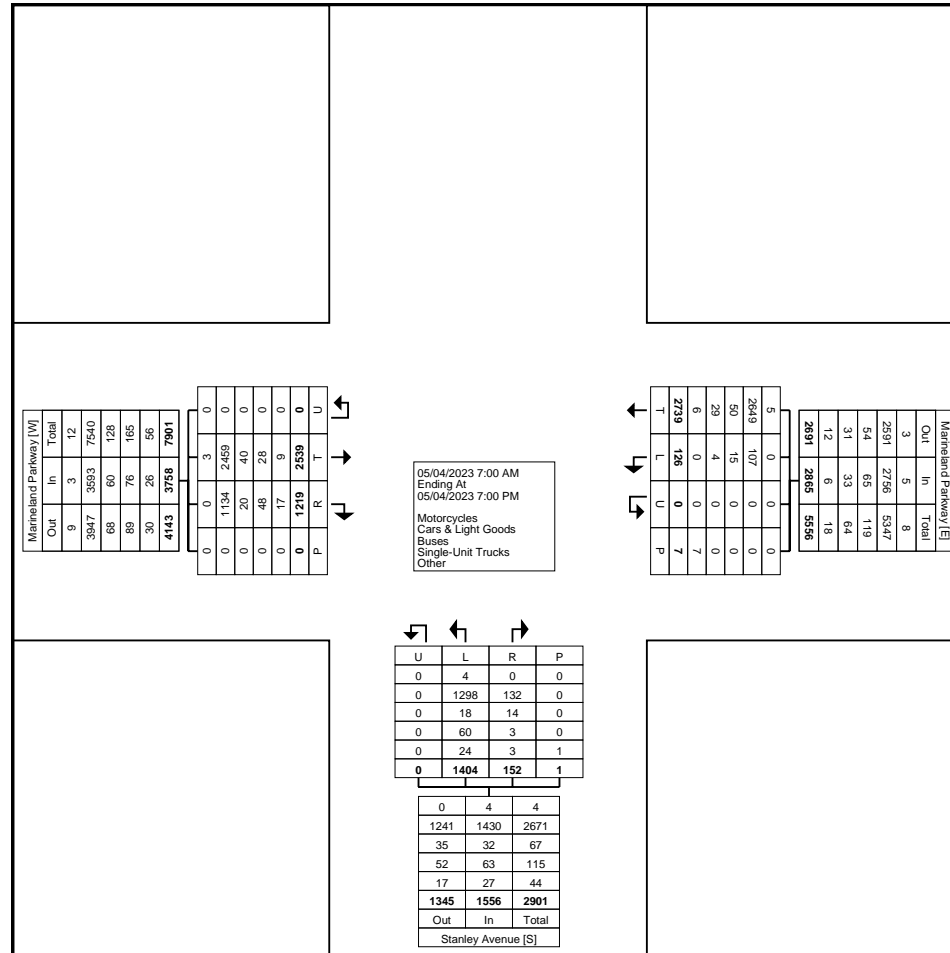
5:45 PM	92	25	0	0	117	3	81	0	0	84	43	9	0	1	52	253
Hourly Total	405	129	0	0	534	21	359	0	2	380	189	21	0	1	210	1124
6:00 PM	105	41	0	0	146	3	82	0	0	85	28	1	0	0	29	260
6:15 PM	98	26	0	0	124	3	77	0	0	80	25	9	0	0	34	238
6:30 PM	79	21	0	0	100	2	95	0	0	97	24	2	0	0	26	223
6:45 PM	80	14	0	0	94	4	92	0	0	96	24	4	0	0	28	218
Hourly Total	362	102	0	0	464	12	346	0	0	358	101	16	0	0	117	939
Grand Total	2539	1219	0	0	3758	126	2739	0	7	2865	1404	152	0	1	1556	8179
Approach %	67.6	32.4	0.0	-	-	4.4	95.6	0.0	-	-	90.2	9.8	0.0	-	-	-
Total %	31.0	14.9	0.0	-	45.9	1.5	33.5	0.0	-	35.0	17.2	1.9	0.0	-	19.0	-
Motorcycles	3	0	0	-	3	0	5	0	-	5	4	0	0	-	4	12
% Motorcycles	0.1	0.0	-	-	0.1	0.0	0.2	-	-	0.2	0.3	0.0	-	-	0.3	0.1
Cars & Light Goods	2459	1134	0	-	3593	107	2649	0	-	2756	1298	132	0	-	1430	7779
% Cars & Light Goods	96.8	93.0	-	-	95.6	84.9	96.7	-	-	96.2	92.5	86.8	-	-	91.9	95.1
Buses	40	20	0	-	60	15	50	0	-	65	18	14	0	-	32	157
% Buses	1.6	1.6	-	-	1.6	11.9	1.8	-	-	2.3	1.3	9.2	-	-	2.1	1.9
Single-Unit Trucks	28	48	0	-	76	4	29	0	-	33	60	3	0	-	63	172
% Single-Unit Trucks	1.1	3.9	-	-	2.0	3.2	1.1	-	-	1.2	4.3	2.0	-	-	4.0	2.1
Articulated Trucks	7	16	0	-	23	0	5	0	-	5	23	1	0	-	24	52
% Articulated Trucks	0.3	1.3	-	-	0.6	0.0	0.2	-	-	0.2	1.6	0.7	-	-	1.5	0.6
Bicycles on Road	2	1	0	-	3	0	1	0	-	1	1	2	0	-	3	7
% Bicycles on Road	0.1	0.1	-	-	0.1	0.0	0.0	-	-	0.0	0.1	1.3	-	-	0.2	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	4	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	57.1	-	-	-	-	100.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	3	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	42.9	-	-	-	-	0.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Stanley Avenue & Marineland
Parkway
Site Code: 220542
Start Date: 05/04/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stanley Avenue & Marineland
Parkway
Site Code: 220542
Start Date: 05/04/2023
Page No: 4

Turning Movement Peak Hour Data (8:00 AM)

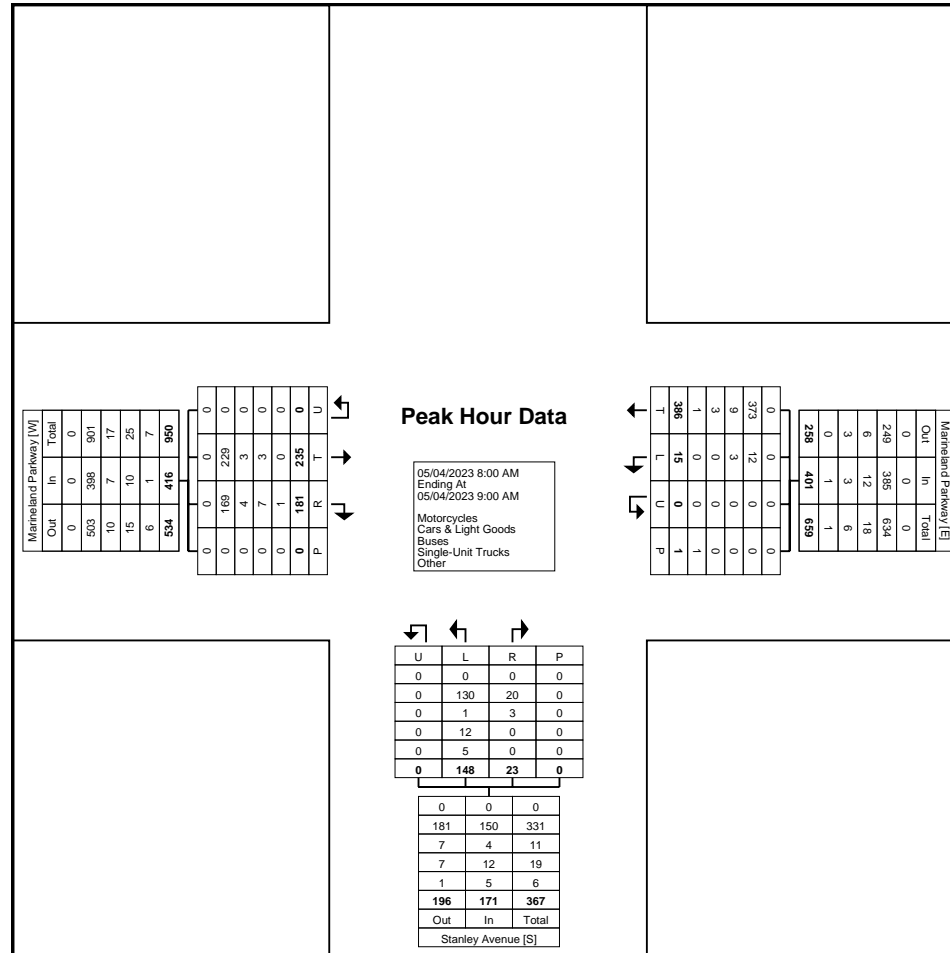
Start Time	Marineland Parkway Eastbound					Marineland Parkway Westbound					Stanley Avenue Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
8:00 AM	40	58	0	0	98	5	94	0	0	99	36	2	0	0	38	235
8:15 AM	55	41	0	0	96	3	83	0	0	86	36	10	0	0	46	228
8:30 AM	70	39	0	0	109	3	93	0	0	96	42	6	0	0	48	253
8:45 AM	70	43	0	0	113	4	116	0	1	120	34	5	0	0	39	272
Total	235	181	0	0	416	15	386	0	1	401	148	23	0	0	171	988
Approach %	56.5	43.5	0.0	-	-	3.7	96.3	0.0	-	-	86.5	13.5	0.0	-	-	-
Total %	23.8	18.3	0.0	-	42.1	1.5	39.1	0.0	-	40.6	15.0	2.3	0.0	-	17.3	-
PHF	0.839	0.780	0.000	-	0.920	0.750	0.832	0.000	-	0.835	0.881	0.575	0.000	-	0.891	0.908
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	229	169	0	-	398	12	373	0	-	385	130	20	0	-	150	933
% Cars & Light Goods	97.4	93.4	-	-	95.7	80.0	96.6	-	-	96.0	87.8	87.0	-	-	87.7	94.4
Buses	3	4	0	-	7	3	9	0	-	12	1	3	0	-	4	23
% Buses	1.3	2.2	-	-	1.7	20.0	2.3	-	-	3.0	0.7	13.0	-	-	2.3	2.3
Single-Unit Trucks	3	7	0	-	10	0	3	0	-	3	12	0	0	-	12	25
% Single-Unit Trucks	1.3	3.9	-	-	2.4	0.0	0.8	-	-	0.7	8.1	0.0	-	-	7.0	2.5
Articulated Trucks	0	1	0	-	1	0	1	0	-	1	5	0	0	-	5	7
% Articulated Trucks	0.0	0.6	-	-	0.2	0.0	0.3	-	-	0.2	3.4	0.0	-	-	2.9	0.7
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
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Count Name: Stanley Avenue & Marineland
Parkway
Site Code: 220542
Start Date: 05/04/2023
Page No: 5



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



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Stanley Avenue & Marineland
Parkway
Site Code: 220542
Start Date: 05/04/2023
Page No: 6

Turning Movement Peak Hour Data (12:00 PM)

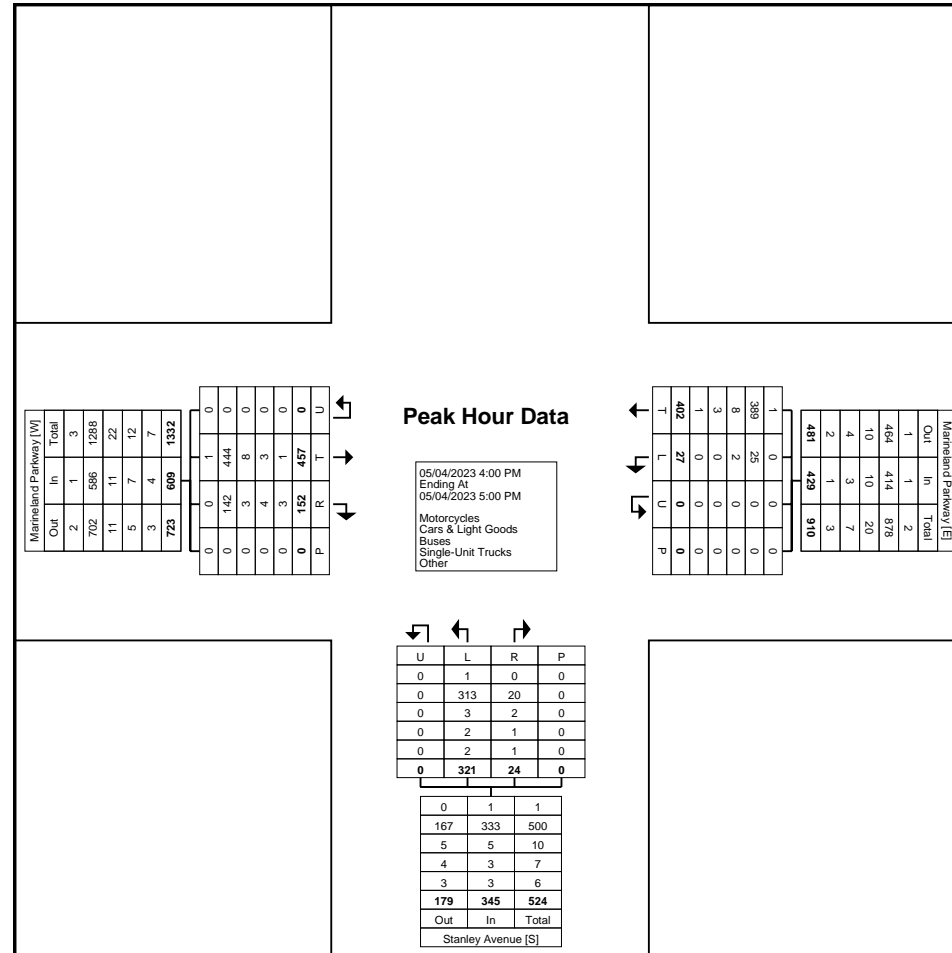
Start Time	Marineland Parkway Eastbound					Marineland Parkway Westbound					Stanley Avenue Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
12:00 PM	95	41	0	0	136	7	82	0	1	89	67	3	0	0	70	295
12:15 PM	83	55	0	0	138	7	85	0	0	92	41	3	0	0	44	274
12:30 PM	90	40	0	0	130	6	92	0	1	98	43	2	0	0	45	273
12:45 PM	104	40	0	0	144	5	90	0	0	95	40	2	0	0	42	281
Total	372	176	0	0	548	25	349	0	2	374	191	10	0	0	201	1123
Approach %	67.9	32.1	0.0	-	-	6.7	93.3	0.0	-	-	95.0	5.0	0.0	-	-	-
Total %	33.1	15.7	0.0	-	48.8	2.2	31.1	0.0	-	33.3	17.0	0.9	0.0	-	17.9	-
PHF	0.894	0.800	0.000	-	0.951	0.893	0.948	0.000	-	0.954	0.713	0.833	0.000	-	0.718	0.952
Motorcycles	1	0	0	-	1	0	0	0	-	0	1	0	0	-	1	2
% Motorcycles	0.3	0.0	-	-	0.2	0.0	0.0	-	-	0.0	0.5	0.0	-	-	0.5	0.2
Cars & Light Goods	361	161	0	-	522	22	339	0	-	361	174	9	0	-	183	1066
% Cars & Light Goods	97.0	91.5	-	-	95.3	88.0	97.1	-	-	96.5	91.1	90.0	-	-	91.0	94.9
Buses	5	1	0	-	6	1	6	0	-	7	1	1	0	-	2	15
% Buses	1.3	0.6	-	-	1.1	4.0	1.7	-	-	1.9	0.5	10.0	-	-	1.0	1.3
Single-Unit Trucks	4	10	0	-	14	2	3	0	-	5	13	0	0	-	13	32
% Single-Unit Trucks	1.1	5.7	-	-	2.6	8.0	0.9	-	-	1.3	6.8	0.0	-	-	6.5	2.8
Articulated Trucks	1	4	0	-	5	0	1	0	-	1	2	0	0	-	2	8
% Articulated Trucks	0.3	2.3	-	-	0.9	0.0	0.3	-	-	0.3	1.0	0.0	-	-	1.0	0.7
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Stanley Avenue & Marineland
Parkway
Site Code: 220542
Start Date: 05/04/2023
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stanley Avenue & Marineland
Parkway - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 1

Turning Movement Data

Start Time	Marineland Parkway Eastbound					Marineland Parkway Westbound					Stanley Avenue Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
10:00 AM	99	19	0	0	118	2	100	0	0	102	22	4	0	0	26	246
10:15 AM	86	23	0	0	109	1	91	0	0	92	38	1	0	0	39	240
10:30 AM	137	17	0	0	154	5	94	0	0	99	29	3	0	0	32	285
10:45 AM	105	36	0	0	141	3	117	0	0	120	31	4	0	0	35	296
Hourly Total	427	95	0	0	522	11	402	0	0	413	120	12	0	0	132	1067
11:00 AM	96	21	1	0	118	3	105	0	0	108	42	3	0	0	45	271
11:15 AM	109	20	0	0	129	1	132	0	0	133	31	2	0	0	33	295
11:30 AM	107	25	0	0	132	1	101	0	0	102	30	3	0	0	33	267
11:45 AM	128	24	0	0	152	2	116	0	0	118	25	4	0	0	29	299
Hourly Total	440	90	1	0	531	7	454	0	0	461	128	12	0	0	140	1132
12:00 PM	100	23	0	0	123	5	103	0	1	108	32	5	0	0	37	268
12:15 PM	102	13	0	0	115	1	126	0	1	127	26	4	0	0	30	272
12:30 PM	100	26	1	0	127	2	120	0	0	122	33	5	0	0	38	287
12:45 PM	120	33	0	0	153	1	111	0	0	112	31	6	0	0	37	302
Hourly Total	422	95	1	0	518	9	460	0	2	469	122	20	0	0	142	1129
1:00 PM	111	21	0	0	132	4	117	0	2	121	36	6	0	0	42	295
1:15 PM	133	22	0	0	155	4	110	0	3	114	33	4	0	0	37	306
1:30 PM	134	25	0	0	159	6	133	0	1	139	26	7	0	0	33	331
1:45 PM	120	18	0	0	138	2	129	0	2	131	27	4	0	0	31	300
Hourly Total	498	86	0	0	584	16	489	0	8	505	122	21	0	0	143	1232
2:00 PM	117	33	0	0	150	1	125	0	3	126	42	4	0	0	46	322
2:15 PM	141	19	0	0	160	3	106	0	0	109	33	5	0	0	38	307
2:30 PM	125	19	0	0	144	5	125	0	0	130	30	1	0	0	31	305
2:45 PM	116	24	0	0	140	1	134	0	3	135	37	2	0	0	39	314
Hourly Total	499	95	0	0	594	10	490	0	6	500	142	12	0	0	154	1248
3:00 PM	122	24	0	0	146	3	143	1	4	147	45	6	0	0	51	344
3:15 PM	122	15	0	0	137	7	139	0	0	146	30	4	0	0	34	317
3:30 PM	100	25	0	0	125	7	169	0	1	176	56	2	0	0	58	359
3:45 PM	121	27	0	0	148	2	147	0	0	149	36	7	0	0	43	340
Hourly Total	465	91	0	0	556	19	598	1	5	618	167	19	0	0	186	1360
4:00 PM	129	30	0	0	159	3	166	0	0	169	30	8	0	0	38	366
4:15 PM	117	15	0	0	132	2	165	0	2	167	25	6	0	0	31	330
4:30 PM	111	23	0	0	134	7	179	0	0	186	41	7	0	0	48	368
4:45 PM	137	20	0	0	157	5	170	0	1	175	42	8	0	0	50	382
Hourly Total	494	88	0	0	582	17	680	0	3	697	138	29	0	0	167	1446
5:00 PM	123	24	0	0	147	5	184	0	0	189	29	10	0	1	39	375

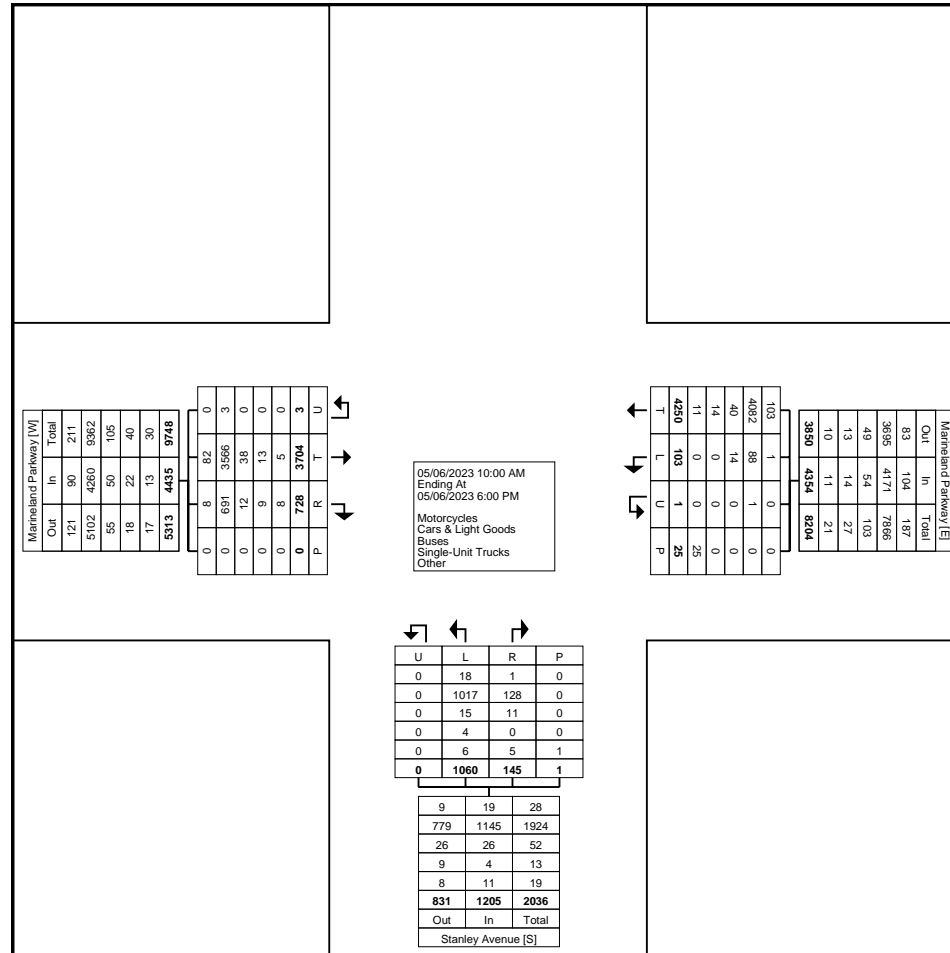
5:15 PM	124	27	0	0	151	1	156	0	0	157	31	3	0	0	34	342
5:30 PM	104	23	0	0	127	6	163	0	1	169	37	4	0	0	41	337
5:45 PM	108	14	1	0	123	2	174	0	0	176	24	3	0	0	27	326
Hourly Total	459	88	1	0	548	14	677	0	1	691	121	20	0	1	141	1380
Grand Total	3704	728	3	0	4435	103	4250	1	25	4354	1060	145	0	1	1205	9994
Approach %	83.5	16.4	0.1	-	-	2.4	97.6	0.0	-	-	88.0	12.0	0.0	-	-	-
Total %	37.1	7.3	0.0	-	44.4	1.0	42.5	0.0	-	43.6	10.6	1.5	0.0	-	12.1	-
Motorcycles	82	8	0	-	90	1	103	0	-	104	18	1	0	-	19	213
% Motorcycles	2.2	1.1	0.0	-	2.0	1.0	2.4	0.0	-	2.4	1.7	0.7	-	-	1.6	2.1
Cars & Light Goods	3566	691	3	-	4260	88	4082	1	-	4171	1017	128	0	-	1145	9576
% Cars & Light Goods	96.3	94.9	100.0	-	96.1	85.4	96.0	100.0	-	95.8	95.9	88.3	-	-	95.0	95.8
Buses	38	12	0	-	50	14	40	0	-	54	15	11	0	-	26	130
% Buses	1.0	1.6	0.0	-	1.1	13.6	0.9	0.0	-	1.2	1.4	7.6	-	-	2.2	1.3
Single-Unit Trucks	13	9	0	-	22	0	14	0	-	14	4	0	0	-	4	40
% Single-Unit Trucks	0.4	1.2	0.0	-	0.5	0.0	0.3	0.0	-	0.3	0.4	0.0	-	-	0.3	0.4
Articulated Trucks	0	2	0	-	2	0	1	0	-	1	2	0	0	-	2	5
% Articulated Trucks	0.0	0.3	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.2	0.0	-	-	0.2	0.1
Bicycles on Road	5	6	0	-	11	0	10	0	-	10	4	5	0	-	9	30
% Bicycles on Road	0.1	0.8	0.0	-	0.2	0.0	0.2	0.0	-	0.2	0.4	3.4	-	-	0.7	0.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	13	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	52.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	12	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	48.0	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stanley Avenue & Marineland
Parkway - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stanley Avenue & Marineland
Parkway - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 4

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Marineland Parkway Eastbound					Marineland Parkway Westbound					Stanley Avenue Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
4:30 PM	111	23	0	0	134	7	179	0	0	186	41	7	0	0	48	368
4:45 PM	137	20	0	0	157	5	170	0	1	175	42	8	0	0	50	382
5:00 PM	123	24	0	0	147	5	184	0	0	189	29	10	0	1	39	375
5:15 PM	124	27	0	0	151	1	156	0	0	157	31	3	0	0	34	342
Total	495	94	0	0	589	18	689	0	1	707	143	28	0	1	171	1467
Approach %	84.0	16.0	0.0	-	-	2.5	97.5	0.0	-	-	83.6	16.4	0.0	-	-	-
Total %	33.7	6.4	0.0	-	40.1	1.2	47.0	0.0	-	48.2	9.7	1.9	0.0	-	11.7	-
PHF	0.903	0.870	0.000	-	0.938	0.643	0.936	0.000	-	0.935	0.851	0.700	0.000	-	0.855	0.960
Motorcycles	12	1	0	-	13	0	18	0	-	18	2	0	0	-	2	33
% Motorcycles	2.4	1.1	-	-	2.2	0.0	2.6	-	-	2.5	1.4	0.0	-	-	1.2	2.2
Cars & Light Goods	477	91	0	-	568	15	660	0	-	675	138	26	0	-	164	1407
% Cars & Light Goods	96.4	96.8	-	-	96.4	83.3	95.8	-	-	95.5	96.5	92.9	-	-	95.9	95.9
Buses	6	2	0	-	8	3	6	0	-	9	2	2	0	-	4	21
% Buses	1.2	2.1	-	-	1.4	16.7	0.9	-	-	1.3	1.4	7.1	-	-	2.3	1.4
Single-Unit Trucks	0	0	0	-	0	0	3	0	-	3	1	0	0	-	1	4
% Single-Unit Trucks	0.0	0.0	-	-	0.0	0.0	0.4	-	-	0.4	0.7	0.0	-	-	0.6	0.3
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.1	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.1	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

Location..... Biggar Road & Lyons Creek Road @
Montrose Road

GeoID..... 01542

Municipality. NIAGARA FALLS

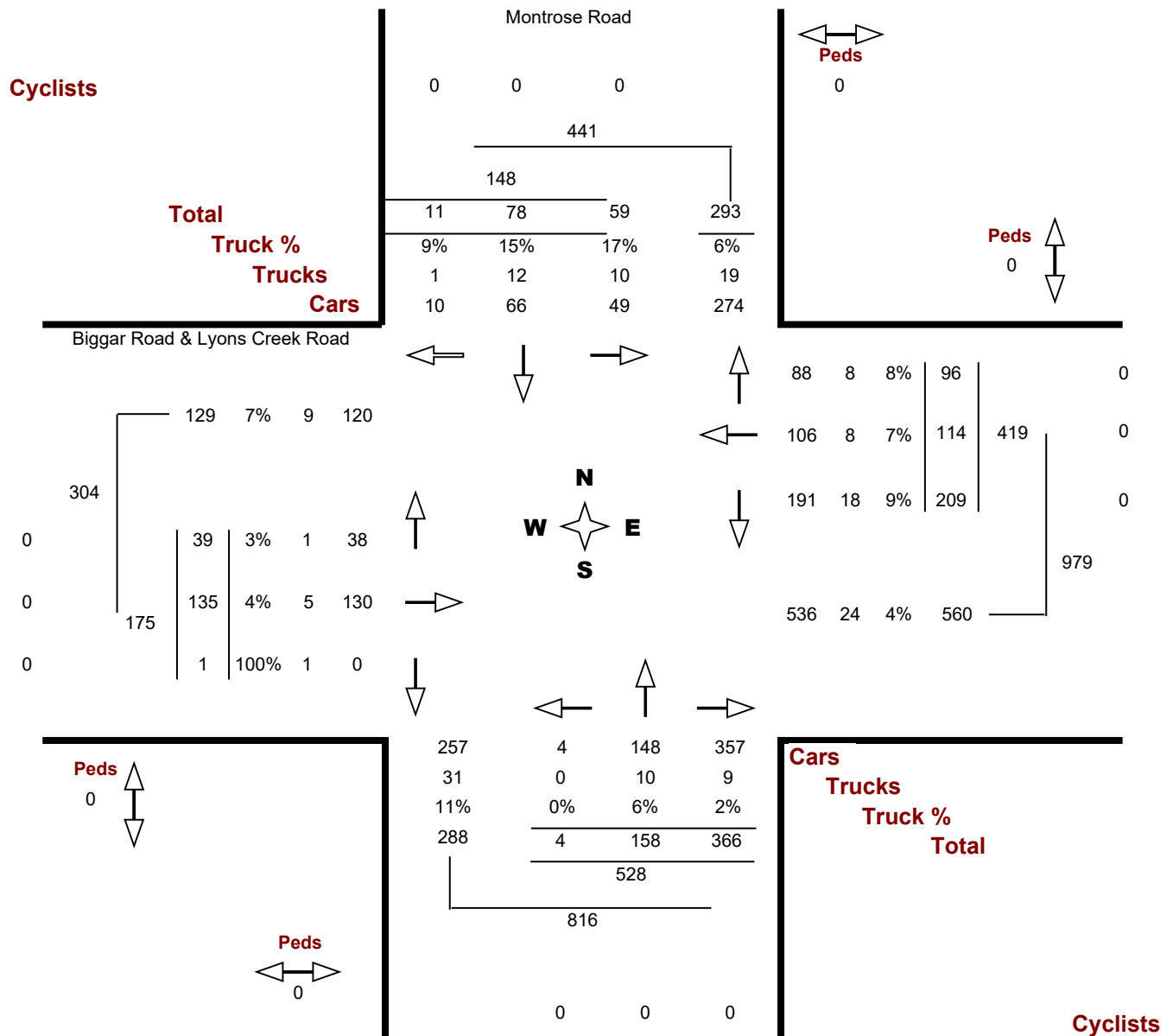
Count Date. Thursday, 11 October, 2018

Traffic Cont.

Count Time. 07:00 AM — 09:00 AM

Major Dir..... North south

Peak Hour.. 07:30 AM — 08:30 AM



Location..... Biggar Road & Lyons Creek Road @
Montrose Road

GeoID..... 01542

Municipality. NIAGARA FALLS

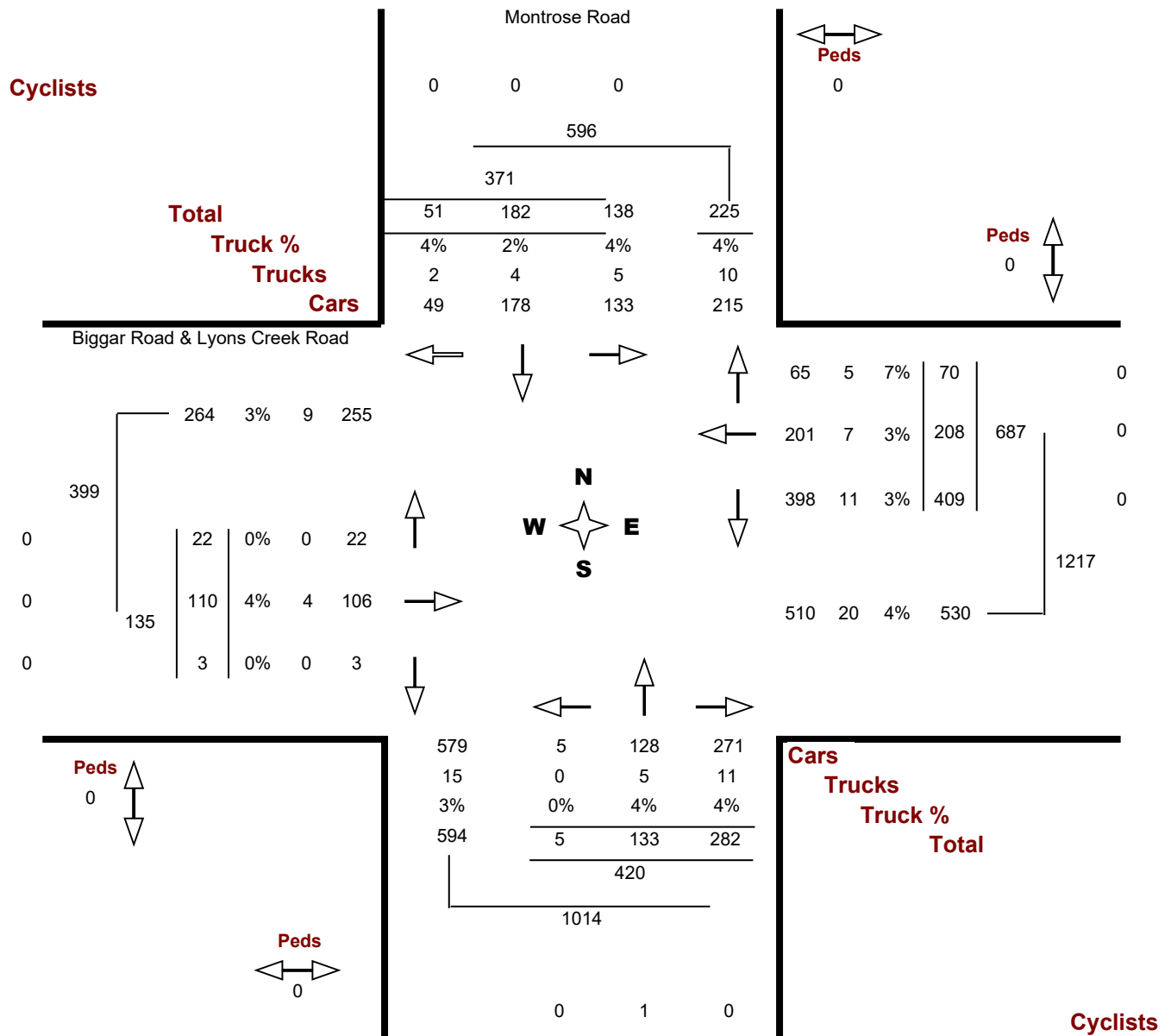
Count Date. Thursday, 11 October, 2018

Traffic Cont.

Count Time. 03:00 PM — 06:00 PM

Major Dir..... North south

Peak Hour.. 04:30 PM — 05:30 PM

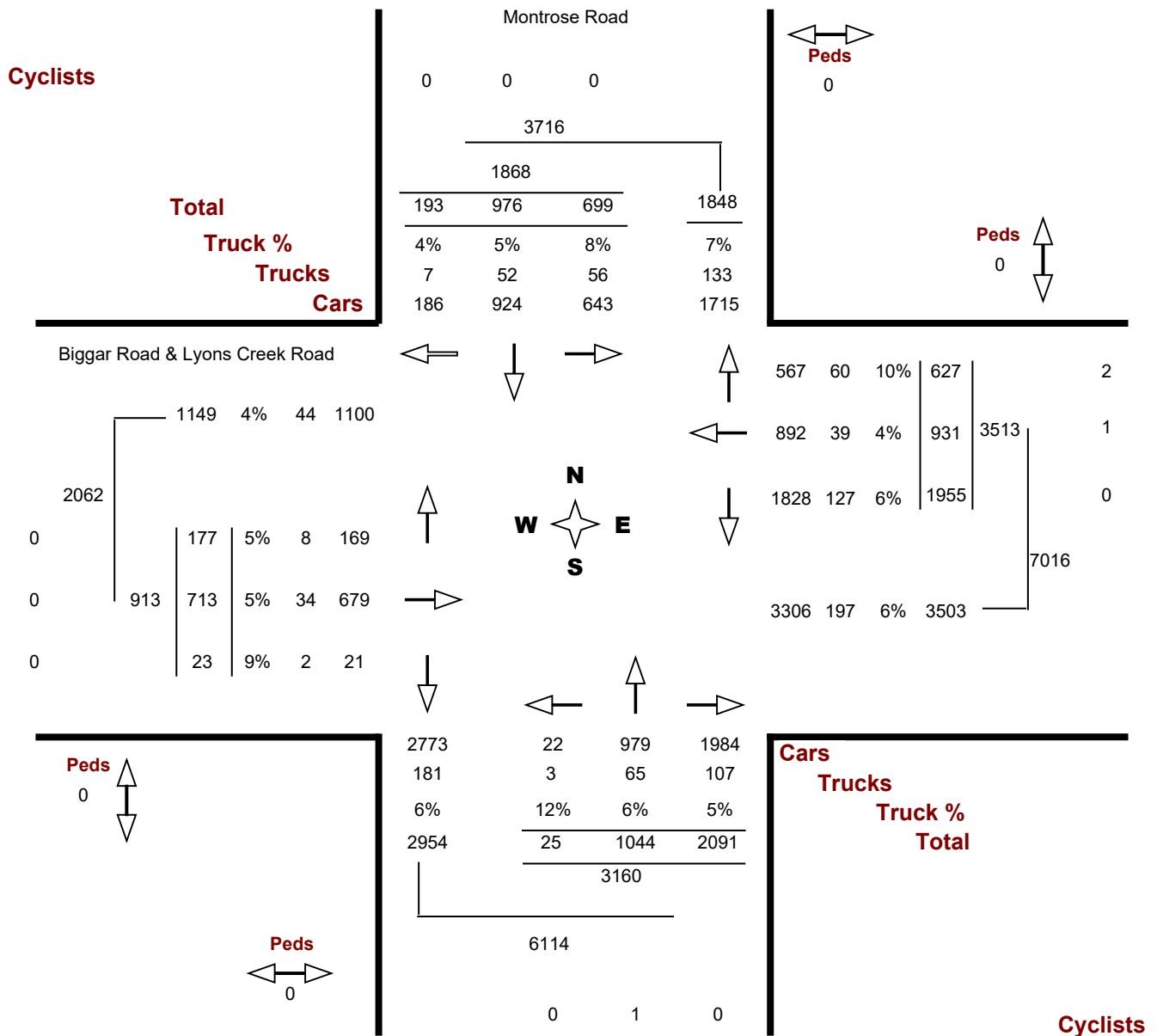


Location..... Biggar Road & Lyons Creek Road @ Montrose Road

Municipality..... NIAGARA FALLS

GeoID..... 01542

Count Date..... Thursday, 11 October, 2018



Turning Movement Count - Details Report (15 min)

Location..... Biggar Road & Lyons Creek Road @ Montrose Road

Municipality..... NIAGARA FALLS

Count Date..... Thursday, October 11, 2018

Montrose Road

Biggar Road & Lyons Creek Road

North Approach

South Approach

East Approach

West Approach

Time Period	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT
07:00 07:15	8	14	0	0	22	1	18	59	0	78	37	15	15	0	67	6	17	0	0	23
07:15 07:30	7	18	3	0	28	0	31	73	0	104	39	10	15	0	64	2	22	1	0	25
07:30 07:45	14	22	2	0	38	1	35	87	0	123	64	29	25	0	118	8	34	0	0	42
07:45 08:00	17	15	2	0	34	2	51	97	0	150	53	29	30	0	112	11	29	0	0	40
Hourly Total	46	69	7	0	122	4	135	316	0	455	193	83	85	0	361	27	102	1	0	130
08:00 08:15	18	22	4	0	44	0	36	81	0	117	51	30	23	0	104	12	33	0	0	45
08:15 08:30	10	19	3	0	32	1	36	101	0	138	41	26	18	0	85	8	39	1	0	48
08:30 08:45	18	17	0	0	35	0	29	102	0	131	43	25	22	0	90	8	28	0	0	36
08:45 09:00	14	19	2	0	35	1	32	69	0	102	59	30	15	0	104	8	34	0	0	42
Hourly Total	60	77	9	0	146	2	133	353	0	488	194	111	78	0	383	36	134	1	0	171
11:00 11:15	29	19	5	0	53	3	29	45	0	77	54	22	20	0	96	2	9	0	0	11
11:15 11:30	14	30	3	0	47	1	34	50	0	85	45	18	13	0	76	3	14	0	0	17
11:30 11:45	15	12	5	0	32	0	25	62	0	87	41	20	14	0	75	1	14	0	0	15
11:45 12:00	28	27	2	0	57	0	33	46	0	79	43	15	14	0	72	5	14	1	0	20
Hourly Total	86	88	15	0	189	4	121	203	0	328	183	75	61	0	319	11	51	1	0	63
12:00 12:15	13	28	6	0	47	1	31	49	0	81	37	31	18	0	86	1	19	2	0	22
12:15 12:30	19	24	6	0	49	0	43	56	0	99	33	21	23	0	77	3	19	1	0	23
12:30 12:45	17	21	8	0	46	0	27	61	0	88	36	24	21	0	81	2	16	0	0	18
12:45 13:00	25	30	4	0	59	2	32	45	0	79	46	24	29	0	99	8	13	1	0	22
Hourly Total	74	103	24	0	201	3	133	211	0	347	152	100	91	0	343	14	67	4	0	85
13:00 13:15	23	30	6	0	59	0	27	43	0	70	50	29	24	0	103	13	11	4	0	28
13:15 13:30	27	38	3	0	68	0	39	47	0	86	41	21	19	0	81	7	23	0	0	30
13:30 13:45	20	26	8	0	54	0	29	60	0	89	60	20	27	0	107	4	21	0	0	25
13:45 14:00	22	31	5	0	58	0	23	52	0	75	54	17	21	0	92	4	12	0	0	16
Hourly Total	92	125	22	0	239	0	118	202	0	320	205	87	91	0	383	28	67	4	0	99
15:00 15:15	28	47	9	0	84	0	35	51	0	86	63	20	15	0	98	6	21	0	0	27
15:15 15:30	20	33	8	0	61	0	34	68	0	102	98	36	19	0	153	8	26	3	0	37
15:30 15:45	39	35	8	0	82	2	34	72	0	108	74	37	27	0	138	5	26	1	0	32
15:45 16:00	24	43	12	0	79	3	48	74	0	125	74	32	14	0	120	5	28	3	0	36
Hourly Total	111	158	37	0	306	5	151	265	0	421	309	125	75	0	509	24	101	7	0	132
16:00 16:15	29	39	11	0	79	0	25	49	0	74	85	54	21	0	160	1	17	1	0	19

Montrose Road

Biggar Road & Lyons Creek Road

North Approach

South Approach

East Approach

West Approach

Time Period	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT
16:15 16:30	20	39	9	0	68	0	32	88	0	120	94	35	23	0	152	2	26	0	0	28
16:30 16:45	33	45	10	0	88	2	26	61	0	89	101	50	21	0	172	5	38	1	0	44
16:45 17:00	29	36	16	0	81	0	48	78	0	126	95	45	19	0	159	8	27	1	0	36
Hourly Total	111	159	46	0	316	2	131	276	0	409	375	184	84	0	643	16	108	3	0	127
17:00 17:15	41	65	15	0	121	0	27	64	0	91	109	54	13	0	176	5	26	0	0	31
17:15 17:30	35	36	10	0	81	3	32	79	0	114	104	59	17	0	180	4	19	1	0	24
17:30 17:45	28	56	4	0	88	2	29	68	0	99	70	31	18	0	119	6	16	1	0	23
17:45 18:00	15	40	4	0	59	0	34	54	0	88	61	22	14	0	97	6	22	0	0	28
Hourly Total	119	197	33	0	349	5	122	265	0	392	344	166	62	0	572	21	83	2	0	106
Grand Total	699	976	193	0	1868	25	1044	2091	0	3160	1955	931	627	0	3513	177	713	23	0	913
Truck %	8%	5%	4%	0%	6%	12%	6%	5%	0%	6%	6%	4%	10%	0%	6%	5%	5%	9%	0%	5%



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Dorchester Road & Jill Drive
Site Code: 220542
Start Date: 05/04/2023
Page No: 1

Turning Movement Data

Start Time	Jill Drive Eastbound						Jill Drive Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	5	3	0	0	0	8	0	1	1	0	0	2	1	21	2	0	1	24	0	12	5	0	1	17	51
7:15 AM	6	4	2	0	0	12	0	0	1	0	0	1	2	24	0	0	0	26	0	8	1	0	0	9	48
7:30 AM	13	4	0	0	0	17	0	1	2	0	0	3	1	37	0	0	0	38	1	14	6	0	1	21	79
7:45 AM	9	3	1	0	0	13	0	0	0	0	0	0	1	22	2	0	1	25	0	12	3	0	1	15	53
Hourly Total	33	14	3	0	0	50	0	2	4	0	0	6	5	104	4	0	2	113	1	46	15	0	3	62	231
8:00 AM	6	2	0	0	1	8	2	0	2	0	0	4	2	27	1	0	2	30	0	6	1	0	0	7	49
8:15 AM	14	4	0	0	7	18	0	0	3	0	1	3	0	29	2	0	1	31	0	4	3	0	0	7	59
8:30 AM	16	6	0	0	3	22	0	2	0	0	6	2	1	39	0	0	4	40	0	19	9	0	6	28	92
8:45 AM	10	6	0	0	2	16	1	0	0	0	0	1	0	26	2	0	8	28	0	17	5	0	1	22	67
Hourly Total	46	18	0	0	13	64	3	2	5	0	7	10	3	121	5	0	15	129	0	46	18	0	7	64	267
9:00 AM	11	5	0	0	7	16	0	1	1	0	1	2	2	20	3	0	3	25	0	10	8	0	1	18	61
9:15 AM	5	5	1	0	1	11	0	2	1	0	0	3	2	15	1	0	0	18	1	10	4	0	1	15	47
9:30 AM	10	4	3	0	0	17	0	0	0	0	1	0	1	26	2	0	0	29	1	18	3	0	1	22	68
9:45 AM	9	2	0	0	2	11	2	1	1	0	0	4	4	28	2	0	1	34	1	13	5	0	2	19	68
Hourly Total	35	16	4	0	10	55	2	4	3	0	2	9	9	89	8	0	4	106	3	51	20	0	5	74	244
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	10	4	2	0	1	16	2	2	0	0	0	4	1	22	2	0	0	25	0	15	6	0	0	21	66
11:45 AM	6	1	1	0	1	8	0	2	1	0	0	3	3	31	1	0	0	35	0	24	3	0	0	27	73
Hourly Total	16	5	3	0	2	24	2	4	1	0	0	7	4	53	3	0	0	60	0	39	9	0	0	48	139
12:00 PM	13	8	2	0	1	23	1	0	0	0	0	1	1	22	0	0	0	23	0	17	14	0	0	31	78
12:15 PM	6	2	0	0	0	8	1	1	4	0	1	6	3	26	1	0	0	30	0	13	5	0	2	18	62
12:30 PM	8	4	0	0	2	12	1	3	0	0	0	4	1	19	0	0	2	20	1	12	2	0	0	15	51
12:45 PM	7	4	0	0	2	11	0	4	0	0	0	4	1	20	2	0	2	23	0	18	5	0	1	23	61
Hourly Total	34	18	2	0	5	54	3	8	4	0	1	15	6	87	3	0	4	96	1	60	26	0	3	87	252
1:00 PM	11	4	2	0	3	17	0	0	0	0	1	0	2	12	1	0	1	15	2	15	5	0	1	22	54
1:15 PM	7	7	1	0	2	15	0	4	0	0	1	4	1	27	2	0	0	30	0	10	6	0	3	16	65
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	18	11	3	0	5	32	0	4	0	0	2	4	3	39	3	0	1	45	2	25	11	0	4	38	119
4:00 PM	3	4	6	0	0	13	0	0	1	0	1	1	2	41	0	0	1	43	0	26	8	0	1	34	91
4:15 PM	6	3	2	0	0	11	0	0	0	0	1	0	0	33	0	0	1	33	0	30	5	0	1	35	79
4:30 PM	9	2	5	0	4	16	0	3	6	0	0	9	3	49	0	0	0	52	0	37	12	0	3	49	126
4:45 PM	16	3	2	0	1	21	0	1	2	0	1	3	3	38	0	0	0	41	1	34	8	0	1	43	108
Hourly Total	34	12	15	0	5	61	0	4	9	0	3	13	8	161	0	0	2	169	1	127	33	0	6	161	404
5:00 PM	17	2	0	0	0	19	0	1	2	0	0	3	2	45	0	0	0	47	1	32	16	0	0	49	118
5:15 PM	20	0	4	0	0	24	1	0	0	0	4	1	3	32	0	0	1	35	2	22	11	0	0	35	95

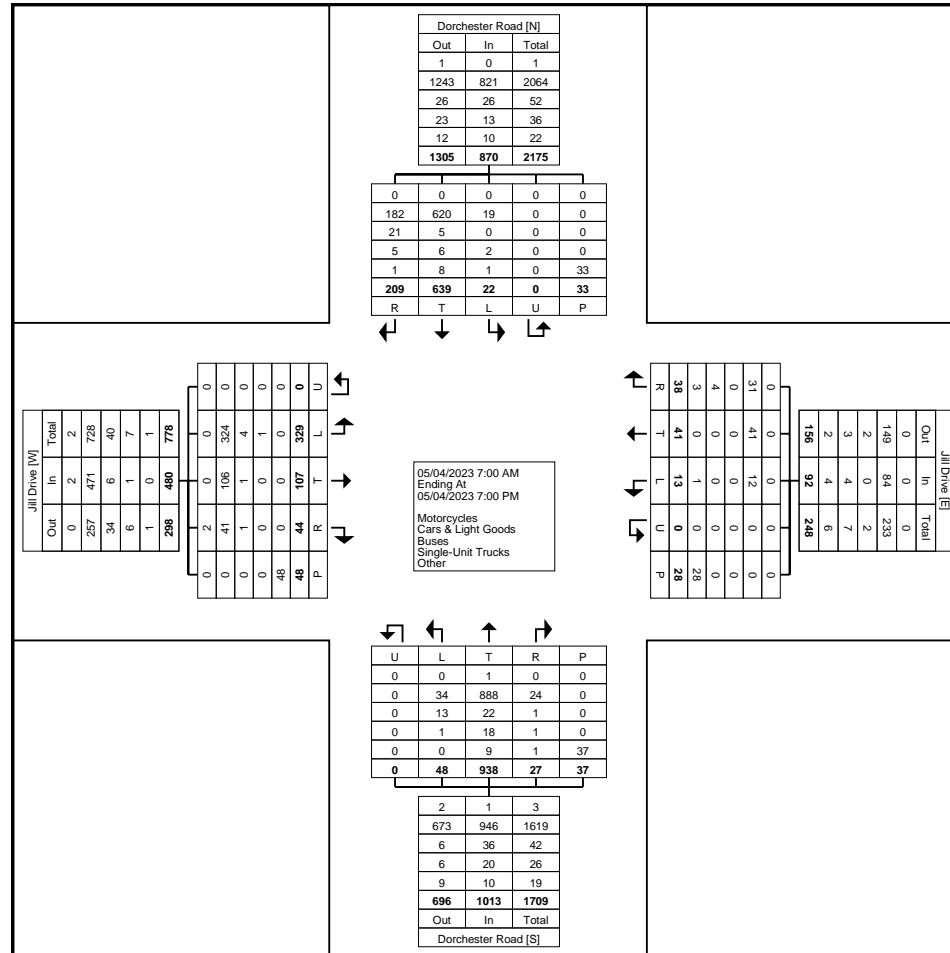
5:30 PM	14	2	3	0	0	19	0	3	1	0	0	4	1	51	0	0	2	52	2	46	7	0	2	55	130
5:45 PM	15	1	1	0	1	17	0	3	2	0	3	5	0	34	0	0	4	34	1	36	5	0	1	42	98
Hourly Total	66	5	8	0	1	79	1	7	5	0	7	13	6	162	0	0	7	168	6	136	39	0	3	181	441
6:00 PM	11	3	3	0	1	17	1	2	2	0	3	5	2	38	0	0	0	40	2	24	9	0	0	35	97
6:15 PM	11	1	0	0	0	12	1	3	0	0	0	4	0	30	0	0	0	30	2	24	13	0	0	39	85
6:30 PM	14	2	3	0	2	19	0	1	3	0	2	4	2	25	1	0	1	28	1	31	12	0	1	44	95
6:45 PM	11	2	0	0	4	13	0	0	2	0	1	2	0	29	0	0	1	29	3	30	4	0	1	37	81
Hourly Total	47	8	6	0	7	61	2	6	7	0	6	15	4	122	1	0	2	127	8	109	38	0	2	155	358
Grand Total	329	107	44	0	48	480	13	41	38	0	28	92	48	938	27	0	37	1013	22	639	209	0	33	870	2455
Approach %	68.5	22.3	9.2	0.0	-	-	14.1	44.6	41.3	0.0	-	-	4.7	92.6	2.7	0.0	-	-	2.5	73.4	24.0	0.0	-	-	-
Total %	13.4	4.4	1.8	0.0	-	19.6	0.5	1.7	1.5	0.0	-	3.7	2.0	38.2	1.1	0.0	-	41.3	0.9	26.0	8.5	0.0	-	35.4	-
Motorcycles	0	0	2	0	-	2	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	3
% Motorcycles	0.0	0.0	4.5	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	324	106	41	0	-	471	12	41	31	0	-	84	34	888	24	0	-	946	19	620	182	0	-	821	2322
% Cars & Light Goods	98.5	99.1	93.2	-	-	98.1	92.3	100.0	81.6	-	-	91.3	70.8	94.7	88.9	-	-	93.4	86.4	97.0	87.1	-	-	94.4	94.6
Buses	4	1	1	0	-	6	0	0	0	0	-	0	13	22	1	0	-	36	0	5	21	0	-	26	68
% Buses	1.2	0.9	2.3	-	-	1.3	0.0	0.0	0.0	-	-	0.0	27.1	2.3	3.7	-	-	3.6	0.0	0.8	10.0	-	-	3.0	2.8
Single-Unit Trucks	1	0	0	0	-	1	0	0	4	0	-	4	1	18	1	0	-	20	2	6	5	0	-	13	38
% Single-Unit Trucks	0.3	0.0	0.0	-	-	0.2	0.0	0.0	10.5	-	-	4.3	2.1	1.9	3.7	-	-	2.0	9.1	0.9	2.4	-	-	1.5	1.5
Articulated Trucks	0	0	0	0	-	0	0	0	3	0	-	3	0	8	1	0	-	9	1	7	1	0	-	9	21
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	7.9	-	-	3.3	0.0	0.9	3.7	-	-	0.9	4.5	1.1	0.5	-	-	1.0	0.9
Bicycles on Road	0	0	0	0	-	0	1	0	0	0	-	1	0	1	0	0	-	1	0	1	0	0	-	1	3
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	7.7	0.0	0.0	-	-	1.1	0.0	0.1	0.0	-	-	0.1	0.0	0.2	0.0	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	4	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	8.3	-	-	-	-	-	3.6	-	-	-	-	-	2.7	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	44	-	-	-	-	-	27	-	-	-	-	-	36	-	-	-	-	-	33	-	-
% Pedestrians	-	-	-	-	91.7	-	-	-	-	-	96.4	-	-	-	-	-	97.3	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Dorchester Road & Jill Drive
Site Code: 220542
Start Date: 05/04/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Dorchester Road & Jill Drive
Site Code: 220542
Start Date: 05/04/2023
Page No: 4

Turning Movement Peak Hour Data (8:15 AM)

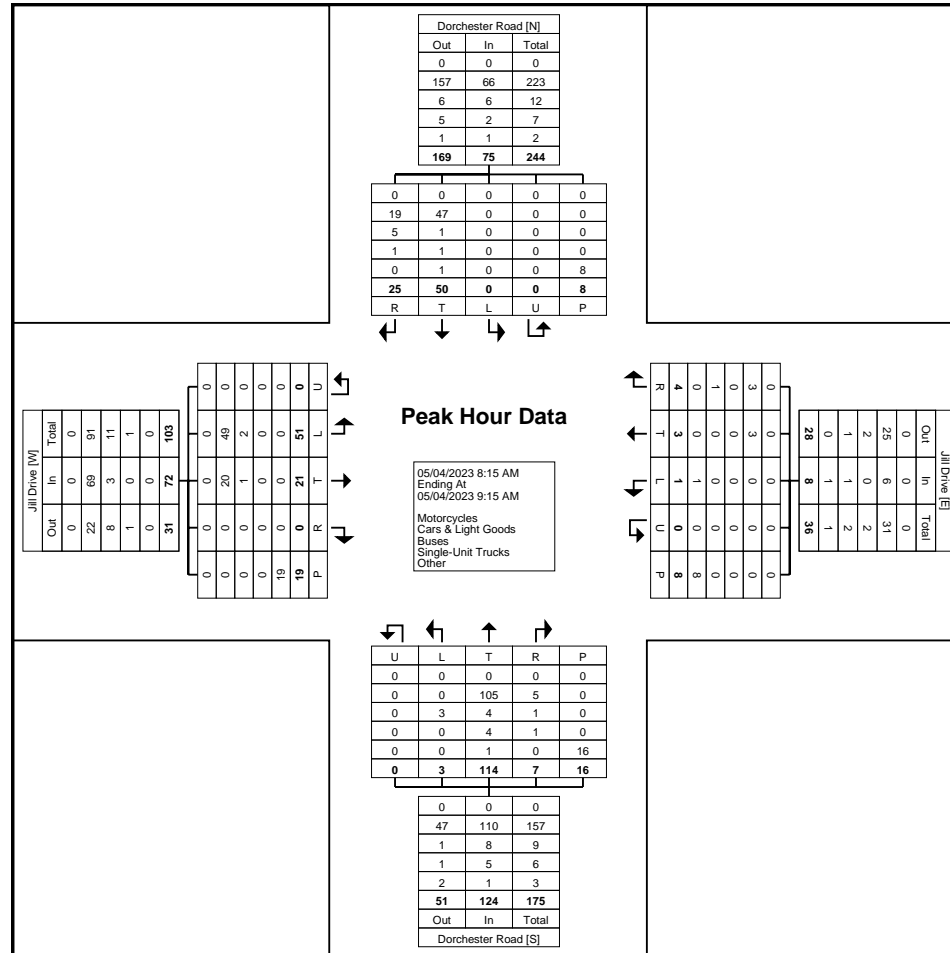
Start Time	Jill Drive Eastbound						Jill Drive Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
8:15 AM	14	4	0	0	7	18	0	0	3	0	1	3	0	29	2	0	1	31	0	4	3	0	0	7	59
8:30 AM	16	6	0	0	3	22	0	2	0	0	6	2	1	39	0	0	4	40	0	19	9	0	6	28	92
8:45 AM	10	6	0	0	2	16	1	0	0	0	0	1	0	26	2	0	8	28	0	17	5	0	1	22	67
9:00 AM	11	5	0	0	7	16	0	1	1	0	1	2	2	20	3	0	3	25	0	10	8	0	1	18	61
Total	51	21	0	0	19	72	1	3	4	0	8	8	3	114	7	0	16	124	0	50	25	0	8	75	279
Approach %	70.8	29.2	0.0	0.0	-	-	12.5	37.5	50.0	0.0	-	-	2.4	91.9	5.6	0.0	-	-	0.0	66.7	33.3	0.0	-	-	-
Total %	18.3	7.5	0.0	0.0	-	25.8	0.4	1.1	1.4	0.0	-	2.9	1.1	40.9	2.5	0.0	-	44.4	0.0	17.9	9.0	0.0	-	26.9	-
PHF	0.797	0.875	0.000	0.000	-	0.818	0.250	0.375	0.333	0.000	-	0.667	0.375	0.731	0.583	0.000	-	0.775	0.000	0.658	0.694	0.000	-	0.670	0.758
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	49	20	0	0	-	69	0	3	3	0	-	6	0	105	5	0	-	110	0	47	19	0	-	66	251
% Cars & Light Goods	96.1	95.2	-	-	-	95.8	0.0	100.0	75.0	-	-	75.0	0.0	92.1	71.4	-	-	88.7	-	94.0	76.0	-	-	88.0	90.0
Buses	2	1	0	0	-	3	0	0	0	0	-	0	3	4	1	0	-	8	0	1	5	0	-	6	17
% Buses	3.9	4.8	-	-	-	4.2	0.0	0.0	0.0	-	-	0.0	100.0	3.5	14.3	-	-	6.5	-	2.0	20.0	-	-	8.0	6.1
Single-Unit Trucks	0	0	0	0	-	0	0	0	1	0	-	1	0	4	1	0	-	5	0	1	1	0	-	2	8
% Single-Unit Trucks	0.0	0.0	-	-	-	0.0	0.0	0.0	25.0	-	-	12.5	0.0	3.5	14.3	-	-	4.0	-	2.0	4.0	-	-	2.7	2.9
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	2
% Articulated Trucks	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.9	0.0	-	-	0.8	-	2.0	0.0	-	-	1.3	0.7
Bicycles on Road	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	-	-	0.0	100.0	0.0	0.0	-	-	12.5	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.4
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	10.5	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	17	-	-	-	-	-	8	-	-	-	-	-	16	-	-	-	-	-	8	-	-
% Pedestrians	-	-	-	-	89.5	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Dorchester Road & Jill Drive
Site Code: 220542
Start Date: 05/04/2023
Page No: 5



Turning Movement Peak Hour Data Plot (8:15 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Dorchester Road & Jill Drive
Site Code: 220542
Start Date: 05/04/2023
Page No: 6

Turning Movement Peak Hour Data (11:30 AM)

Start Time	Jill Drive Eastbound						Jill Drive Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:30 AM	10	4	2	0	1	16	2	2	0	0	0	4	1	22	2	0	0	25	0	15	6	0	0	21	66
11:45 AM	6	1	1	0	1	8	0	2	1	0	0	3	3	31	1	0	0	35	0	24	3	0	0	27	73
12:00 PM	13	8	2	0	1	23	1	0	0	0	0	1	1	22	0	0	0	23	0	17	14	0	0	31	78
12:15 PM	6	2	0	0	0	8	1	1	4	0	1	6	3	26	1	0	0	30	0	13	5	0	2	18	62
Total	35	15	5	0	3	55	4	5	5	0	1	14	8	101	4	0	0	113	0	69	28	0	2	97	279
Approach %	63.6	27.3	9.1	0.0	-	-	28.6	35.7	35.7	0.0	-	-	7.1	89.4	3.5	0.0	-	-	0.0	71.1	28.9	0.0	-	-	-
Total %	12.5	5.4	1.8	0.0	-	19.7	1.4	1.8	1.8	0.0	-	5.0	2.9	36.2	1.4	0.0	-	40.5	0.0	24.7	10.0	0.0	-	34.8	-
PHF	0.673	0.469	0.625	0.000	-	0.598	0.500	0.625	0.313	0.000	-	0.583	0.667	0.815	0.500	0.000	-	0.807	0.000	0.719	0.500	0.000	-	0.782	0.894
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	35	15	5	0	-	55	4	5	5	0	-	14	8	96	4	0	-	108	0	66	25	0	-	91	268
% Cars & Light Goods	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0	95.0	100.0	-	-	95.6	-	95.7	89.3	-	-	93.8	96.1
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	1	0	-	1	2
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.0	0.0	-	-	0.9	-	0.0	3.6	-	-	1.0	0.7
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	0	0	1	0	-	1	3
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	2.0	0.0	-	-	1.8	-	0.0	3.6	-	-	1.0	1.1
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	0	3	1	0	-	4	6
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	2.0	0.0	-	-	1.8	-	4.3	3.6	-	-	4.1	2.2
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Dorchester Road & Jill Drive
Site Code: 220542
Start Date: 05/04/2023
Page No: 8

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Jill Drive Eastbound						Jill Drive Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	16	3	2	0	1	21	0	1	2	0	1	3	3	38	0	0	0	41	1	34	8	0	1	43	108
5:00 PM	17	2	0	0	0	19	0	1	2	0	0	3	2	45	0	0	0	47	1	32	16	0	0	49	118
5:15 PM	20	0	4	0	0	24	1	0	0	0	4	1	3	32	0	0	1	35	2	22	11	0	0	35	95
5:30 PM	14	2	3	0	0	19	0	3	1	0	0	4	1	51	0	0	2	52	2	46	7	0	2	55	130
Total	67	7	9	0	1	83	1	5	5	0	5	11	9	166	0	0	3	175	6	134	42	0	3	182	451
Approach %	80.7	8.4	10.8	0.0	-	-	9.1	45.5	45.5	0.0	-	-	5.1	94.9	0.0	0.0	-	-	3.3	73.6	23.1	0.0	-	-	-
Total %	14.9	1.6	2.0	0.0	-	18.4	0.2	1.1	1.1	0.0	-	2.4	2.0	36.8	0.0	0.0	-	38.8	1.3	29.7	9.3	0.0	-	40.4	-
PHF	0.838	0.583	0.563	0.000	-	0.865	0.250	0.417	0.625	0.000	-	0.688	0.750	0.814	0.000	0.000	-	0.841	0.750	0.728	0.656	0.000	-	0.827	0.867
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	66	7	9	0	-	82	1	5	5	0	-	11	6	162	0	0	-	168	6	133	39	0	-	178	439
% Cars & Light Goods	98.5	100.0	100.0	-	-	98.8	100.0	100.0	100.0	-	-	100.0	66.7	97.6	-	-	-	96.0	100.0	99.3	92.9	-	-	97.8	97.3
Buses	0	0	0	0	-	0	0	0	0	0	-	0	2	3	0	0	-	5	0	0	1	0	-	1	6
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	22.2	1.8	-	-	-	2.9	0.0	0.0	2.4	-	-	0.5	1.3
Single-Unit Trucks	1	0	0	0	-	1	0	0	0	0	-	0	1	1	0	0	-	2	0	0	2	0	-	2	5
% Single-Unit Trucks	1.5	0.0	0.0	-	-	1.2	0.0	0.0	0.0	-	-	0.0	11.1	0.6	-	-	-	1.1	0.0	0.0	4.8	-	-	1.1	1.1
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	0.0	0.0	0.7	0.0	-	-	0.5	0.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	33.3	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-	-	2	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	66.7	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Dorchester Road & Jill Drive -
Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 1

Turning Movement Data

Start Time	Jill Drive Eastbound						Jill Drive Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
10:00 AM	18	2	2	0	0	22	0	2	4	0	2	6	1	37	0	0	2	38	1	24	3	0	0	28	94
10:15 AM	12	0	0	0	5	12	0	0	0	0	0	0	1	32	0	0	2	33	1	17	8	0	0	26	71
10:30 AM	21	1	1	0	0	23	0	1	3	0	6	4	2	24	4	0	3	30	1	37	11	0	2	49	106
10:45 AM	19	1	0	0	4	20	1	1	4	0	0	6	0	24	2	0	0	26	0	33	3	0	0	36	88
Hourly Total	70	4	3	0	9	77	1	4	11	0	8	16	4	117	6	0	7	127	3	111	25	0	2	139	359
11:00 AM	12	0	0	0	1	12	1	2	1	0	0	4	0	47	0	0	4	47	0	39	7	0	2	46	109
11:15 AM	19	3	1	0	6	23	1	0	3	0	0	4	0	45	0	0	2	45	0	33	5	0	1	38	110
11:30 AM	15	2	0	0	3	17	0	0	4	0	0	4	3	42	0	0	1	45	0	29	7	0	1	36	102
11:45 AM	14	0	1	0	3	15	0	0	1	0	2	1	1	49	0	0	0	50	0	26	4	0	0	30	96
Hourly Total	60	5	2	0	13	67	2	2	9	0	2	13	4	183	0	0	7	187	0	127	23	0	4	150	417
12:00 PM	14	0	0	0	3	14	0	2	1	0	0	3	0	36	0	0	1	36	0	37	12	0	0	49	102
12:15 PM	15	1	0	0	1	16	0	3	1	0	1	4	0	32	0	0	1	32	0	38	10	0	0	48	100
12:30 PM	4	1	1	0	5	6	0	3	3	0	0	6	2	42	0	0	2	44	2	47	12	0	0	61	117
12:45 PM	10	1	2	0	1	13	3	2	1	0	4	6	0	48	0	0	4	48	1	32	9	0	0	42	109
Hourly Total	43	3	3	0	10	49	3	10	6	0	5	19	2	158	0	0	8	160	3	154	43	0	0	200	428
1:00 PM	16	0	0	0	4	16	0	1	4	0	1	5	1	38	2	0	1	41	0	38	8	0	2	46	108
1:15 PM	15	1	1	0	0	17	0	0	1	0	5	1	1	31	0	0	0	32	2	33	6	0	0	41	91
1:30 PM	16	1	1	0	0	18	2	0	0	0	9	2	1	43	3	0	1	47	1	21	6	0	0	28	95
1:45 PM	18	3	1	0	2	22	1	2	1	0	3	4	1	42	0	0	0	43	2	31	7	0	0	40	109
Hourly Total	65	5	3	0	6	73	3	3	6	0	18	12	4	154	5	0	2	163	5	123	27	0	2	155	403
2:00 PM	14	2	0	0	1	16	1	2	1	0	0	4	1	43	0	0	0	44	2	28	9	0	0	39	103
2:15 PM	14	3	1	0	4	18	0	2	2	0	2	4	0	32	0	0	1	32	1	23	5	0	0	29	83
2:30 PM	11	3	0	0	0	14	0	2	1	0	1	3	1	33	0	0	3	34	3	25	11	0	0	39	90
2:45 PM	15	2	1	0	0	18	0	0	0	0	3	0	0	36	0	0	4	36	1	18	6	0	0	25	79
Hourly Total	54	10	2	0	5	66	1	6	4	0	6	11	2	144	0	0	8	146	7	94	31	0	0	132	355
3:00 PM	13	3	2	0	3	18	1	1	0	0	1	2	0	35	3	0	0	38	0	31	6	0	0	37	95
3:15 PM	16	2	0	0	2	18	0	0	1	0	1	1	0	30	0	0	0	30	0	30	6	0	0	36	85
3:30 PM	17	1	0	0	2	18	0	0	3	0	1	3	1	29	0	0	0	30	0	33	17	0	0	50	101
3:45 PM	11	0	3	0	4	14	0	5	0	0	0	5	1	32	1	0	1	34	2	32	7	0	0	41	94
Hourly Total	57	6	5	0	11	68	1	6	4	0	3	11	2	126	4	0	1	132	2	126	36	0	0	164	375
4:00 PM	10	3	1	0	1	14	1	0	5	0	3	6	1	30	0	0	0	31	0	42	7	0	2	49	100
4:15 PM	16	0	2	0	2	18	0	0	0	0	3	0	3	38	1	0	0	42	0	28	5	0	1	33	93
4:30 PM	7	1	0	0	0	8	0	1	1	0	3	2	1	29	1	0	1	31	1	24	10	0	2	35	76
4:45 PM	12	2	0	0	2	14	3	1	1	0	1	5	0	33	0	0	1	33	0	30	13	0	1	43	95
Hourly Total	45	6	3	0	5	54	4	2	7	0	10	13	5	130	2	0	2	137	1	124	35	0	6	160	364

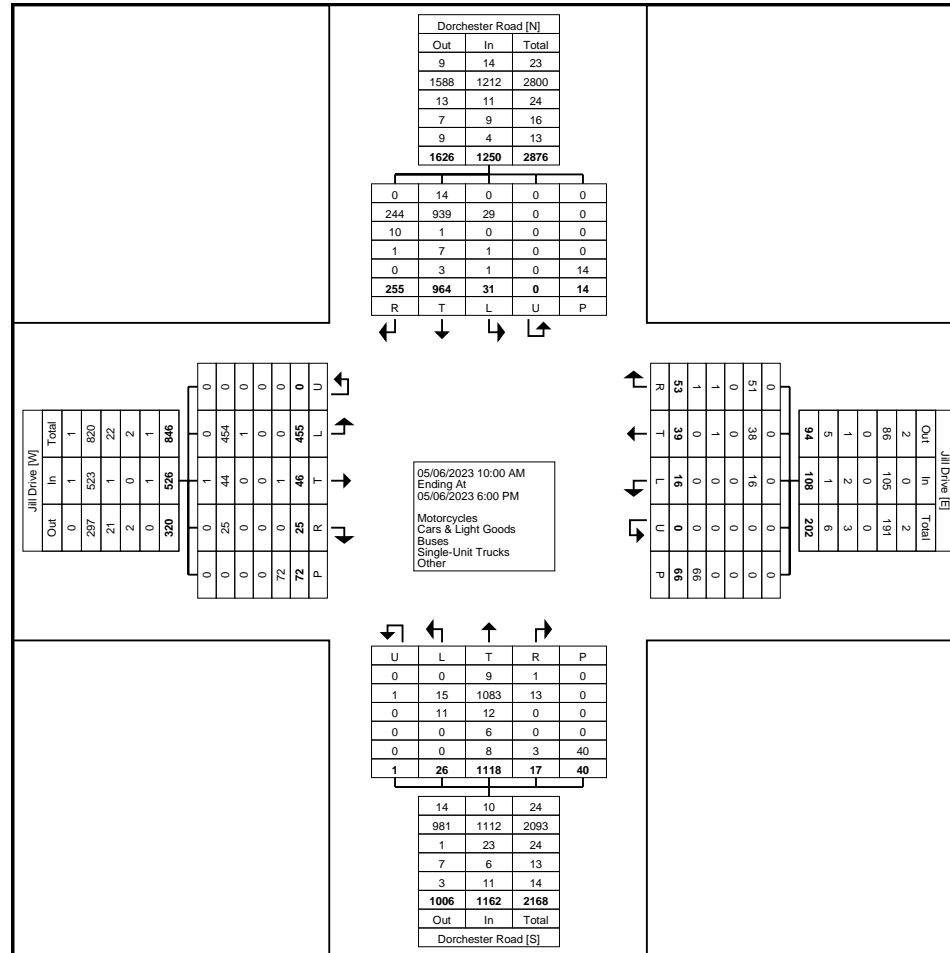
5:00 PM	18	2	2	0	7	22	1	1	1	0	1	3	1	29	0	0	2	30	2	26	11	0	0	39	94
5:15 PM	13	3	1	0	3	17	0	1	3	0	6	4	1	25	0	0	0	26	1	26	8	0	0	35	82
5:30 PM	15	0	0	0	1	15	0	2	1	0	1	3	1	25	0	0	0	26	4	35	7	0	0	46	90
5:45 PM	15	2	1	0	2	18	0	2	1	0	6	3	0	27	0	1	3	28	3	18	9	0	0	30	79
Hourly Total	61	7	4	0	13	72	1	6	6	0	14	13	3	106	0	1	5	110	10	105	35	0	0	150	345
Grand Total	455	46	25	0	72	526	16	39	53	0	66	108	26	1118	17	1	40	1162	31	964	255	0	14	1250	3046
Approach %	86.5	8.7	4.8	0.0	-	-	14.8	36.1	49.1	0.0	-	-	2.2	96.2	1.5	0.1	-	-	2.5	77.1	20.4	0.0	-	-	-
Total %	14.9	1.5	0.8	0.0	-	17.3	0.5	1.3	1.7	0.0	-	3.5	0.9	36.7	0.6	0.0	-	38.1	1.0	31.6	8.4	0.0	-	41.0	-
Motorcycles	0	1	0	0	-	1	0	0	0	0	-	0	0	9	1	0	-	10	0	14	0	0	-	14	25
% Motorcycles	0.0	2.2	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.8	5.9	0.0	-	0.9	0.0	1.5	0.0	-	-	1.1	0.8
Cars & Light Goods	454	44	25	0	-	523	16	38	51	0	-	105	15	1083	13	1	-	1112	29	939	244	0	-	1212	2952
% Cars & Light Goods	99.8	95.7	100.0	-	-	99.4	100.0	97.4	96.2	-	-	97.2	57.7	96.9	76.5	100.0	-	95.7	93.5	97.4	95.7	-	-	97.0	96.9
Buses	1	0	0	0	-	1	0	0	0	0	-	0	11	12	0	0	-	23	0	1	10	0	-	11	35
% Buses	0.2	0.0	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	42.3	1.1	0.0	0.0	-	2.0	0.0	0.1	3.9	-	-	0.9	1.1
Single-Unit Trucks	0	0	0	0	-	0	0	1	1	0	-	2	0	6	0	0	-	6	1	7	1	0	-	9	17
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	2.6	1.9	-	-	1.9	0.0	0.5	0.0	0.0	-	0.5	3.2	0.7	0.4	-	-	0.7	0.6
Articulated Trucks	0	0	0	0	-	0	0	0	1	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.9	-	-	0.9	0.0	0.1	0.0	0.0	-	0.1	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	1	0	0	-	1	0	0	0	0	-	0	0	7	3	0	-	10	1	3	0	0	-	4	15
% Bicycles on Road	0.0	2.2	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.6	17.6	0.0	-	0.9	3.2	0.3	0.0	-	-	0.3	0.5
Bicycles on Crosswalk	-	-	-	-	7	-	-	-	-	-	18	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	9.7	-	-	-	-	-	27.3	-	-	-	-	-	2.5	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	65	-	-	-	-	-	48	-	-	-	-	-	39	-	-	-	-	-	14	-	-
% Pedestrians	-	-	-	-	90.3	-	-	-	-	-	72.7	-	-	-	-	-	97.5	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Dorchester Road & Jill Drive - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Dorchester Road & Jill Drive -
Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 4

Turning Movement Peak Hour Data (12:15 PM)

Start Time	Jill Drive Eastbound						Jill Drive Westbound						Dorchester Road Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:15 PM	15	1	0	0	1	16	0	3	1	0	1	4	0	32	0	0	1	32	0	38	10	0	0	48	100
12:30 PM	4	1	1	0	5	6	0	3	3	0	0	6	2	42	0	0	2	44	2	47	12	0	0	61	117
12:45 PM	10	1	2	0	1	13	3	2	1	0	4	6	0	48	0	0	4	48	1	32	9	0	0	42	109
1:00 PM	16	0	0	0	4	16	0	1	4	0	1	5	1	38	2	0	1	41	0	38	8	0	2	46	108
Total	45	3	3	0	11	51	3	9	9	0	6	21	3	160	2	0	8	165	3	155	39	0	2	197	434
Approach %	88.2	5.9	5.9	0.0	-	-	14.3	42.9	42.9	0.0	-	-	1.8	97.0	1.2	0.0	-	-	1.5	78.7	19.8	0.0	-	-	-
Total %	10.4	0.7	0.7	0.0	-	11.8	0.7	2.1	2.1	0.0	-	4.8	0.7	36.9	0.5	0.0	-	38.0	0.7	35.7	9.0	0.0	-	45.4	-
PHF	0.703	0.750	0.375	0.000	-	0.797	0.250	0.750	0.563	0.000	-	0.875	0.375	0.833	0.250	0.000	-	0.859	0.375	0.824	0.813	0.000	-	0.807	0.927
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	4	0	0	-	4	4
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	2.6	0.0	-	-	2.0	0.9
Cars & Light Goods	44	3	3	0	-	50	3	9	9	0	-	21	2	153	2	0	-	157	3	150	38	0	-	191	419
% Cars & Light Goods	97.8	100.0	100.0	-	-	98.0	100.0	100.0	100.0	-	-	100.0	66.7	95.6	100.0	-	-	95.2	100.0	96.8	97.4	-	-	97.0	96.5
Buses	1	0	0	0	-	1	0	0	0	0	-	0	1	2	0	0	-	3	0	0	1	0	-	1	5
% Buses	2.2	0.0	0.0	-	-	2.0	0.0	0.0	0.0	-	-	0.0	33.3	1.3	0.0	-	-	1.8	0.0	0.0	2.6	-	-	0.5	1.2
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	2
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.3	0.0	-	-	1.2	0.0	0.0	0.0	-	-	0.0	0.5
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	3	0	0	-	3	0	1	0	0	-	1	4
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.9	0.0	-	-	1.8	0.0	0.6	0.0	-	-	0.5	0.9
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	16.7	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	11	-	-	-	-	-	5	-	-	-	-	-	8	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	83.3	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Dorchester Road & Oldfield Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 1

Turning Movement Data

Start Time	Dorchester Road Eastbound						Oldfield Road Westbound						Construction Driveway Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	1	0	0	0	0	1	0	2	10	0	0	12	0	0	0	0	0	0	5	0	5	0	1	10	23
7:15 AM	2	0	0	0	0	2	0	2	19	0	0	21	0	0	0	0	0	0	9	0	3	0	0	12	35
7:30 AM	7	0	0	0	0	7	1	0	21	0	0	22	0	0	0	0	0	0	7	0	11	0	0	18	47
7:45 AM	3	0	0	0	0	3	2	3	12	0	0	17	0	1	0	0	0	1	4	0	11	0	0	15	36
Hourly Total	13	0	0	0	0	13	3	7	62	0	0	72	0	1	0	0	0	1	25	0	30	0	1	55	141
8:00 AM	4	0	0	0	0	4	1	2	20	0	0	23	0	0	0	0	0	0	7	1	10	0	0	18	45
8:15 AM	5	1	0	0	0	6	0	3	11	0	0	14	0	1	0	0	0	1	5	0	4	0	0	9	30
8:30 AM	5	0	0	0	0	5	0	2	17	0	0	19	0	0	1	0	0	1	7	1	9	0	0	17	42
8:45 AM	1	1	0	0	0	2	0	0	20	0	0	20	0	0	0	0	0	0	8	0	7	0	0	15	37
Hourly Total	15	2	0	0	0	17	1	7	68	0	0	76	0	1	1	0	0	2	27	2	30	0	0	59	154
9:00 AM	4	3	0	0	0	7	1	0	11	0	0	12	0	0	0	0	0	0	11	0	6	0	2	17	36
9:15 AM	1	2	0	0	0	3	0	1	8	0	0	9	0	0	0	0	0	0	5	0	6	0	0	11	23
9:30 AM	1	0	0	0	0	1	0	1	14	0	0	15	0	2	1	0	0	3	12	0	8	0	0	20	39
9:45 AM	7	1	0	0	0	8	0	4	12	0	0	16	0	0	0	0	0	0	7	0	5	0	0	12	36
Hourly Total	13	6	0	0	0	19	1	6	45	0	0	52	0	2	1	0	0	3	35	0	25	0	2	60	134
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	6	1	0	0	1	7	0	3	9	0	0	12	0	0	0	0	1	0	5	0	13	0	0	18	37
11:45 AM	15	4	0	0	0	19	0	3	14	0	0	17	0	0	0	0	0	0	7	0	18	0	0	25	61
Hourly Total	21	5	0	0	1	26	0	6	23	0	0	29	0	0	0	0	1	0	12	0	31	0	0	43	98
12:00 PM	17	9	0	0	0	26	2	2	5	0	0	9	0	1	0	0	0	1	3	0	6	0	0	9	45
12:15 PM	9	3	0	0	0	12	0	6	10	1	0	17	1	1	1	0	0	3	6	0	7	0	0	13	45
12:30 PM	8	2	0	0	0	10	0	3	6	0	0	9	0	0	0	0	0	0	5	0	8	0	0	13	32
12:45 PM	4	0	0	0	0	4	0	2	9	0	0	11	0	0	0	0	0	0	11	0	14	0	0	25	40
Hourly Total	38	14	0	0	0	52	2	13	30	1	0	46	1	2	1	0	0	4	25	0	35	0	0	60	162
1:00 PM	9	2	0	0	0	11	0	2	5	0	0	7	0	0	0	0	0	0	13	0	6	0	0	19	37
1:15 PM	9	3	0	0	0	12	0	1	12	0	0	13	0	0	0	0	0	0	9	0	5	0	0	14	39
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	18	5	0	0	0	23	0	3	17	0	0	20	0	0	0	0	0	0	22	0	11	0	0	33	76
4:00 PM	19	5	0	0	0	24	0	3	20	0	0	23	0	0	0	0	0	0	20	0	15	1	0	36	83
4:15 PM	13	2	0	0	0	15	0	3	13	0	0	16	0	0	0	0	0	0	17	0	14	0	0	31	62
4:30 PM	19	1	0	0	0	20	0	3	19	0	0	22	0	0	0	0	0	0	18	0	13	1	0	32	74
4:45 PM	18	3	0	0	1	21	0	2	12	0	0	14	0	0	0	0	0	0	20	0	12	0	1	32	67
Hourly Total	69	11	0	0	1	80	0	11	64	0	0	75	0	0	0	0	0	0	75	0	54	2	1	131	286
5:00 PM	24	4	0	0	0	28	0	4	17	0	0	21	0	0	0	0	0	0	17	0	13	0	0	30	79
5:15 PM	6	1	0	0	0	7	0	3	21	0	0	24	0	0	0	0	0	0	12	0	9	0	0	21	52

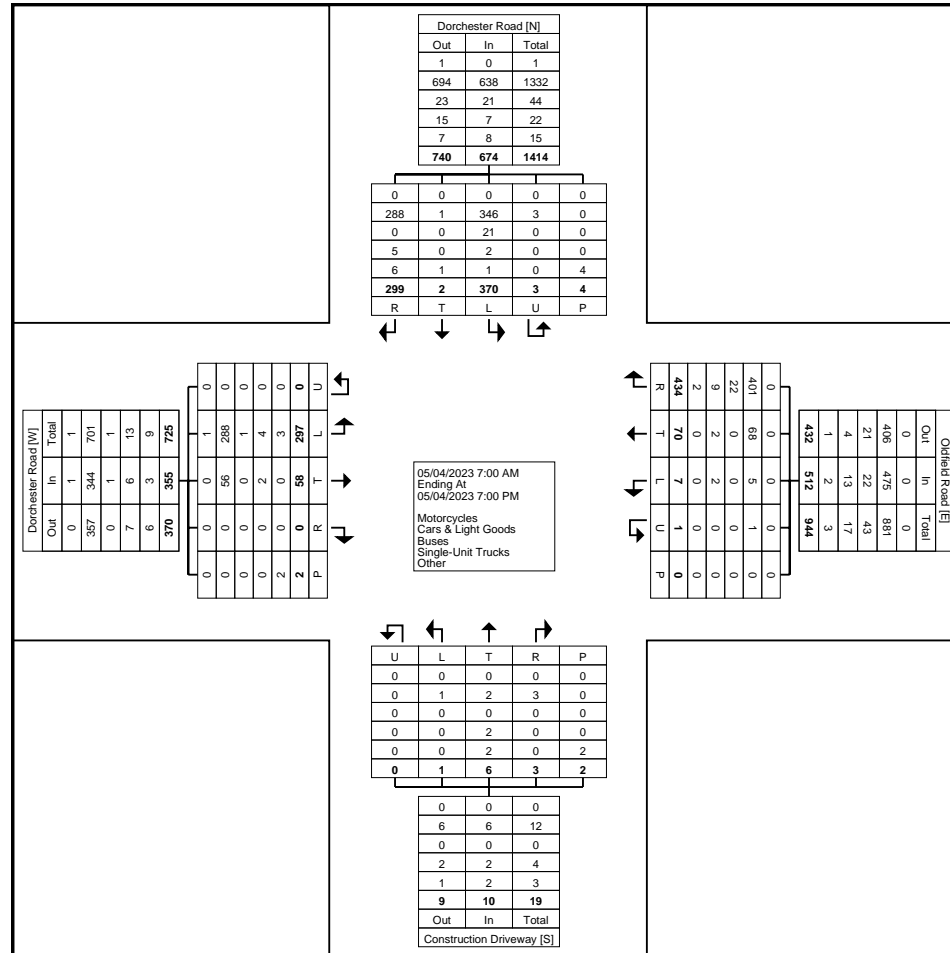
5:30 PM	22	1	0	0	0	23	0	4	22	0	0	26	0	0	0	0	1	0	19	0	15	0	0	34	83
5:45 PM	19	2	0	0	0	21	0	4	9	0	0	13	0	0	0	0	0	0	22	0	17	0	0	39	73
Hourly Total	71	8	0	0	0	79	0	15	69	0	0	84	0	0	0	0	1	0	70	0	54	0	0	124	287
6:00 PM	16	2	0	0	0	18	0	1	17	0	0	18	0	0	0	0	0	0	18	0	7	0	0	25	61
6:15 PM	7	1	0	0	0	8	0	0	12	0	0	12	0	0	0	0	0	0	27	0	2	1	0	30	50
6:30 PM	4	2	0	0	0	6	0	0	16	0	0	16	0	0	0	0	0	0	22	0	10	0	0	32	54
6:45 PM	12	2	0	0	0	14	0	1	11	0	0	12	0	0	0	0	0	0	12	0	10	0	0	22	48
Hourly Total	39	7	0	0	0	46	0	2	56	0	0	58	0	0	0	0	0	0	79	0	29	1	0	109	213
Grand Total	297	58	0	0	2	355	7	70	434	1	0	512	1	6	3	0	2	10	370	2	299	3	4	674	1551
Approach %	83.7	16.3	0.0	0.0	-	-	1.4	13.7	84.8	0.2	-	-	10.0	60.0	30.0	0.0	-	-	54.9	0.3	44.4	0.4	-	-	-
Total %	19.1	3.7	0.0	0.0	-	22.9	0.5	4.5	28.0	0.1	-	33.0	0.1	0.4	0.2	0.0	-	0.6	23.9	0.1	19.3	0.2	-	43.5	-
Motorcycles	1	0	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Motorcycles	0.3	0.0	-	-	-	0.3	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.1
Cars & Light Goods	288	56	0	0	-	344	5	68	401	1	-	475	1	2	3	0	-	6	346	1	288	3	-	638	1463
% Cars & Light Goods	97.0	96.6	-	-	-	96.9	71.4	97.1	92.4	100.0	-	92.8	100.0	33.3	100.0	-	-	60.0	93.5	50.0	96.3	100.0	-	94.7	94.3
Buses	1	0	0	0	-	1	0	0	22	0	-	22	0	0	0	0	-	0	21	0	0	0	-	21	44
% Buses	0.3	0.0	-	-	-	0.3	0.0	0.0	5.1	0.0	-	4.3	0.0	0.0	0.0	-	-	0.0	5.7	0.0	0.0	0.0	-	3.1	2.8
Single-Unit Trucks	4	2	0	0	-	6	2	2	9	0	-	13	0	2	0	0	-	2	2	0	5	0	-	7	28
% Single-Unit Trucks	1.3	3.4	-	-	-	1.7	28.6	2.9	2.1	0.0	-	2.5	0.0	33.3	0.0	-	-	20.0	0.5	0.0	1.7	0.0	-	1.0	1.8
Articulated Trucks	2	0	0	0	-	2	0	0	0	0	-	0	0	2	0	0	-	2	1	1	3	0	-	5	9
% Articulated Trucks	0.7	0.0	-	-	-	0.6	0.0	0.0	0.0	0.0	-	0.0	0.0	33.3	0.0	-	-	20.0	0.3	50.0	1.0	0.0	-	0.7	0.6
Bicycles on Road	1	0	0	0	-	1	0	0	2	0	-	2	0	0	0	0	-	0	0	0	3	0	-	3	6
% Bicycles on Road	0.3	0.0	-	-	-	0.3	0.0	0.0	0.5	0.0	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.0	0.0	-	0.4	0.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	2	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Dorchester Road & Oldfield Road
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Start Date: 05/04/2023
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Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Dorchester Road & Oldfield Road
Site Code: 220542
Start Date: 05/04/2023
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Turning Movement Peak Hour Data (7:15 AM)

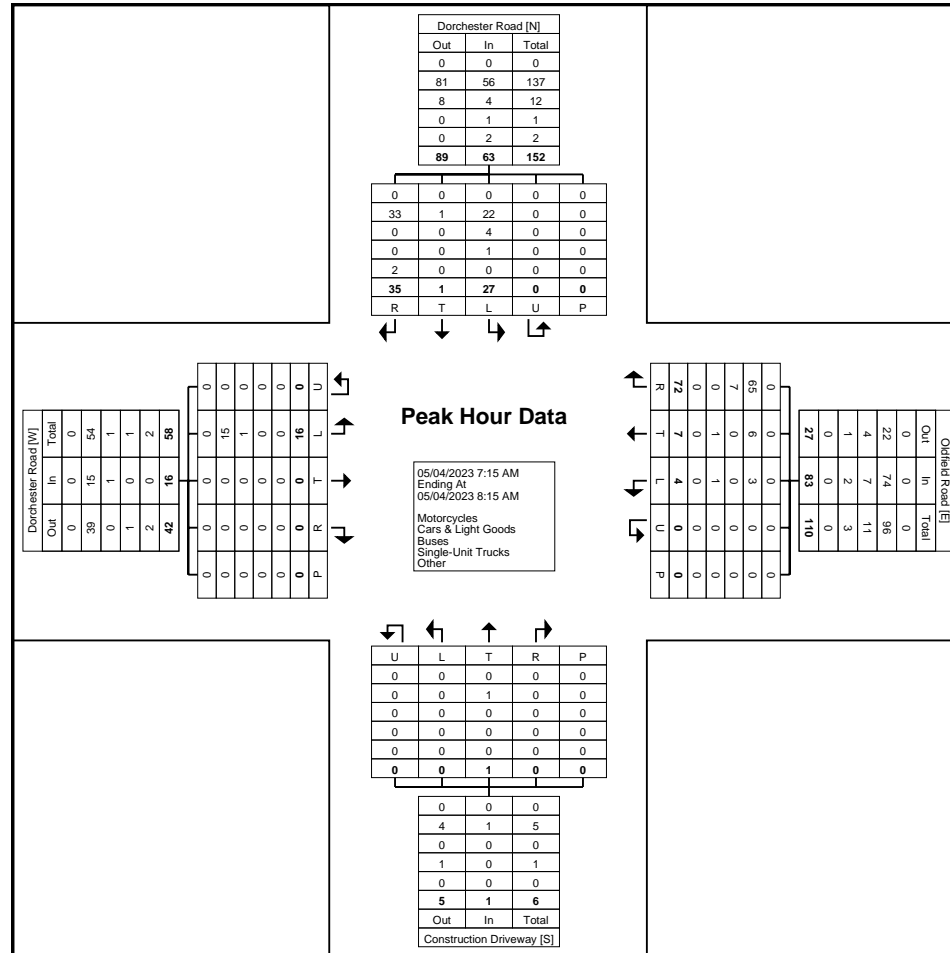
Start Time	Dorchester Road Eastbound						Oldfield Road Westbound						Construction Driveway Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:15 AM	2	0	0	0	0	2	0	2	19	0	0	21	0	0	0	0	0	0	9	0	3	0	0	12	35
7:30 AM	7	0	0	0	0	7	1	0	21	0	0	22	0	0	0	0	0	0	7	0	11	0	0	18	47
7:45 AM	3	0	0	0	0	3	2	3	12	0	0	17	0	1	0	0	0	1	4	0	11	0	0	15	36
8:00 AM	4	0	0	0	0	4	1	2	20	0	0	23	0	0	0	0	0	0	7	1	10	0	0	18	45
Total	16	0	0	0	0	16	4	7	72	0	0	83	0	1	0	0	0	1	27	1	35	0	0	63	163
Approach %	100.0	0.0	0.0	0.0	-	-	4.8	8.4	86.7	0.0	-	-	0.0	100.0	0.0	0.0	-	-	42.9	1.6	55.6	0.0	-	-	-
Total %	9.8	0.0	0.0	0.0	-	9.8	2.5	4.3	44.2	0.0	-	50.9	0.0	0.6	0.0	0.0	-	0.6	16.6	0.6	21.5	0.0	-	38.7	-
PHF	0.571	0.000	0.000	0.000	-	0.571	0.500	0.583	0.857	0.000	-	0.902	0.000	0.250	0.000	0.000	-	0.250	0.750	0.250	0.795	0.000	-	0.875	0.867
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	-	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	15	0	0	0	-	15	3	6	65	0	-	74	0	1	0	0	-	1	22	1	33	0	-	56	146
% Cars & Light Goods	93.8	-	-	-	-	93.8	75.0	85.7	90.3	-	-	89.2	-	100.0	-	-	-	100.0	81.5	100.0	94.3	-	-	88.9	89.6
Buses	1	0	0	0	-	1	0	0	7	0	-	7	0	0	0	0	-	0	4	0	0	0	-	4	12
% Buses	6.3	-	-	-	-	6.3	0.0	0.0	9.7	-	-	8.4	-	0.0	-	-	-	0.0	14.8	0.0	0.0	-	-	6.3	7.4
Single-Unit Trucks	0	0	0	0	-	0	1	1	0	0	-	2	0	0	0	0	-	0	1	0	0	0	-	1	3
% Single-Unit Trucks	0.0	-	-	-	-	0.0	25.0	14.3	0.0	-	-	2.4	-	0.0	-	-	-	0.0	3.7	0.0	0.0	-	-	1.6	1.8
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	2	0	-	2	2
% Articulated Trucks	0.0	-	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	-	0.0	0.0	0.0	5.7	-	-	3.2	1.2
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	-	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Dorchester Road & Oldfield Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 5



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



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Count Name: Dorchester Road & Oldfield Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 6

Turning Movement Peak Hour Data (11:30 AM)

Start Time	Dorchester Road Eastbound						Oldfield Road Westbound						Construction Driveway Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
11:30 AM	6	1	0	0	1	7	0	3	9	0	0	12	0	0	0	0	1	0	5	0	13	0	0	18	37
11:45 AM	15	4	0	0	0	19	0	3	14	0	0	17	0	0	0	0	0	0	7	0	18	0	0	25	61
12:00 PM	17	9	0	0	0	26	2	2	5	0	0	9	0	1	0	0	0	1	3	0	6	0	0	9	45
12:15 PM	9	3	0	0	0	12	0	6	10	1	0	17	1	1	1	0	0	3	6	0	7	0	0	13	45
Total	47	17	0	0	1	64	2	14	38	1	0	55	1	2	1	0	1	4	21	0	44	0	0	65	188
Approach %	73.4	26.6	0.0	0.0	-	-	3.6	25.5	69.1	1.8	-	-	25.0	50.0	25.0	0.0	-	-	32.3	0.0	67.7	0.0	-	-	-
Total %	25.0	9.0	0.0	0.0	-	34.0	1.1	7.4	20.2	0.5	-	29.3	0.5	1.1	0.5	0.0	-	2.1	11.2	0.0	23.4	0.0	-	34.6	-
PHF	0.691	0.472	0.000	0.000	-	0.615	0.250	0.583	0.679	0.250	-	0.809	0.250	0.500	0.250	0.000	-	0.333	0.750	0.000	0.611	0.000	-	0.650	0.770
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0
Cars & Light Goods	46	17	0	0	-	63	2	14	37	1	-	54	1	0	1	0	-	2	19	0	44	0	-	63	182
% Cars & Light Goods	97.9	100.0	-	-	-	98.4	100.0	100.0	97.4	100.0	-	98.2	100.0	0.0	100.0	-	-	50.0	90.5	-	100.0	-	-	96.9	96.8
Buses	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	-	0	1	0	0	0	-	1	2
% Buses	0.0	0.0	-	-	-	0.0	0.0	0.0	2.6	0.0	-	1.8	0.0	0.0	0.0	-	-	0.0	4.8	-	0.0	-	-	1.5	1.1
Single-Unit Trucks	1	0	0	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	2
% Single-Unit Trucks	2.1	0.0	-	-	-	1.6	0.0	0.0	0.0	0.0	-	0.0	0.0	50.0	0.0	-	-	25.0	0.0	-	0.0	-	-	0.0	1.1
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1	0	0	0	-	1	2
% Articulated Trucks	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	50.0	0.0	-	-	25.0	4.8	-	0.0	-	-	1.5	1.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
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Count Name: Dorchester Road & Oldfield Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 8

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Dorchester Road Eastbound						Oldfield Road Westbound						Construction Driveway Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
5:00 PM	24	4	0	0	0	28	0	4	17	0	0	21	0	0	0	0	0	0	17	0	13	0	0	30	79
5:15 PM	6	1	0	0	0	7	0	3	21	0	0	24	0	0	0	0	0	0	12	0	9	0	0	21	52
5:30 PM	22	1	0	0	0	23	0	4	22	0	0	26	0	0	0	0	1	0	19	0	15	0	0	34	83
5:45 PM	19	2	0	0	0	21	0	4	9	0	0	13	0	0	0	0	0	0	22	0	17	0	0	39	73
Total	71	8	0	0	0	79	0	15	69	0	0	84	0	0	0	0	1	0	70	0	54	0	0	124	287
Approach %	89.9	10.1	0.0	0.0	-	-	0.0	17.9	82.1	0.0	-	-	0.0	0.0	0.0	0.0	-	-	56.5	0.0	43.5	0.0	-	-	-
Total %	24.7	2.8	0.0	0.0	-	27.5	0.0	5.2	24.0	0.0	-	29.3	0.0	0.0	0.0	0.0	-	0.0	24.4	0.0	18.8	0.0	-	43.2	-
PHF	0.740	0.500	0.000	0.000	-	0.705	0.000	0.938	0.784	0.000	-	0.808	0.000	0.000	0.000	0.000	-	0.000	0.795	0.000	0.794	0.000	-	0.795	0.864
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	-	0.0	-	0.0	0.0	-	-	0.0	-	-	-	-	-	-	0.0	-	0.0	-	-	0.0	0.0
Cars & Light Goods	70	8	0	0	-	78	0	15	66	0	-	81	0	0	0	0	-	0	68	0	54	0	-	122	281
% Cars & Light Goods	98.6	100.0	-	-	-	98.7	-	100.0	95.7	-	-	96.4	-	-	-	-	-	-	97.1	-	100.0	-	-	98.4	97.9
Buses	0	0	0	0	-	0	0	0	2	0	-	2	0	0	0	0	-	0	2	0	0	0	-	2	4
% Buses	0.0	0.0	-	-	-	0.0	-	0.0	2.9	-	-	2.4	-	-	-	-	-	-	2.9	-	0.0	-	-	1.6	1.4
Single-Unit Trucks	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Single-Unit Trucks	0.0	0.0	-	-	-	0.0	-	0.0	1.4	-	-	1.2	-	-	-	-	-	-	0.0	-	0.0	-	-	0.0	0.3
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	-	0.0	-	0.0	0.0	-	-	0.0	-	-	-	-	-	-	0.0	-	0.0	-	-	0.0	0.0
Bicycles on Road	1	0	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	1.4	0.0	-	-	-	1.3	-	0.0	0.0	-	-	0.0	-	-	-	-	-	-	0.0	-	0.0	-	-	0.0	0.3
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
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Count Name: Dorchester Road & Oldfield Road -
Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 1

Turning Movement Data

Start Time	Dorchester Road Eastbound						Oldfield Road Westbound						Construction Driveway Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
10:00 AM	25	4	0	0	0	29	0	2	10	0	0	12	0	0	0	0	0	0	11	0	15	0	1	26	67
10:15 AM	10	3	0	0	0	13	0	1	15	0	0	16	0	0	0	0	1	0	14	0	4	0	0	18	47
10:30 AM	11	2	0	0	0	13	0	0	13	0	0	13	0	0	0	0	1	0	13	0	8	0	0	21	47
10:45 AM	7	1	0	0	0	8	0	4	14	0	0	18	0	0	0	0	0	0	17	0	12	0	0	29	55
Hourly Total	53	10	0	0	0	63	0	7	52	0	0	59	0	0	0	0	2	0	55	0	39	0	1	94	216
11:00 AM	21	4	0	0	1	25	0	4	15	0	0	19	0	0	0	0	0	0	22	0	20	0	1	42	86
11:15 AM	17	3	0	0	0	20	0	3	18	0	0	21	0	0	0	0	0	0	14	0	8	0	0	22	63
11:30 AM	11	0	0	0	0	11	0	0	19	0	0	19	0	0	0	0	0	0	10	0	12	0	0	22	52
11:45 AM	18	2	0	0	1	20	0	2	22	0	0	24	0	0	0	0	1	0	8	0	15	0	0	23	67
Hourly Total	67	9	0	0	2	76	0	9	74	0	0	83	0	0	0	0	1	0	54	0	55	0	1	109	268
12:00 PM	13	1	0	0	0	14	0	3	9	0	0	12	0	0	0	0	0	0	16	0	15	1	0	32	58
12:15 PM	8	1	0	0	0	9	0	0	17	1	0	18	0	0	0	0	0	0	12	0	20	0	0	32	59
12:30 PM	20	3	0	0	0	23	0	8	18	0	0	26	0	0	0	0	0	0	24	0	19	0	0	43	92
12:45 PM	21	6	0	0	0	27	0	2	19	0	0	21	0	0	0	0	0	0	15	0	18	0	0	33	81
Hourly Total	62	11	0	0	0	73	0	13	63	1	0	77	0	0	0	0	0	0	67	0	72	1	0	140	290
1:00 PM	14	2	0	0	0	16	0	2	12	0	0	14	0	0	0	0	0	0	18	0	11	0	0	29	59
1:15 PM	15	3	0	0	0	18	0	3	9	0	0	12	0	0	0	0	0	0	19	0	14	0	0	33	63
1:30 PM	14	2	0	0	0	16	0	1	21	0	0	22	0	0	0	0	0	0	13	0	10	0	0	23	61
1:45 PM	11	2	0	0	0	13	0	2	22	0	0	24	0	0	0	0	0	0	18	0	18	0	0	36	73
Hourly Total	54	9	0	0	0	63	0	8	64	0	0	72	0	0	0	0	0	0	68	0	53	0	0	121	256
2:00 PM	20	0	0	0	0	20	0	3	12	0	0	15	0	0	0	0	0	0	17	0	12	2	0	31	66
2:15 PM	4	4	0	0	0	8	0	0	20	0	0	20	0	0	0	0	0	0	18	0	10	1	0	29	57
2:30 PM	7	1	0	0	0	8	0	3	24	0	0	27	0	0	0	0	0	0	13	0	9	0	0	22	57
2:45 PM	8	0	0	0	0	8	0	11	16	0	0	27	0	0	0	0	0	0	11	0	9	0	0	20	55
Hourly Total	39	5	0	0	0	44	0	17	72	0	0	89	0	0	0	0	0	0	59	0	40	3	0	102	235
3:00 PM	16	2	0	0	0	18	0	0	14	0	0	14	0	0	0	0	0	0	15	0	7	0	0	22	54
3:15 PM	6	1	0	0	0	7	0	0	8	0	0	8	0	0	0	0	0	0	13	0	11	0	0	24	39
3:30 PM	7	2	0	0	0	9	0	1	13	0	0	14	0	0	0	0	0	0	12	0	5	1	2	18	41
3:45 PM	6	10	0	0	0	16	0	3	16	0	0	19	0	0	0	0	0	0	20	0	2	1	0	23	58
Hourly Total	35	15	0	0	0	50	0	4	51	0	0	55	0	0	0	0	0	0	60	0	25	2	2	87	192
4:00 PM	2	3	0	0	0	5	0	3	13	0	0	16	0	0	0	0	0	0	18	0	9	0	0	27	48
4:15 PM	13	2	0	0	0	15	0	4	19	0	0	23	0	0	0	0	0	0	18	0	6	0	0	24	62
4:30 PM	5	3	0	0	0	8	0	1	15	0	0	16	0	0	0	0	0	0	13	0	3	1	0	17	41
4:45 PM	4	1	0	0	0	5	0	2	21	0	0	23	0	0	0	0	1	0	22	0	11	0	0	33	61
Hourly Total	24	9	0	0	0	33	0	10	68	0	0	78	0	0	0	0	1	0	71	0	29	1	0	101	212

5:00 PM	5	2	0	0	0	7	0	1	19	0	0	20	0	0	0	0	0	14	0	6	0	0	20	47
5:15 PM	4	0	0	0	2	4	0	3	10	0	0	13	0	0	0	0	0	12	0	7	0	2	19	36
5:30 PM	2	1	0	0	0	3	0	0	18	0	0	18	0	0	0	0	0	19	0	6	0	0	25	46
5:45 PM	10	2	0	0	0	12	0	1	11	0	0	12	0	0	0	0	0	13	0	3	0	0	16	40
Hourly Total	21	5	0	0	2	26	0	5	58	0	0	63	0	0	0	0	0	58	0	22	0	2	80	169
Grand Total	355	73	0	0	4	428	0	73	502	1	0	576	0	0	0	0	4	492	0	335	7	6	834	1838
Approach %	82.9	17.1	0.0	0.0	-	-	0.0	12.7	87.2	0.2	-	-	0.0	0.0	0.0	0.0	-	59.0	0.0	40.2	0.8	-	-	-
Total %	19.3	4.0	0.0	0.0	-	23.3	0.0	4.0	27.3	0.1	-	31.3	0.0	0.0	0.0	0.0	-	26.8	0.0	18.2	0.4	-	45.4	-
Motorcycles	6	2	0	0	-	8	0	5	2	0	-	7	0	0	0	0	-	2	0	13	1	-	16	31
% Motorcycles	1.7	2.7	-	-	-	1.9	-	6.8	0.4	0.0	-	1.2	-	-	-	-	-	0.4	-	3.9	14.3	-	1.9	1.7
Cars & Light Goods	336	62	0	0	-	398	0	60	476	1	-	537	0	0	0	0	-	470	0	312	6	-	788	1723
% Cars & Light Goods	94.6	84.9	-	-	-	93.0	-	82.2	94.8	100.0	-	93.2	-	-	-	-	-	95.5	-	93.1	85.7	-	94.5	93.7
Buses	0	0	0	0	-	0	0	0	11	0	-	11	0	0	0	0	-	11	0	0	0	-	11	22
% Buses	0.0	0.0	-	-	-	0.0	-	0.0	2.2	0.0	-	1.9	-	-	-	-	-	2.2	-	0.0	0.0	-	1.3	1.2
Single-Unit Trucks	1	0	0	0	-	1	0	0	3	0	-	3	0	0	0	0	-	3	0	2	0	-	5	9
% Single-Unit Trucks	0.3	0.0	-	-	-	0.2	-	0.0	0.6	0.0	-	0.5	-	-	-	-	-	0.6	-	0.6	0.0	-	0.6	0.5
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1	0	1	0	-	2	2
% Articulated Trucks	0.0	0.0	-	-	-	0.0	-	0.0	0.0	0.0	-	0.0	-	-	-	-	-	0.2	-	0.3	0.0	-	0.2	0.1
Bicycles on Road	12	9	0	0	-	21	0	8	10	0	-	18	0	0	0	0	-	5	0	7	0	-	12	51
% Bicycles on Road	3.4	12.3	-	-	-	4.9	-	11.0	2.0	0.0	-	3.1	-	-	-	-	-	1.0	-	2.1	0.0	-	1.4	2.8
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	4	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	6	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Dorchester Road & Oldfield Road -
Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 4

Turning Movement Peak Hour Data (12:30 PM)

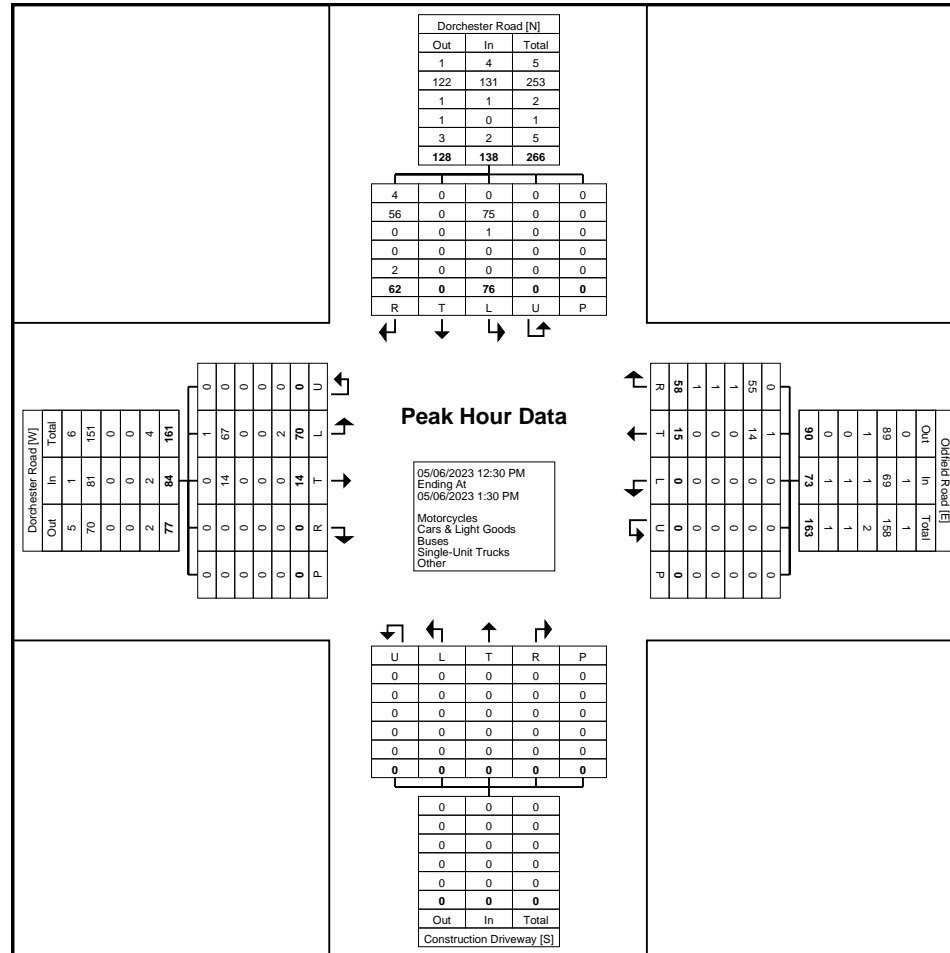
Start Time	Dorchester Road Eastbound						Oldfield Road Westbound						Construction Driveway Northbound						Dorchester Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:30 PM	20	3	0	0	0	23	0	8	18	0	0	26	0	0	0	0	0	0	24	0	19	0	0	43	92
12:45 PM	21	6	0	0	0	27	0	2	19	0	0	21	0	0	0	0	0	0	15	0	18	0	0	33	81
1:00 PM	14	2	0	0	0	16	0	2	12	0	0	14	0	0	0	0	0	0	18	0	11	0	0	29	59
1:15 PM	15	3	0	0	0	18	0	3	9	0	0	12	0	0	0	0	0	0	19	0	14	0	0	33	63
Total	70	14	0	0	0	84	0	15	58	0	0	73	0	0	0	0	0	0	76	0	62	0	0	138	295
Approach %	83.3	16.7	0.0	0.0	-	-	0.0	20.5	79.5	0.0	-	-	0.0	0.0	0.0	0.0	-	-	55.1	0.0	44.9	0.0	-	-	-
Total %	23.7	4.7	0.0	0.0	-	28.5	0.0	5.1	19.7	0.0	-	24.7	0.0	0.0	0.0	0.0	-	0.0	25.8	0.0	21.0	0.0	-	46.8	-
PHF	0.833	0.583	0.000	0.000	-	0.778	0.000	0.469	0.763	0.000	-	0.702	0.000	0.000	0.000	0.000	-	0.000	0.792	0.000	0.816	0.000	-	0.802	0.802
Motorcycles	1	0	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	0	4	0	-	4	6
% Motorcycles	1.4	0.0	-	-	-	1.2	-	6.7	0.0	-	-	1.4	-	-	-	-	-	-	0.0	-	6.5	-	-	2.9	2.0
Cars & Light Goods	67	14	0	0	-	81	0	14	55	0	-	69	0	0	0	0	-	0	75	0	56	0	-	131	281
% Cars & Light Goods	95.7	100.0	-	-	-	96.4	-	93.3	94.8	-	-	94.5	-	-	-	-	-	-	98.7	-	90.3	-	-	94.9	95.3
Buses	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	-	0	1	0	0	0	-	1	2
% Buses	0.0	0.0	-	-	-	0.0	-	0.0	1.7	-	-	1.4	-	-	-	-	-	-	1.3	-	0.0	-	-	0.7	0.7
Single-Unit Trucks	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Single-Unit Trucks	0.0	0.0	-	-	-	0.0	-	0.0	1.7	-	-	1.4	-	-	-	-	-	-	0.0	-	0.0	-	-	0.0	0.3
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	-	0.0	-	0.0	0.0	-	-	0.0	-	-	-	-	-	-	0.0	-	0.0	-	-	0.0	0.0
Bicycles on Road	2	0	0	0	-	2	0	0	1	0	-	1	0	0	0	0	-	0	0	0	2	0	-	2	5
% Bicycles on Road	2.9	0.0	-	-	-	2.4	-	0.0	1.7	-	-	1.4	-	-	-	-	-	-	0.0	-	3.2	-	-	1.4	1.7
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Dorchester Road & Oldfield Road - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 5



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



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Chippawa Parkway & Stanley Avenue
Site Code: 220542
Start Date: 05/04/2023
Page No: 1

Turning Movement Data

Start Time	Chippawa Parkway Eastbound						Chippawa Parkway Westbound						Stanley Avenue Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	0	1	0	0	1	1	1	2	0	0	4	1	44	0	0	0	45	2	24	0	0	0	26	76
7:15 AM	0	0	2	0	0	2	5	1	2	0	0	8	3	50	2	0	0	55	3	19	1	0	0	23	88
7:30 AM	3	0	0	0	0	3	0	1	5	0	2	6	4	44	1	0	0	49	1	20	3	0	0	24	82
7:45 AM	2	1	4	0	0	7	1	0	7	0	0	8	3	81	2	0	0	86	6	29	1	0	1	36	137
Hourly Total	5	1	7	0	0	13	7	3	16	0	2	26	11	219	5	0	0	235	12	92	5	0	1	109	383
8:00 AM	1	1	1	0	0	3	0	0	2	0	0	2	5	38	0	0	0	43	4	24	1	0	2	29	77
8:15 AM	0	0	3	0	0	3	2	0	2	0	0	4	0	54	1	0	0	55	1	26	3	0	2	30	92
8:30 AM	0	0	3	0	0	3	3	0	2	0	0	5	3	50	2	0	0	55	0	26	0	0	1	26	89
8:45 AM	1	2	4	0	0	7	3	0	0	0	0	3	2	44	0	0	0	46	3	27	1	0	0	31	87
Hourly Total	2	3	11	0	0	16	8	0	6	0	0	14	10	186	3	0	0	199	8	103	5	0	5	116	345
9:00 AM	3	1	1	0	0	5	0	2	2	0	0	4	3	35	0	0	1	38	1	17	3	0	1	21	68
9:15 AM	1	2	2	0	0	5	1	0	3	0	0	4	6	37	0	0	0	43	1	17	0	0	0	18	70
9:30 AM	0	3	2	0	0	5	2	2	1	0	0	5	2	27	0	0	0	29	2	17	1	0	0	20	59
9:45 AM	0	1	5	0	0	6	4	2	1	0	0	7	2	28	1	0	0	31	0	20	0	0	0	20	64
Hourly Total	4	7	10	0	0	21	7	6	7	0	0	20	13	127	1	0	1	141	4	71	4	0	1	79	261
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	2	5	4	0	0	11	0	2	3	0	0	5	2	31	0	0	0	33	5	30	1	0	0	36	85
11:45 AM	3	0	4	0	0	7	0	3	4	0	0	7	1	30	2	0	0	33	3	25	3	0	0	31	78
Hourly Total	5	5	8	0	0	18	0	5	7	0	0	12	3	61	2	0	0	66	8	55	4	0	0	67	163
12:00 PM	1	1	2	0	0	4	1	2	4	0	0	7	7	32	2	0	0	41	10	40	3	0	0	53	105
12:15 PM	2	0	3	1	0	6	1	2	5	0	0	8	6	37	3	0	0	46	2	36	3	0	0	41	101
12:30 PM	0	1	3	0	0	4	5	1	3	0	1	9	0	32	0	0	0	32	3	29	1	0	1	33	78
12:45 PM	4	2	5	0	0	11	0	2	4	0	0	6	5	32	3	0	0	40	2	24	5	0	0	31	88
Hourly Total	7	4	13	1	0	25	7	7	16	0	1	30	18	133	8	0	0	159	17	129	12	0	1	158	372
1:00 PM	3	0	0	0	0	3	0	0	2	0	0	2	3	34	1	0	0	38	2	24	2	0	0	28	71
1:15 PM	2	3	5	0	0	10	1	3	2	0	0	6	3	35	3	0	0	41	1	31	0	0	0	32	89
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	5	3	5	0	0	13	1	3	4	0	0	8	6	69	4	0	0	79	3	55	2	0	0	60	160
4:00 PM	0	3	7	0	0	10	2	2	0	0	0	4	4	36	6	0	0	46	1	99	3	0	0	103	163
4:15 PM	4	4	5	0	0	13	2	1	1	0	0	4	1	39	5	0	0	45	3	68	1	0	0	72	134
4:30 PM	1	1	10	0	0	12	4	1	1	0	2	6	5	26	2	0	0	33	4	81	2	0	0	87	138
4:45 PM	0	3	3	0	0	6	2	1	1	0	0	4	5	50	3	0	0	58	1	52	2	0	0	55	123
Hourly Total	5	11	25	0	0	41	10	5	3	0	2	18	15	151	16	0	0	182	9	300	8	0	0	317	558
5:00 PM	1	2	8	0	0	11	4	1	2	0	0	7	7	26	2	0	0	35	1	84	3	0	0	88	141
5:15 PM	0	3	3	0	0	6	1	0	0	0	0	1	6	31	6	0	1	43	1	39	3	0	0	43	93

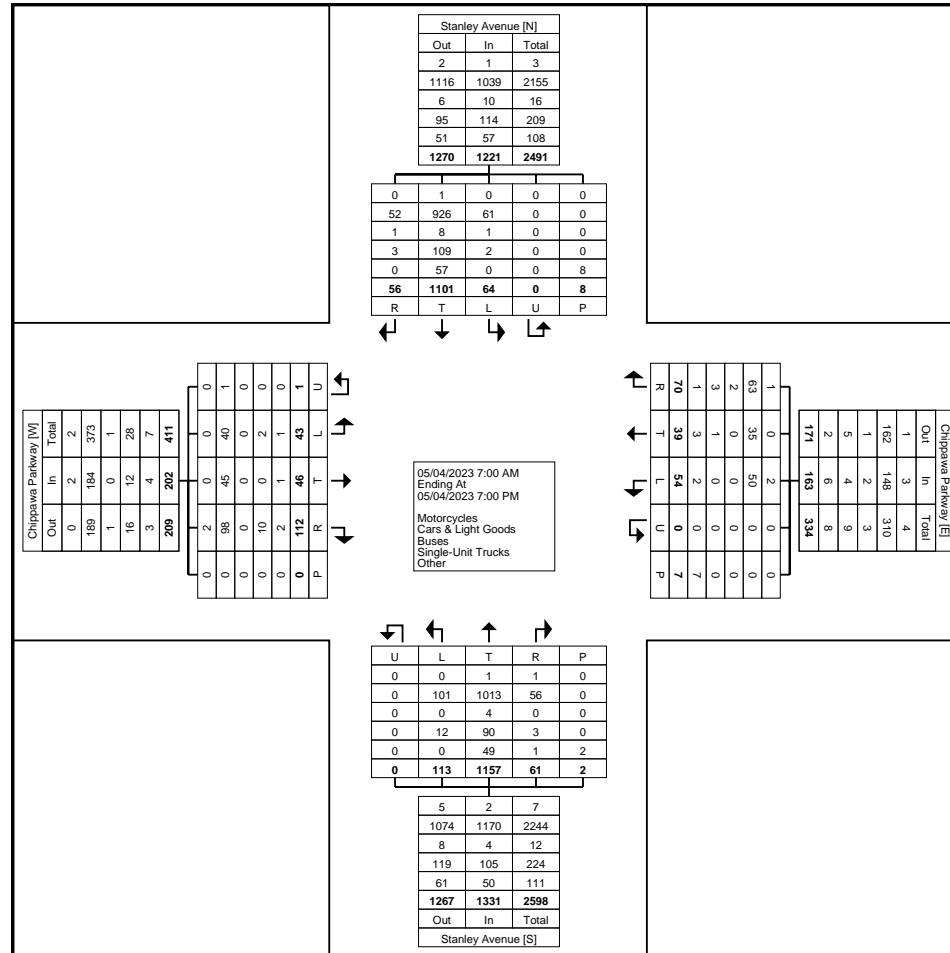
5:30 PM	3	2	10	0	0	15	2	2	1	0	0	5	12	33	6	0	0	51	0	41	7	0	0	48	119
5:45 PM	3	1	5	0	0	9	2	2	2	0	0	6	2	29	1	0	0	32	1	24	0	0	0	25	72
Hourly Total	7	8	26	0	0	41	9	5	5	0	0	19	27	119	15	0	1	161	3	188	13	0	0	204	425
6:00 PM	2	1	1	0	0	4	1	1	1	0	0	3	3	21	1	0	0	25	0	33	1	0	0	34	66
6:15 PM	0	0	1	0	0	1	1	2	4	0	0	7	1	25	1	0	0	27	0	36	2	0	0	38	73
6:30 PM	1	0	2	0	0	3	2	1	0	0	2	3	3	23	3	0	0	29	0	19	0	0	0	19	54
6:45 PM	0	3	3	0	0	6	1	1	1	0	0	3	3	23	2	0	0	28	0	20	0	0	0	20	57
Hourly Total	3	4	7	0	0	14	5	5	6	0	2	16	10	92	7	0	0	109	0	108	3	0	0	111	250
Grand Total	43	46	112	1	0	202	54	39	70	0	7	163	113	1157	61	0	2	1331	64	1101	56	0	8	1221	2917
Approach %	21.3	22.8	55.4	0.5	-	-	33.1	23.9	42.9	0.0	-	-	8.5	86.9	4.6	0.0	-	-	5.2	90.2	4.6	0.0	-	-	-
Total %	1.5	1.6	3.8	0.0	-	6.9	1.9	1.3	2.4	0.0	-	5.6	3.9	39.7	2.1	0.0	-	45.6	2.2	37.7	1.9	0.0	-	41.9	-
Motorcycles	0	0	2	0	-	2	2	0	1	0	-	3	0	1	1	0	-	2	0	1	0	0	-	1	8
% Motorcycles	0.0	0.0	1.8	0.0	-	1.0	3.7	0.0	1.4	-	-	1.8	0.0	0.1	1.6	-	-	0.2	0.0	0.1	0.0	-	-	0.1	0.3
Cars & Light Goods	40	45	98	1	-	184	50	35	63	0	-	148	101	1013	56	0	-	1170	61	926	52	0	-	1039	2541
% Cars & Light Goods	93.0	97.8	87.5	100.0	-	91.1	92.6	89.7	90.0	-	-	90.8	89.4	87.6	91.8	-	-	87.9	95.3	84.1	92.9	-	-	85.1	87.1
Buses	0	0	0	0	-	0	0	0	2	0	-	2	0	4	0	0	-	4	1	8	1	0	-	10	16
% Buses	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	2.9	-	-	1.2	0.0	0.3	0.0	-	-	0.3	1.6	0.7	1.8	-	-	0.8	0.5
Single-Unit Trucks	2	0	10	0	-	12	0	1	3	0	-	4	12	90	3	0	-	105	2	109	3	0	-	114	235
% Single-Unit Trucks	4.7	0.0	8.9	0.0	-	5.9	0.0	2.6	4.3	-	-	2.5	10.6	7.8	4.9	-	-	7.9	3.1	9.9	5.4	-	-	9.3	8.1
Articulated Trucks	1	0	0	0	-	1	1	0	0	0	-	1	0	47	1	0	-	48	0	55	0	0	-	55	105
% Articulated Trucks	2.3	0.0	0.0	0.0	-	0.5	1.9	0.0	0.0	-	-	0.6	0.0	4.1	1.6	-	-	3.6	0.0	5.0	0.0	-	-	4.5	3.6
Bicycles on Road	0	1	2	0	-	3	1	3	1	0	-	5	0	2	0	0	-	2	0	2	0	0	-	2	12
% Bicycles on Road	0.0	2.2	1.8	0.0	-	1.5	1.9	7.7	1.4	-	-	3.1	0.0	0.2	0.0	-	-	0.2	0.0	0.2	0.0	-	-	0.2	0.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	14.3	-	-	-	-	-	50.0	-	-	-	-	-	12.5	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	6	-	-	-	-	-	1	-	-	-	-	-	7	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	85.7	-	-	-	-	-	50.0	-	-	-	-	-	87.5	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Chippawa Parkway & Stanley Avenue
Site Code: 220542
Start Date: 05/04/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Chippawa Parkway & Stanley Avenue
Site Code: 220542
Start Date: 05/04/2023
Page No: 4

Turning Movement Peak Hour Data (7:45 AM)

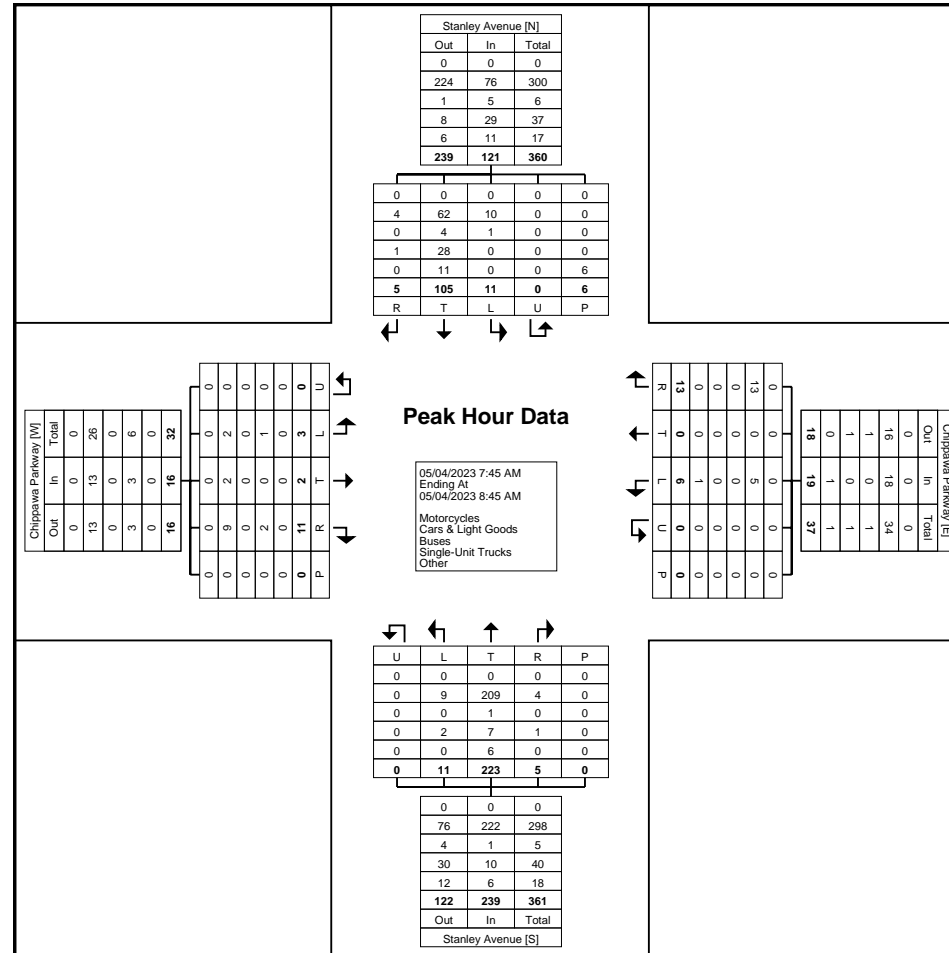
Start Time	Chippawa Parkway Eastbound						Chippawa Parkway Westbound						Stanley Avenue Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:45 AM	2	1	4	0	0	7	1	0	7	0	0	8	3	81	2	0	0	86	6	29	1	0	1	36	137
8:00 AM	1	1	1	0	0	3	0	0	2	0	0	2	5	38	0	0	0	43	4	24	1	0	2	29	77
8:15 AM	0	0	3	0	0	3	2	0	2	0	0	4	0	54	1	0	0	55	1	26	3	0	2	30	92
8:30 AM	0	0	3	0	0	3	3	0	2	0	0	5	3	50	2	0	0	55	0	26	0	0	1	26	89
Total	3	2	11	0	0	16	6	0	13	0	0	19	11	223	5	0	0	239	11	105	5	0	6	121	395
Approach %	18.8	12.5	68.8	0.0	-	-	31.6	0.0	68.4	0.0	-	-	4.6	93.3	2.1	0.0	-	-	9.1	86.8	4.1	0.0	-	-	-
Total %	0.8	0.5	2.8	0.0	-	4.1	1.5	0.0	3.3	0.0	-	4.8	2.8	56.5	1.3	0.0	-	60.5	2.8	26.6	1.3	0.0	-	30.6	-
PHF	0.375	0.500	0.688	0.000	-	0.571	0.500	0.000	0.464	0.000	-	0.594	0.550	0.688	0.625	0.000	-	0.695	0.458	0.905	0.417	0.000	-	0.840	0.721
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	2	2	9	0	-	13	5	0	13	0	-	18	9	209	4	0	-	222	10	62	4	0	-	76	329
% Cars & Light Goods	66.7	100.0	81.8	-	-	81.3	83.3	-	100.0	-	-	94.7	81.8	93.7	80.0	-	-	92.9	90.9	59.0	80.0	-	-	62.8	83.3
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1	4	0	0	-	5	6
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	0.4	0.0	-	-	0.4	9.1	3.8	0.0	-	-	4.1	1.5
Single-Unit Trucks	1	0	2	0	-	3	0	0	0	0	-	0	2	7	1	0	-	10	0	28	1	0	-	29	42
% Single-Unit Trucks	33.3	0.0	18.2	-	-	18.8	0.0	-	0.0	-	-	0.0	18.2	3.1	20.0	-	-	4.2	0.0	26.7	20.0	-	-	24.0	10.6
Articulated Trucks	0	0	0	0	-	0	1	0	0	0	-	1	0	6	0	0	-	6	0	10	0	0	-	10	17
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	16.7	-	0.0	-	-	5.3	0.0	2.7	0.0	-	-	2.5	0.0	9.5	0.0	-	-	8.3	4.3
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.0	0.0	-	-	0.8	0.3
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	6	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
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Cambridge, Ontario, Canada N1R 8J8
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Count Name: Chippawa Parkway & Stanley Avenue
Site Code: 220542
Start Date: 05/04/2023
Page No: 5



Turning Movement Peak Hour Data Plot (7:45 AM)



Paradigm Transportation Solutions Limited
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Count Name: Chippawa Parkway & Stanley Avenue
Site Code: 220542
Start Date: 05/04/2023
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Turning Movement Peak Hour Data (12:00 PM)

Start Time	Chippawa Parkway Eastbound						Chippawa Parkway Westbound						Stanley Avenue Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	1	1	2	0	0	4	1	2	4	0	0	7	7	32	2	0	0	41	10	40	3	0	0	53	105
12:15 PM	2	0	3	1	0	6	1	2	5	0	0	8	6	37	3	0	0	46	2	36	3	0	0	41	101
12:30 PM	0	1	3	0	0	4	5	1	3	0	1	9	0	32	0	0	0	32	3	29	1	0	1	33	78
12:45 PM	4	2	5	0	0	11	0	2	4	0	0	6	5	32	3	0	0	40	2	24	5	0	0	31	88
Total	7	4	13	1	0	25	7	7	16	0	1	30	18	133	8	0	0	159	17	129	12	0	1	158	372
Approach %	28.0	16.0	52.0	4.0	-	-	23.3	23.3	53.3	0.0	-	-	11.3	83.6	5.0	0.0	-	-	10.8	81.6	7.6	0.0	-	-	-
Total %	1.9	1.1	3.5	0.3	-	6.7	1.9	1.9	4.3	0.0	-	8.1	4.8	35.8	2.2	0.0	-	42.7	4.6	34.7	3.2	0.0	-	42.5	-
PHF	0.438	0.500	0.650	0.250	-	0.568	0.350	0.875	0.800	0.000	-	0.833	0.643	0.899	0.667	0.000	-	0.864	0.425	0.806	0.600	0.000	-	0.745	0.886
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	7	4	11	1	-	23	7	7	16	0	-	30	16	101	7	0	-	124	16	101	12	0	-	129	306
% Cars & Light Goods	100.0	100.0	84.6	100.0	-	92.0	100.0	100.0	100.0	-	-	100.0	88.9	75.9	87.5	-	-	78.0	94.1	78.3	100.0	-	-	81.6	82.3
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	0	2	0	-	2	0	0	0	0	-	0	2	20	1	0	-	23	1	21	0	0	-	22	47
% Single-Unit Trucks	0.0	0.0	15.4	0.0	-	8.0	0.0	0.0	0.0	-	-	0.0	11.1	15.0	12.5	-	-	14.5	5.9	16.3	0.0	-	-	13.9	12.6
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	12	0	0	-	12	0	7	0	0	-	7	19
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	9.0	0.0	-	-	7.5	0.0	5.4	0.0	-	-	4.4	5.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-



Paradigm Transportation Solutions Limited
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Count Name: Chippawa Parkway & Stanley Avenue
Site Code: 220542
Start Date: 05/04/2023
Page No: 8

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Chippawa Parkway Eastbound						Chippawa Parkway Westbound						Stanley Avenue Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	0	3	7	0	0	10	2	2	0	0	0	4	4	36	6	0	0	46	1	99	3	0	0	103	163
4:15 PM	4	4	5	0	0	13	2	1	1	0	0	4	1	39	5	0	0	45	3	68	1	0	0	72	134
4:30 PM	1	1	10	0	0	12	4	1	1	0	2	6	5	26	2	0	0	33	4	81	2	0	0	87	138
4:45 PM	0	3	3	0	0	6	2	1	1	0	0	4	5	50	3	0	0	58	1	52	2	0	0	55	123
Total	5	11	25	0	0	41	10	5	3	0	2	18	15	151	16	0	0	182	9	300	8	0	0	317	558
Approach %	12.2	26.8	61.0	0.0	-	-	55.6	27.8	16.7	0.0	-	-	8.2	83.0	8.8	0.0	-	-	2.8	94.6	2.5	0.0	-	-	-
Total %	0.9	2.0	4.5	0.0	-	7.3	1.8	0.9	0.5	0.0	-	3.2	2.7	27.1	2.9	0.0	-	32.6	1.6	53.8	1.4	0.0	-	56.8	-
PHF	0.313	0.688	0.625	0.000	-	0.788	0.625	0.625	0.750	0.000	-	0.750	0.750	0.755	0.667	0.000	-	0.784	0.563	0.758	0.667	0.000	-	0.769	0.856
Motorcycles	0	0	2	0	-	2	2	0	0	0	-	2	0	0	1	0	-	1	0	1	0	0	-	1	6
% Motorcycles	0.0	0.0	8.0	-	-	4.9	20.0	0.0	0.0	-	-	11.1	0.0	0.0	6.3	-	-	0.5	0.0	0.3	0.0	-	-	0.3	1.1
Cars & Light Goods	5	11	23	0	-	39	8	5	2	0	-	15	15	135	15	0	-	165	9	280	7	0	-	296	515
% Cars & Light Goods	100.0	100.0	92.0	-	-	95.1	80.0	100.0	66.7	-	-	83.3	100.0	89.4	93.8	-	-	90.7	100.0	93.3	87.5	-	-	93.4	92.3
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	2
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.7	0.0	-	-	0.5	0.0	0.3	0.0	-	-	0.3	0.4
Single-Unit Trucks	0	0	0	0	-	0	0	0	1	0	-	1	0	8	0	0	-	8	0	9	1	0	-	10	19
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	33.3	-	-	5.6	0.0	5.3	0.0	-	-	4.4	0.0	3.0	12.5	-	-	3.2	3.4
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	7	0	0	-	7	0	9	0	0	-	9	16
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	4.6	0.0	-	-	3.8	0.0	3.0	0.0	-	-	2.8	2.9
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
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Count Name: Chippawa Parkway & Stanley Avenue - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 1

Turning Movement Data

Start Time	Chippawa Parkway Eastbound						Chippawa Parkway Westbound						Stanley Avenue Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
10:00 AM	2	1	4	0	0	7	1	0	0	0	0	1	5	19	0	0	0	24	0	17	1	0	0	18	50
10:15 AM	3	4	3	0	0	10	3	11	1	0	2	15	4	29	3	0	0	36	0	11	2	0	0	13	74
10:30 AM	3	0	6	0	0	9	0	6	0	0	0	6	4	24	2	0	0	30	0	19	1	0	0	20	65
10:45 AM	3	1	9	0	0	13	1	1	2	0	0	4	8	28	1	0	0	37	3	23	4	0	0	30	84
Hourly Total	11	6	22	0	0	39	5	18	3	0	2	26	21	100	6	0	0	127	3	70	8	0	0	81	273
11:00 AM	4	1	7	0	0	12	1	6	3	0	0	10	5	23	3	0	0	31	3	21	2	0	0	26	79
11:15 AM	0	0	3	0	0	3	2	4	3	0	0	9	3	17	0	0	1	20	1	13	0	0	0	14	46
11:30 AM	2	4	6	0	0	12	3	2	0	0	0	5	3	26	1	0	0	30	3	22	1	0	0	26	73
11:45 AM	0	3	8	0	0	11	4	2	0	0	0	6	5	30	1	0	0	36	0	21	4	0	0	25	78
Hourly Total	6	8	24	0	0	38	10	14	6	0	0	30	16	96	5	0	1	117	7	77	7	0	0	91	276
12:00 PM	2	1	7	0	0	10	2	4	2	0	0	8	1	18	2	0	0	21	1	22	2	0	0	25	64
12:15 PM	0	2	6	0	0	8	3	3	0	0	0	6	6	30	1	0	0	37	0	16	1	0	0	17	68
12:30 PM	3	7	9	0	0	19	1	4	1	0	0	6	5	29	6	0	3	40	2	22	2	0	0	26	91
12:45 PM	3	5	11	0	0	19	0	5	3	0	0	8	3	28	2	0	0	33	0	27	1	0	1	28	88
Hourly Total	8	15	33	0	0	56	6	16	6	0	0	28	15	105	11	0	3	131	3	87	6	0	1	96	311
1:00 PM	0	1	5	0	0	6	2	2	1	0	0	5	5	36	1	0	0	42	1	13	1	0	0	15	68
1:15 PM	0	5	8	0	0	13	2	6	0	0	0	8	2	24	3	0	1	29	0	22	3	0	0	25	75
1:30 PM	2	1	2	0	0	5	0	1	0	0	0	1	7	27	1	0	2	35	1	21	5	0	0	27	68
1:45 PM	0	4	5	0	0	9	0	4	0	0	0	4	6	20	2	0	0	28	1	13	2	0	0	16	57
Hourly Total	2	11	20	0	0	33	4	13	1	0	0	18	20	107	7	0	3	134	3	69	11	0	0	83	268
2:00 PM	3	4	7	0	0	14	3	3	1	0	0	7	5	44	2	0	0	51	1	29	2	0	0	32	104
2:15 PM	1	3	7	0	0	11	2	2	0	0	0	4	6	28	4	0	0	38	0	25	0	1	0	26	79
2:30 PM	1	1	3	0	0	5	3	0	0	0	0	3	1	29	3	0	0	33	0	18	0	0	0	18	59
2:45 PM	0	5	7	0	0	12	2	3	0	0	0	5	6	35	1	0	0	42	0	25	1	0	0	26	85
Hourly Total	5	13	24	0	0	42	10	8	1	0	0	19	18	136	10	0	0	164	1	97	3	1	0	102	327
3:00 PM	0	2	7	0	0	9	4	3	1	0	0	8	4	35	3	0	0	42	1	22	0	0	0	23	82
3:15 PM	2	2	4	0	0	8	2	2	1	0	0	5	2	29	1	0	0	32	0	21	1	0	1	22	67
3:30 PM	0	4	3	0	0	7	1	5	0	0	0	6	6	53	1	0	0	60	1	25	0	0	0	26	99
3:45 PM	1	2	3	0	0	6	4	2	0	0	0	6	4	31	1	0	0	36	0	27	2	0	0	29	77
Hourly Total	3	10	17	0	0	30	11	12	2	0	0	25	16	148	6	0	0	170	2	95	3	0	1	100	325
4:00 PM	1	5	6	0	0	12	2	3	1	0	0	6	1	33	0	0	0	34	2	23	1	0	0	26	78
4:15 PM	1	3	6	0	0	10	3	6	0	0	0	9	5	28	1	0	0	34	0	19	0	0	0	19	72
4:30 PM	1	3	4	0	0	8	7	0	0	0	0	7	1	34	1	0	0	36	1	27	2	0	0	30	81
4:45 PM	1	0	5	0	0	6	1	1	1	0	0	3	2	37	5	0	0	44	0	15	0	0	0	15	68
Hourly Total	4	11	21	0	0	36	13	10	2	0	0	25	9	132	7	0	0	148	3	84	3	0	0	90	299

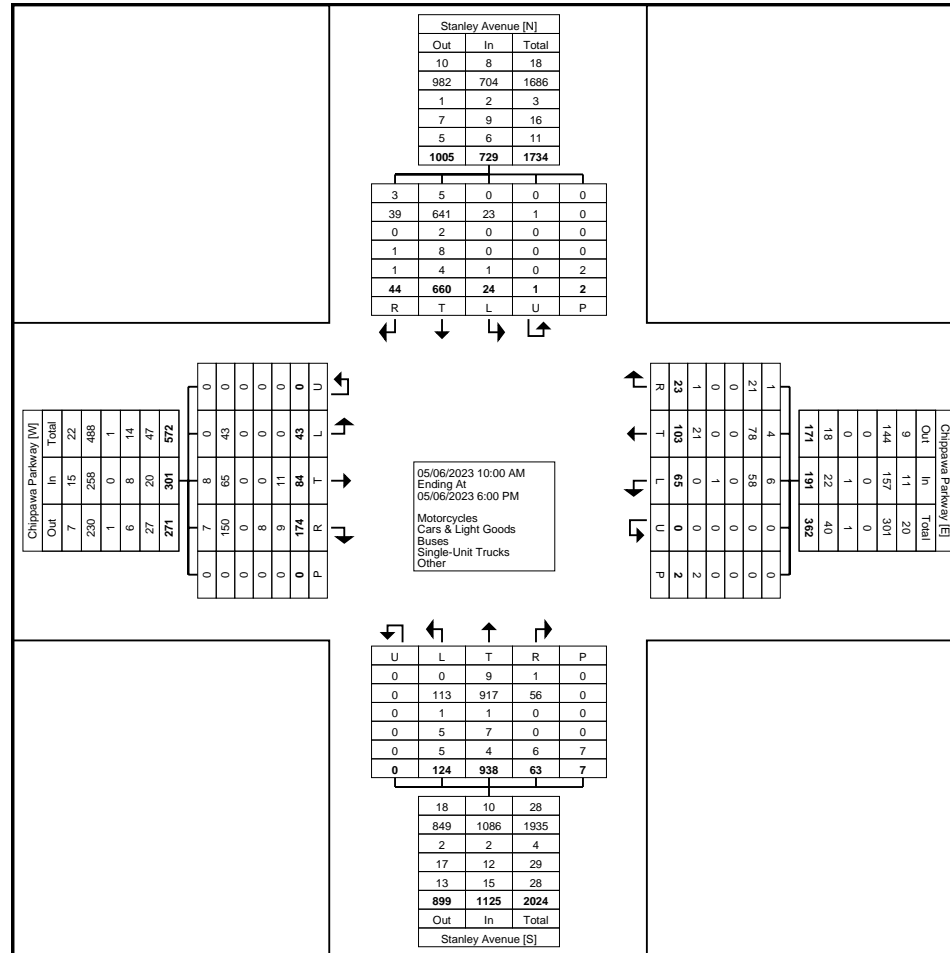
5:00 PM	1	0	3	0	0	4	2	2	0	0	0	4	3	34	4	0	0	41	0	23	1	0	0	24	73
5:15 PM	0	5	4	0	0	9	2	2	1	0	0	5	3	31	4	0	0	38	2	21	0	0	0	23	75
5:30 PM	2	2	3	0	0	7	1	4	0	0	0	5	0	30	2	0	0	32	0	20	1	0	0	21	65
5:45 PM	1	3	3	0	0	7	1	4	1	0	0	6	3	19	1	0	0	23	0	17	1	0	0	18	54
Hourly Total	4	10	13	0	0	27	6	12	2	0	0	20	9	114	11	0	0	134	2	81	3	0	0	86	267
Grand Total	43	84	174	0	0	301	65	103	23	0	2	191	124	938	63	0	7	1125	24	660	44	1	2	729	2346
Approach %	14.3	27.9	57.8	0.0	-	-	34.0	53.9	12.0	0.0	-	-	11.0	83.4	5.6	0.0	-	-	3.3	90.5	6.0	0.1	-	-	-
Total %	1.8	3.6	7.4	0.0	-	12.8	2.8	4.4	1.0	0.0	-	8.1	5.3	40.0	2.7	0.0	-	48.0	1.0	28.1	1.9	0.0	-	31.1	-
Motorcycles	0	8	7	0	-	15	6	4	1	0	-	11	0	9	1	0	-	10	0	5	3	0	-	8	44
% Motorcycles	0.0	9.5	4.0	-	-	5.0	9.2	3.9	4.3	-	-	5.8	0.0	1.0	1.6	-	-	0.9	0.0	0.8	6.8	0.0	-	1.1	1.9
Cars & Light Goods	43	65	150	0	-	258	58	78	21	0	-	157	113	917	56	0	-	1086	23	641	39	1	-	704	2205
% Cars & Light Goods	100.0	77.4	86.2	-	-	85.7	89.2	75.7	91.3	-	-	82.2	91.1	97.8	88.9	-	-	96.5	95.8	97.1	88.6	100.0	-	96.6	94.0
Buses	0	0	0	0	-	0	0	0	0	0	-	0	1	1	0	0	-	2	0	2	0	0	-	2	4
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.8	0.1	0.0	-	-	0.2	0.0	0.3	0.0	0.0	-	0.3	0.2
Single-Unit Trucks	0	0	8	0	-	8	1	0	0	0	-	1	5	7	0	0	-	12	0	8	1	0	-	9	30
% Single-Unit Trucks	0.0	0.0	4.6	-	-	2.7	1.5	0.0	0.0	-	-	0.5	4.0	0.7	0.0	-	-	1.1	0.0	1.2	2.3	0.0	-	1.2	1.3
Articulated Trucks	0	0	1	0	-	1	0	0	0	0	-	0	1	2	0	0	-	3	0	0	0	0	-	0	4
% Articulated Trucks	0.0	0.0	0.6	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.8	0.2	0.0	-	-	0.3	0.0	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Road	0	11	8	0	-	19	0	21	1	0	-	22	4	2	6	0	-	12	1	4	1	0	-	6	59
% Bicycles on Road	0.0	13.1	4.6	-	-	6.3	0.0	20.4	4.3	-	-	11.5	3.2	0.2	9.5	-	-	1.1	4.2	0.6	2.3	0.0	-	0.8	2.5
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	-	2	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	28.6	-	-	-	-	-	50.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	2	-	-	-	-	-	-	5	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	71.4	-	-	-	-	-	50.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Chippawa Parkway & Stanley Avenue - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Chippawa Parkway & Stanley
Avenue - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 4

Turning Movement Peak Hour Data (2:45 PM)

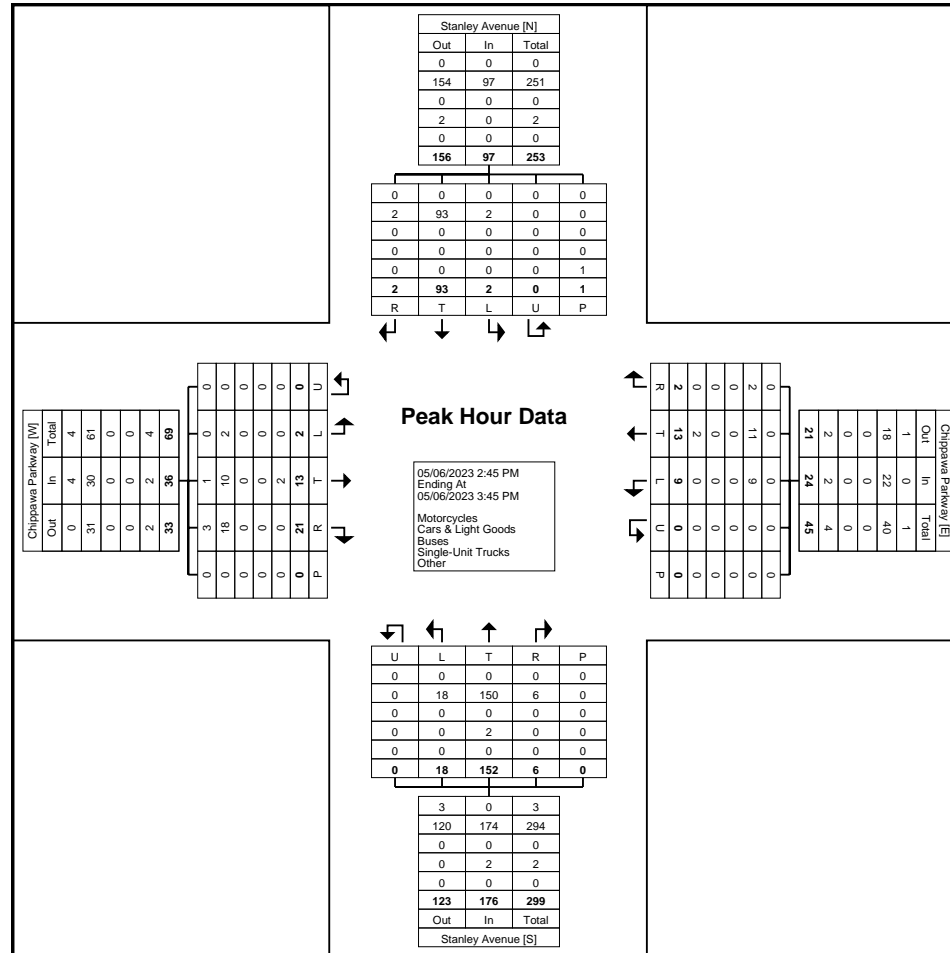
Start Time	Chippawa Parkway Eastbound						Chippawa Parkway Westbound						Stanley Avenue Northbound						Stanley Avenue Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
2:45 PM	0	5	7	0	0	12	2	3	0	0	0	5	6	35	1	0	0	42	0	25	1	0	0	26	85
3:00 PM	0	2	7	0	0	9	4	3	1	0	0	8	4	35	3	0	0	42	1	22	0	0	0	23	82
3:15 PM	2	2	4	0	0	8	2	2	1	0	0	5	2	29	1	0	0	32	0	21	1	0	1	22	67
3:30 PM	0	4	3	0	0	7	1	5	0	0	0	6	6	53	1	0	0	60	1	25	0	0	0	26	99
Total	2	13	21	0	0	36	9	13	2	0	0	24	18	152	6	0	0	176	2	93	2	0	1	97	333
Approach %	5.6	36.1	58.3	0.0	-	-	37.5	54.2	8.3	0.0	-	-	10.2	86.4	3.4	0.0	-	-	2.1	95.9	2.1	0.0	-	-	-
Total %	0.6	3.9	6.3	0.0	-	10.8	2.7	3.9	0.6	0.0	-	7.2	5.4	45.6	1.8	0.0	-	52.9	0.6	27.9	0.6	0.0	-	29.1	-
PHF	0.250	0.650	0.750	0.000	-	0.750	0.563	0.650	0.500	0.000	-	0.750	0.750	0.717	0.500	0.000	-	0.733	0.500	0.930	0.500	0.000	-	0.933	0.841
Motorcycles	0	1	3	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	4
% Motorcycles	0.0	7.7	14.3	-	-	11.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.2
Cars & Light Goods	2	10	18	0	-	30	9	11	2	0	-	22	18	150	6	0	-	174	2	93	2	0	-	97	323
% Cars & Light Goods	100.0	76.9	85.7	-	-	83.3	100.0	84.6	100.0	-	-	91.7	100.0	98.7	100.0	-	-	98.9	100.0	100.0	100.0	-	-	100.0	97.0
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	0	0	0	0	-	0	2
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	1.3	0.0	-	-	1.1	0.0	0.0	0.0	-	-	0.0	0.6
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	2	0	0	-	2	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	4
% Bicycles on Road	0.0	15.4	0.0	-	-	5.6	0.0	15.4	0.0	-	-	8.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Chippawa Parkway & Stanley
Avenue - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 5



Turning Movement Peak Hour Data Plot (2:45 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Stanley Avenue & Lyons Creek Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 1

Turning Movement Data

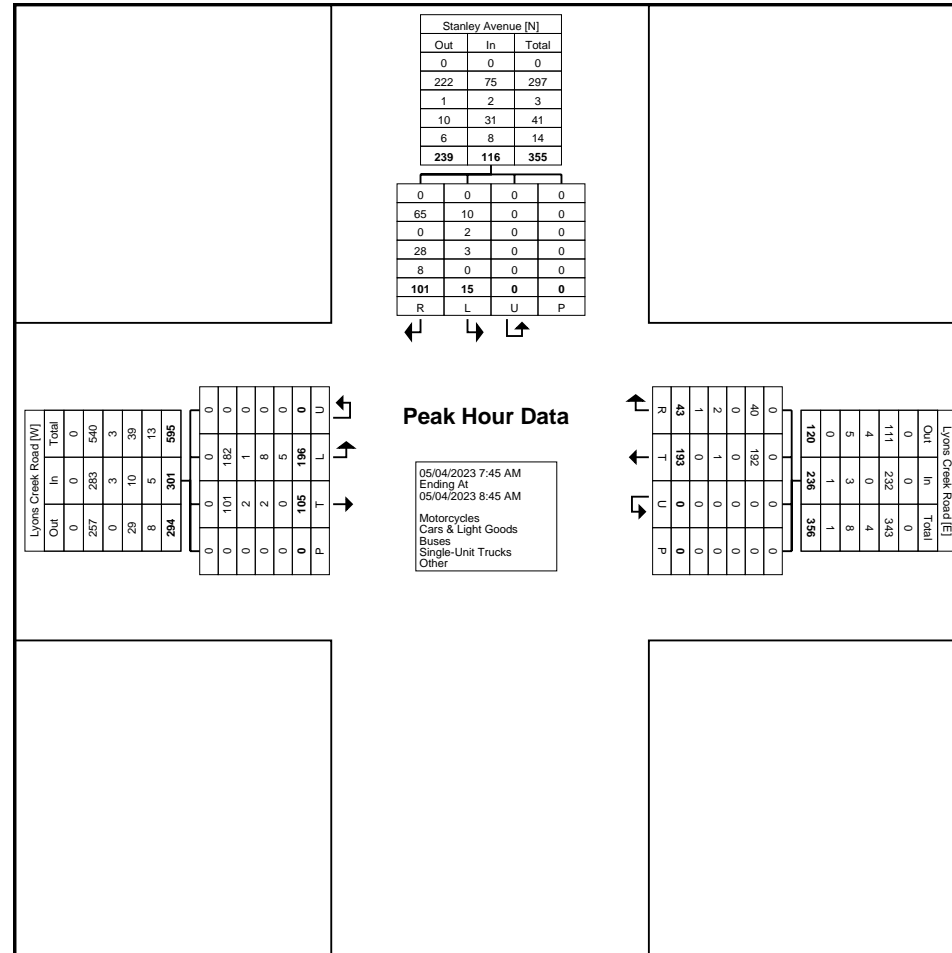
Start Time	Lyons Creek Road Eastbound					Lyons Creek Road Westbound					Stanley Avenue Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	30	24	0	0	54	42	17	0	0	59	7	21	0	0	28	141
7:15 AM	43	24	0	0	67	52	11	0	0	63	3	25	0	0	28	158
7:30 AM	40	19	0	0	59	61	9	0	0	70	1	19	0	0	20	149
7:45 AM	70	28	0	0	98	49	12	0	0	61	6	26	0	0	32	191
Hourly Total	183	95	0	0	278	204	49	0	0	253	17	91	0	0	108	639
8:00 AM	33	23	0	0	56	44	14	0	0	58	3	25	0	0	28	142
8:15 AM	50	25	0	0	75	41	7	0	0	48	3	28	0	0	31	154
8:30 AM	43	29	0	0	72	59	10	0	0	69	3	22	0	0	25	166
8:45 AM	32	26	0	0	58	54	15	0	0	69	10	31	0	0	41	168
Hourly Total	158	103	0	0	261	198	46	0	0	244	19	106	0	0	125	630
9:00 AM	31	20	0	0	51	32	7	0	0	39	6	11	0	0	17	107
9:15 AM	29	28	0	0	57	34	13	0	0	47	5	16	0	0	21	125
9:30 AM	17	30	0	0	47	41	13	0	0	54	3	15	0	0	18	119
9:45 AM	24	28	0	0	52	31	5	0	0	36	9	22	0	0	31	119
Hourly Total	101	106	0	0	207	138	38	0	0	176	23	64	0	0	87	470
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	20	30	0	0	50	33	11	0	0	44	12	25	0	0	37	131
11:45 AM	25	26	0	0	51	27	7	0	0	34	10	17	0	0	27	112
Hourly Total	45	56	0	0	101	60	18	0	0	78	22	42	0	0	64	243
12:00 PM	32	27	0	0	59	38	13	0	0	51	17	27	0	0	44	154
12:15 PM	31	35	0	0	66	47	14	0	0	61	15	26	0	0	41	168
12:30 PM	24	33	0	0	57	27	9	0	0	36	12	26	0	0	38	131
12:45 PM	18	29	0	0	47	40	21	0	0	61	8	18	0	0	26	134
Hourly Total	105	124	0	0	229	152	57	0	0	209	52	97	0	0	149	587
1:00 PM	29	31	0	0	60	34	8	0	0	42	8	18	0	0	26	128
1:15 PM	28	32	0	0	60	25	13	0	0	38	15	18	0	0	33	131
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	57	63	0	0	120	59	21	0	0	80	23	36	0	0	59	259
4:00 PM	28	56	0	0	84	45	13	0	0	58	26	79	0	0	105	247
4:15 PM	34	73	0	0	107	36	11	0	0	47	19	53	0	0	72	226
4:30 PM	29	52	0	0	81	52	7	0	0	59	16	81	0	0	97	237
4:45 PM	42	84	0	0	126	32	13	0	0	45	11	47	0	0	58	229
Hourly Total	133	265	0	0	398	165	44	0	0	209	72	260	0	0	332	939
5:00 PM	22	61	0	0	83	40	11	0	0	51	19	71	0	0	90	224
5:15 PM	32	80	0	0	112	37	11	0	0	48	8	36	0	0	44	204
5:30 PM	36	70	0	0	106	40	17	0	0	57	21	31	0	0	52	215



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stanley Avenue & Lyons Creek Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 5



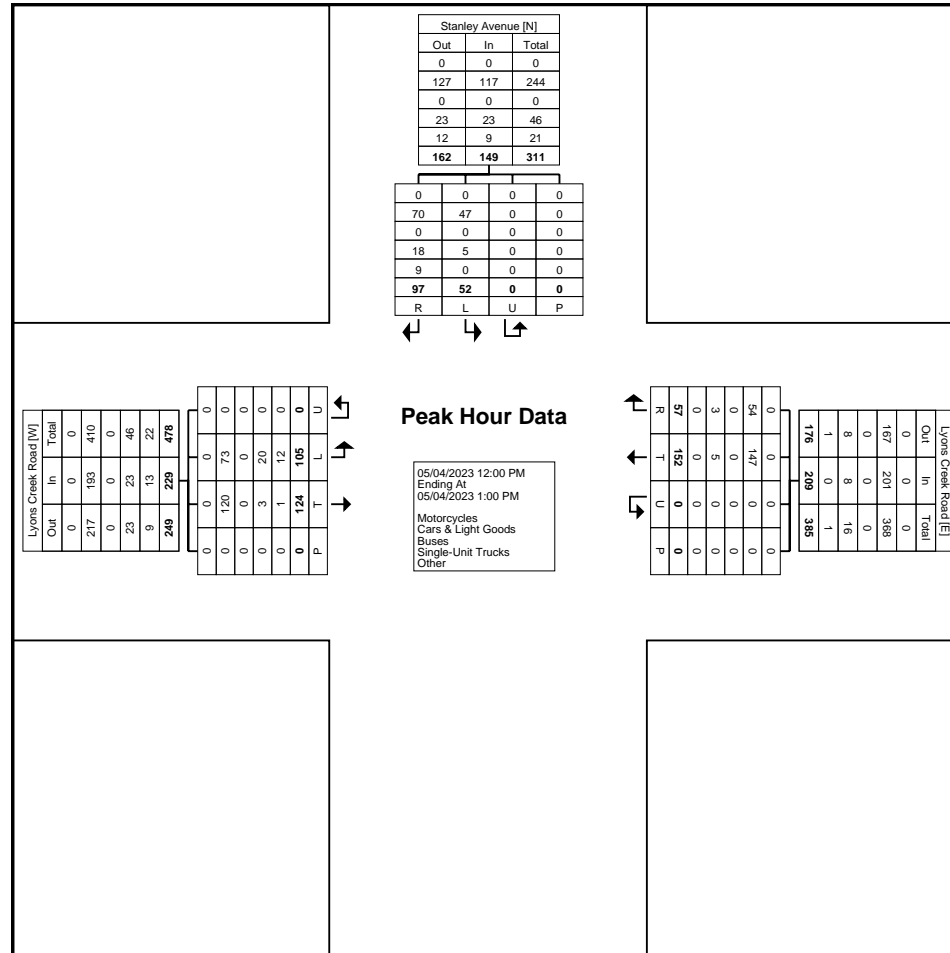
Turning Movement Peak Hour Data Plot (7:45 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stanley Avenue & Lyons Creek Road
Site Code: 220542
Start Date: 05/04/2023
Page No: 7



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



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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

Count Name: Stanley Avenue & Lyons Creek
Road - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 1

Turning Movement Data

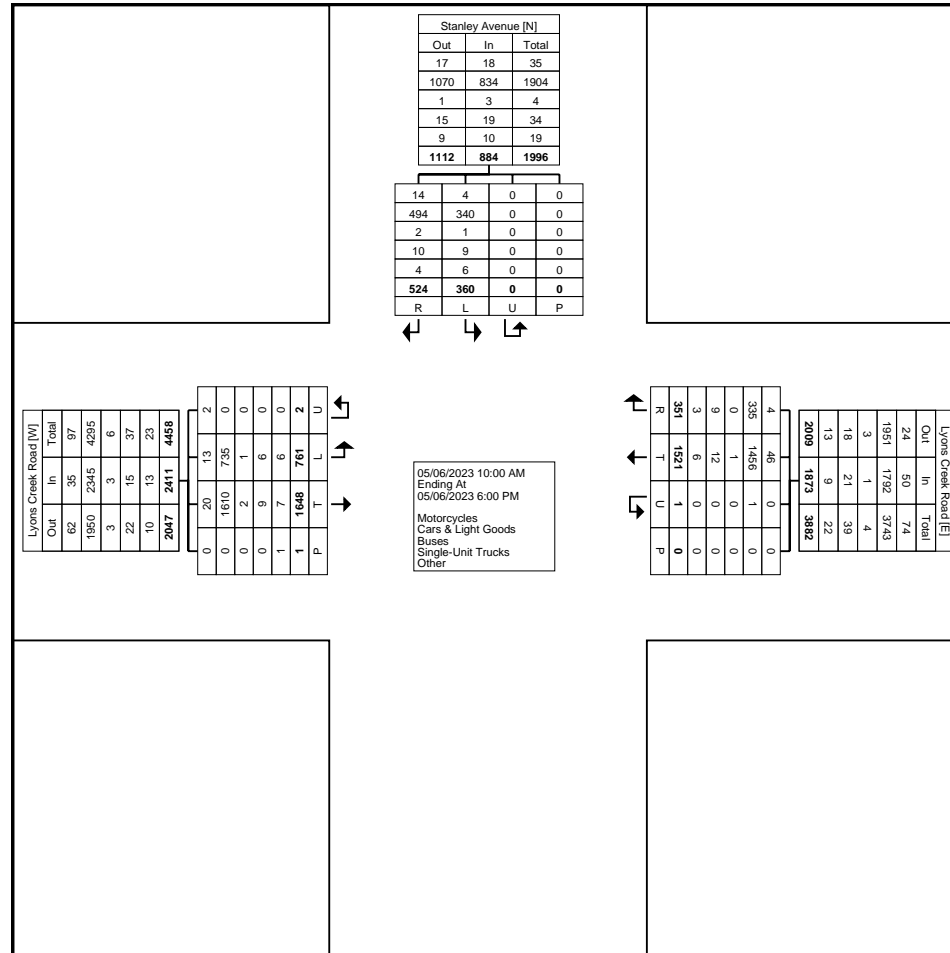
Start Time	Lyons Creek Road Eastbound					Lyons Creek Road Westbound					Stanley Avenue Southbound					Int. Total
	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
10:00 AM	10	39	0	0	49	41	12	0	0	53	7	16	0	0	23	125
10:15 AM	30	42	0	0	72	57	7	1	0	65	6	9	0	0	15	152
10:30 AM	17	45	0	0	62	44	11	0	0	55	13	11	0	0	24	141
10:45 AM	22	36	0	0	58	39	17	0	0	56	9	21	0	0	30	144
Hourly Total	79	162	0	0	241	181	47	1	0	229	35	57	0	0	92	562
11:00 AM	21	44	0	0	65	39	7	0	0	46	12	20	0	0	32	143
11:15 AM	11	46	0	0	57	52	14	0	0	66	9	7	0	0	16	139
11:30 AM	14	44	0	0	58	49	10	0	0	59	14	15	0	0	29	146
11:45 AM	23	57	0	0	80	38	13	0	0	51	19	13	0	0	32	163
Hourly Total	69	191	0	0	260	178	44	0	0	222	54	55	0	0	109	591
12:00 PM	17	48	0	0	65	49	2	0	0	51	9	20	0	0	29	145
12:15 PM	28	47	0	0	75	49	14	0	0	63	12	14	0	0	26	164
12:30 PM	26	47	0	0	73	40	8	0	0	48	12	12	0	0	24	145
12:45 PM	15	53	0	0	68	38	15	0	0	53	19	15	0	0	34	155
Hourly Total	86	195	0	0	281	176	39	0	0	215	52	61	0	0	113	609
1:00 PM	26	58	0	0	84	42	19	0	0	61	13	10	0	0	23	168
1:15 PM	19	67	0	0	86	55	7	0	0	62	12	20	0	0	32	180
1:30 PM	22	53	0	0	75	58	13	0	0	71	4	16	0	0	20	166
1:45 PM	17	49	0	1	66	42	10	0	0	52	10	12	0	0	22	140
Hourly Total	84	227	0	1	311	197	49	0	0	246	39	58	0	0	97	654
2:00 PM	33	45	0	0	78	49	17	0	0	66	13	23	0	0	36	180
2:15 PM	26	58	0	0	84	54	11	0	0	65	15	22	0	0	37	186
2:30 PM	25	44	0	0	69	59	9	0	0	68	11	15	0	0	26	163
2:45 PM	26	60	0	0	86	72	12	0	0	84	12	18	0	0	30	200
Hourly Total	110	207	0	0	317	234	49	0	0	283	51	78	0	0	129	729
3:00 PM	30	62	0	0	92	42	14	0	0	56	11	24	0	0	35	183
3:15 PM	24	56	0	0	80	57	8	0	0	65	10	15	0	0	25	170
3:30 PM	44	60	0	0	104	54	16	0	0	70	13	17	0	0	30	204
3:45 PM	21	55	0	0	76	54	12	0	0	66	12	23	0	0	35	177
Hourly Total	119	233	0	0	352	207	50	0	0	257	46	79	0	0	125	734
4:00 PM	28	75	0	0	103	41	9	0	0	50	10	20	0	0	30	183
4:15 PM	22	57	0	0	79	56	11	0	0	67	12	13	0	0	25	171
4:30 PM	27	54	0	0	81	28	9	0	0	37	10	27	0	0	37	155
4:45 PM	42	47	0	0	89	56	5	0	0	61	12	13	0	0	25	175
Hourly Total	119	233	0	0	352	181	34	0	0	215	44	73	0	0	117	684
5:00 PM	30	48	0	0	78	35	11	0	0	46	11	15	0	0	26	150



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Stanley Avenue & Lyons Creek
Road - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 3



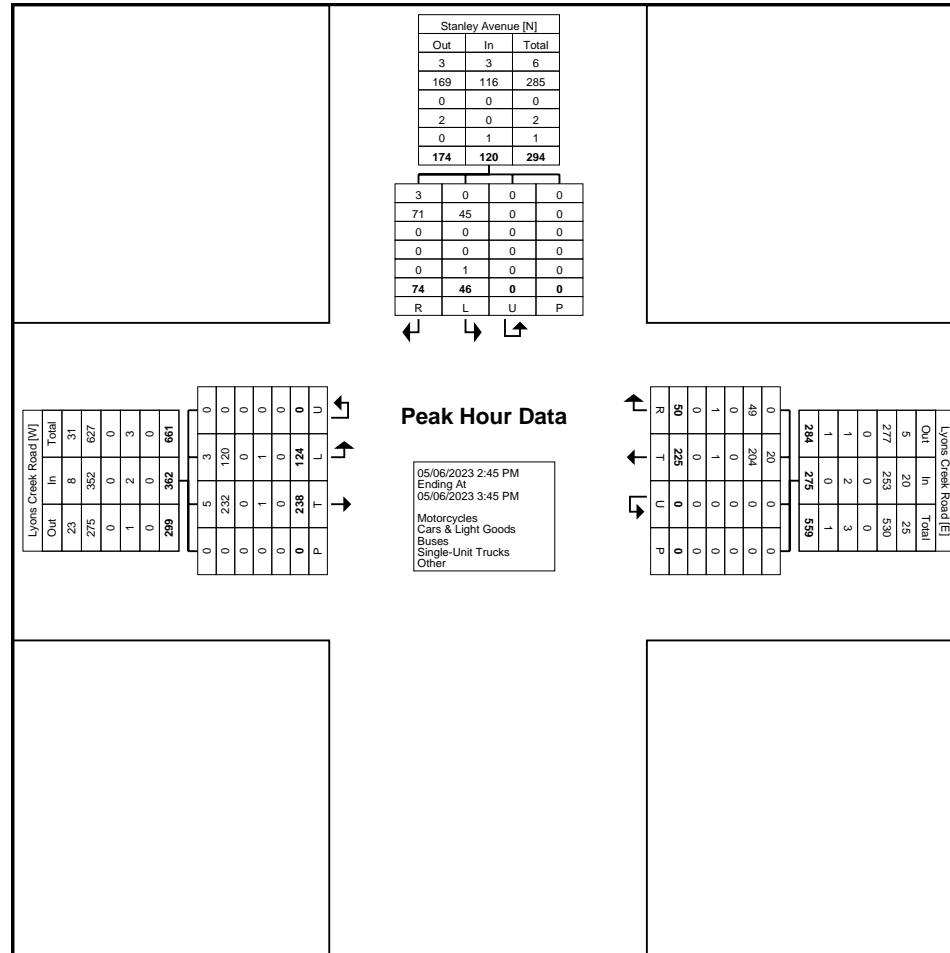
Turning Movement Data Plot



Paradigm Transportation Solutions Limited
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Cambridge, Ontario, Canada N1R 8J8
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Count Name: Stanley Avenue & Lyons Creek
Road - Saturday
Site Code: 220542
Start Date: 05/06/2023
Page No: 5



Turning Movement Peak Hour Data Plot (2:45 PM)

Signal Code: 098MCL**Intersection: RR98(Montrose Rd.) & McLeod Rd.****Municipality: niagarafalls****Owner: region****Last Modified: 2022-12-07 9:40:39 AM**

Timing Parameters	EBD & WBD ADVANCE McLEOD RD.	EBD & WBD THRU McLEOD RD.	NBD & SBD ADVANCE MONTROSE RD.	NBD & SBD THRU MONTROSE RD.	n/a	n/a
Min Green	6	10	6	8	0	0
Walk	0	12	0	14	0	0
Ped Clearance	0	20	0	24	0	0
Vehicle Ext.	2.5	2.5	2.5	2.5	0	0
Max Green	10	40	20	29	0	0
Yellow	3	4	3	4	0	0
All Red	0	4	0	4	0	0

Offset

Minimum Cycle	34	0
Pedestrian Cycle	86	
Maximum Cycle	130	95
Operation	FA	

Installed On: 2018-03-07

Count Date: 2009-09-08

FA = Fully Actuated

SA = Semi Actuated

FT = Fixed Time

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Signal Code: 0490KW**Intersection: RR49 (McLEOD RD.) & OAKWOOD DR.****Municipality: niagarafalls****Owner: region****Last Modified: 2023-02-23 8:52:52 AM**

Timing Parameters	EBD & WBD AVANCE McLEOD	EBD & WBD McLEOD	NBD OAKWOOD (SPLIT)	SBD OAKWOOD (SPLIT)	n/a	n/a
Min Green	6	10	8	8	0	0
Walk	0	12	14	16	0	0
Ped Clearance	0	20	25	28	0	0
Vehicle Ext.	2.5	2.5	2.5	2.5	0	0
Max Green	20	35	28	10	0	0
Yellow	3	4	4	4	0	0
All Red	0	4	5	5	0	0

Offset

Minimum Cycle	35	0
Pedestrian Cycle	93	
Maximum Cycle	130	32
Operation	FA	

Installed On: 2018-10-02

Count Date: --/--/----

FA = Fully Actuated

SA = Semi Actuated

FT = Fixed Time

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Signal Code: 049DRC**Intersection: RR49 (McLEOD RD.) & DORCHESTER RD.****Municipality: niagarafalls****Owner: Region****Last Modified: 2017-07-05 10:25:35 AM**

Timing Parameters	EBD & WBD ADVANCE McLEOD RD.	EBD & WBD THRU McLEOD RD.	NBD & SBD ADVANCE DORCHESTER RD.	NBD & SBD THRU DORCHESTER RD.	n/a	n/a
Min Green	5	10	5	8	0	0
Walk	0	9	0	12	0	0
Ped Clearance	0	15	0	19	0	0
Vehicle Ext.	2.5	2.2	2.5	2.2	0	0
Max Green	25	29	12	36	0	0
Yellow	3	4.1	3	4.1	0	0
All Red	0	2.3	0	2.6	0	0

Offset

Minimum Cycle	31.1	0
Pedestrian Cycle	68.1	
Maximum Cycle	121.1	0
Operation	FA	

Installed On: 2017-06-07

Count Date: 2015-07-27

FA = Fully Actuated

SA = Semi Actuated

FT = Fixed Time

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Signal Code: 049DRM**Intersection: RR49 (McLEOD RD.) & DRUMMOND RD.****Municipality: niagarafalls****Owner: region****Last Modified: 2021-09-21 10:43:20 AM**

Timing Parameters	EBD ADV. McLEOD	EBD & WBD McLEOD	NBD & SBD DRUMMOND	n/a	n/a	n/a
Min Green	6	10	8	0	0	0
Walk	0	9	9	0	0	0
Ped Clearance	0	15	15	0	0	0
Vehicle Ext.	2.5	2.5	2.5	0	0	0
Max Green	15	45	27	0	0	0
Yellow	3	4.1	4.1	0	0	0
All Red	0	2.4	2.7	0	0	0
				Offset		
Minimum Cycle			31.3	0		
Pedestrian Cycle			61.3			
Maximum Cycle			103.3	0		
Operation			FA			
Installed On:	2011-10-14					
Count Date:	--/--/----					
FA = Fully Actuated	SA = Semi Actuated	FT = Fixed Time				
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Signal Code: 49W102**Intersection: RR49 (Marineland Pkwy) & RR102 (Stanley Ave. W.)****Municipality: niagarafalls****Owner: Region****Last Modified: 2020-06-11 2:55:35 PM**

Timing Parameters	EBD ADVANCE MARINELAND PKWY	EBD & WBD THRU MARINELAND PKWY	NBD THRU THUNDERING WATERS ENT. (SPLIT)	SBD THRU STANLEY AVE. (SPLIT)	n/a	n/a
Min Green	6	8	8	8	0	0
Walk	0	12	11	11	0	0
Ped Clearance	0	20	19	19	0	0
Vehicle Ext.	2.3	2.5	4	4	0	0
Max Green	12	35	20	30	0	0
Yellow	3	4.1	4.1	4.1	0	0
All Red	0	3.1	3.1	3.1	0	0

Offset

Minimum Cycle	30.4	0
Pedestrian Cycle	76.4	
Maximum Cycle	121.6	0
Operation	FA	

Installed On: 2009-08-06

Count Date: 2013-07-24

FA = Fully Actuated

SA = Semi Actuated

FT = Fixed Time

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Signal Code: 49E102**Intersection: RR49(Marineland Pkwy) & RR102(Stanley Ave. E.)****Municipality: niagarafalls****Owner: Region****Last Modified: 2018-05-15 1:05:14 PM**

Timing Parameters	EBD & WBD THRU MARINELAND PKWY	NBD THRU STANLEY AVE.	n/a	n/a	n/a	n/a
Min Green	10	8	0	0	0	0
Walk	0	12	0	0	0	0
Ped Clearance	0	20	0	0	0	0
Vehicle Ext.	2.9	2.8	0	0	0	0
Max Green	35	30	0	0	0	0
Yellow	4.5	4.1	0	0	0	0
All Red	3	2.4	0	0	0	0
			Offset			
Minimum Cycle		32	0			
Pedestrian Cycle		38.5				
Maximum Cycle		79	0			
Operation		FA				
Installed On:	2010-10-19					
Count Date:	2015-09-09					
FA = Fully Actuated	SA = Semi Actuated	FT = Fixed Time				
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Signal Code: 047098**Intersection: RR47 (LYON'S CREEK RD.) & RR98 (MONTROSE RD.)****Municipality: niagarafalls****Owner: Region****Last Modified: 2020-04-28 3:39:40 PM**

Timing Parameters	EBD & WBD LYON'S CREEK RD.	NBD & SBD MONTROSE RD.	n/a	n/a	n/a	n/a
Min Green	10	10	0	0	0	0
Walk	8	10	0	0	0	0
Ped Clearance	12	15	0	0	0	0
Vehicle Ext.	6	6	0	0	0	0
Max Green	40	45	0	0	0	0
Yellow	4.1	4.1	0	0	0	0
All Red	2.2	2.2	0	0	0	0
			Offset			
Minimum Cycle		32.6	0			
Pedestrian Cycle		57.6				
Maximum Cycle		97.6	0			
Operation		FA				
Installed On:	2009-02-12					
Count Date:	2015-08-26					
FA = Fully Actuated	SA = Semi Actuated	FT = Fixed Time				
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Appendix C

Commercial Shared Parking Calculations



Commercial Shared Parking Calculation

Weekday						
Time of Day Factors						
TIME	Visitors	Visitors	Visitors	Visitors	Visitors	
	Retail	Fine/ Casual Dining	Supermarket	Bank	Cinema	
6:00	1%	0%	5%	0%	0%	-
7:00	5%	0%	20%	0%	0%	-
8:00	15%	0%	30%	50%	0%	-
9:00	35%	0%	50%	90%	0%	-
10:00	60%	15%	60%	100%	0%	-
11:00	75%	40%	67%	50%	0%	-
12:00	100%	75%	85%	50%	20%	-
13:00	100%	75%	90%	50%	45%	-
14:00	95%	65%	95%	70%	55%	-
15:00	85%	40%	97%	50%	55%	-
16:00	85%	50%	100%	80%	55%	-
17:00	85%	75%	100%	100%	60%	-
18:00	90%	95%	100%	0%	60%	-
19:00	80%	100%	85%	0%	80%	-
20:00	65%	100%	55%	0%	100%	-
21:00	45%	100%	35%	0%	100%	-
22:00	15%	95%	20%	0%	80%	-
23:00	5%	75%	5%	0%	65%	-
0:00	0%	25%	5%	0%	40%	-
Parking Supply						Total
Overall	234	292	40	10	174	750
6:00	2	0	2	0	0	4
7:00	12	0	8	0	0	20
8:00	35	0	12	5	0	52
9:00	82	0	20	9	0	111
10:00	140	44	24	10	0	218
11:00	176	117	27	5	0	324
12:00	234	219	34	5	35	527
13:00	234	219	36	5	78	572
14:00	222	190	38	7	96	553
15:00	199	117	39	5	96	455
16:00	199	146	40	8	96	489
17:00	199	219	40	10	104	572
18:00	211	277	40	0	104	632
19:00	187	292	34	0	139	652
20:00	152	292	22	0	174	640
21:00	105	292	14	0	174	585
22:00	35	277	8	0	139	460
23:00	12	219	2	0	113	346
0:00	0	73	2	0	70	145

PEAK

PEAK

Weekend						
Time of Day Factors						
TIME	Visitors	Visitors	Visitors	Visitors	Visitors	
	Retail	Fine/ Casual Dining	Supermarket	Bank	Cinema	
6:00	1%	0%	10%	0%	0%	-
7:00	5%	0%	25%	0%	0%	-
8:00	30%	0%	50%	25%	0%	-
9:00	50%	0%	75%	40%	0%	-
10:00	70%	0%	95%	75%	0%	-
11:00	90%	15%	100%	100%	0%	-
12:00	95%	50%	100%	90%	20%	-
13:00	100%	55%	100%	0%	45%	-
14:00	100%	45%	100%	0%	55%	-
15:00	95%	45%	100%	0%	55%	-
16:00	90%	45%	100%	0%	55%	-
17:00	80%	60%	90%	0%	60%	-
18:00	75%	90%	50%	0%	60%	-
19:00	70%	95%	33%	0%	80%	-
20:00	65%	100%	25%	0%	100%	-
21:00	50%	90%	15%	0%	100%	-
22:00	30%	90%	5%	0%	100%	-
23:00	10%	90%	4%	0%	80%	-
0:00	0%	50%	3%	0%	50%	-
Parking Supply						Total
Overall	234	292	40	10	174	750
6:00	2	0	4	0	0	6
7:00	12	0	10	0	0	22
8:00	70	0	20	3	0	93
9:00	117	0	30	4	0	151
10:00	164	0	38	8	0	209
11:00	211	44	40	10	0	304
12:00	222	146	40	9	35	452
13:00	234	161	40	0	78	513
14:00	234	131	40	0	96	501
15:00	222	131	40	0	96	489
16:00	211	131	40	0	96	478
17:00	187	175	36	0	104	503
18:00	176	263	20	0	104	563
19:00	164	277	13	0	139	594
20:00	152	292	10	0	174	628
21:00	117	263	6	0	174	560
22:00	70	263	2	0	174	509
23:00	23	263	2	0	139	427
0:00	0	146	1	0	87	234

Appendix D

ITE Internal Trip Capture Calculations



NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	220542 - Riverfront Phase 2	Organization:	Paradigm Transportation Solutions Limited
Project Location:	Niagara Falls	Performed By:	
Scenario Description:		Date:	
Analysis Year:	Site Generated Traffic	Checked By:	
Analysis Period:	AM Street Peak Hour	Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office			-	0		
Retail	820	211,080	Square Feet	258	160	98
Restaurant	-	-	-	0		
Cinema/Entertainment	-	-	-	0		
Residential	220/221/252	609	Dwelling Units	205	53	152
Hotel	310	320	Rooms	153	86	67
All Other Land Uses ²	-	-	-	0		
Total				616	299	317

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	2	0	0		0
Hotel	0	6	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	616	299	317
Internal Capture Percentage	3%	3%	3%
External Vehicle-Trips ³	598	290	308
External Transit-Trips ⁴	0	0	0
External Non-Motorized Trips ⁴	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	5%	1%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	2%	1%
Hotel	0%	9%

¹Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

³Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

⁴Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	220542 - Riverfront Phase 2
Analysis Period:	AM Street Peak Hour

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	160	160	1.00	98	98
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	53	53	1.00	152	152
Hotel	1.00	86	86	1.00	67	67

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	28		13	0	14	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	3	2	30	0		0
Hotel	50	9	6	0	0	

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		51	0	0	0	0
Retail	0		0	0	1	0
Restaurant	0	13		0	3	3
Cinema/Entertainment	0	0	0		0	0
Residential	0	27	0	0		0
Hotel	0	6	0	0	0	

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	0	0	0	0	0	0
Retail	8	152	160	152	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	52	53	52	0	0
Hotel	0	86	86	86	0	0
All Other Land Uses ³	0	0	0	0	0	0

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	0	0	0	0	0	0
Retail	1	97	98	97	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	2	150	152	150	0	0
Hotel	6	61	67	61	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A
²Person-Trips
³Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator
*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool					
Project Name:	220542 - Riverfront Phase 2			Organization:	Paradigm Transportation Solutions Limited
Project Location:	Niagara Falls			Performed By:	
Scenario Description:				Date:	
Analysis Year:	Site Generated Traffic			Checked By:	
Analysis Period:	PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office			-	0		
Retail	820	211,080	Square Feet	966	464	502
Restaurant	-	-	-	0		
Cinema/Entertainment	-	-	-	0		
Residential	220/221/252	609	Dwelling Units	224	135	89
Hotel	310	320	Rooms	209	107	102
All Other Land Uses ²	-	-	-	0		
Total				1399	706	693

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	62	18
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	37	0	0		3
Hotel	0	9	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	1,399	706	693
Internal Capture Percentage	18%	18%	19%
External Vehicle-Trips ³	1,141	577	564
External Transit-Trips ⁴	0	0	0
External Non-Motorized Trips ⁴	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	16%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	46%	45%
Hotel	20%	9%

¹Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

³Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

⁴Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	220542 - Riverfront Phase 2
Analysis Period:	PM Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	464	464	1.00	502	502
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	135	135	1.00	89	89
Hotel	1.00	107	107	1.00	102	102

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	10		146	20	131	25
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	4	37	19	0		3
Hotel	0	16	69	0	2	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		37	0	0	5	0
Retail	0		0	0	62	18
Restaurant	0	232		0	22	76
Cinema/Entertainment	0	19	0		5	1
Residential	0	46	0	0		13
Hotel	0	9	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	0	0	0	0	0	0
Retail	46	418	464	418	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	62	73	135	73	0	0
Hotel	21	86	107	86	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	0	0	0	0	0	0
Retail	80	422	502	422	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	40	49	89	49	0	0
Hotel	9	93	102	93	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

²Person-Trips

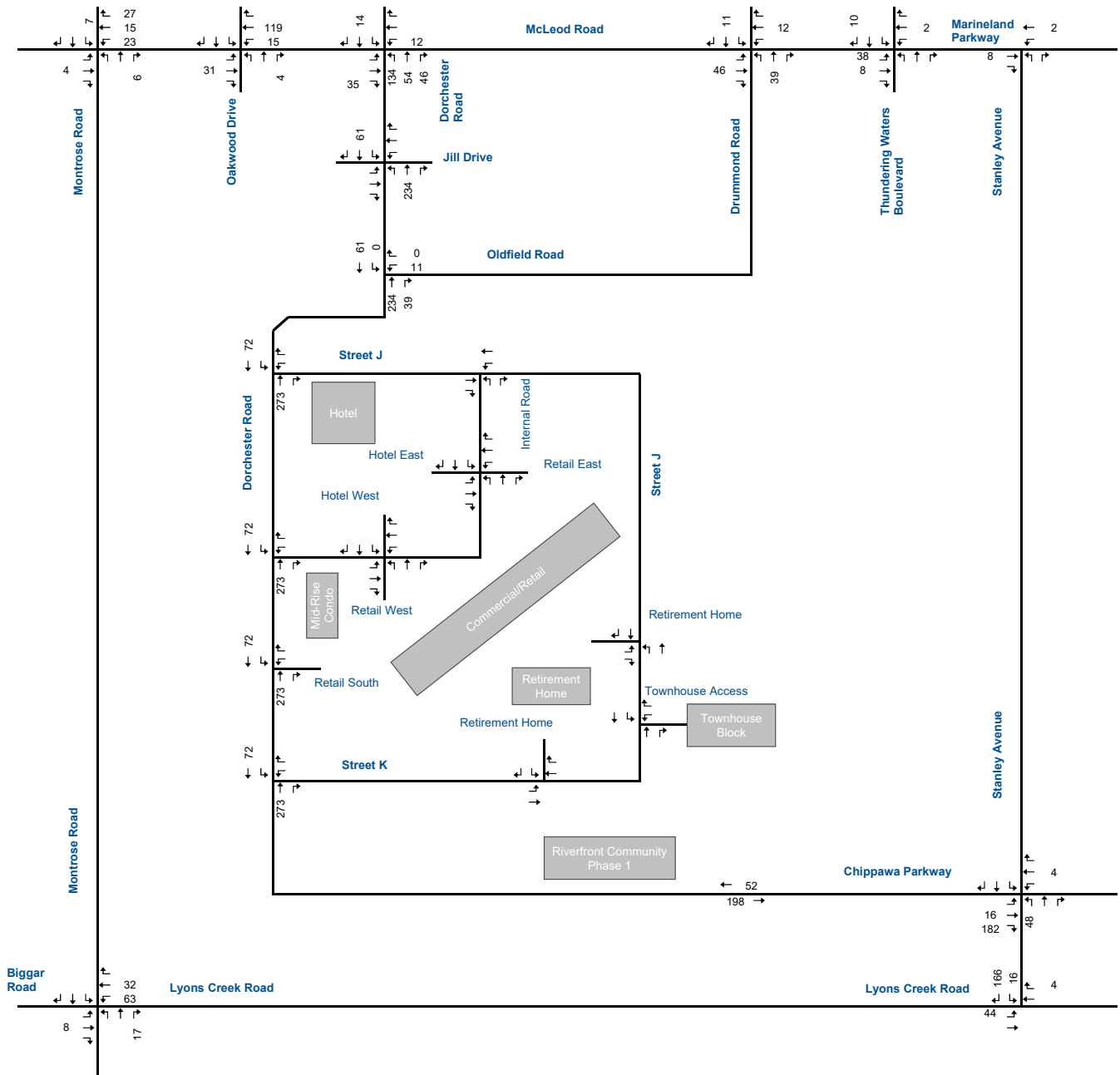
³Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

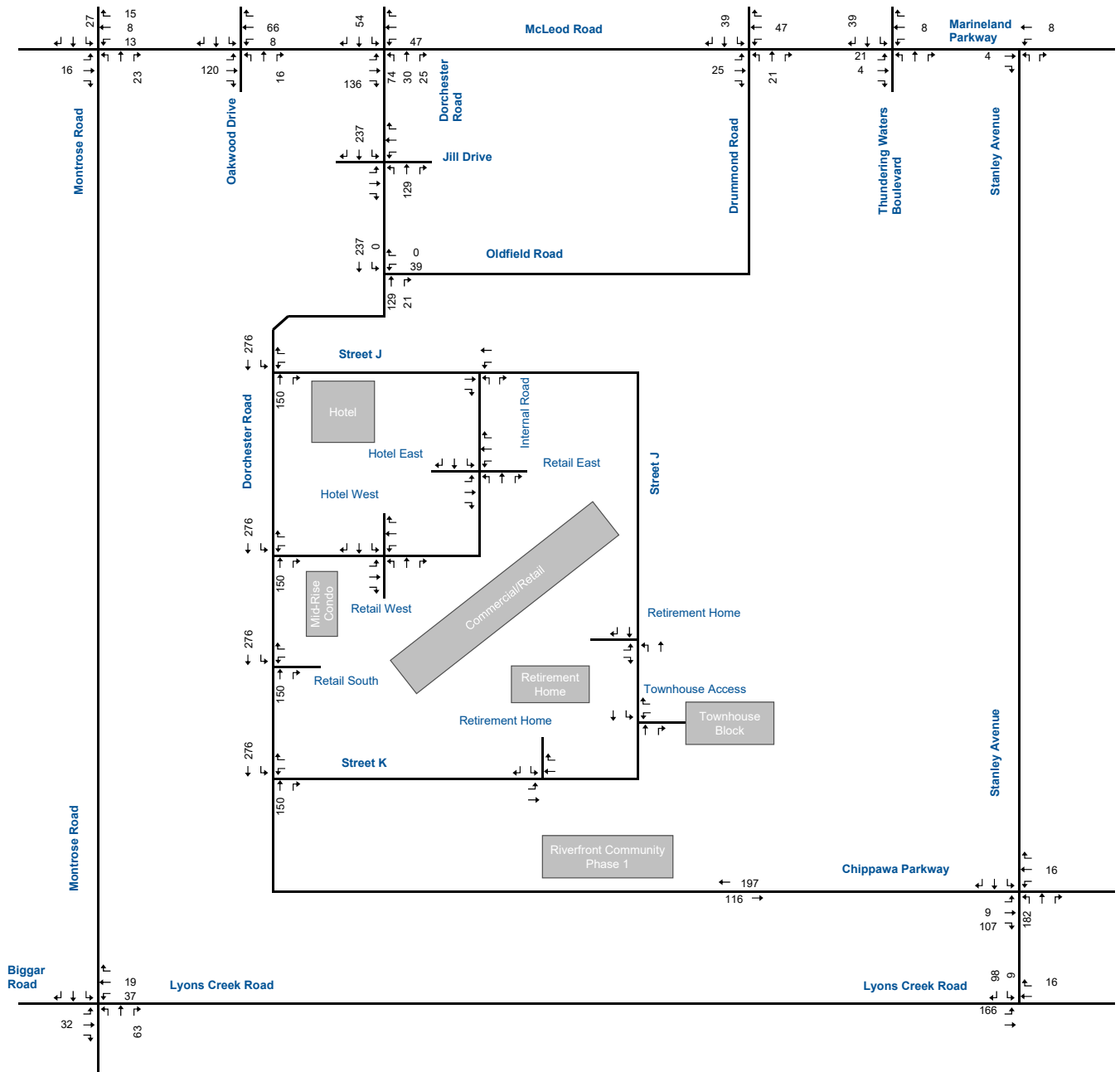
Appendix E

Site Specific Development Traffic

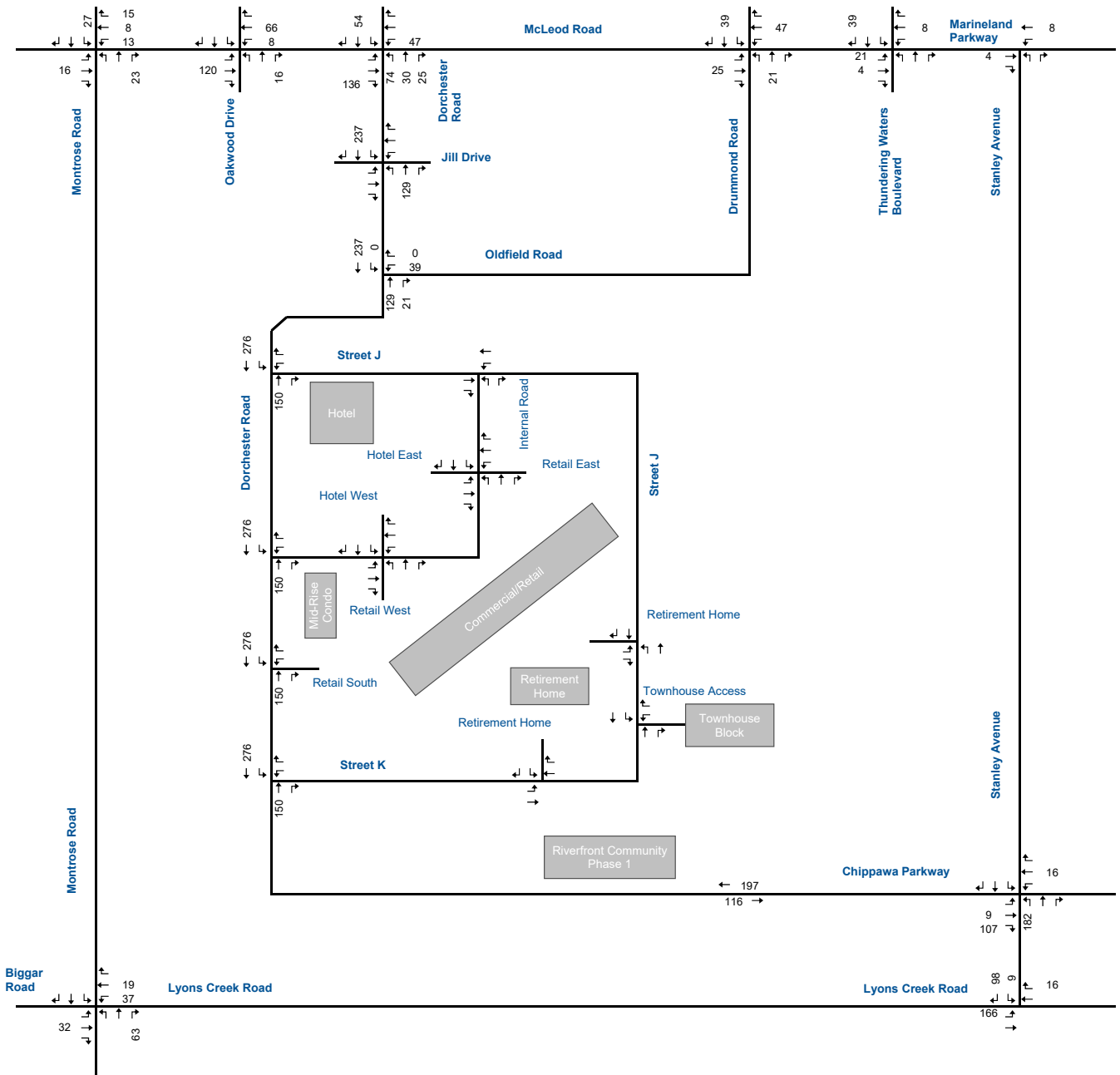




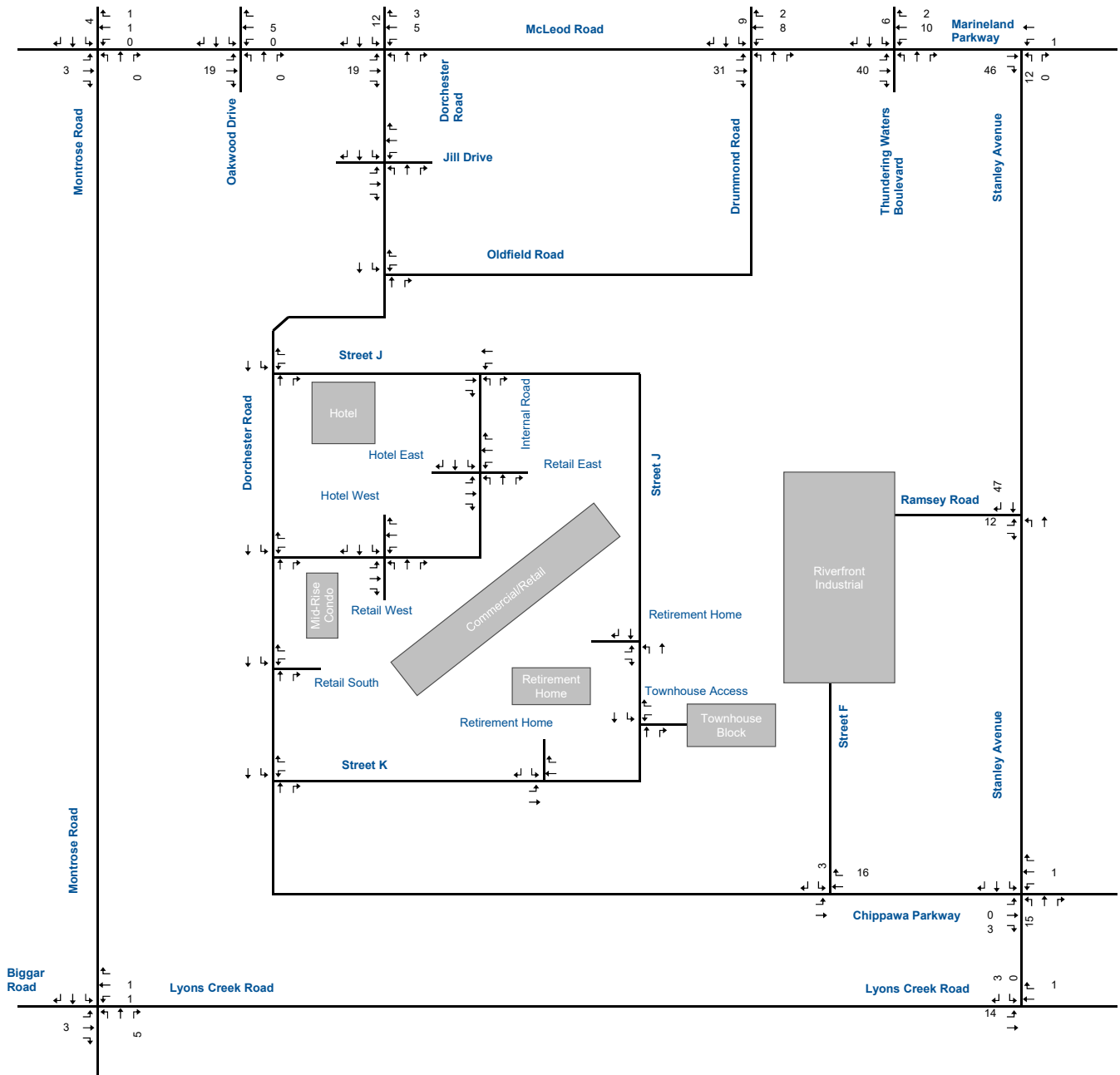
Background Development Riverfront Phase 1 Weekday AM Peak Hour



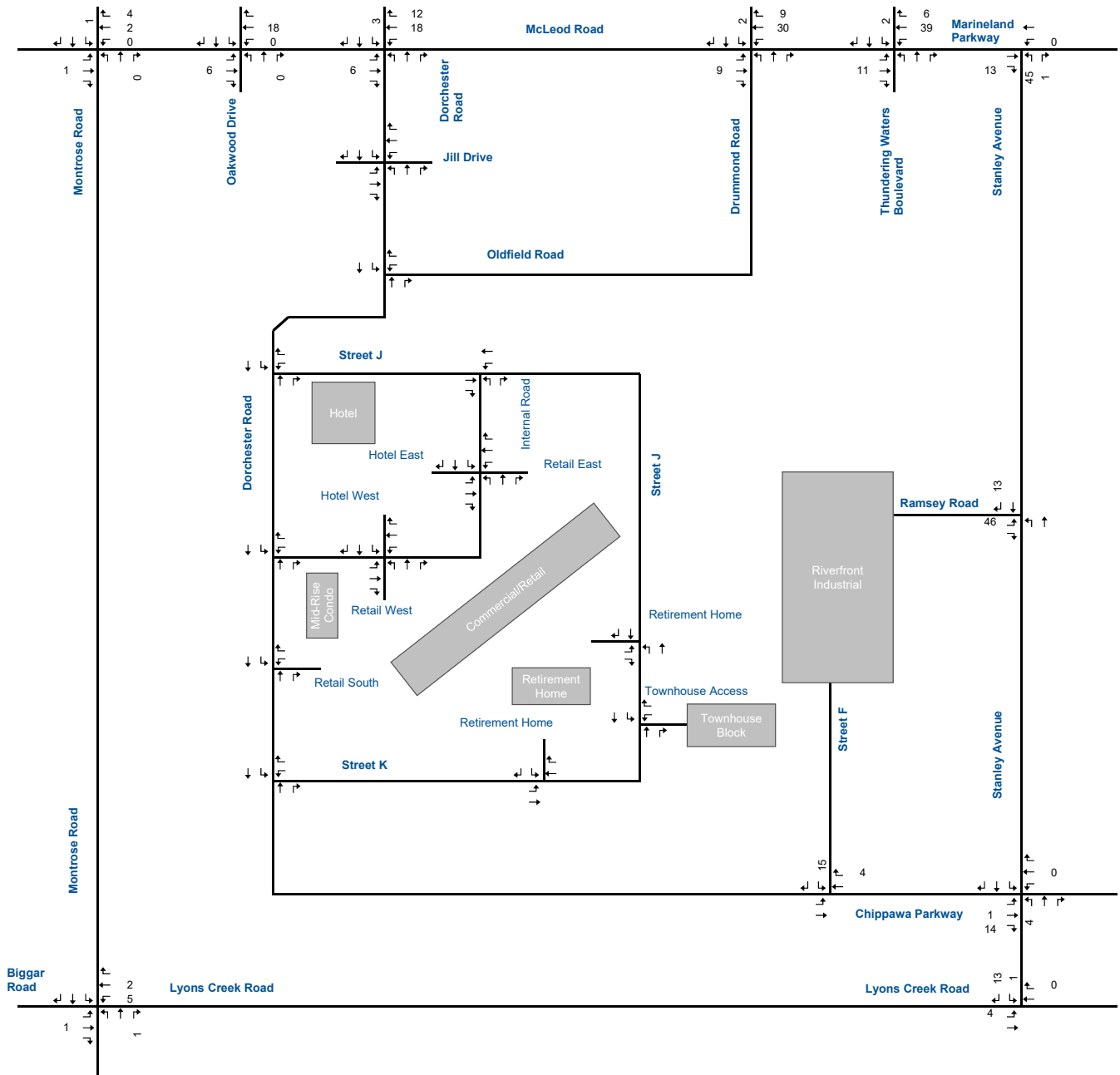
Background Development Riverfront Phase 1 Weekday PM Peak Hour



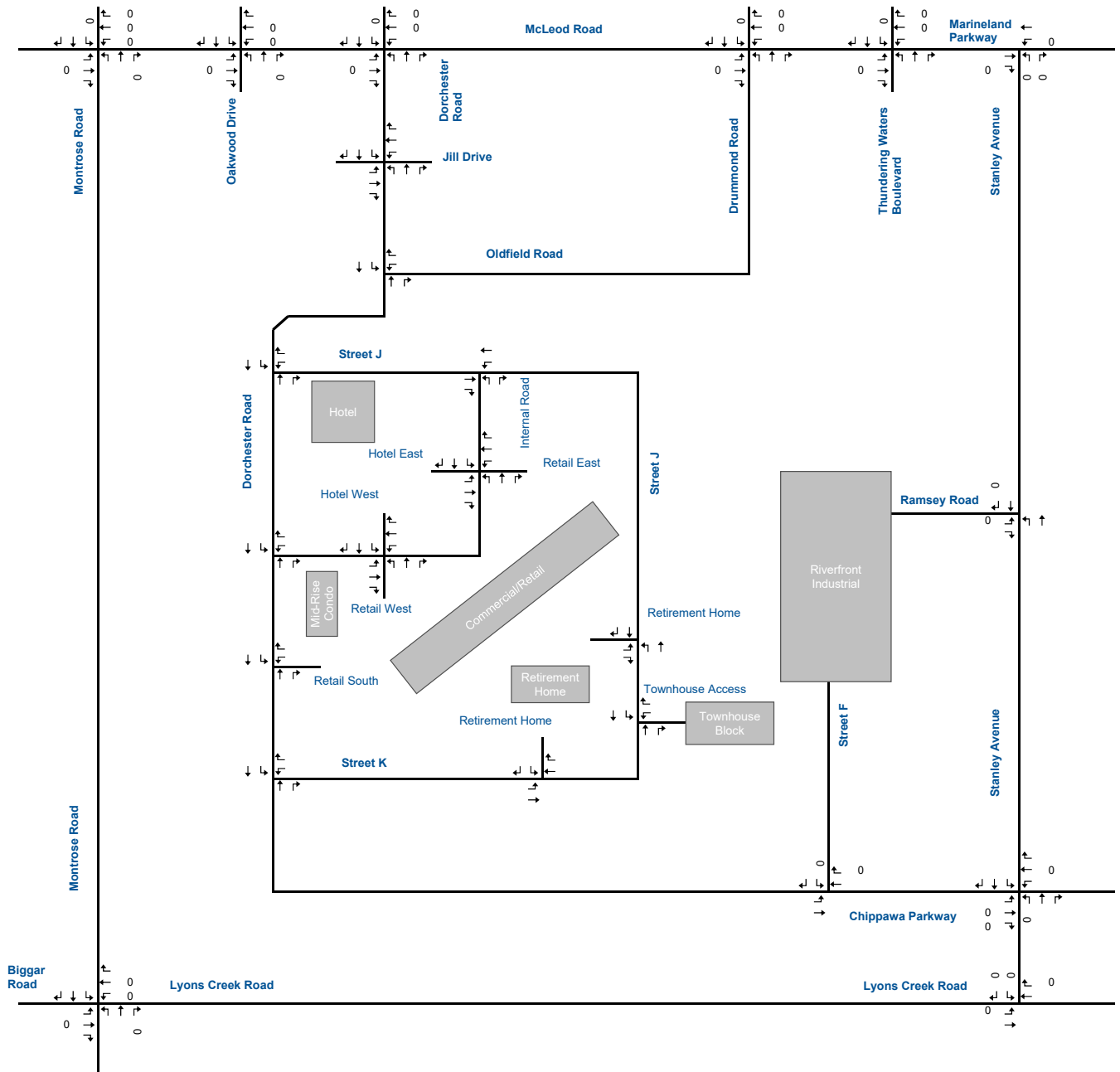
Background Development Riverfront Phase 1 Saturday Peak Hour



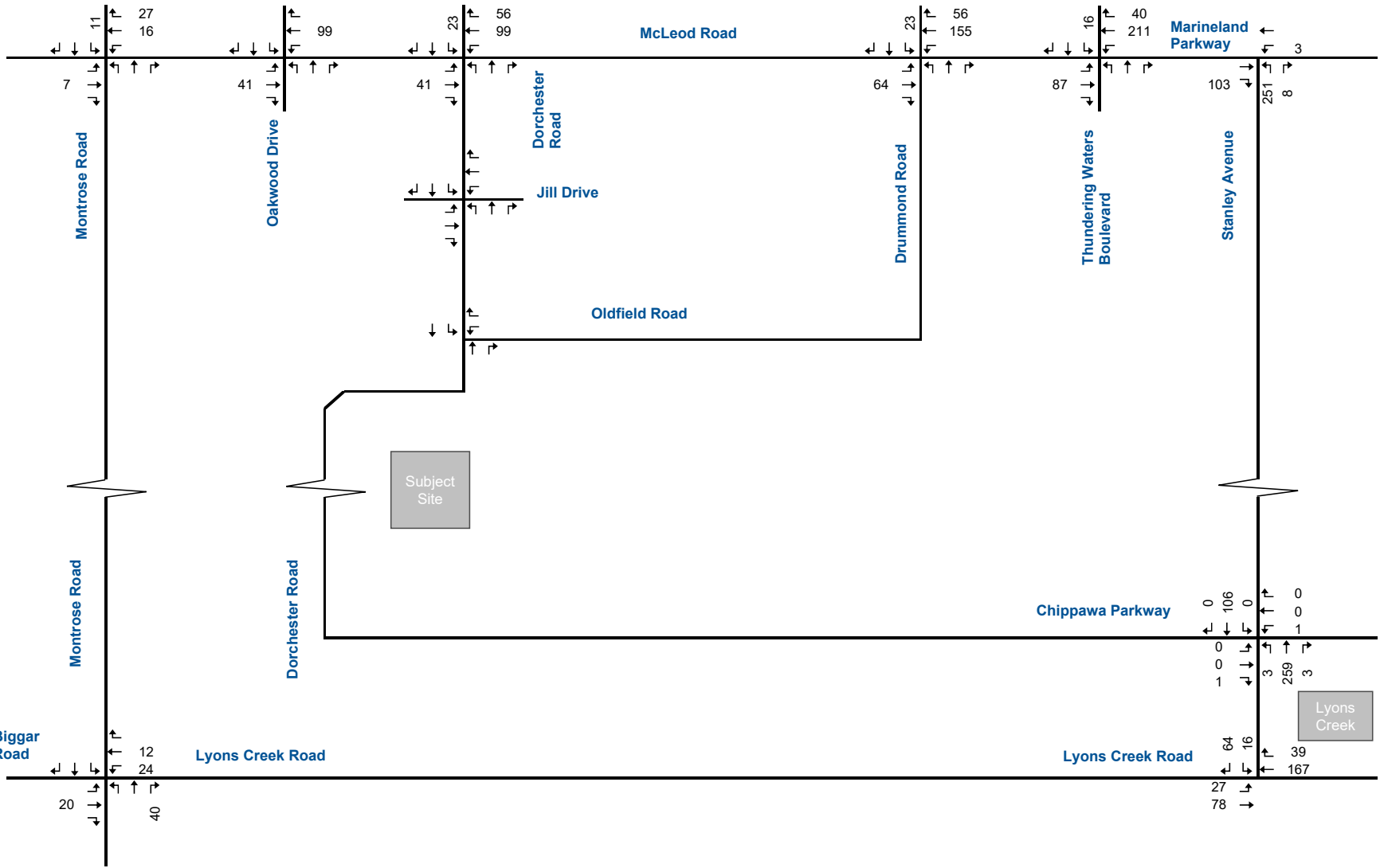
Background Development Riverfront Block 12 Weekday AM Peak Hour



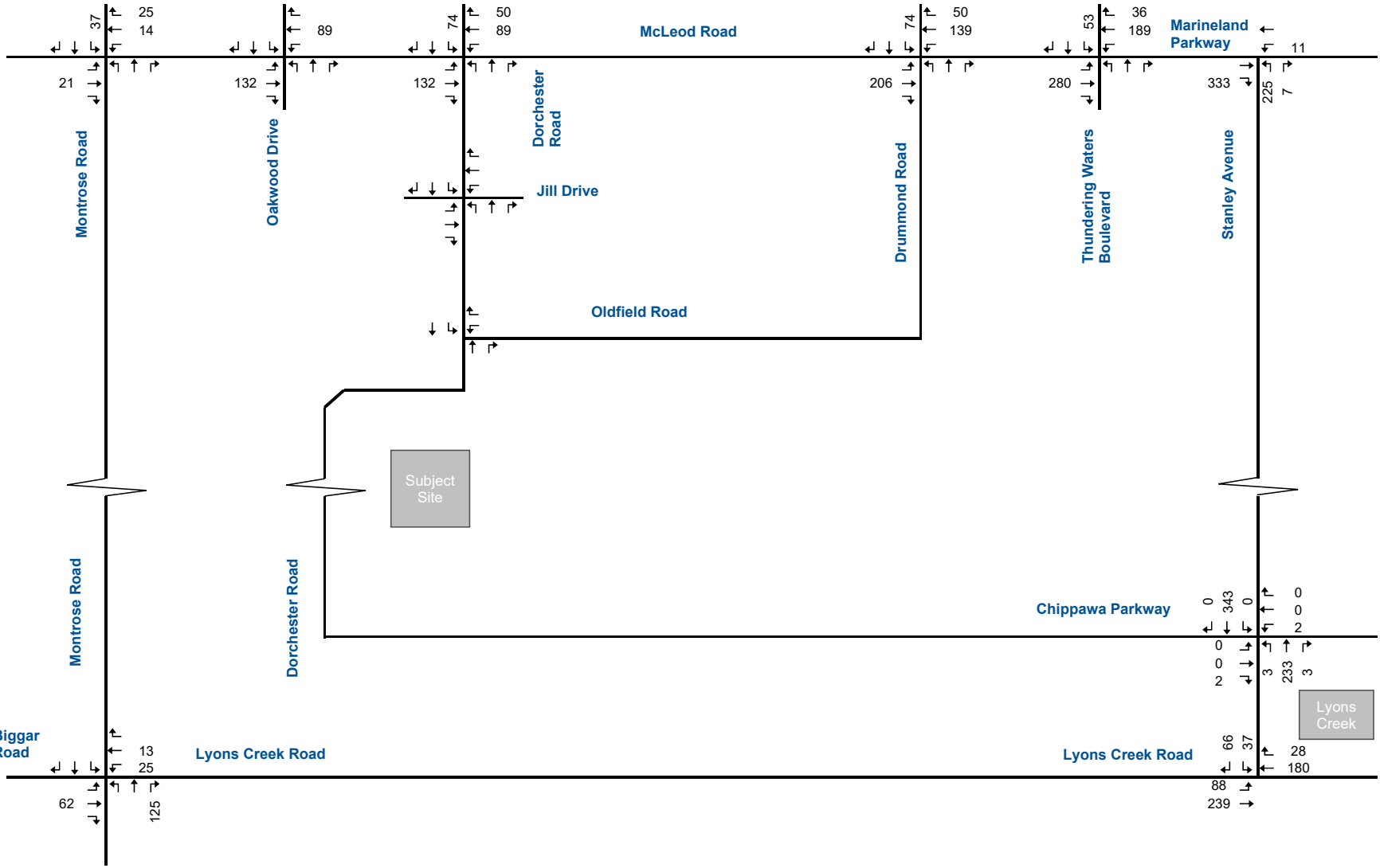
Background Development Riverfront Block 12 Weekday PM Peak Hour



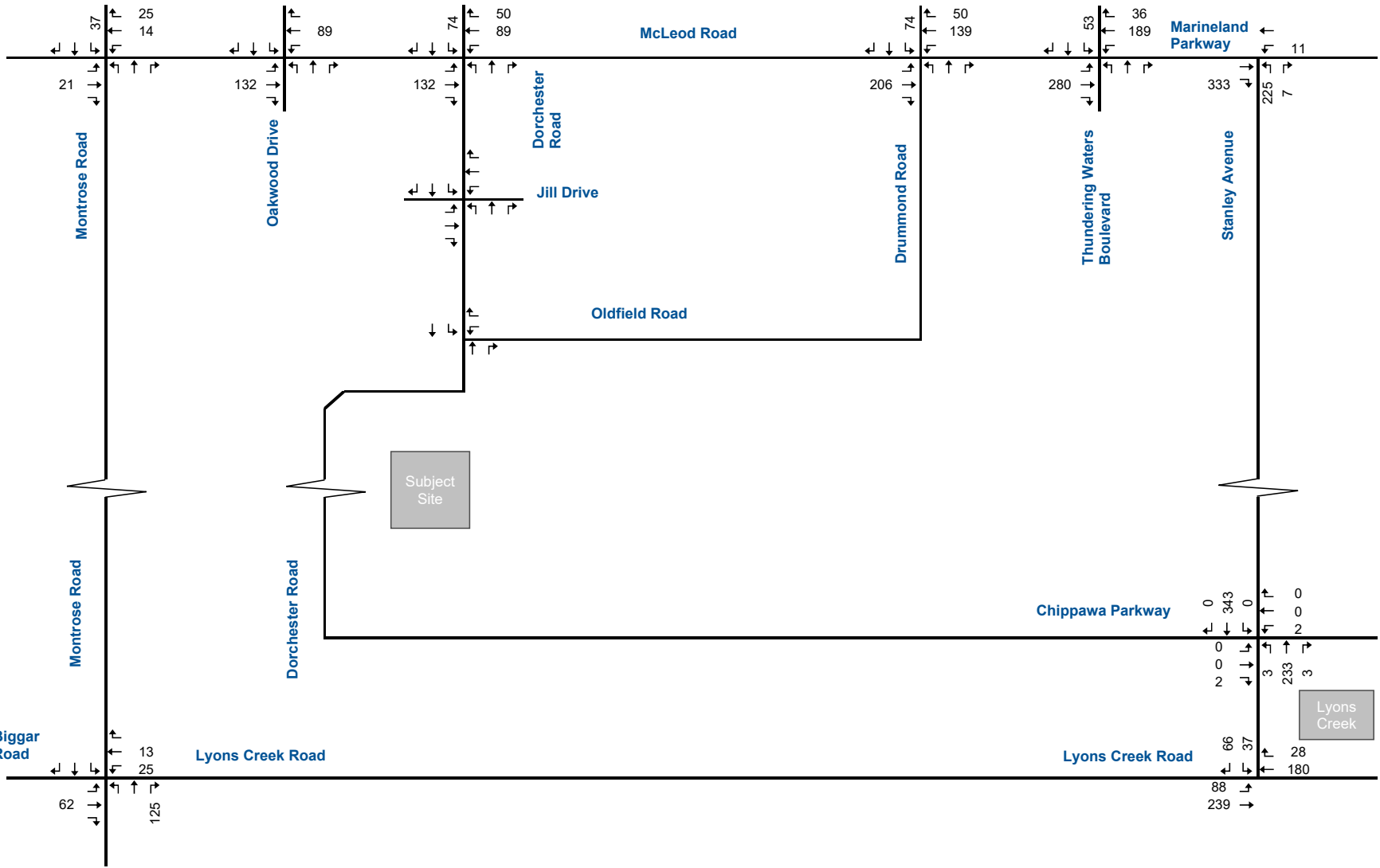
Background Development Riverfront Block 12 Saturday Peak Hour



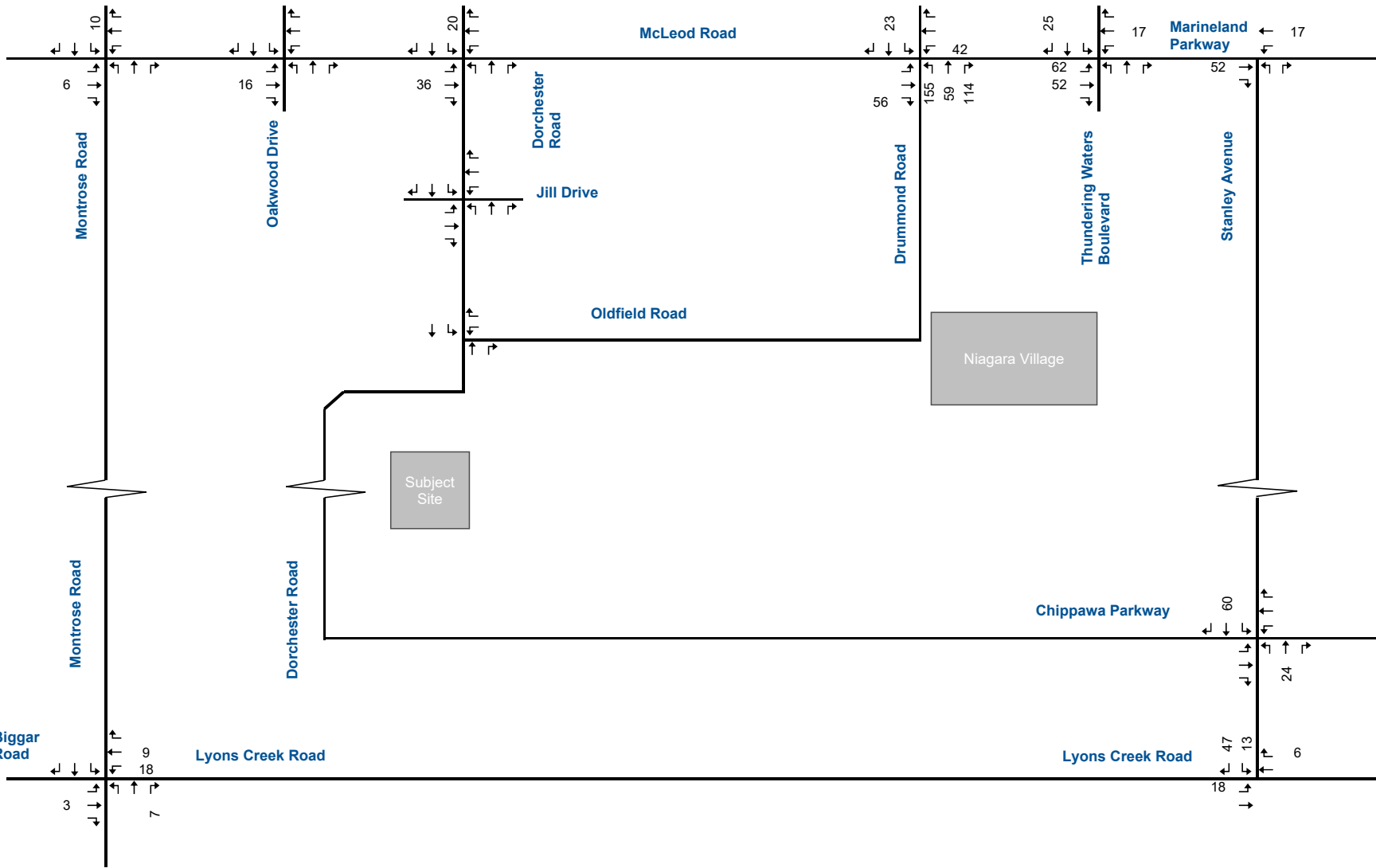
Background Development - 8970 & 9015 Stanley Avenue Weekday AM Peak Hour



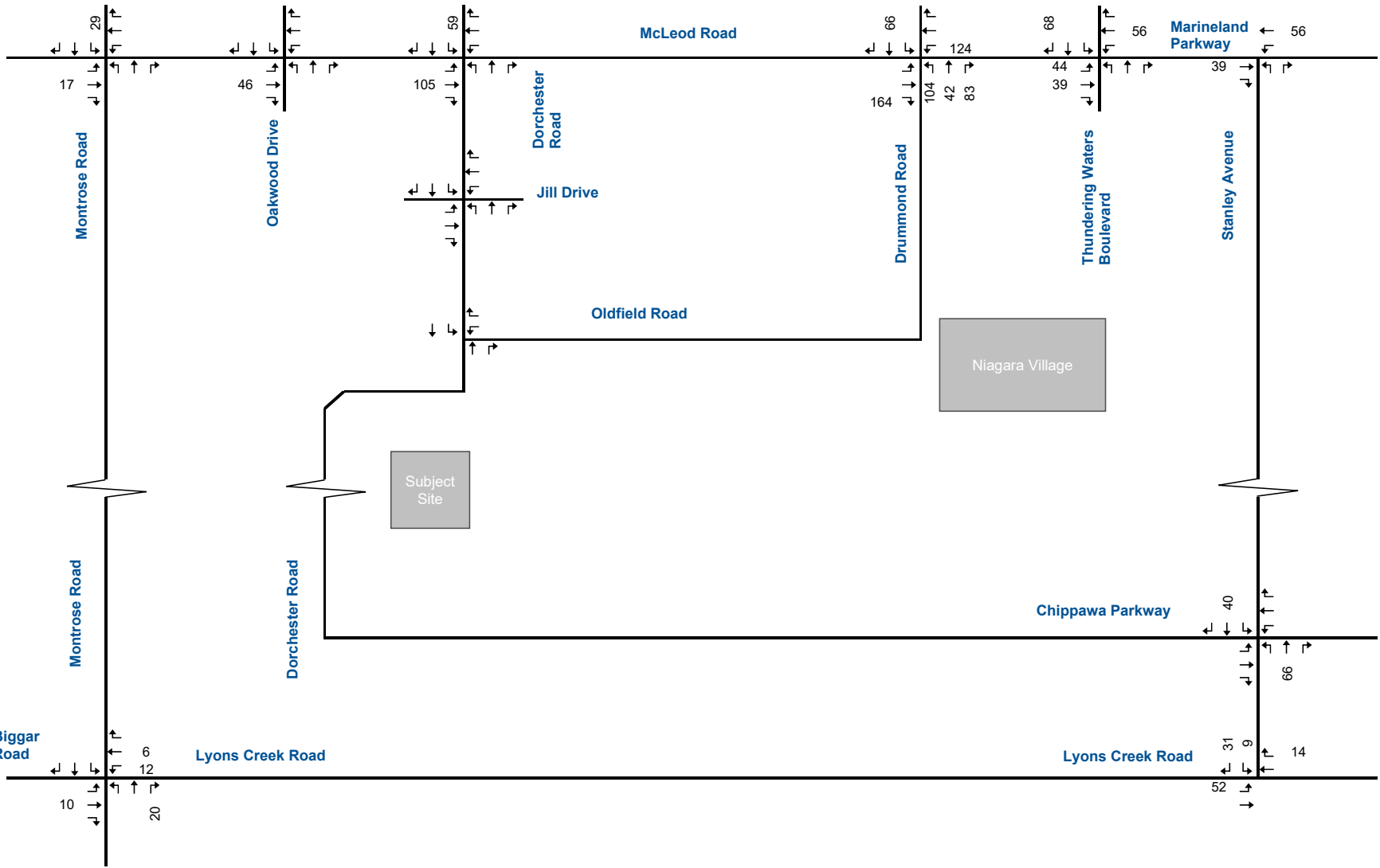
Background Development - 8970 & 9015 Stanley Avenue Weekday PM Peak Hour



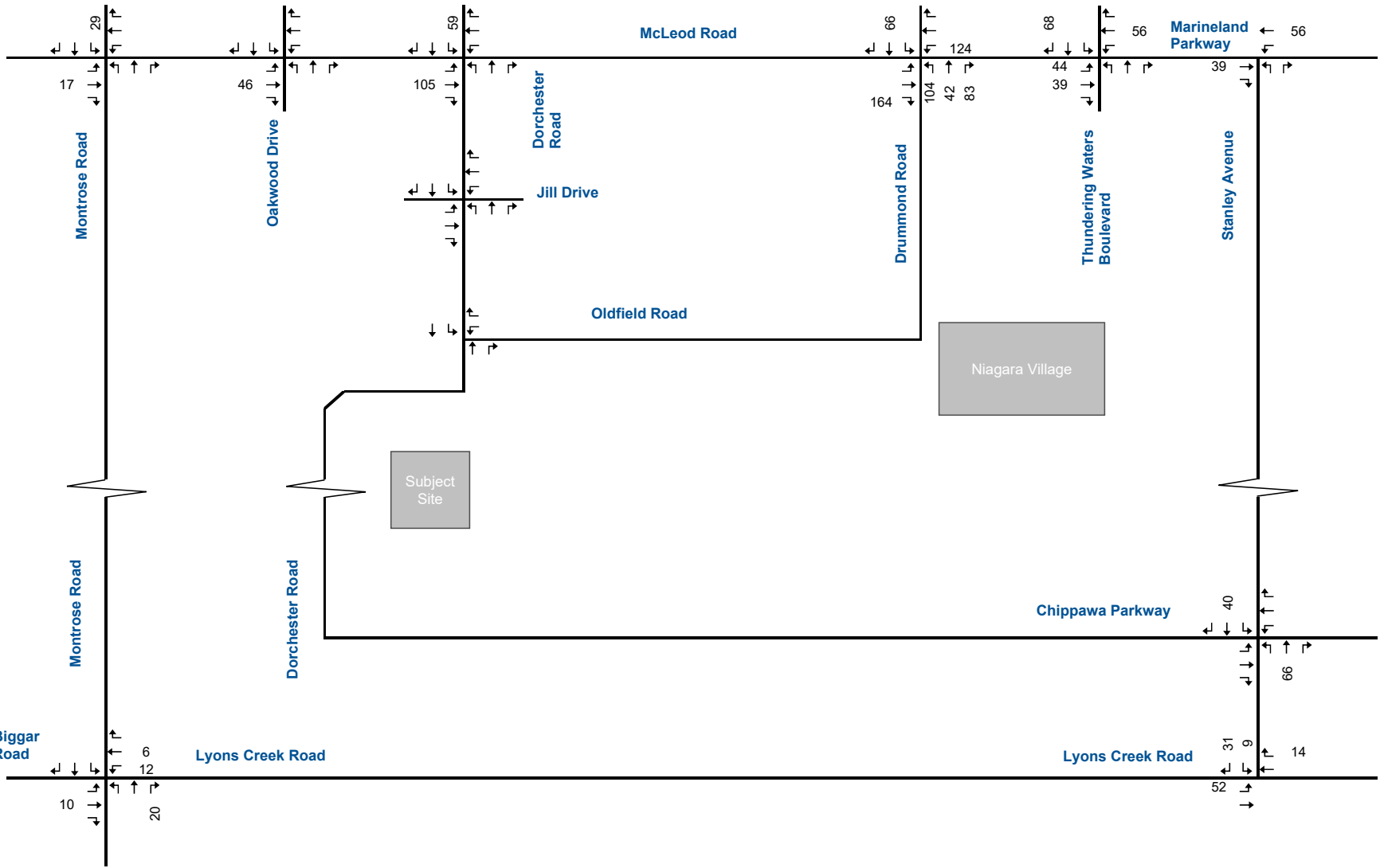
Background Development - 8970 & 9015 Stanley Avenue Saturday Peak Hour



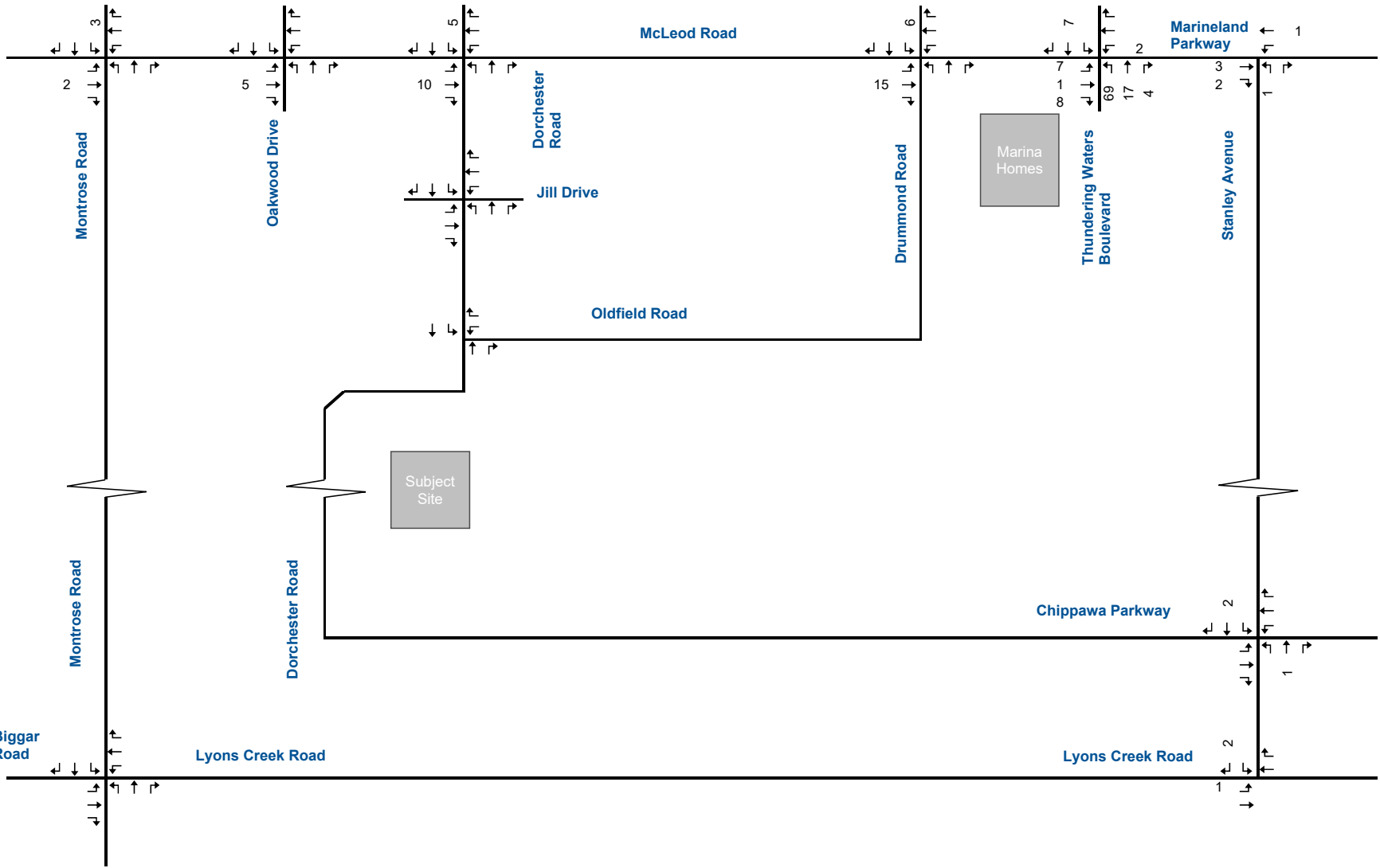
Background Development - Niagara Village Weekday AM Peak Hour



Background Development - Niagara Village Weekday PM Peak Hour

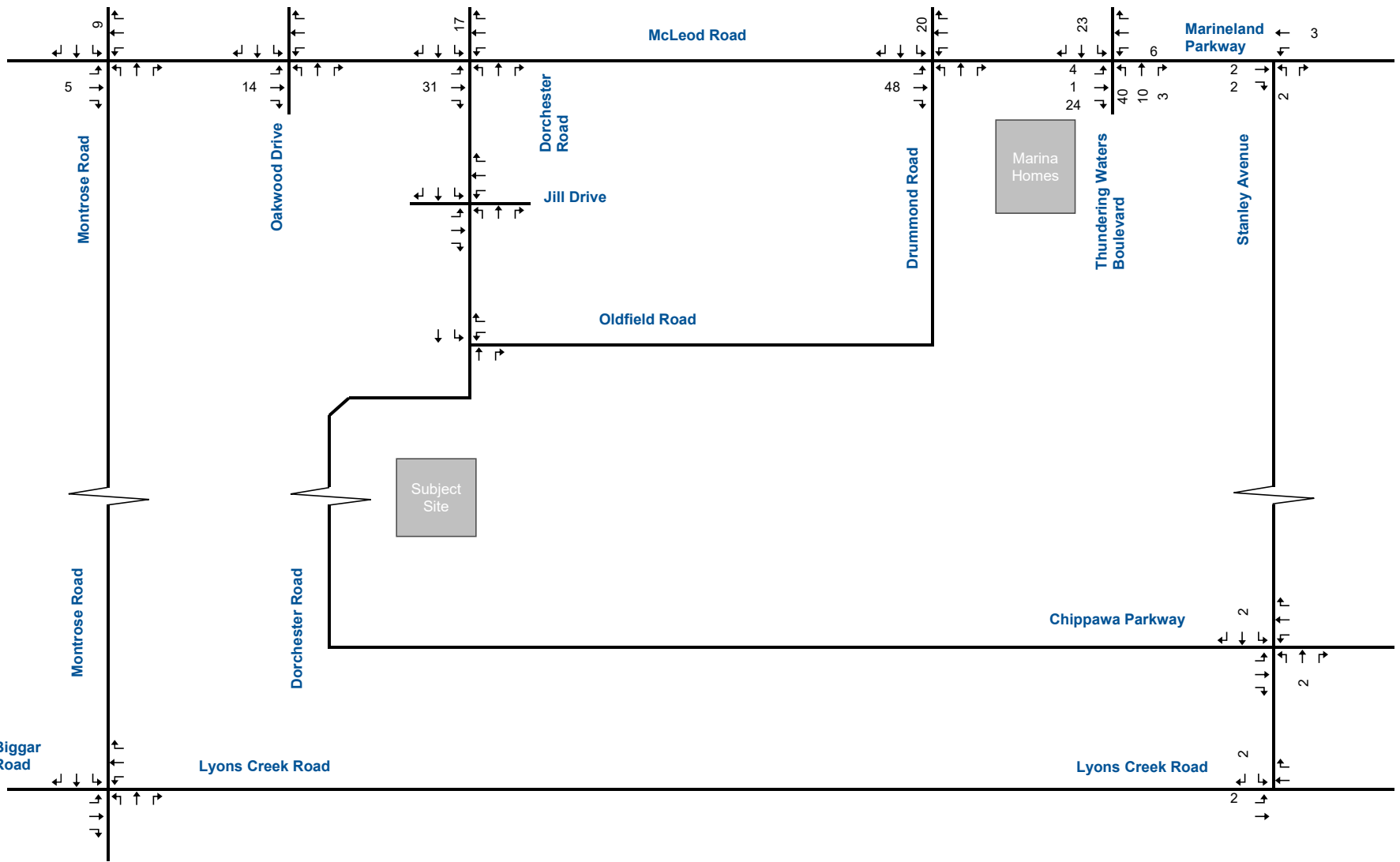


Background Development - Niagara Village Saturday Peak Hour

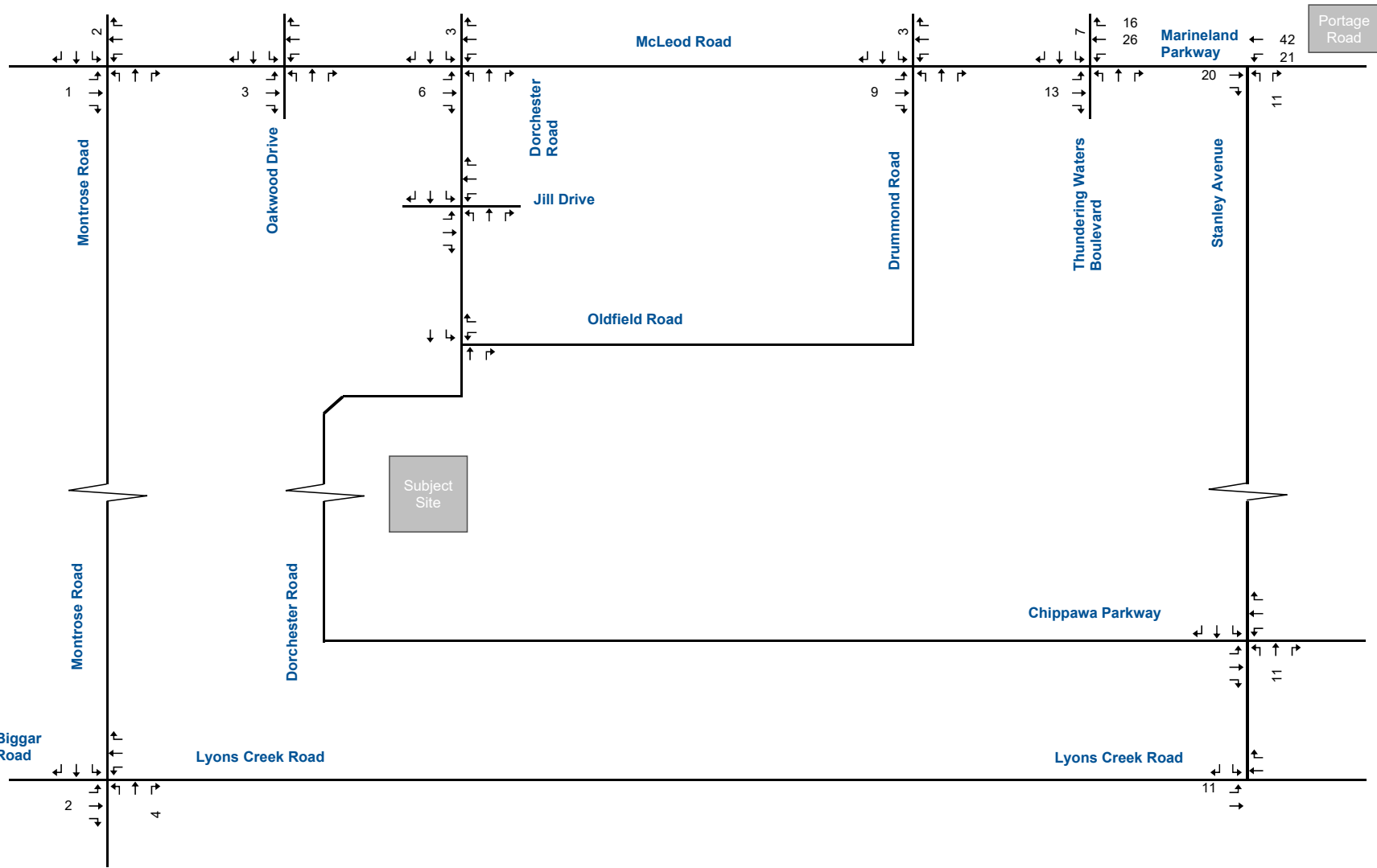


Background Development - 5500 Marineland Parkway

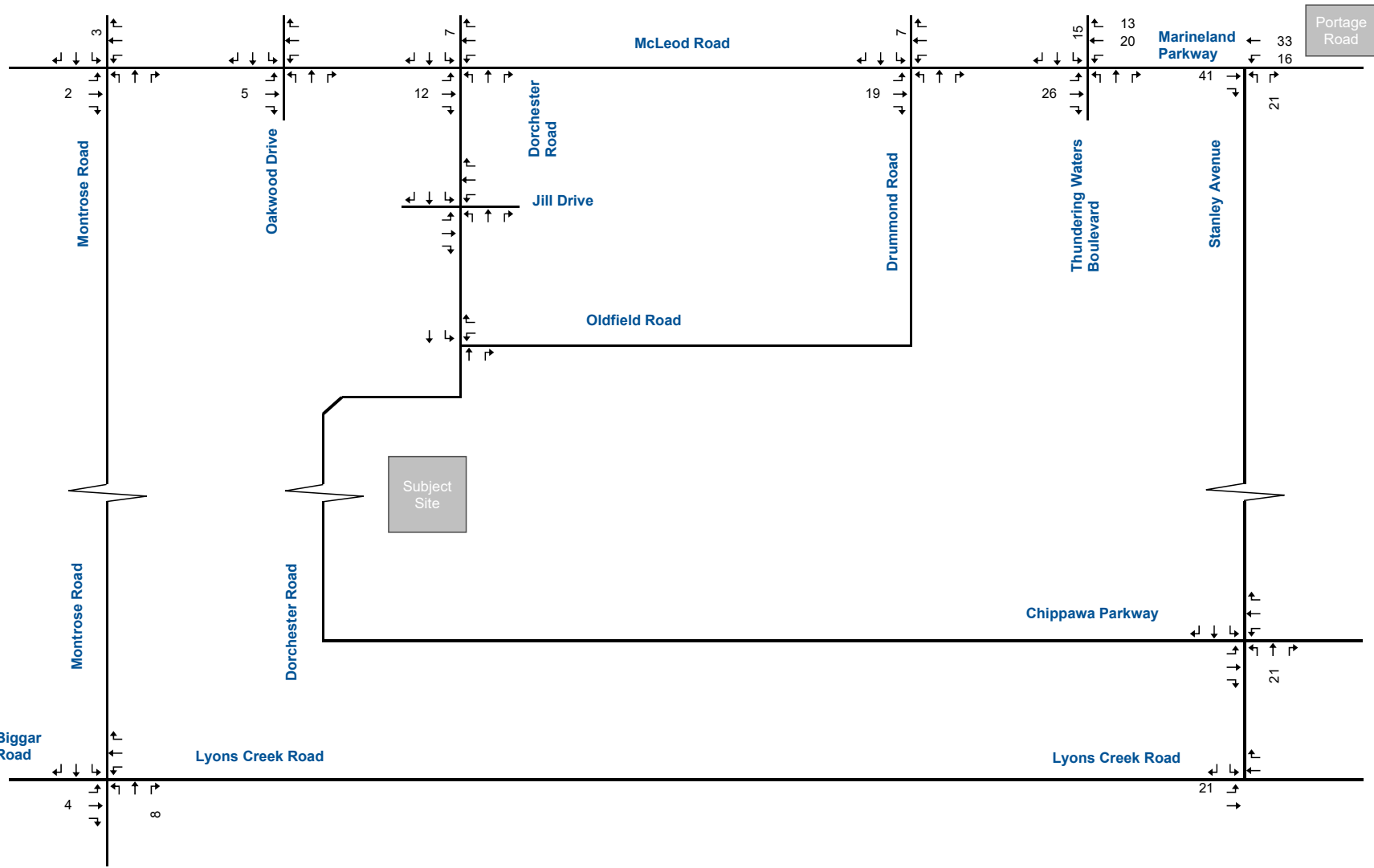
Weekday AM Peak Hour



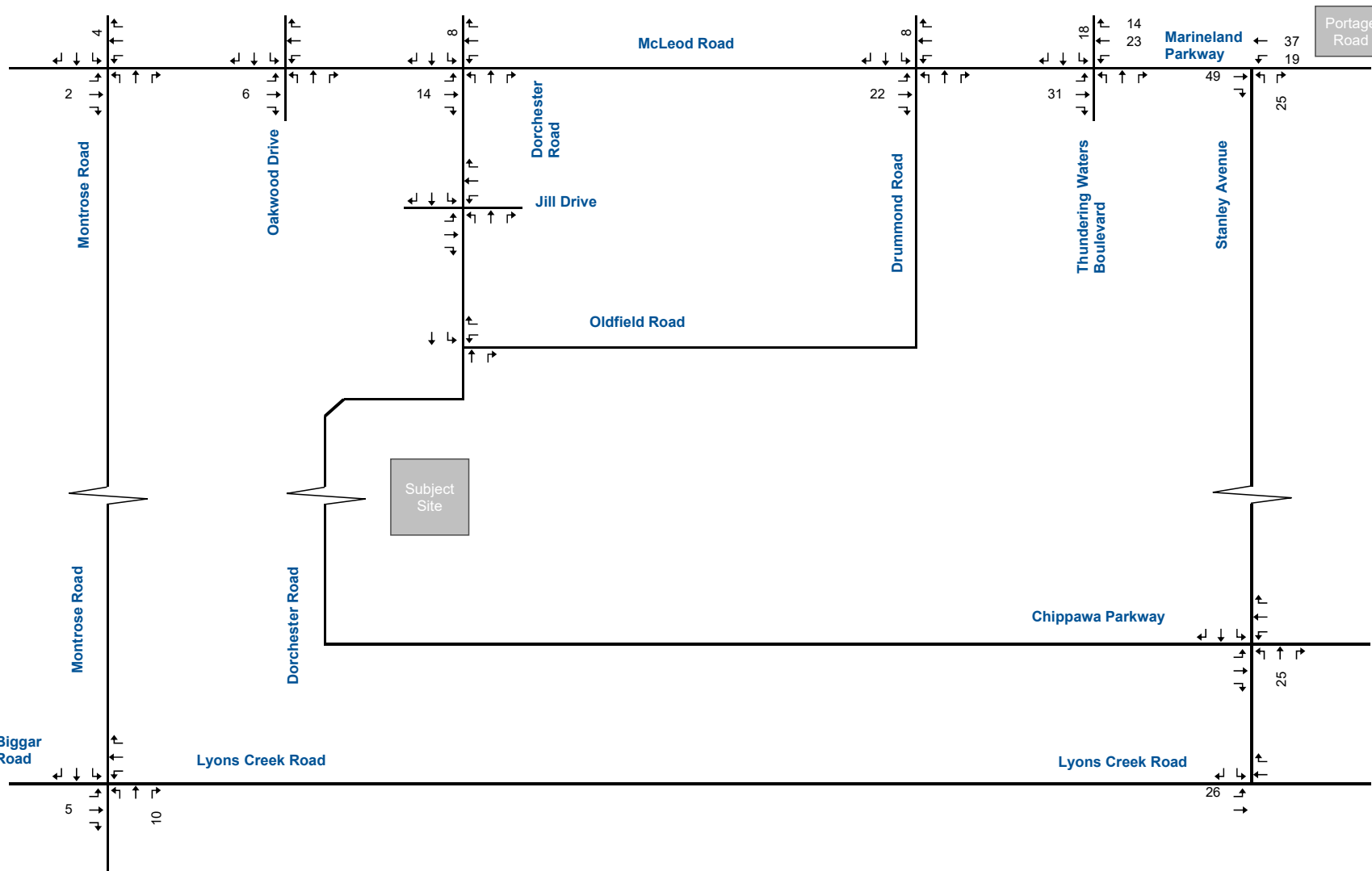
Background Development - 5500 Marineland Parkway Saturday Peak Hour



Background Development - Portage Road Weekday AM Peak Hour



Background Development - Portage Road Weekday PM Peak Hour



Background Development - Portage Road Saturday Peak Hour

Appendix F

Synchro Reports



Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	99	821	20	52	694	157	21	61	117	128	70	75
Future Volume (vph)	99	821	20	52	694	157	21	61	117	128	70	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0		0.0	115.0		0.0	130.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00					0.99
Frt		0.996				0.850			0.850			0.922
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	4480	0	1484	3228	1430	1662	1591	1340	1583	2890	0
Fit Permitted	0.166			0.205			0.653			0.658		
Satd. Flow (perm)	262	4480	0	320	3228	1430	1141	1591	1340	1097	2890	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				169			126			81
Link Speed (k/h)		50			50			50				50
Link Distance (m)		759.2			692.3			721.0				213.3
Travel Time (s)		54.7			49.8			51.9				15.4
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	6%	15%	12%	3%	4%	0%	10%	11%	5%	11%	0%
Adj. Flow (vph)	106	883	22	56	746	169	23	66	126	138	75	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	905	0	56	746	169	23	66	126	138	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1		2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	


Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2			2	6	
Detector Phase	7	4		3	8	8	5	2		2	1	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0		46.0	9.5	46.0
Total Split (s)	13.0	48.0		13.0	48.0	48.0	23.0	46.0		46.0	23.0	46.0
Total Split (%)	10.0%	36.9%		10.0%	36.9%	36.9%	17.7%	35.4%		35.4%	17.7%	35.4%
Maximum Green (s)	10.0	40.0		10.0	40.0	40.0	20.0	38.0		38.0	20.0	38.0
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0		4.0	0.0	4.0
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0		-4.0	1.0	-4.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	None	Max
Walk Time (s)		12.0			12.0	12.0		14.0		14.0		14.0
Flash Dont Walk (s)		20.0			20.0	20.0		24.0		24.0		24.0
Pedestrian Calls (#/hr)		0			0	0		0		0		0
Act Effct Green (s)	54.9	47.9		51.7	44.8	44.8	56.0	50.7		50.7	65.0	59.3
Actuated g/C Ratio	0.42	0.37		0.40	0.34	0.34	0.43	0.39		0.39	0.50	0.46
v/c Ratio	0.56	0.55		0.30	0.67	0.28	0.04	0.11		0.21	0.24	0.11
Control Delay	34.4	34.6		8.5	22.3	7.5	17.3	27.0		5.5	19.0	10.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	34.4	34.6		8.5	22.3	7.5	17.3	27.0		5.5	19.0	10.9
LOS	C	C		A	C	A	B	C		A	B	B
Approach Delay		34.6			18.9			13.3				14.7
Approach LOS		C			B			B				B
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	105											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.67											
Intersection Signal Delay:	24.3						Intersection LOS: C					
Intersection Capacity Utilization:	68.4%						ICU Level of Service C					
Analysis Period (min):	15											
Splits and Phases:	1: Montrose Road & McLeod Road											

Queues
1: Montrose Road & McLeod Road

Base Year
AM Peak Hour




Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	106	905	56	746	169	23	66	126	138	156
v/c Ratio	0.56	0.55	0.30	0.67	0.28	0.04	0.11	0.21	0.24	0.11
Control Delay	34.4	34.6	8.5	22.3	7.5	17.3	27.0	5.5	19.0	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	34.6	8.5	22.3	7.5	17.3	27.0	5.5	19.0	10.9
Queue Length 50th (m)	17.0	71.5	3.9	93.4	20.1	3.1	11.2	0.0	19.8	6.1
Queue Length 95th (m)	29.7	88.9	m4.2	116.0	m27.5	8.0	22.7	13.6	32.8	13.4
Internal Link Dist (m)		735.2		668.3			697.0			189.3
Turn Bay Length (m)	55.0		155.0			115.0			130.0	
Base Capacity (vph)	196	1653	213	1113	603	646	620	599	619	1362
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.55	0.26	0.67	0.28	0.04	0.11	0.21	0.22	0.11

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

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Base Year
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	99	821	20	52	694	157	21	61	117	128	70	75
Future Volume (vph)	99	821	20	52	694	157	21	61	117	128	70	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1498	4481		1484	3228	1430	1661	1591	1340	1583	2891	
Flt Permitted	0.17	1.00		0.21	1.00	1.00	0.65	1.00	1.00	0.66	1.00	
Satd. Flow (perm)	261	4481		321	3228	1430	1142	1591	1340	1096	2891	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	106	883	22	56	746	169	23	66	126	138	75	81
RTOR Reduction (vph)	0	2	0	0	0	112	0	0	76	0	44	0
Lane Group Flow (vph)	106	903	0	56	746	57	23	66	50	138	112	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	11%	6%	15%	12%	3%	4%	0%	10%	11%	5%	11%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	51.3	42.1		46.3	39.6	39.6	51.8	47.9	47.9	62.2	55.3	
Effective Green, g (s)	49.3	46.1		44.3	43.6	43.6	49.8	51.9	51.9	61.2	59.3	
Actuated g/C Ratio	0.38	0.35		0.34	0.34	0.34	0.38	0.40	0.40	0.47	0.46	
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	177	1589		160	1082	479	449	635	534	554	1318	
v/s Ratio Prot	c0.04	0.20		0.02	c0.23		0.00	0.04		c0.02	0.04	
v/s Ratio Perm	0.19			0.10		0.04	0.02		0.04	c0.10		
v/c Ratio	0.60	0.57		0.35	0.69	0.12	0.05	0.10	0.09	0.25	0.08	
Uniform Delay, d1	29.4	33.9		30.0	37.3	29.9	25.1	24.5	24.4	20.0	20.0	
Progression Factor	1.00	1.00		0.24	0.53	1.47	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.5	1.5		0.8	2.9	0.4	0.0	0.3	0.4	0.2	0.1	
Delay (s)	33.9	35.4		8.1	22.9	44.4	25.1	24.8	24.7	20.2	20.1	
Level of Service	C	D		A	C	D	C	C	C	C	C	
Approach Delay (s)		35.2			25.8			24.8			20.2	
Approach LOS		D			C			C			C	

Intersection Summary
 HCM 2000 Control Delay 28.9 HCM 2000 Level of Service C
 HCM 2000 Volume to Capacity ratio 0.44
 Actuated Cycle Length (s) 130.0 Sum of lost time (s) 16.0
 Intersection Capacity Utilization 68.4% ICU Level of Service C
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	37	577	263	136	865	19	165	15	139	11	4	16
Future Volume (vph)	37	577	263	136	865	19	165	15	139	11	4	16
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0		0.0	80.0		0.0	95.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00		1.00	1.00				0.99
Frt			0.850		0.997				0.850		0.880	
Flt Protected	0.950			0.950			0.950	0.960		0.950		
Satd. Flow (prot)	1583	3167	1365	1511	3216	0	1462	1496	1403	1662	1388	0
Flt Permitted	0.187			0.268			0.950	0.960		0.950		
Satd. Flow (perm)	311	3167	1365	426	3216	0	1461	1495	1403	1662	1388	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			268		2				143		16	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		692.3			616.3			360.6			181.9	
Travel Time (s)		49.8			44.4			26.0			13.1	
Confl. Peds. (#/hr)	2				2	1						1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	5%	9%	10%	3%	5%	8%	0%	6%	0%	25%	6%
Adj. Flow (vph)	38	589	268	139	883	19	168	15	142	11	4	16
Shared Lane Traffic (%)					46%							
Lane Group Flow (vph)	38	589	268	139	902	0	91	92	142	11	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

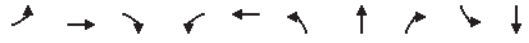
Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	23.0	43.0	43.0	23.0	43.0		41.0	41.0	41.0	23.0	23.0	
Total Split (%)	17.7%	33.1%	33.1%	17.7%	33.1%		31.5%	31.5%	31.5%	17.7%	17.7%	
Maximum Green (s)	20.0	35.0	35.0	20.0	35.0		32.0	32.0	32.0	14.0	14.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	53.0	47.0	42.0	62.0	53.9		37.0	37.0	37.0	19.0	19.0	
Actuated g/C Ratio	0.41	0.36	0.32	0.48	0.41		0.28	0.28	0.28	0.15	0.15	
v/c Ratio	0.21	0.51	0.43	0.47	0.68		0.22	0.22	0.28	0.05	0.09	
Control Delay	12.0	17.1	6.7	25.3	34.7		37.2	37.2	6.9	48.5	24.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	12.0	17.1	6.7	25.3	34.7		37.2	37.2	6.9	48.5	24.6	
LOS	B	B	A	C	C		D	D	A	D	C	
Approach Delay		13.8			33.5			24.0			33.0	
Approach LOS		B			C			C			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.68											
Intersection Signal Delay:	24.4						Intersection LOS: C					
Intersection Capacity Utilization:	78.3%						ICU Level of Service D					
Analysis Period (min):	15											
Splits and Phases:	2: Oakwood Drive & McLeod Road											

Queues
2: Oakwood Drive & McLeod Road

Base Year
AM Peak Hour




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	589	268	139	902	91	92	142	11	20
v/c Ratio	0.21	0.51	0.43	0.47	0.68	0.22	0.22	0.28	0.05	0.09
Control Delay	12.0	17.1	6.7	25.3	34.7	37.2	37.2	6.9	48.5	24.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	17.1	6.7	25.3	34.7	37.2	37.2	6.9	48.5	24.6
Queue Length 50th (m)	1.2	69.1	24.3	21.1	104.7	19.7	20.0	0.0	2.6	1.0
Queue Length 95th (m)	m3.6	95.0	66.3	35.0	133.1	35.7	35.8	16.0	8.6	8.9
Internal Link Dist (m)	668.3			592.3			336.6			157.9
Turn Bay Length (m)	50.0	80.0			95.0			20.0		
Base Capacity (vph)	334	1145	622	361	1334	416	425	501	242	216
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.51	0.43	0.39	0.68	0.22	0.22	0.28	0.05	0.09

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Base Year
AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	37	577	263	136	865	19	165	15	139	11	4	16
Future Volume (vph)	37	577	263	136	865	19	165	15	139	11	4	16
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85	1.00	0.88	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3167	1365	1511	3215	1462	1496	1403	1662	1388	1388	1388
Flt Permitted	0.19	1.00	1.00	0.27	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	311	3167	1365	427	3215	1462	1496	1403	1662	1388	1388	1388
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	38	589	268	139	883	19	168	15	142	11	4	16
RTOR Reduction (vph)	0	0	181	0	1	0	0	0	102	0	14	0
Lane Group Flow (vph)	38	589	87	139	901	0	91	92	40	11	6	0
Confl. Peds. (#/hr)	2				2		1				1	
Heavy Vehicles (%)	5%	5%	9%	10%	3%	5%	8%	0%	6%	0%	25%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Split	NA	Perm	Split	NA	NA	NA
Protected Phases	7	4		3	8	2	2		6	6		
Permitted Phases	4		4	8				2				
Actuated Green, G (s)	48.7	43.0	43.0	58.0	49.3	32.0	32.0	32.0	14.0	14.0		
Effective Green, g (s)	46.7	47.0	42.0	57.0	53.3	37.0	37.0	37.0	19.0	19.0		
Actuated g/C Ratio	0.36	0.36	0.32	0.44	0.41	0.28	0.28	0.28	0.15	0.15		
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0	9.0	9.0	9.0	9.0	9.0		
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		
Lane Grp Cap (vph)	157	1144	441	278	1318	416	425	399	242	202		
v/s Ratio Prot	0.01	0.19		c0.04	c0.28		c0.06	0.06		c0.01	0.00	
v/s Ratio Perm	0.08		0.06	0.18					0.03			
v/c Ratio	0.24	0.51	0.20	0.50	0.68	0.22	0.22	0.10	0.05	0.03		
Uniform Delay, d1	28.6	32.6	31.8	24.0	31.4	35.5	35.4	34.3	47.7	47.6		
Progression Factor	0.51	0.47	1.17	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	0.5	1.5	0.9	1.0	2.9	1.2	1.2	0.5	0.4	0.3		
Delay (s)	15.1	16.7	38.0	25.0	34.3	36.7	36.6	34.8	48.1	47.9		
Level of Service	B	B	D	C	C	D	D	C	D	D		
Approach Delay (s)	23.0				33.1		35.8		48.0			
Approach LOS	C				C		D		D			

Intersection Summary

HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	225	466	33	50	546	97	147	120	45	95	80	258
Future Volume (vph)	225	466	33	50	546	97	147	120	45	95	80	258
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0	0.0	15.0	0.0	30.0	0.0	30.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	0	0
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00	0.98	0.99	0.99	0.98	0.99	0.98	0.96	0.98		
Frt	0.990		0.977		0.959		0.885					
Fit Protected	0.950		0.950		0.950		0.950		0.950			
Satd. Flow (prot)	1554	3175	0	1599	3076	0	1599	1585	0	1568	1428	0
Fit Permitted	0.242		0.447		0.151		0.517					
Satd. Flow (perm)	394	3175	0	739	3076	0	253	1585	0	822	1428	0
Right Turn on Red		Yes		Yes		Yes		Yes		Yes		Yes
Satd. Flow (RTOR)	6		16		16		141					
Link Speed (k/h)	50		50		50		50					
Link Distance (m)	616.3		1045.5		348.9		308.0					
Travel Time (s)	44.4		75.3		25.1		22.2					
Confl. Peds. (#/hr)	7	21	21	7	10	44	44	10				
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%
Adj. Flow (vph)	247	512	36	55	600	107	162	132	49	104	88	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	548	0	55	707	0	162	181	0	104	372	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6		3.6		3.6		3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8		4.8		4.8		4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	25	15	25	15	25	15	25	15	25	15
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4		9.4		9.4		9.4		9.4		9.4	
Detector 2 Size(m)	0.6		0.6		0.6		0.6		0.6		0.6	
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA		
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases	4		8		2		6					
Detector Phase	7	4	3	8	5	2	1	6				
Switch Phase												
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	8.0	5.0	8.0				
Minimum Split (s)	9.5	30.4	9.5	30.4	9.5	37.7	9.5	37.7				
Total Split (s)	28.0	35.4	28.0	35.4	15.0	42.7	15.0	42.7				
Total Split (%)	23.1%	29.2%	23.1%	29.2%	12.4%	35.3%	12.4%	35.3%				
Maximum Green (s)	25.0	29.0	25.0	29.0	12.0	36.0	12.0	36.0				
Yellow Time (s)	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1				
All-Red Time (s)	0.0	2.3	0.0	2.3	0.0	2.6	0.0	2.6				
Lost Time Adjust (s)	1.0	-2.4	1.0	-2.4	1.0	-2.7	1.0	-2.7				
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None				
Walk Time (s)	9.0		9.0		12.0		12.0					
Flash Dont Walk (s)	15.0		15.0		19.0		19.0					
Pedestrian Calls (#/hr)	0		0		0		0					
Act Effct Green (s)	69.5	60.7	56.3	49.8	40.8	30.2	38.5	29.0				
Actuated g/C Ratio	0.57	0.50	0.46	0.41	0.34	0.25	0.32	0.24				
v/c Ratio	0.66	0.34	0.14	0.56	0.80	0.44	0.33	0.83				
Control Delay	23.8	21.2	16.2	31.9	54.4	36.9	27.3	41.8				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay	23.8	21.2	16.2	31.9	54.4	36.9	27.3	41.8				
LOS	C	C	B	C	D	D	C	D				
Approach Delay	22.0		30.8		45.2		38.6					
Approach LOS	C		C		D		D					
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.83											
Intersection Signal Delay:	31.5						Intersection LOS: C					
Intersection Capacity Utilization:	79.2%						ICU Level of Service D					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											

Queues
3: Dorchester Road & McLeod Road

Base Year
AM Peak Hour

	↖	→	↘	←	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	247	548	55	707	162	181	104	372
v/c Ratio	0.66	0.34	0.14	0.56	0.80	0.44	0.33	0.83
Control Delay	23.8	21.2	16.2	31.9	54.4	36.9	27.3	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	21.2	16.2	31.9	54.4	36.9	27.3	41.8
Queue Length 50th (m)	30.5	43.7	5.9	68.8	28.2	34.7	17.4	56.7
Queue Length 95th (m)	55.7	69.1	14.6	#120.7	#48.3	52.2	27.1	87.7
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	455	1593	589	1273	208	517	339	552
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	0.54	0.34	0.09	0.56	0.78	0.35	0.31	0.67

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Base Year
AM Peak Hour

	↖	→	↘	↙	←	↘	↑	↙	↘	↓	↙	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	↖
Traffic Volume (vph)	225	466	33	50	546	97	147	120	45	95	80	258
Future Volume (vph)	225	466	33	50	546	97	147	120	45	95	80	258
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.96		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1552	3175		1582	3077		1598	1586		1540	1429	
Flt Permitted	0.24	1.00		0.45	1.00		0.15	1.00		0.52	1.00	
Satd. Flow (perm)	395	3175		745	3077		254	1586		838	1429	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	247	512	36	55	600	107	162	132	49	104	88	284
RTOR Reduction (vph)	0	3	0	0	9	0	0	12	0	0	107	0
Lane Group Flow (vph)	247	545	0	55	698	0	162	169	0	104	265	0
Confl. Peds. (#/hr)	7		21	21		7	10		44	44		10
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	67.1	57.7		53.8	47.4		39.1	27.5		36.7	26.3	
Effective Green, g (s)	66.1	60.1		51.8	49.8		37.1	30.2		34.7	29.0	
Actuated g/C Ratio	0.55	0.50		0.43	0.41		0.31	0.25		0.29	0.24	
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	365	1575		355	1265		195	395		294	342	
v/s Ratio Prot	c0.09	0.17		0.01	0.23		c0.07	0.11		0.03	c0.19	
v/s Ratio Perm	c0.28			0.06			0.18			0.07		
v/c Ratio	0.68	0.35		0.15	0.55		0.83	0.43		0.35	0.77	
Uniform Delay, d1	17.2	18.5		20.5	27.1		34.5	38.2		33.2	43.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.9	0.6		0.2	1.7		24.9	0.7		0.7	10.4	
Delay (s)	22.1	19.2		20.7	28.9		59.4	38.9		33.9	53.4	
Level of Service	C	B		C	C		E	D		C	D	
Approach Delay (s)		20.1			28.3			48.6			49.2	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔		↔		
Traffic Volume (vph)	150	367	56	9	359	114	104	116	17	78	63	152
Future Volume (vph)	150	367	56	9	359	114	104	116	17	78	63	152
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			1.00		0.99		0.99
Frt		0.985			0.964			0.990		0.990		0.894
Flt Protected		0.987			0.999			0.979		0.950		
Satd. Flow (prot)	0	3131	0	0	3025	0	0	1609	0	1646	1452	0
Flt Permitted		0.672			0.942			0.576		0.538		
Satd. Flow (perm)	0	2128	0	0	2853	0	0	946	0	924	1452	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			53			4		118		
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		1045.5			1070.0			834.0		207.0		
Travel Time (s)		75.3			77.0			60.0		14.9		
Confl. Peds. (#/hr)	7		3	3		7	4		13	13		4
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
Heavy Vehicles (%)	5%	2%	4%	56%	4%	4%	4%	7%	0%	1%	10%	5%
Adj. Flow (vph)	167	408	62	10	399	127	116	129	19	87	70	169
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	637	0	0	536	0	0	264	0	87	239	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		
Link Offset(m)		0.0			0.0			0.0		0.0		
Crosswalk Width(m)		4.8			4.8			4.8		4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4		9.4		
Detector 2 Size(m)		0.6			0.6			0.6		0.6		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0		0.0		

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8				2			6	
Detector Phase	7	4		8	8			2	2		6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0			8.0	8.0		8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5			30.8	30.8		30.8	30.8
Total Split (s)	18.0	51.5		51.5	51.5			33.8	33.8		33.8	33.8
Total Split (%)	17.4%	49.9%		49.9%	49.9%			32.7%	32.7%		32.7%	32.7%
Maximum Green (s)	15.0	45.0		45.0	45.0			27.0	27.0		27.0	27.0
Yellow Time (s)	3.0	4.1		4.1	4.1			4.1	4.1		4.1	4.1
All-Red Time (s)	0.0	2.4		2.4	2.4			2.7	2.7		2.7	2.7
Lost Time Adjust (s)		-2.5			-2.5			-2.8	-2.8		-2.8	-2.8
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Recall Mode	None	C-Max		C-Max	C-Max			Max	Max		Max	Max
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)		65.5			65.5			29.8	29.8		29.8	29.8
Actuated g/C Ratio		0.63			0.63			0.29	0.29		0.29	0.29
v/c Ratio		0.47			0.29			0.96	0.96		0.33	0.48
Control Delay		10.8			8.0			82.5	33.1		18.5	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		10.8			8.0			82.5	33.1		18.5	
LOS		B			A			F	C		B	
Approach Delay		10.8			8.0			82.5			22.4	
Approach LOS		B			A			F			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	103.3											
Actuated Cycle Length:	103.3											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	75											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.96											
Intersection Signal Delay:	22.9						Intersection LOS: C					
Intersection Capacity Utilization:	93.3%						ICU Level of Service F					
Analysis Period (min):	15											
Splits and Phases:	4: Drummond Road & McLeod Road											

Queues
4: Drummond Road & McLeod Road

Base Year
AM Peak Hour

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	637	536	264	87	239
v/c Ratio	0.47	0.29	0.96	0.33	0.48
Control Delay	10.8	8.0	82.5	33.1	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	8.0	82.5	33.1	18.5
Queue Length 50th (m)	32.4	21.6	54.1	14.4	19.9
Queue Length 95th (m)	45.5	30.4	#107.2	29.0	43.8
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	1357	1828	275	266	502
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	0.96	0.33	0.48

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

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Base Year
AM Peak Hour

	↘	→	↙	↗	←	↖	↑	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↔	↔	
Traffic Volume (vph)	150	367	56	9	359	114	104	116	17	78	63	152
Future Volume (vph)	150	367	56	9	359	114	104	116	17	78	63	152
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Frbp, ped/bikes		1.00			0.99			1.00		1.00		0.99
Flpb, ped/bikes		1.00			1.00			1.00		0.99		1.00
Frt		0.99			0.96			0.99		1.00		0.89
Flt Protected		0.99			1.00			0.98		0.95		1.00
Satd. Flow (prot)		3127			3027			1607		1632		1452
Flt Permitted		0.67			0.94			0.58		0.54		1.00
Satd. Flow (perm)		2129			2854			947		924		1452
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)	167	408	62	10	399	127	116	129	19	87	70	169
RTOR Reduction (vph)	0	8	0	0	19	0	0	3	0	0	84	0
Lane Group Flow (vph)	0	629	0	0	517	0	0	261	0	87	155	0
Confl. Peds. (#/hr)	7		3	3		7	4		13	13		4
Heavy Vehicles (%)	5%	2%	4%	56%	4%	4%	4%	7%	0%	1%	10%	5%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		63.0			63.0			27.0		27.0		27.0
Effective Green, g (s)		65.5			65.5			29.8		29.8		29.8
Actuated g/C Ratio		0.63			0.63			0.29		0.29		0.29
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5
Lane Grp Cap (vph)		1349			1809			273		266		418
v/s Ratio Prot												0.11
v/s Ratio Perm		c0.30			0.18			c0.28		0.09		
v/c Ratio		0.47			0.29			0.96		0.33		0.37
Uniform Delay, d1		9.8			8.4			36.1		28.9		29.3
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		0.2			0.4			44.4		3.3		2.5
Delay (s)		10.0			8.8			80.5		32.1		31.8
Level of Service		B			A			F		C		C
Approach Delay (s)		10.0			8.8			80.5				31.9
Approach LOS		B			A			F				C
Intersection Summary												
HCM 2000 Control Delay			24.3									C
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			103.3					Sum of lost time (s)		11.0		
Intersection Capacity Utilization			93.3%					ICU Level of Service		F		
Analysis Period (min)			15									

c Critical Lane Group


Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Base Year Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	26	279	5	2	360	176	3	11	6	132	4	29
Future Volume (vph)	26	279	5	2	360	176	3	11	6	132	4	29
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00						0.98					
Frt			0.850			0.850		0.957			0.867	
Flt Protected	0.950			0.950			0.993		0.950			
Satd. Flow (prot)	1599	3228	1488	1662	3137	1417	0	1663	0	1539	1349	0
Flt Permitted	0.427			0.563			0.993		0.950			
Satd. Flow (perm)	718	3228	1488	985	3137	1385	0	1663	0	1539	1349	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			196		7			32	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1070.0			261.8			326.3			294.0	
Travel Time (s)		77.0			18.8			23.5			21.2	
Confl. Peds. (#/hr)	1					1						
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
Heavy Vehicles (%)	4%	3%	0%	0%	6%	5%	0%	0%	0%	8%	0%	14%
Adj. Flow (vph)	29	310	6	2	400	196	3	12	7	147	4	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	310	6	2	400	196	0	22	0	147	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Base Year Peak Hour


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	Split	NA
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	15.0	57.2	57.2	42.2	42.2	42.2	37.2	37.2		37.2	37.2	
Total Split (%)	11.4%	43.5%	43.5%	32.1%	32.1%	32.1%	28.3%	28.3%		28.3%	28.3%	
Maximum Green (s)	12.0	50.0	50.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	64.4	64.4	64.4	58.5	58.5	58.5		33.2		22.0	22.0	
Actuated g/C Ratio	0.49	0.49	0.49	0.44	0.44	0.44		0.25		0.17	0.17	
v/c Ratio	0.07	0.20	0.01	0.00	0.29	0.27		0.05		0.57	0.14	
Control Delay	19.9	20.2	0.0	26.0	25.8	4.7		28.9		58.7	16.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	19.9	20.2	0.0	26.0	25.8	4.7		28.9		58.7	16.9	
LOS	B	C	A	C	C	A		C		E	B	
Approach Delay		19.8			18.9			28.9			50.4	
Approach LOS		B			B			C			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	131.6											
Actuated Cycle Length:	131.6											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	125											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.57											
Intersection Signal Delay:	24.4						Intersection LOS: C					
Intersection Capacity Utilization:	48.3%						ICU Level of Service A					
Analysis Period (min)	15											
Splits and Phases:	5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway											

Queues Base Year
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	29	310	6	2	400	196	22	147	36
v/c Ratio	0.07	0.20	0.01	0.00	0.29	0.27	0.05	0.57	0.14
Control Delay	19.9	20.2	0.0	26.0	25.8	4.7	28.9	58.7	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	20.2	0.0	26.0	25.8	4.7	28.9	58.7	16.9
Queue Length 50th (m)	4.0	24.5	0.0	0.3	37.6	0.0	3.1	37.4	0.9
Queue Length 95th (m)	10.7	37.8	0.0	2.3	56.7	16.5	10.4	57.1	10.5
Internal Link Dist (m)	1046.0			237.8			302.3		
Turn Bay Length (m)	60.0	50.0		25.0	80.0				
Base Capacity (vph)	425	1580	777	437	1394	724	424	388	364
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	0.20	0.01	0.00	0.29	0.27	0.05	0.38	0.10
Intersection Summary									

HCM Signalized Intersection Capacity Analysis Base Year
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔		↔↔		↔	↔		
Traffic Volume (vph)	26	279	5	2	360	176	3	11	6	132	4	29	
Future Volume (vph)	26	279	5	2	360	176	3	11	6	132	4	29	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00		
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98		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	1.00	0.85		0.96		1.00	0.87		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	1.00		
Satd. Flow (prot)	1598	3228	1488	1662	3137	1385		1663		1539	1349		
Flt Permitted	0.43	1.00	1.00	0.56	1.00	1.00		0.99		0.95	1.00		
Satd. Flow (perm)	719	3228	1488	986	3137	1385		1663		1539	1349		
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)	29	310	6	2	400	196	3	12	7	147	4	32	
RTOR Reduction (vph)	0	0	3	0	0	111	0	5	0	0	27	0	
Lane Group Flow (vph)	29	310	3	2	400	85	0	17	0	147	9	0	
Confl. Peds. (#/hr)	1												
Heavy Vehicles (%)	4%	3%	0%	0%	6%	5%	0%	0%	0%	8%	0%	14%	
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA		
Protected Phases	7	4			8		2	2		6	6		
Permitted Phases	4		4	8		8							
Actuated Green, G (s)	61.2	61.2	61.2	54.1	54.1	54.1		30.0		18.8	18.8		
Effective Green, g (s)	60.2	64.4	64.4	57.3	57.3	57.3		33.2		22.0	22.0		
Actuated g/C Ratio	0.46	0.49	0.49	0.44	0.44	0.44		0.25		0.17	0.17		
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2		7.2		7.2	7.2		
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5		4.0		4.0	4.0		
Lane Grp Cap (vph)	349	1579	728	429	1365	603		419		257	225		
v/s Ratio Prot	0.00	c0.10			c0.13			c0.01		c0.10	0.01		
v/s Ratio Perm	0.04		0.00	0.00		0.06							
v/c Ratio	0.08	0.20	0.00	0.00	0.29	0.14		0.04		0.57	0.04		
Uniform Delay, d1	20.1	19.0	17.2	21.0	24.0	22.4		37.2		50.5	46.0		
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	0.3	0.0	0.0	0.5	0.5		0.2		3.7	0.1		
Delay (s)	20.2	19.3	17.2	21.0	24.6	22.8		37.3		54.1	46.1		
Level of Service	C	B	B	C	C	C		D		D	D		
Approach Delay (s)	19.3			24.0			37.3			52.5			
Approach LOS	B			C			D			D			
Intersection Summary													
HCM 2000 Control Delay	27.4					HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio	0.28												
Actuated Cycle Length (s)	131.6					Sum of lost time (s)				19.2			
Intersection Capacity Utilization	48.3%					ICU Level of Service				A			
Analysis Period (min)	15												
c Critical Lane Group													

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Base Year
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	235	181	15	386	148	23
Future Volume (vph)	235	181	15	386	148	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						0.99
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3228	1390	1385	3228	2880	1316
Flt Permitted			0.565		0.950	
Satd. Flow (perm)	3228	1390	824	3228	2880	1300
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		199				25
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	7%	20%	3%	12%	13%
Adj. Flow (vph)	258	199	16	424	163	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	258	199	16	424	163	25
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Base Year
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	42.5	42.5	42.5	42.5	36.5	36.5
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.2%	46.2%
Maximum Green (s)	35.0	35.0	35.0	35.0	30.0	30.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	19.3	19.3	19.3	19.3	51.7	51.7
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.65	0.65
v/c Ratio	0.33	0.41	0.08	0.54	0.09	0.03
Control Delay	24.9	6.2	22.1	28.1	5.8	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	6.2	22.1	28.1	5.8	2.7
LOS	C	A	C	C	A	A
Approach Delay	16.8			27.9	5.4	
Approach LOS	B			C	A	
Intersection Summary						
Area Type:	Other					
Cycle Length: 79						
Actuated Cycle Length: 79						
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green						
Natural Cycle: 65						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.54						
Intersection Signal Delay: 19.3	Intersection LOS: B					
Intersection Capacity Utilization 46.9%	ICU Level of Service A					
Analysis Period (min) 15						
Splits and Phases: 6: Stanley Avenue & Marineland Parkway						
↔ Ø2 (R)	↔ Ø4				↔ Ø8	
36.5 s	42.5 s				42.5 s	

Queues
6: Stanley Avenue & Marineland Parkway

Base Year
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	258	199	16	424	163	25
v/c Ratio	0.33	0.41	0.08	0.54	0.09	0.03
Control Delay	24.9	6.2	22.1	28.1	5.8	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	6.2	22.1	28.1	5.8	2.7
Queue Length 50th (m)	17.6	0.0	2.0	30.6	4.2	0.0
Queue Length 95th (m)	25.6	14.5	6.3	41.3	9.0	2.9
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1573	779	401	1573	1884	859
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.26	0.04	0.27	0.09	0.03
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Base Year
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕	↕	↕	↕↕	↕↕	↕
Traffic Volume (vph)	235	181	15	386	148	23
Future Volume (vph)	235	181	15	386	148	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3228	1390	1385	3228	2880	1300
Flt Permitted	1.00	1.00	0.57	1.00	0.95	1.00
Satd. Flow (perm)	3228	1390	825	3228	2880	1300
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	258	199	16	424	163	25
RTOR Reduction (vph)	0	150	0	0	0	9
Lane Group Flow (vph)	258	49	16	424	163	16
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	3%	7%	20%	3%	12%	13%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	15.8	15.8	15.8	15.8	49.2	49.2
Effective Green, g (s)	19.3	19.3	19.3	19.3	51.7	51.7
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.65	0.65
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	788	339	201	788	1884	850
v/s Ratio Prot	0.08			c0.13	c0.06	
v/s Ratio Perm		0.03	0.02			0.01
v/c Ratio	0.33	0.14	0.08	0.54	0.09	0.02
Uniform Delay, d1	24.5	23.4	23.0	26.0	5.0	4.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2	0.2	0.7	0.1	0.0
Delay (s)	24.7	23.6	23.2	26.7	5.1	4.8
Level of Service	C	C	C	C	A	A
Approach Delay (s)	24.2			26.5	5.1	
Approach LOS	C			C	A	
Intersection Summary						
HCM 2000 Control Delay		21.8			HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.21				
Actuated Cycle Length (s)		79.0			Sum of lost time (s)	8.0
Intersection Capacity Utilization		46.9%			ICU Level of Service	A
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	41	142	1	220	120	101	4	166	385	62	82	12
Future Volume (vph)	41	142	1	220	120	101	4	166	385	62	82	12
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.969			0.906			0.990	
Flt Protected		0.989			0.976						0.981	
Satd. Flow (prot)	0	1658	0	0	1529	0	0	1537	0	0	1474	0
Flt Permitted		0.849			0.722			0.999			0.668	
Satd. Flow (perm)	0	1424	0	0	1131	0	0	1535	0	0	1003	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					19			163			6	
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		507.4			421.7			216.1			150.6	
Travel Time (s)		22.8			19.0			13.0			9.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	100%	9%	7%	8%	0%	6%	2%	17%	15%	9%
Adj. Flow (vph)	45	154	1	239	130	110	4	180	418	67	89	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	200	0	0	479	0	0	602	0	0	169	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

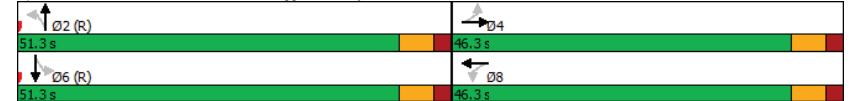
Base Year
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.3	26.3		26.3	26.3		31.3	31.3		31.3	31.3	
Total Split (s)	46.3	46.3		46.3	46.3		51.3	51.3		51.3	51.3	
Total Split (%)	47.4%	47.4%		47.4%	47.4%		52.6%	52.6%		52.6%	52.6%	
Maximum Green (s)	40.0	40.0		40.0	40.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	4.1	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		-2.3			-2.3			-2.3			-2.3	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		42.3			42.3			47.3			47.3	
Actuated g/C Ratio		0.43			0.43			0.48			0.48	
v/c Ratio		0.32			0.96			0.73			0.35	
Control Delay		20.1			58.7			20.3			17.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		20.1			58.7			20.3			17.5	
LOS		C			E			C			B	
Approach Delay		20.1			58.7			20.3			17.5	
Approach LOS		C			E			C			B	

Intersection Summary

Area Type:	Other
Cycle Length:	97.6
Actuated Cycle Length:	97.6
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.96
Intersection Signal Delay:	32.7
Intersection LOS:	C
Intersection Capacity Utilization:	95.4%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 7: Montrose Road & Biggar Road/Lyons Creek Road



Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year
AM Peak Hour

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	200	479	602	169
v/c Ratio	0.32	0.96	0.73	0.35
Control Delay	20.1	58.7	20.3	17.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	20.1	58.7	20.3	17.5
Queue Length 50th (m)	25.5	87.0	67.6	19.2
Queue Length 95th (m)	42.9	#155.9	112.8	35.3
Internal Link Dist (m)	483.4	397.7	192.1	126.6
Turn Bay Length (m)				
Base Capacity (vph)	617	500	827	489
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.96	0.73	0.35

Intersection Summary

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

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year
AM Peak Hour

	↖	→	↘	↙	←	↖	↘	↑	↙	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	41	142	1	220	120	101	4	166	385	62	82	12
Future Volume (vph)	41	142	1	220	120	101	4	166	385	62	82	12
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Fr _t		1.00			0.97			0.91			0.99	
Fit Protected		0.99			0.98			1.00			0.98	
Satd. Flow (prot)		1659			1529			1537			1472	
Fit Permitted		0.85			0.72			1.00			0.67	
Satd. Flow (perm)		1424			1132			1535			1003	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	154	1	239	130	110	4	180	418	67	89	13
RTOR Reduction (vph)	0	0	0	0	11	0	0	84	0	0	3	0
Lane Group Flow (vph)	0	200	0	0	468	0	0	518	0	0	166	0
Heavy Vehicles (%)	3%	4%	100%	9%	7%	8%	0%	6%	2%	17%	15%	9%
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)		40.0			40.0			45.0			45.0	
Effective Green, g (s)		42.3			42.3			47.3			47.3	
Actuated g/C Ratio		0.43			0.43			0.48			0.48	
Clearance Time (s)		6.3			6.3			6.3			6.3	
Vehicle Extension (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		617			490			743			486	
v/s Ratio Prot												
v/s Ratio Perm		0.14			c0.41			c0.34			0.17	
v/c Ratio		0.32			0.96			0.70			0.34	
Uniform Delay, d1		18.2			26.7			19.6			15.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			30.4			5.4			1.9	
Delay (s)		19.1			57.1			24.9			17.4	
Level of Service		B			E			C			B	
Approach Delay (s)		19.1			57.1			24.9			17.4	
Approach LOS		B			E			C			B	

Intersection Summary

HCM 2000 Control Delay 33.9 HCM 2000 Level of Service C

HCM 2000 Volume to Capacity ratio 0.82

Actuated Cycle Length (s) 97.6 Sum of lost time (s) 8.0

Intersection Capacity Utilization 95.4% ICU Level of Service F

Analysis Period (min) 15

c Critical Lane Group

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Base Year
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	51	21	0	1	3	4	3	114	7	0	50	25
Future Volume (vph)	51	21	0	1	3	4	3	114	7	0	50	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.993			0.955	
Flt Protected		0.966			0.995			0.999				
Satd. Flow (prot)	0	1621	0	0	1443	0	0	1558	0	0	1492	0
Flt Permitted		0.966			0.995			0.999				
Satd. Flow (perm)	0	1621	0	0	1443	0	0	1558	0	0	1492	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	8		16	16		8	17		8	8		17
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	4%	5%	0%	0%	0%	25%	100%	8%	29%	0%	6%	24%
Adj. Flow (vph)	67	28	0	1	4	5	4	150	9	0	66	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	0	0	10	0	0	163	0	0	99	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	29.1%											
Analysis Period (min)	15											
	ICU Level of Service A											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Base Year
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	51	21	0	1	3	4	3	114	7	0	50	25
Future Volume (vph)	51	21	0	1	3	4	3	114	7	0	50	25
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	67	28	0	1	4	5	4	150	9	0	66	33
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	95	10	163	99								
Volume Left (vph)	67	1	4	0								
Volume Right (vph)	0	5	9	33								
Hadj (s)	0.21	-0.07	0.17	0.00								
Departure Headway (s)	4.7	4.6	4.4	4.3								
Degree Utilization, x	0.12	0.01	0.20	0.12								
Capacity (veh/h)	712	728	785	791								
Control Delay (s)	8.4	7.6	8.5	7.9								
Approach Delay (s)	8.4	7.6	8.5	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	8.3											
Level of Service	A											
Intersection Capacity Utilization	29.1%											
Analysis Period (min)	15											
	ICU Level of Service A											

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Base Year
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	72	16	0	27	36
Future Volume (vph)	5	72	16	0	27	36
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.874					
Flt Protected	0.997					0.979
Satd. Flow (prot)	1374	0	1750	0	0	1584
Flt Permitted	0.997					0.979
Satd. Flow (perm)	1374	0	1750	0	0	1584
Link Speed (k/h)	50		60			60
Link Distance (m)	1040.1		438.6			461.8
Travel Time (s)	74.9		26.3			27.7
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	25%	10%	0%	0%	19%	0%
Adj. Flow (vph)	6	83	18	0	31	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	89	0	18	0	0	72
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	22.1%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Base Year
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	5	72	16	0	27	36
Future Volume (vph)	5	72	16	0	27	36
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	6	83	18	0	31	41
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	89	18	72			
Volume Left (vph)	6	0	31			
Volume Right (vph)	83	0	0			
Hadj (s)	-0.36	0.00	0.23			
Departure Headway (s)	3.7	4.2	4.3			
Degree Utilization, x	0.09	0.02	0.09			
Capacity (veh/h)	935	835	812			
Control Delay (s)	7.1	7.2	7.7			
Approach Delay (s)	7.1	7.2	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay	7.4					
Level of Service	A					
Intersection Capacity Utilization	22.1%		ICU Level of Service A		A	
Analysis Period (min)	15					

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Base Year
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	3	2	11	6	0	13	11	223	5	11	105	5
Future Volume (vph)	3	2	11	6	0	13	11	223	5	11	105	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.908			0.907			0.997			0.994	
Flt Protected		0.991			0.985			0.998			0.996	
Satd. Flow (prot)	0	1331	0	0	1486	0	0	1630	0	0	1270	0
Flt Permitted		0.991			0.985			0.998			0.996	
Satd. Flow (perm)	0	1331	0	0	1486	0	0	1630	0	0	1270	0
Link Speed (k/h)		60			60			70			60	
Link Distance (m)		372.3			519.4			156.9			312.6	
Travel Time (s)		22.3			31.2			8.1			18.8	
Confl. Peds. (#/hr)	6					6						
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles (%)	33%	0%	18%	17%	0%	0%	18%	6%	20%	9%	40%	20%
Adj. Flow (vph)	4	3	15	8	0	18	15	310	7	15	146	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	22	0	0	26	0	0	332	0	0	168	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	27.6%				ICU Level of Service A							
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Base Year
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	3	2	11	6	0	13	11	223	5	11	105	5
Future Volume (Veh/h)	3	2	11	6	0	13	11	223	5	11	105	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	4	3	15	8	0	18	15	310	7	15	146	7
Pedestrians											6	
Lane Width (m)											3.6	
Walking Speed (m/s)											1.2	
Percent Blockage											1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	547	526	150	540	526	320	153				317	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	547	526	150	540	526	320	153				317	
tC, single (s)	7.4	6.5	6.4	7.3	6.5	6.2	4.3				4.2	
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	3.7	4.0	3.3	2.4				2.3	
p0 queue free %	99	99	98	98	100	98	99				99	
cM capacity (veh/h)	384	449	857	413	449	722	1335				1205	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	26	332	168								
Volume Left	4	8	15	15								
Volume Right	15	18	7	7								
eSH	636	587	1335	1205								
Volume to Capacity	0.03	0.04	0.01	0.01								
Queue Length 95th (m)	0.9	1.1	0.3	0.3								
Control Delay (s)	10.9	11.4	0.5	0.8								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.9	11.4	0.5	0.8								
Approach LOS	B	B										
Intersection Summary												
Average Delay				1.5								
Intersection Capacity Utilization			27.6%	ICU Level of Service							A	
Analysis Period (min)			15									

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Base Year
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	196	105	193	43	15	101
Future Volume (vph)	196	105	193	43	15	101
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.975			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1554	1683	1671	0	1250	1094
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1554	1683	1671	0	1250	1094
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	7%	4%	1%	7%	33%	36%
Adj. Flow (vph)	231	124	227	51	18	119
Shared Lane Traffic (%)						
Lane Group Flow (vph)	231	124	278	0	18	119
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control		Stop	Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	39.0%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Base Year
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	196	105	193	43	15	101
Future Volume (vph)	196	105	193	43	15	101
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	231	124	227	51	18	119
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	231	124	278	18	119	
Volume Left (vph)	231	0	0	18	0	
Volume Right (vph)	0	0	51	0	119	
Hadj (s)	0.62	0.07	-0.07	1.06	-0.09	
Departure Headway (s)	5.8	5.3	5.1	7.1	6.0	
Degree Utilization, x	0.37	0.18	0.39	0.04	0.20	
Capacity (veh/h)	595	660	683	470	555	
Control Delay (s)	11.1	8.2	11.4	9.2	9.2	
Approach Delay (s)	10.1		11.4	9.2		
Approach LOS	B		B	A		
Intersection Summary						
Delay			10.4			
Level of Service			B			
Intersection Capacity Utilization	39.0%		ICU Level of Service A			
Analysis Period (min)			15			

Queuing and Blocking Report

Base Year
AM Peak Hour

Intersection: 1: Montrose Road & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	R	L	T	R	L
Maximum Queue (m)	62.2	91.1	94.5	73.2	28.5	88.3	99.5	33.6	13.0	26.6	15.8	46.1
Average Queue (m)	20.9	51.8	52.5	41.9	9.3	52.3	59.7	14.6	2.8	7.2	1.2	19.7
95th Queue (m)	47.1	77.3	78.7	67.5	21.8	84.2	92.3	28.8	9.2	18.5	7.8	38.2
Link Distance (m)	740.7		740.7		669.2		669.2		669.2		699.6	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	55.0		70.0		155.0				115.0		130.0	
Storage Blk Time (%)	0		5		1		0					
Queuing Penalty (veh)	0		5		3		1					

Intersection: 1: Montrose Road & McLeod Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	32.0	28.7
Average Queue (m)	8.4	10.6
95th Queue (m)	21.6	22.5
Link Distance (m)	194.7	194.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Oakwood Drive & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	L	TR
Maximum Queue (m)	37.3	80.0	79.0	306.4	87.3	125.0	125.1	45.1	51.4	29.5	15.1	19.9
Average Queue (m)	8.6	35.6	35.1	28.5	34.3	72.0	76.2	15.1	27.7	11.5	3.0	4.7
95th Queue (m)	24.5	69.2	66.1	157.0	76.2	115.3	117.4	37.3	47.2	23.8	10.3	13.7
Link Distance (m)	669.2		669.2		669.2		592.5		592.5		164.6	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0				80.0				95.0		20.0	
Storage Blk Time (%)	3				0		6				0	
Queuing Penalty (veh)	1				1		8				0	

Queuing and Blocking Report

Base Year
AM Peak Hour

Intersection: 3: Dorchester Road & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR	
Maximum Queue (m)	62.2	89.6	78.8	57.3	95.7	93.7	22.5	99.7	37.4	121.8	
Average Queue (m)	38.0	31.9	36.6	13.8	53.5	55.6	19.2	43.9	23.2	56.3	
95th Queue (m)	64.7	74.7	72.7	40.8	89.6	90.9	27.4	84.3	43.8	108.5	
Link Distance (m)	592.5		592.5		1024.4		1024.4		325.7		294.0
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	55.0				50.0				15.0		30.0
Storage Blk Time (%)	3		2		0		9		28		35
Queuing Penalty (veh)	7		5		0		5		46		51

Intersection: 4: Drummond Road & McLeod Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LTR	L	TR
Maximum Queue (m)	68.2	61.1	55.0	57.6	79.8	27.3	72.1
Average Queue (m)	31.5	26.1	19.1	22.0	41.3	16.7	32.7
95th Queue (m)	56.3	51.9	43.0	46.3	68.3	30.9	62.3
Link Distance (m)	1024.4	1024.4	1047.7	1047.7	811.3		193.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)						20.0	
Storage Blk Time (%)						8	
Queuing Penalty (veh)						16	

Intersection: 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Movement	EB	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	LTR	L	TR
Maximum Queue (m)	16.3	37.5	48.6	9.2	7.1	51.1	50.2	12.1	81.3	20.0
Average Queue (m)	4.8	15.0	26.5	0.6	0.4	23.5	27.4	2.7	33.8	6.7
95th Queue (m)	13.7	31.4	45.1	4.4	3.1	43.6	47.0	8.6	61.1	16.6
Link Distance (m)	1047.7		1047.7		239.8		239.8		277.4	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	60.0				50.0		25.0			
Storage Blk Time (%)			1				9			
Queuing Penalty (veh)			0				0			

Queuing and Blocking Report

Base Year
AM Peak Hour

Intersection: 6: Stanley Avenue & Marineland Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	L	T	T	L	L	R
Maximum Queue (m)	47.1	48.1	9.4	19.4	60.9	64.8	15.9	27.9	15.1
Average Queue (m)	21.5	24.2	0.3	4.5	31.9	27.4	3.4	9.4	1.7
95th Queue (m)	39.3	42.2	5.0	14.9	49.6	50.2	12.4	21.9	8.4
Link Distance (m)	239.8	239.8			155.4	155.4			485.6
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	65.0			105.0		160.0		80.0	
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	61.8	201.8	141.9	133.6
Average Queue (m)	27.7	105.4	66.7	53.3
95th Queue (m)	52.4	180.6	126.6	117.1
Link Distance (m)	498.6	412.9	207.4	141.8
Upstream Blk Time (%)	2			
Queuing Penalty (veh)	0			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Dorchester Road & Jill Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	17.6	13.4	31.4	19.4
Average Queue (m)	8.9	2.7	13.2	10.6
95th Queue (m)	15.0	10.1	22.8	17.8
Link Distance (m)	110.7	156.1	446.2	325.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Base Year
AM Peak Hour

Intersection: 9: Dorchester Road & Oldfield Road

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	24.2	12.0	17.4
Average Queue (m)	10.7	4.2	8.7
95th Queue (m)	19.8	11.7	15.4
Link Distance (m)	1023.2	423.0	446.2
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Stanley Avenue & Chippawa Parkway

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	17.1	12.4	10.5	14.5
Average Queue (m)	3.2	3.6	0.4	1.0
95th Queue (m)	11.3	10.7	4.3	7.0
Link Distance (m)	355.4	511.0	139.9	295.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: Lyons Creek Road & Stanley Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (m)	29.5	19.8	31.3	18.9	32.6
Average Queue (m)	15.2	10.8	15.3	2.4	10.3
95th Queue (m)	24.4	17.5	24.5	9.8	24.1
Link Distance (m)		442.7	589.0		785.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	55.0		25.0		
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Zone Summary

Zone wide Queuing Penalty: 200

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	113	979	44	134	932	216	48	114	315	231	164	113
Future Volume (vph)	113	979	44	134	932	216	48	114	315	231	164	113
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0		0.0	115.0		0.0	130.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			7.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00		0.98	0.99		0.99	1.00	0.99	0.99
Frt		0.994					0.850			0.850		0.939
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1599	4647	0	1599	3292	1430	1630	1667	1444	1630	2995	0
Fit Permitted	0.104			0.119			0.573			0.591		
Satd. Flow (perm)	175	4647	0	200	3292	1396	975	1667	1425	1013	2995	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		6				203			292		119	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		759.2			692.3			721.0			213.3	
Travel Time (s)		54.7			49.8			51.9			15.4	
Confl. Peds. (#/hr)	2		1	1		2	13		1	1		13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	2%	5%	4%	1%	4%	2%	5%	3%	2%	4%	2%
Adj. Flow (vph)	119	1031	46	141	981	227	51	120	332	243	173	119
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	1077	0	141	981	227	51	120	332	243	292	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2			2	6	
Detector Phase	7	4		3	8	8	5	2		2	1	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0		46.0	9.5	46.0
Total Split (s)	13.0	48.0		13.0	48.0	48.0	23.0	46.0		46.0	23.0	46.0
Total Split (%)	10.0%	36.9%		10.0%	36.9%	36.9%	17.7%	35.4%		35.4%	17.7%	35.4%
Maximum Green (s)	10.0	40.0		10.0	40.0	40.0	20.0	38.0		38.0	20.0	38.0
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0		4.0	0.0	4.0
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0		-4.0	1.0	-4.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	None	Max
Walk Time (s)		12.0			12.0	12.0		14.0		14.0		14.0
Flash Dont Walk (s)		20.0			20.0	20.0		24.0		24.0		24.0
Pedestrian Calls (#/hr)		0			0	0		0		0		0
Act Effct Green (s)	52.7	44.2		53.3	44.5	44.5	52.2	46.0		46.0	65.0	56.5
Actuated g/C Ratio	0.41	0.34		0.41	0.34	0.34	0.40	0.35		0.35	0.50	0.43
v/c Ratio	0.73	0.68		0.80	0.87	0.37	0.12	0.20		0.48	0.42	0.21
Control Delay	49.5	39.3		47.7	30.1	5.9	18.4	31.5		8.2	21.7	14.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	49.5	39.3		47.7	30.1	5.9	18.4	31.5		8.2	21.7	14.3
LOS	D	D		D	C	A	B	C		A	C	B
Approach Delay		40.3			27.9			14.8				17.6
Approach LOS		D			C			B				B
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	105											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.87											
Intersection Signal Delay:	28.7						Intersection LOS: C					
Intersection Capacity Utilization:	88.1%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	1: Montrose Road & McLeod Road											

Queues
1: Montrose Road & McLeod Road

Base Year
PM Peak Hour

	↖	→	↘	←	↙	↖	↑	↘	↙	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	119	1077	141	981	227	51	120	332	243	292
v/c Ratio	0.73	0.68	0.80	0.87	0.37	0.12	0.20	0.48	0.42	0.21
Control Delay	49.5	39.3	47.7	30.1	5.9	18.4	31.5	8.2	21.7	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.5	39.3	47.7	30.1	5.9	18.4	31.5	8.2	21.7	14.3
Queue Length 50th (m)	19.1	90.8	13.4	117.6	17.5	6.9	22.5	7.2	37.5	14.8
Queue Length 95th (m)	#43.1	107.8	m#37.5	#157.0	m19.4	14.3	40.0	33.7	56.3	25.6
Internal Link Dist (m)		735.2		668.3			697.0			189.3
Turn Bay Length (m)	55.0		155.0			115.0			130.0	
Base Capacity (vph)	169	1585	179	1127	611	572	589	692	596	1369
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.68	0.79	0.87	0.37	0.09	0.20	0.48	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.

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Base Year
PM Peak Hour

	↖	→	↘	←	↙	↖	↑	↘	↙	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗ ↘ ↙ ↘ ↙ ↘ ↙ ↘ ↙ ↘ ↙ ↘											
Traffic Volume (vph)	113	979	44	134	932	216	48	114	315	231	164	113
Future Volume (vph)	113	979	44	134	932	216	48	114	315	231	164	113
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1599	4645		1599	3292	1396	1622	1667	1425	1629	2994	
Flt Permitted	0.10	1.00		0.12	1.00	1.00	0.57	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	174	4645		201	3292	1396	979	1667	1425	1014	2994	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	1031	46	141	981	227	51	120	332	243	173	119
RTOR Reduction (vph)	0	4	0	0	0	134	0	0	187	0	67	0
Lane Group Flow (vph)	119	1073	0	141	981	93	51	120	145	243	225	0
Conf. Peds. (#/hr)	2		1	1		2	13		1	1		13
Heavy Vehicles (%)	4%	2%	5%	4%	1%	4%	2%	5%	3%	2%	4%	2%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2		6	
Actuated Green, G (s)	49.1	39.6		49.7	39.9	39.9	48.7	42.6	42.6	61.6	52.5	
Effective Green, g (s)	47.1	43.6		47.7	43.9	43.9	46.7	46.6	46.6	60.6	56.5	
Actuated g/C Ratio	0.36	0.34		0.37	0.34	0.34	0.36	0.36	0.36	0.47	0.43	
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	156	1557		168	1111	471	376	597	510	543	1301	
v/s Ratio Prot	0.05	0.23		c0.06	c0.30		0.01	0.07		c0.05	0.08	
v/s Ratio Perm	0.23			0.25		0.07	0.04		0.10	c0.16		
v/c Ratio	0.76	0.69		0.84	0.88	0.20	0.14	0.20	0.28	0.45	0.17	
Uniform Delay, d1	32.7	37.3		31.0	40.6	30.5	27.6	28.8	29.8	21.9	22.5	
Progression Factor	1.00	1.00		0.92	0.56	0.79	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.8	2.5		22.4	7.8	0.7	0.1	0.8	1.4	0.4	0.3	
Delay (s)	51.5	39.9		51.1	30.5	24.8	27.7	29.6	31.2	22.4	22.8	
Level of Service	D	D		D	C	C	C	C	C	C	C	
Approach Delay (s)		41.0			31.7			30.4			22.6	
Approach LOS		D			C			C			C	

Intersection Summary
 HCM 2000 Control Delay 33.3 HCM 2000 Level of Service C
 HCM 2000 Volume to Capacity ratio 0.64
 Actuated Cycle Length (s) 130.0 Sum of lost time (s) 16.0
 Intersection Capacity Utilization 88.1% ICU Level of Service E
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	37	935	357	208	1017	17	347	4	301	24	13	83
Future Volume (vph)	37	935	357	208	1017	17	347	4	301	24	13	83
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0		0.0	80.0		0.0	95.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor			0.96	1.00	1.00		1.00	1.00				0.99
Frt			0.850		0.998				0.850			0.870
Fit Protected	0.950			0.950			0.950	0.953		0.950		
Satd. Flow (prot)	1583	3292	1444	1614	3249	0	1533	1531	1458	1662	1484	0
Fit Permitted	0.130			0.096			0.950	0.953		0.950		
Satd. Flow (perm)	217	3292	1389	163	3249	0	1526	1524	1458	1662	1484	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			299		1				307			85
Link Speed (k/h)		50			50			50				50
Link Distance (m)		692.3			616.3			360.6				181.9
Travel Time (s)		49.8			44.4			26.0				13.1
Confl. Peds. (#/hr)	9		9	9		9	6					6
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Adj. Flow (vph)	38	954	364	212	1038	17	354	4	307	24	13	85
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	38	954	364	212	1055	0	181	177	307	24	98	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0		10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0		0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	23.0	43.0	43.0	23.0	43.0		41.0	41.0	41.0	23.0	23.0	
Total Split (%)	17.7%	33.1%	33.1%	17.7%	33.1%		31.5%	31.5%	31.5%	17.7%	17.7%	
Maximum Green (s)	20.0	35.0	35.0	20.0	35.0		32.0	32.0	32.0	14.0	14.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	48.6	42.7	37.7	62.0	53.9		37.0	37.0	37.0	19.0	19.0	
Actuated g/C Ratio	0.37	0.33	0.29	0.48	0.41		0.28	0.28	0.28	0.15	0.15	
v/c Ratio	0.27	0.88	0.59	0.85	0.78		0.42	0.41	0.48	0.10	0.34	
Control Delay	20.3	36.9	8.6	59.9	38.7		41.3	41.1	6.6	49.4	16.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	20.3	36.9	8.6	59.9	38.7		41.3	41.1	6.6	49.4	16.6	
LOS	C	D	A	E	D		D	D	A	D	B	
Approach Delay		28.9			42.3			25.2			23.1	
Approach LOS		C			D			C			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.88											
Intersection Signal Delay:	32.9						Intersection LOS: C					
Intersection Capacity Utilization:	95.0%						ICU Level of Service F					
Analysis Period (min):	15											
Splits and Phases:	2: Oakwood Drive & McLeod Road											
<p>The diagram shows the timing for 8 lanes. Lane 1 (EBL) has a split of 41s. Lane 2 (EBT) has a split of 23s. Lane 3 (EBR) has a split of 23s. Lane 4 (WBL) has a split of 43s. Lane 5 (WBT) has a split of 43s. Lane 6 (WBR) has a split of 23s. Lane 7 (NBL) has a split of 23s. Lane 8 (NBT) has a split of 43s. Lane 9 (NBR) has a split of 43s. Lane 10 (SBL) has a split of 23s. Lane 11 (SBT) has a split of 43s. Lane 12 (SBR) has a split of 43s. The diagram also shows the sequence of phases: 02, 06, 03, 04 (R), 07, 08 (R).</p>												

Queues
2: Oakwood Drive & McLeod Road

Base Year
PM Peak Hour

	↖	→	↘	↙	←	↖	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	954	364	212	1055	181	177	307	24	98
v/c Ratio	0.27	0.88	0.59	0.85	0.78	0.42	0.41	0.48	0.10	0.34
Control Delay	20.3	36.9	8.6	59.9	38.7	41.3	41.1	6.6	49.4	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	36.9	8.6	59.9	38.7	41.3	41.1	6.6	49.4	16.6
Queue Length 50th (m)	2.3	132.0	46.7	39.4	130.7	41.7	40.7	0.0	5.7	3.1
Queue Length 95th (m)	m4.6	#180.0	76.2	#73.7	164.2	65.8	64.6	23.0	14.3	20.0
Internal Link Dist (m)		668.3		592.3		336.6			157.9	
Turn Bay Length (m)	50.0		80.0		95.0			20.0		
Base Capacity (vph)	300	1080	614	289	1347	436	435	634	242	289
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.88	0.59	0.73	0.78	0.42	0.41	0.48	0.10	0.34

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Base Year
PM Peak Hour

	↖	→	↘	↙	←	↖	↑	↘	↙	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	37	935	357	208	1017	17	347	4	301	24	13	83
Future Volume (vph)	37	935	357	208	1017	17	347	4	301	24	13	83
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3292	1389	1614	3248		1533	1531	1458	1662	1484	
Flt Permitted	0.13	1.00	1.00	0.10	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	217	3292	1389	163	3248		1533	1531	1458	1662	1484	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	38	954	364	212	1038	17	354	4	307	24	13	85
RTOR Reduction (vph)	0	0	212	0	1	0	0	0	220	0	73	0
Lane Group Flow (vph)	38	954	152	212	1054	0	181	177	87	24	25	0
Confl. Peds. (#/hr)	9		9	9		9	6					6
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	44.4	38.7	38.7	58.0	49.3		32.0	32.0	32.0	14.0	14.0	
Effective Green, g (s)	42.4	42.7	37.7	57.0	53.3		37.0	37.0	37.0	19.0	19.0	
Actuated g/C Ratio	0.33	0.33	0.29	0.44	0.41		0.28	0.28	0.28	0.15	0.15	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	120	1081	402	242	1331		436	435	414	242	216	
v/s Ratio Prot	0.01	c0.29		c0.10	0.32		c0.12	0.12		0.01	c0.02	
v/s Ratio Perm	0.09		0.11	0.28					0.06			
v/c Ratio	0.32	0.88	0.38	0.88	0.79		0.42	0.41	0.21	0.10	0.12	
Uniform Delay, d1	31.9	41.3	36.8	35.6	33.5		37.7	37.6	35.4	48.1	48.2	
Progression Factor	0.84	0.65	0.61	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	8.7	2.2	27.6	4.9		2.9	2.8	1.2	0.8	1.1	
Delay (s)	27.8	35.3	24.5	63.2	38.4		40.6	40.4	36.6	48.9	49.3	
Level of Service	C	D	C	E	D		D	D	D	D	D	
Approach Delay (s)		32.2			42.6			38.7			49.2	
Approach LOS		C			D			D			D	

Intersection Summary
 HCM 2000 Control Delay 37.9 HCM 2000 Level of Service D
 HCM 2000 Volume to Capacity ratio 0.60
 Actuated Cycle Length (s) 130.0 Sum of lost time (s) 16.0
 Intersection Capacity Utilization 95.0% ICU Level of Service F
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	279	691	85	42	682	79	234	114	34	114	97	291
Future Volume (vph)	279	691	85	42	682	79	234	114	34	114	97	291
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0	0.0	15.0	0.0	15.0	0.0	30.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	0	0
Taper Length (m)	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	0.0	0.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.98	0.97	0.97	0.97
Frt	0.983			0.985			0.966			0.887		
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3207	0	1630	3227	0	1614	1677	0	1662	1481	0
Fit Permitted	0.181			0.329			0.140			0.591		
Satd. Flow (perm)	308	3207	0	559	3227	0	236	1677	0	1016	1481	0
Right Turn on Red		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		11			10			13			131	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		616.3			1045.5			348.9			308.0	
Travel Time (s)		44.4			75.3			25.1			22.2	
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Adj. Flow (vph)	288	712	88	43	703	81	241	118	35	118	100	300
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	800	0	43	784	0	241	153	0	118	400	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.4		9.5	30.4		9.5	37.7		9.5	37.7	
Total Split (s)	28.0	35.4		28.0	35.4		15.0	42.7		15.0	42.7	
Total Split (%)	23.1%	29.2%		23.1%	29.2%		12.4%	35.3%		12.4%	35.3%	
Maximum Green (s)	25.0	29.0		25.0	29.0		12.0	36.0		12.0	36.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.3		0.0	2.3		0.0	2.6		0.0	2.6	
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		9.0			9.0			12.0			12.0	
Flash Dont Walk (s)		15.0			15.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	67.2	58.8		51.5	45.4		43.2	32.3		40.5	30.9	
Actuated g/C Ratio	0.55	0.49		0.43	0.37		0.36	0.27		0.33	0.26	
v/c Ratio	0.79	0.51		0.15	0.64		1.15	0.34		0.30	0.84	
Control Delay	34.8	24.6		17.6	36.6		138.4	33.4		25.7	44.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.8	24.6		17.6	36.6		138.4	33.4		25.7	44.0	
LOS	C	C		B	D		F	C		C	D	
Approach Delay		27.3			35.6			97.6			39.9	
Approach LOS		C			D			F			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.15											
Intersection Signal Delay:	41.8						Intersection LOS: D					
Intersection Capacity Utilization:	94.0%						ICU Level of Service F					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											
<p>The diagram shows the timing for 8 lanes. Lane 1 (EBL) has a 15s split. Lane 2 (EBT) has a 42.7s split. Lane 3 (EBR) has a 28s split. Lane 4 (WBL) has a 35.4s split. Lane 5 (WBT) has a 28s split. Lane 6 (WBR) has a 42.7s split. Lane 7 (NBL) has a 28s split. Lane 8 (NBT) has a 35.4s split. Right-turn lanes (EBR, WBR, NBR) are shown with red arrows and 'R' in parentheses.</p>												

Queues
3: Dorchester Road & McLeod Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	288	800	43	784	241	153	118	400
v/c Ratio	0.79	0.51	0.15	0.64	1.15	0.34	0.30	0.84
Control Delay	34.8	24.6	17.6	36.6	138.4	33.4	25.7	44.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	24.6	17.6	36.6	138.4	33.4	25.7	44.0
Queue Length 50th (m)	38.2	72.4	4.8	85.3	~53.7	28.0	19.2	65.6
Queue Length 95th (m)	74.0	105.4	12.1	#139.1	#101.0	44.3	30.0	99.5
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	432	1563	515	1216	209	544	410	562
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	0.67	0.51	0.08	0.64	1.15	0.28	0.29	0.71

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Base Year
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	691	85	42	682	79	234	114	34	114	97	291
Future Volume (vph)	279	691	85	42	682	79	234	114	34	114	97	291
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1628	3209		1622	3225		1613	1676		1645	1481	
Flt Permitted	0.18	1.00		0.33	1.00		0.14	1.00		0.59	1.00	
Satd. Flow (perm)	311	3209		562	3225		237	1676		1023	1481	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	288	712	88	43	703	81	241	118	35	118	100	300
RTOR Reduction (vph)	0	6	0	0	6	0	0	10	0	0	98	0
Lane Group Flow (vph)	288	794	0	43	778	0	241	143	0	118	302	0
Conf. Peds. (#/hr)	15		21	21		15	21		20	20		21
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	64.8	55.8		49.0	43.0		41.6	29.6		38.8	28.2	
Effective Green, g (s)	63.8	58.2		47.0	45.4		39.6	32.3		36.8	30.9	
Actuated g/C Ratio	0.53	0.48		0.39	0.37		0.33	0.27		0.30	0.26	
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	357	1542		261	1209		202	447		360	377	
v/s Ratio Prot	c0.12	0.25		0.01	0.24		c0.11	0.09		0.03	0.20	
v/s Ratio Perm	c0.31			0.06			c0.28			0.07		
v/c Ratio	0.81	0.52		0.16	0.64		1.19	0.32		0.33	0.80	
Uniform Delay, d1	20.4	21.7		23.3	31.2		35.1	35.6		31.6	42.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.5	1.2		0.3	2.6		125.1	0.4		0.5	11.6	
Delay (s)	33.0	22.9		23.6	33.8		160.2	36.0		32.2	53.9	
Level of Service	C	C		C	C		F	D		C	D	
Approach Delay (s)		25.6			33.3			112.0			48.9	
Approach LOS		C			C			F			D	

Intersection Summary

- HCM 2000 Control Delay: 44.2
- HCM 2000 Volume to Capacity ratio: 0.93
- Actuated Cycle Length (s): 121.1
- Intersection Capacity Utilization: 94.0%
- Analysis Period (min): 15
- HCM 2000 Level of Service: D
- Sum of lost time (s): 16.0
- ICU Level of Service: F
- c Critical Lane Group

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	221	430	108	18	563	139	87	86	20	140	103	190
Future Volume (vph)	221	430	108	18	563	139	87	86	20	140	103	190
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			0.99			1.00			0.99		0.99
Frt	0.979			0.971			0.986			0.903		
Flt Protected	0.986			0.999			0.978			0.950		
Satd. Flow (prot)	0	3150	0	0	3147	0	0	1624	0	1662	1527	0
Flt Permitted	0.580			0.922			0.458			0.575		
Satd. Flow (perm)	0	1851	0	0	2904	0	0	759	0	1000	1527	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35			37			6			91	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1045.5			1070.0			834.0			207.0	
Travel Time (s)		75.3			77.0			60.0			14.9	
Confl. Peds. (#/hr)	8		6	6		8	8		8	8		8
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
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	5%	2%	5%	0%	2%	2%
Adj. Flow (vph)	246	478	120	20	626	154	97	96	22	156	114	211
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	844	0	0	800	0	0	215	0	156	325	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8				2			6	
Detector Phase	7	4		8	8			2	2		6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0			8.0	8.0		8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5			30.8	30.8		30.8	30.8
Total Split (s)	18.0	51.5		51.5	51.5			33.8	33.8		33.8	33.8
Total Split (%)	17.4%	49.9%		49.9%	49.9%			32.7%	32.7%		32.7%	32.7%
Maximum Green (s)	15.0	45.0		45.0	45.0			27.0	27.0		27.0	27.0
Yellow Time (s)	3.0	4.1		4.1	4.1			4.1	4.1		4.1	4.1
All-Red Time (s)	0.0	2.4		2.4	2.4			2.7	2.7		2.7	2.7
Lost Time Adjust (s)		-2.5			-2.5			-2.8	-2.8		-2.8	-2.8
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Recall Mode	None	C-Max		C-Max	C-Max			Max	Max		Max	Max
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)		65.5			65.5			29.8	29.8		29.8	29.8
Actuated g/C Ratio		0.63			0.63			0.29	0.29		0.29	0.29
v/c Ratio		0.71			0.43			0.96	0.96		0.54	0.64
Control Delay		16.2			9.9			89.2	89.2		39.3	29.5
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		16.2			9.9			89.2	89.2		39.3	29.5
LOS		B			A			F	F		D	C
Approach Delay		16.2			9.9			89.2	89.2		32.7	
Approach LOS		B			A			F	F		C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	103.3											
Actuated Cycle Length:	103.3											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	75											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.96											
Intersection Signal Delay:	24.1						Intersection LOS: C					
Intersection Capacity Utilization:	99.5%						ICU Level of Service F					
Analysis Period (min):	15											
Splits and Phases:	4: Drummond Road & McLeod Road											

Queues
4: Drummond Road & McLeod Road

Base Year
PM Peak Hour

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	844	800	215	156	325
v/c Ratio	0.71	0.43	0.96	0.54	0.64
Control Delay	16.2	9.9	89.2	39.3	29.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	9.9	89.2	39.3	29.5
Queue Length 50th (m)	54.8	38.8	43.7	27.7	43.1
Queue Length 95th (m)	79.8	51.5	#92.3	49.7	74.6
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	1186	1854	223	288	505
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.71	0.43	0.96	0.54	0.64

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Base Year
PM Peak Hour

	↘	→	↙	↗	←	↖	↑	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕		↘	↙	
Traffic Volume (vph)	221	430	108	18	563	139	87	86	20	140	103	190
Future Volume (vph)	221	430	108	18	563	139	87	86	20	140	103	190
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Frbp, ped/bikes		1.00			0.99			1.00		1.00		0.99
Flpb, ped/bikes		1.00			1.00			1.00		0.99		1.00
Frt		0.98			0.97			0.99		1.00		0.90
Flt Protected		0.99			1.00			0.98		0.95		1.00
Satd. Flow (prot)		3143			3147			1621		1652		1526
Flt Permitted		0.58			0.92			0.46		0.58		1.00
Satd. Flow (perm)		1850			2904			759		1001		1526
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)	246	478	120	20	626	154	97	96	22	156	114	211
RTOR Reduction (vph)	0	13	0	0	14	0	0	4	0	0	65	0
Lane Group Flow (vph)	0	831	0	0	786	0	0	211	0	156	260	0
Confl. Peds. (#/hr)	8		6	6		8	8		8	8		8
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	5%	2%	5%	0%	2%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2				6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		63.0			63.0			27.0		27.0		27.0
Effective Green, g (s)		65.5			65.5			29.8		29.8		29.8
Actuated g/C Ratio		0.63			0.63			0.29		0.29		0.29
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5
Lane Grp Cap (vph)		1173			1841			218		288		440
v/s Ratio Prot												0.17
v/s Ratio Perm		c0.45			0.27			c0.28		0.16		
v/c Ratio		0.71			0.43			0.97		0.54		0.59
Uniform Delay, d1		12.6			9.5			36.3		31.0		31.5
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		1.8			0.7			52.9		7.1		5.7
Delay (s)		14.4			10.2			89.2		38.1		37.3
Level of Service		B			B			F		D		D
Approach Delay (s)		14.4			10.2			89.2				37.6
Approach LOS		B			B			F				D
Intersection Summary												
HCM 2000 Control Delay			24.6				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			103.3			Sum of lost time (s)			11.0			
Intersection Capacity Utilization			99.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												


Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Base Year Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔		↔	↔	↔	↔	↔
Traffic Volume (vph)	47	370	9	10	519	221	3	10	6	226	13	57
Future Volume (vph)	47	370	9	10	519	221	3	10	6	226	13	57
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			7.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								1.00				0.99
Frt			0.850			0.850		0.959				0.878
Flt Protected	0.950			0.950				0.993		0.950		
Satd. Flow (prot)	1599	3260	1488	1662	3260	1417	0	1667	0	1554	1520	0
Flt Permitted	0.303			0.522				0.993		0.950		
Satd. Flow (perm)	510	3260	1488	914	3260	1417	0	1666	0	1554	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			233		6				60
Link Speed (k/h)		50			50			50				50
Link Distance (m)		1070.0			261.8			326.3				294.0
Travel Time (s)		77.0			18.8			23.5				21.2
Conf. Peds. (#/hr)							1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	2%	0%	0%	2%	5%	0%	0%	0%	7%	0%	0%
Adj. Flow (vph)	49	389	9	11	546	233	3	11	6	238	14	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	389	9	11	546	233	0	20	0	238	74	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Base Year Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	Split	NA
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	15.0	57.2	57.2	42.2	42.2	42.2	37.2	37.2		37.2	37.2	
Total Split (%)	11.4%	43.5%	43.5%	32.1%	32.1%	32.1%	28.3%	28.3%		28.3%	28.3%	
Maximum Green (s)	12.0	50.0	50.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	58.0	58.0	58.0	49.4	49.4	49.4		33.2		28.4	28.4	
Actuated g/C Ratio	0.44	0.44	0.44	0.38	0.38	0.38		0.25		0.22	0.22	
v/c Ratio	0.18	0.27	0.01	0.03	0.45	0.34		0.05		0.71	0.20	
Control Delay	24.7	24.8	0.0	31.2	34.1	5.5		29.5		59.5	14.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	24.7	24.8	0.0	31.2	34.1	5.5		29.5		59.5	14.1	
LOS	C	C	A	C	C	A		C		E	B	
Approach Delay		24.3			25.6			29.5			48.7	
Approach LOS		C			C			C			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	131.6											
Actuated Cycle Length:	131.6											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	125											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.71											
Intersection Signal Delay:	29.9						Intersection LOS: C					
Intersection Capacity Utilization:	51.0%						ICU Level of Service A					
Analysis Period (min):	15											
Splits and Phases:	5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway											

Queues Base Year
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	49	389	9	11	546	233	20	238	74
v/c Ratio	0.18	0.27	0.01	0.03	0.45	0.34	0.05	0.71	0.20
Control Delay	24.7	24.8	0.0	31.2	34.1	5.5	29.5	59.5	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.7	24.8	0.0	31.2	34.1	5.5	29.5	59.5	14.1
Queue Length 50th (m)	7.7	35.3	0.0	2.0	60.3	0.0	2.9	60.2	3.0
Queue Length 95th (m)	16.8	50.3	0.0	7.1	84.3	19.4	9.7	87.4	15.8
Internal Link Dist (m)	1046.0			237.8			302.3		270.0
Turn Bay Length (m)	60.0	50.0		25.0	80.0				
Base Capacity (vph)	316	1437	709	342	1223	677	425	392	428
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	0.16	0.27	0.01	0.03	0.45	0.34	0.05	0.61	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔		↔↔		↔	↔	
Traffic Volume (vph)	47	370	9	10	519	221		3	10	6	226	13
Future Volume (vph)	47	370	9	10	519	221		3	10	6	226	13
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750		1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	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		0.96	1.00	0.88	1.00	0.88
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1599	3260	1488	1662	3260	1417		1667	1554	1521	1554	1521
Flt Permitted	0.30	1.00	1.00	0.52	1.00	1.00		0.99	0.95	1.00	0.95	1.00
Satd. Flow (perm)	510	3260	1488	913	3260	1417		1667	1554	1521	1554	1521
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	389	9	11	546	233		3	11	6	238	14
RTOR Reduction (vph)	0	0	5	0	0	147		0	4	0	0	47
Lane Group Flow (vph)	49	389	4	11	546	86		0	16	0	238	27
Confl. Peds. (#/hr)	1											
Heavy Vehicles (%)	4%	2%	0%	0%	2%	5%		0%	0%	0%	7%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm		Split	NA	Split	NA	NA
Protected Phases	7	4			8			2	2		6	6
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	54.8	54.8	54.8	45.6	45.6	45.6		30.0		25.2	25.2	
Effective Green, g (s)	53.8	58.0	58.0	48.8	48.8	48.8		33.2		28.4	28.4	
Actuated g/C Ratio	0.41	0.44	0.44	0.37	0.37	0.37		0.25		0.22	0.22	
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2		7.2		7.2	7.2	
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5		4.0		4.0	4.0	
Lane Grp Cap (vph)	251	1436	655	338	1208	525		420		335	328	
v/s Ratio Prot	0.01	c0.12			c0.17			c0.01		c0.15	0.02	
v/s Ratio Perm	0.07		0.00	0.01		0.06						
v/c Ratio	0.20	0.27	0.01	0.03	0.45	0.16		0.04		0.71	0.08	
Uniform Delay, d1	24.7	23.4	20.6	26.4	31.3	27.7		37.1		47.8	41.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.5	0.0	0.2	1.2	0.7		0.2		7.4	0.1	
Delay (s)	25.0	23.8	20.7	26.5	32.5	28.4		37.3		55.2	41.3	
Level of Service	C	C	C	C	C	C		D		E	D	
Approach Delay (s)	23.9			31.2				37.3		51.9		
Approach LOS	C			C				D		D		

HCM Signalized Intersection Capacity Analysis Base Year
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour



Intersection Summary

HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	131.6	Sum of lost time (s)	19.2
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Base Year
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	457	152	27	402	321	24
Future Volume (vph)	457	152	27	402	321	24
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3228	1390	1554	3228	3162	1316
Flt Permitted			0.356		0.950	
Satd. Flow (perm)	3228	1390	582	3228	3162	1316
Right Turn on Red		Yes			Yes	
Satd. Flow (RTOR)		158				25
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	7%	7%	3%	2%	13%
Adj. Flow (vph)	476	158	28	419	334	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	476	158	28	419	334	25
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4	
Detector 2 Size(m)		0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)		0.0			0.0	
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

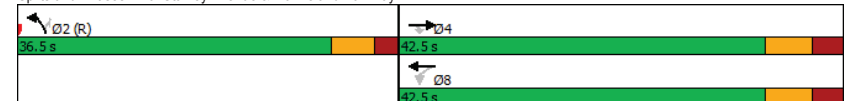
Base Year
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	42.5	42.5	42.5	42.5	36.5	36.5
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.2%	46.2%
Maximum Green (s)	35.0	35.0	35.0	35.0	30.0	30.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	20.9	20.9	20.9	20.9	50.1	50.1
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.63	0.63
v/c Ratio	0.56	0.33	0.18	0.49	0.17	0.03
Control Delay	27.1	5.6	23.7	25.9	6.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	5.6	23.7	25.9	6.8	3.2
LOS	C	A	C	C	A	A
Approach Delay	21.7			25.8	6.6	
Approach LOS	C			C	A	

Intersection Summary

Area Type: Other
 Cycle Length: 79
 Actuated Cycle Length: 79
 Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 19.2
 Intersection Capacity Utilization 41.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 6: Stanley Avenue & Marineland Parkway



Queues
6: Stanley Avenue & Marineland Parkway

Base Year
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	476	158	28	419	334	25
v/c Ratio	0.56	0.33	0.18	0.49	0.17	0.03
Control Delay	27.1	5.6	23.7	25.9	6.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	5.6	23.7	25.9	6.8	3.2
Queue Length 50th (m)	34.2	0.0	3.4	29.5	9.6	0.0
Queue Length 95th (m)	44.2	12.4	9.4	38.7	18.4	3.1
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1573	758	283	1573	2003	843
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.21	0.10	0.27	0.17	0.03

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Base Year
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕	↕	↕	↕↕	↕↕	↕
Traffic Volume (vph)	457	152	27	402	321	24
Future Volume (vph)	457	152	27	402	321	24
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Fr	1.00	0.85	1.00	1.00	1.00	0.85
Fit Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3228	1390	1554	3228	3162	1316
Fit Permitted	1.00	1.00	0.36	1.00	0.95	1.00
Satd. Flow (perm)	3228	1390	582	3228	3162	1316
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	476	158	28	419	334	25
RTOR Reduction (vph)	0	116	0	0	0	9
Lane Group Flow (vph)	476	42	28	419	334	16
Heavy Vehicles (%)	3%	7%	7%	3%	2%	13%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	17.4	17.4	17.4	17.4	47.6	47.6
Effective Green, g (s)	20.9	20.9	20.9	20.9	50.1	50.1
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.63	0.63
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	853	367	153	853	2005	834
v/s Ratio Prot	c0.15			0.13	c0.11	
v/s Ratio Perm		0.03	0.05			0.01
v/c Ratio	0.56	0.11	0.18	0.49	0.17	0.02
Uniform Delay, d1	25.1	22.0	22.5	24.6	5.9	5.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1	0.5	0.4	0.2	0.0
Delay (s)	25.8	22.2	23.0	25.0	6.1	5.4
Level of Service	C	C	C	C	A	A
Approach Delay (s)	24.9			24.9	6.0	
Approach LOS	C			C	A	

Intersection Summary

HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	23	116	3	430	219	74	5	140	296	145	191	54
Future Volume (vph)	23	116	3	430	219	74	5	140	296	145	191	54
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.986			0.909			0.981	
Flt Protected		0.992			0.971			0.999			0.982	
Satd. Flow (prot)	0	1676	0	0	1620	0	0	1529	0	0	1636	0
Flt Permitted		0.875			0.724			0.996			0.608	
Satd. Flow (perm)	0	1478	0	0	1208	0	0	1524	0	0	1013	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			7			147			12	
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		507.4			421.7			216.1			150.6	
Travel Time (s)		22.8			19.0			13.0			9.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Adj. Flow (vph)	25	126	3	467	238	80	5	152	322	158	208	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	154	0	0	785	0	0	479	0	0	425	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.3	26.3		26.3	26.3		31.3	31.3		31.3	31.3	
Total Split (s)	46.3	46.3		46.3	46.3		51.3	51.3		51.3	51.3	
Total Split (%)	47.4%	47.4%		47.4%	47.4%		52.6%	52.6%		52.6%	52.6%	
Maximum Green (s)	40.0	40.0		40.0	40.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	4.1	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		-2.3			-2.3			-2.3			-2.3	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		42.3			42.3			47.3			47.3	
Actuated g/C Ratio		0.43			0.43			0.48			0.48	
v/c Ratio		0.24			1.49			0.59			0.86	
Control Delay		18.7			255.8			15.6			40.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.7			255.8			15.6			40.4	
LOS		B			F			B			D	
Approach Delay		18.7			255.8			15.6			40.4	
Approach LOS		B			F			B			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	97.6											
Actuated Cycle Length:	97.6											
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green											
Natural Cycle:	80											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.49											
Intersection Signal Delay:	123.9						Intersection LOS: F					
Intersection Capacity Utilization:	111.1%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	7: Montrose Road & Biggar Road/Lyons Creek Road											

Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year
PM Peak Hour

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	154	785	479	425
v/c Ratio	0.24	1.49	0.59	0.86
Control Delay	18.7	255.8	15.6	40.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.7	255.8	15.6	40.4
Queue Length 50th (m)	18.7	~218.4	44.8	69.8
Queue Length 95th (m)	32.9	#292.3	77.3	#132.2
Internal Link Dist (m)	483.4	397.7	192.1	126.6
Turn Bay Length (m)				
Base Capacity (vph)	641	527	814	497
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	1.49	0.59	0.86

Intersection Summary
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year
PM Peak Hour

	↖	→	↘	↙	←	↖	↘	↑	↙	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	23	116	3	430	219	74	5	140	296	145	191	54
Future Volume (vph)	23	116	3	430	219	74	5	140	296	145	191	54
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Fr		1.00			0.99			0.91			0.98	
Fit Protected		0.99			0.97			1.00			0.98	
Satd. Flow (prot)		1676			1621			1530			1636	
Fit Permitted		0.88			0.72			1.00			0.61	
Satd. Flow (perm)		1479			1209			1525			1014	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	126	3	467	238	80	5	152	322	158	208	59
RTOR Reduction (vph)	0	1	0	0	4	0	0	76	0	0	6	0
Lane Group Flow (vph)	0	153	0	0	781	0	0	403	0	0	419	0
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
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)		40.0			40.0			45.0			45.0	
Effective Green, g (s)		42.3			42.3			47.3			47.3	
Actuated g/C Ratio		0.43			0.43			0.48			0.48	
Clearance Time (s)		6.3			6.3			6.3			6.3	
Vehicle Extension (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		641			523			739			491	
v/s Ratio Prot												
v/s Ratio Perm		0.10			0.65			0.26			0.41	
v/c Ratio		0.24			1.49			0.55			0.85	
Uniform Delay, d1		17.5			27.6			17.6			22.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			232.0			2.9			16.9	
Delay (s)		18.0			259.6			20.5			39.0	
Level of Service		B			F			C			D	
Approach Delay (s)		18.0			259.6			20.5			39.0	
Approach LOS		B			F			C			D	

Intersection Summary
 HCM 2000 Control Delay 126.4 HCM 2000 Level of Service F
 HCM 2000 Volume to Capacity ratio 1.15
 Actuated Cycle Length (s) 97.6 Sum of lost time (s) 8.0
 Intersection Capacity Utilization 111.1% ICU Level of Service H
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Base Year
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	67	7	9	1	5	5	9	166	0	6	134	42
Future Volume (vph)	67	7	9	1	5	5	9	166	0	6	134	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.986			0.938						0.969	
Flt Protected		0.961			0.996			0.998			0.998	
Satd. Flow (prot)	0	1645	0	0	1635	0	0	1687	0	0	1666	0
Flt Permitted		0.961			0.996			0.998			0.998	
Satd. Flow (perm)	0	1645	0	0	1635	0	0	1687	0	0	1666	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	3		2	2		3	1		5	5		1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	33%	2%	0%	0%	0%	7%
Adj. Flow (vph)	77	8	10	1	6	6	10	191	0	7	154	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	0	0	13	0	0	201	0	0	209	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	32.1%					ICU Level of Service A						
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Base Year
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Sign Control		Stop			Stop			Stop			Stop		
Traffic Volume (vph)	67	7	9	1	5	5	9	166	0	6	134	42	
Future Volume (vph)	67	7	9	1	5	5	9	166	0	6	134	42	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	
Hourly flow rate (vph)	77	8	10	1	6	6	10	191	0	7	154	48	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total (vph)	95	13	201	209									
Volume Left (vph)	77	1	10	7									
Volume Right (vph)	10	6	0	48									
Hadj (s)	0.11	-0.26	0.07	-0.10									
Departure Headway (s)	5.0	4.7	4.5	4.3									
Degree Utilization, x	0.13	0.02	0.25	0.25									
Capacity (veh/h)	668	683	776	802									
Control Delay (s)	8.7	7.8	9.0	8.7									
Approach Delay (s)	8.7	7.8	9.0	8.7									
Approach LOS	A	A	A	A									
Intersection Summary													
Delay	8.8												
Level of Service	A												
Intersection Capacity Utilization	32.1%				ICU Level of Service				A				
Analysis Period (min)	15												

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Base Year
PM Peak Hour

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Volume (vph)	15	69	71	8	70	54
Future Volume (vph)	15	69	71	8	70	54
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.889		0.987			
Flt Protected	0.991					0.973
Satd. Flow (prot)	1493	0	1727	0	0	1674
Flt Permitted	0.991					0.973
Satd. Flow (perm)	1493	0	1727	0	0	1674
Link Speed (k/h)	50		60			60
Link Distance (m)	1040.1		438.6			461.8
Travel Time (s)	74.9		26.3			27.7
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%
Adj. Flow (vph)	17	80	83	9	81	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	97	0	92	0	0	144
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop			Stop
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.1%				ICU Level of Service A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Base Year
PM Peak Hour

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	15	69	71	8	70	54
Future Volume (vph)	15	69	71	8	70	54
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	17	80	83	9	81	63
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	97	92	144			
Volume Left (vph)	17	0	81			
Volume Right (vph)	80	9	0			
Hadj (s)	-0.40	-0.06	0.14			
Departure Headway (s)	4.0	4.2	4.3			
Degree Utilization, x	0.11	0.11	0.17			
Capacity (veh/h)	846	825	807			
Control Delay (s)	7.5	7.7	8.3			
Approach Delay (s)	7.5	7.7	8.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization	26.1%			ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Base Year
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	11	25	10	5	3	15	151	16	9	300	8
Future Volume (vph)	5	11	25	10	5	3	15	151	16	9	300	8
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.918			0.981			0.988			0.997	
Flt Protected		0.994			0.972			0.996			0.999	
Satd. Flow (prot)	0	1597	0	0	1594	0	0	1578	0	0	1644	0
Flt Permitted		0.994			0.972			0.996			0.999	
Satd. Flow (perm)	0	1597	0	0	1594	0	0	1578	0	0	1644	0
Link Speed (k/h)		60			60			70			60	
Link Distance (m)		372.3			519.4			156.9			312.6	
Travel Time (s)		22.3			31.2			8.1			18.8	
Confl. Peds. (#/hr)								2	2			
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	33%	0%	11%	0%	0%	6%	13%
Adj. Flow (vph)	6	13	29	12	6	3	17	176	19	10	349	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	48	0	0	21	0	0	212	0	0	368	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	15	25	15	25	15	25	15	25	15	25
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	30.1%				ICU Level of Service A							
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Base Year
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	11	25	10	5	3	15	151	16	9	300	8
Future Volume (Veh/h)	5	11	25	10	5	3	15	151	16	9	300	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	6	13	29	12	6	3	17	176	19	10	349	9
Pedestrians					2							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	599	604	354	630	600	188	358				197	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	599	604	354	630	600	188	358				197	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.5	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.6	2.2				2.2	
p0 queue free %	99	97	96	97	99	100	99				99	
cM capacity (veh/h)	403	405	695	364	408	780	1212				1385	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	48	21	212	368								
Volume Left	6	12	17	10								
Volume Right	29	3	19	9								
cSH	541	408	1212	1385								
Volume to Capacity	0.09	0.05	0.01	0.01								
Queue Length 95th (m)	2.3	1.3	0.3	0.2								
Control Delay (s)	12.3	14.3	0.8	0.3								
Lane LOS	B	B	A	A								
Approach Delay (s)	12.3	14.3	0.8	0.3								
Approach LOS	B	B										
Intersection Summary												
Average Delay				1.8								
Intersection Capacity Utilization			30.1%	ICU Level of Service							A	
Analysis Period (min)			15									

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Base Year
PM Peak Hour

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	↗
Traffic Volume (vph)	133	265	165	44	72	260
Future Volume (vph)	133	265	165	44	72	260
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.972			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1511	1733	1670	0	1662	1390
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1511	1733	1670	0	1662	1390
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	1%	5%	0%	7%
Adj. Flow (vph)	140	279	174	46	76	274
Shared Lane Traffic (%)						
Lane Group Flow (vph)	140	279	220	0	76	274
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		25		15	25	15
Sign Control		Stop	Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	36.5%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Base Year
PM Peak Hour

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	↗
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	133	265	165	44	72	260
Future Volume (vph)	133	265	165	44	72	260
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	140	279	174	46	76	274
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	140	279	220	76	274	
Volume Left (vph)	140	0	0	76	0	
Volume Right (vph)	0	0	46	0	274	
Hadj (s)	0.67	0.02	-0.09	0.50	-0.58	
Departure Headway (s)	6.5	5.9	5.8	6.7	5.6	
Degree Utilization, x	0.25	0.45	0.35	0.14	0.43	
Capacity (veh/h)	529	594	592	508	607	
Control Delay (s)	10.5	12.4	12.0	9.6	11.6	
Approach Delay (s)	11.8		12.0		11.2	
Approach LOS	B		B		B	
Intersection Summary						
Delay	11.6					
Level of Service	B					
Intersection Capacity Utilization	36.5%		ICU Level of Service A			
Analysis Period (min)	15					

Queuing and Blocking Report

Base Year
PM Peak Hour

Intersection: 1: Montrose Road & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB			
Directions Served	L	T	T	TR	L	T	T	R	L	T	R	L			
Maximum Queue (m)	62.3	96.3	102.5	77.5	51.3	133.5	133.6	33.3	17.9	50.7	38.3	65.9			
Average Queue (m)	31.4	64.3	65.8	57.3	23.1	77.6	81.5	16.8	6.5	18.1	11.7	31.8			
95th Queue (m)	67.1	86.4	89.3	80.6	42.8	123.1	125.5	29.5	15.0	39.3	30.4	55.4			
Link Distance (m)	740.7		740.7		669.2			669.2			699.6		699.6		
Upstream Blk Time (%)															
Queuing Penalty (veh)															
Storage Bay Dist (m)	55.0			70.0			155.0			115.0			130.0		
Storage Blk Time (%)	0		13		4		1								
Queuing Penalty (veh)	1	15		14		3									

Intersection: 1: Montrose Road & McLeod Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	41.2	51.7
Average Queue (m)	16.4	23.4
95th Queue (m)	34.6	42.5
Link Distance (m)	194.7	194.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Oakwood Drive & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB		
Directions Served	L	T	T	R	L	T	TR	L	LT	R	L	TR		
Maximum Queue (m)	57.3	169.2	170.9	244.5	87.4	152.1	145.4	92.1	103.0	69.2	22.7	43.9		
Average Queue (m)	12.7	85.6	87.2	32.6	54.4	82.7	85.3	42.1	51.4	31.7	6.0	14.7		
95th Queue (m)	40.9	162.6	163.4	132.4	95.5	145.0	143.1	75.9	83.1	56.8	17.2	31.9		
Link Distance (m)	669.2		669.2		669.2		592.5		592.5		342.6		342.6	
Upstream Blk Time (%)														
Queuing Penalty (veh)														
Storage Bay Dist (m)	50.0			80.0			95.0			20.0				
Storage Blk Time (%)	0		23		2		9		0		1		1	
Queuing Penalty (veh)	0	8		10		18		0		1		1		

Queuing and Blocking Report

Base Year
PM Peak Hour

Intersection: 3: Dorchester Road & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB			
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR			
Maximum Queue (m)	62.4	142.9	137.5	57.3	109.9	112.0	22.4	155.0	37.4	192.5			
Average Queue (m)	47.6	60.0	63.2	14.9	69.5	72.5	21.2	74.8	27.1	94.1			
95th Queue (m)	75.4	120.4	117.0	44.8	106.9	109.4	25.9	149.0	47.2	198.2			
Link Distance (m)	592.5		592.5		1024.4		1024.4		325.7		294.0		
Upstream Blk Time (%)											4		
Queuing Penalty (veh)											0		
Storage Bay Dist (m)	55.0			50.0			15.0			30.0			
Storage Blk Time (%)	12		8		0		20		51		29		
Queuing Penalty (veh)	40	21		0		9		75		68		11	

Intersection: 4: Drummond Road & McLeod Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LTR	L	TR
Maximum Queue (m)	88.1	89.9	79.4	81.9	75.1	27.4	124.9
Average Queue (m)	49.5	39.2	31.0	34.6	35.1	23.4	65.5
95th Queue (m)	82.7	78.4	65.7	70.8	63.2	33.9	113.6
Link Distance (m)	1024.4	1024.4	1047.7	1047.7	811.3	193.4	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)						20.0	
Storage Blk Time (%)						27	
Queuing Penalty (veh)						79	

Intersection: 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	
Directions Served	L	T	T	R	L	T	T	R	LTR	L	TR	
Maximum Queue (m)	26.6	52.5	58.4	9.1	32.2	76.0	75.0	17.0	8.7	104.3	30.7	
Average Queue (m)	9.1	25.0	32.4	1.1	3.2	39.8	42.0	0.6	1.6	54.4	11.6	
95th Queue (m)	20.5	46.9	51.8	5.8	16.1	63.1	64.3	12.0	6.1	90.1	23.2	
Link Distance (m)	1047.7		1047.7		239.8		239.8		307.6		277.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			50.0			25.0			80.0		
Storage Blk Time (%)	0		1		25		0		0			
Queuing Penalty (veh)	0	0		2		0		0				

Queuing and Blocking Report

Base Year
PM Peak Hour

Intersection: 6: Stanley Avenue & Marineland Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	L	T	T	L	L	R
Maximum Queue (m)	71.5	75.4	50.1	22.0	50.4	51.4	32.3	46.4	14.8
Average Queue (m)	37.1	39.9	3.0	7.3	29.0	25.1	8.1	22.1	2.4
95th Queue (m)	63.5	65.0	25.0	18.3	46.3	43.4	22.4	38.6	9.9
Link Distance (m)	239.8	239.8			155.4	155.4		485.6	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)			65.0	105.0			160.0		80.0
Storage Blk Time (%)		1	0						
Queuing Penalty (veh)		1	0						

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	51.6	430.8	106.3	156.8
Average Queue (m)	19.1	418.9	47.0	128.0
95th Queue (m)	38.4	439.7	84.8	183.1
Link Distance (m)	498.6	412.9	207.4	141.8
Upstream Blk Time (%)		94		56
Queuing Penalty (veh)		0		0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Dorchester Road & Jill Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	17.8	8.8	23.2	20.8
Average Queue (m)	8.7	2.4	13.1	12.2
95th Queue (m)	14.5	8.7	20.7	18.6
Link Distance (m)	110.7	156.1	446.2	325.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Base Year
PM Peak Hour

Intersection: 9: Dorchester Road & Oldfield Road

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	23.3	19.3	14.0
Average Queue (m)	10.5	9.3	9.2
95th Queue (m)	18.5	16.0	11.9
Link Distance (m)	1023.2	423.0	446.2
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Stanley Avenue & Chippawa Parkway

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	17.7	14.7	12.8	1.6
Average Queue (m)	7.3	3.7	1.2	0.1
95th Queue (m)	15.1	11.4	6.6	1.2
Link Distance (m)	355.4	511.0	139.9	295.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: Lyons Creek Road & Stanley Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (m)	27.3	27.6	27.6	16.8	35.4
Average Queue (m)	13.6	15.3	14.7	6.0	13.8
95th Queue (m)	21.8	23.0	23.4	12.0	27.6
Link Distance (m)		442.7	589.0		785.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	55.0			25.0	
Storage Blk Time (%)					1
Queuing Penalty (veh)					1

Zone Summary

Zone wide Queuing Penalty: 491

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Base Year
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	120	959	38	139	749	200	53	96	279	191	162	68
Future Volume (vph)	120	959	38	139	749	200	53	96	279	191	162	68
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0		0.0	115.0		0.0	130.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00				1.00	
Frt		0.994				0.850			0.850		0.956	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1539	4518	0	1599	3228	1444	1662	1636	1403	1599	3058	0
Fit Permitted	0.127			0.105			0.592			0.610		
Satd. Flow (perm)	206	4518	0	177	3228	1444	1035	1636	1403	1026	3058	0
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		5				225			307		52	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		759.2			692.3			721.0			213.3	
Travel Time (s)		54.7			49.8			51.9			15.4	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	5%	8%	4%	3%	3%	0%	7%	6%	4%	5%	0%
Adj. Flow (vph)	135	1078	43	156	842	225	60	108	313	215	182	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	135	1121	0	156	842	225	60	108	313	215	258	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Base Year
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2			2	6	
Detector Phase	7	4		3	8	8	5	2		2	1	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0		46.0	9.5	46.0
Total Split (s)	13.0	48.0		13.0	48.0	48.0	23.0	46.0		46.0	23.0	46.0
Total Split (%)	10.0%	36.9%		10.0%	36.9%	36.9%	17.7%	35.4%		35.4%	17.7%	35.4%
Maximum Green (s)	10.0	40.0		10.0	40.0	40.0	20.0	38.0		38.0	20.0	38.0
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0		4.0	0.0	4.0
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0		-4.0	1.0	-4.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	None	Max
Walk Time (s)		12.0			12.0	12.0		14.0		14.0		14.0
Flash Dont Walk (s)		20.0			20.0	20.0		24.0		24.0		24.0
Pedestrian Calls (#/hr)		0			0	0		0		0		0
Act Effct Green (s)	52.7	44.0		53.3	44.3	44.3	53.5	47.0		47.0	65.0	56.2
Actuated g/C Ratio	0.41	0.34		0.41	0.34	0.34	0.41	0.36		0.36	0.50	0.43
v/c Ratio	0.78	0.73		0.92	0.77	0.35	0.13	0.18		0.45	0.37	0.19
Control Delay	54.1	41.0		70.8	27.2	6.3	18.4	30.7		5.9	21.0	19.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	54.1	41.0		70.8	27.2	6.3	18.4	30.7		5.9	21.0	19.2
LOS	D	D		E	C	A	B	C		A	C	B
Approach Delay		42.4			28.9			13.0				20.0
Approach LOS		D			C			B				B
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	105											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.92											
Intersection Signal Delay:	30.4						Intersection LOS: C					
Intersection Capacity Utilization:	79.7%						ICU Level of Service D					
Analysis Period (min):	15											
Splits and Phases:	1: Montrose Road & McLeod Road											

Queues
1: Montrose Road & McLeod Road

Base Year
Saturday Peak Hour

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	135	1121	156	842	225	60	108	313	215	258
v/c Ratio	0.78	0.73	0.92	0.77	0.35	0.13	0.18	0.45	0.37	0.19
Control Delay	54.1	41.0	70.8	27.2	6.3	18.4	30.7	5.9	21.0	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	41.0	70.8	27.2	6.3	18.4	30.7	5.9	21.0	19.2
Queue Length 50th (m)	22.0	96.7	20.4	93.2	17.8	8.2	19.8	1.1	32.6	17.9
Queue Length 95th (m)	#48.4	112.7	m#60.9	124.5	23.5	15.9	36.0	22.2	49.2	28.1
Internal Link Dist (m)		735.2		668.3			697.0			189.3
Turn Bay Length (m)	55.0		155.0			115.0			130.0	
Base Capacity (vph)	176	1532	170	1099	640	600	590	702	596	1352
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.73	0.92	0.77	0.35	0.10	0.18	0.45	0.36	0.19

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Base Year
Saturday Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	120	959	38	139	749	200	53	96	279	191	162	68
Future Volume (vph)	120	959	38	139	749	200	53	96	279	191	162	68
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ftbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1539	4519		1599	3228	1444	1661	1636	1403	1599	3057	
Flt Permitted	0.13	1.00		0.11	1.00	1.00	0.59	1.00	1.00	0.61	1.00	
Satd. Flow (perm)	205	4519		177	3228	1444	1036	1636	1403	1026	3057	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	135	1078	43	156	842	225	60	108	313	215	182	76
RTOR Reduction (vph)	0	3	0	0	0	149	0	0	195	0	30	0
Lane Group Flow (vph)	135	1118	0	156	842	76	60	108	118	215	228	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	8%	5%	8%	4%	3%	3%	0%	7%	6%	4%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	49.1	39.4		49.7	39.7	39.7	50.0	43.6	43.6	61.6	52.2	
Effective Green, g (s)	47.1	43.4		47.7	43.7	43.7	48.0	47.6	47.6	60.6	56.2	
Actuated g/C Ratio	0.36	0.33		0.37	0.34	0.34	0.37	0.37	0.37	0.47	0.43	
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	163	1508		163	1085	485	408	599	513	539	1321	
v/s Ratio Prot	0.06	0.25		c0.07	0.26		0.01	0.07		c0.04	0.07	
v/s Ratio Perm	0.24			c0.28		0.05	0.05		0.08	c0.14		
v/c Ratio	0.83	0.74		0.96	0.78	0.16	0.15	0.18	0.23	0.40	0.17	
Uniform Delay, d1	31.9	38.3		31.9	38.8	30.2	26.8	28.0	28.5	21.5	22.6	
Progression Factor	1.00	1.00		1.01	0.60	1.34	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	27.4	3.3		49.7	4.3	0.5	0.1	0.7	1.0	0.4	0.3	
Delay (s)	59.3	41.7		82.0	27.4	40.9	27.0	28.6	29.6	21.9	22.9	
Level of Service	E	D		F	C	D	C	C	C	C	C	
Approach Delay (s)		43.5			36.9			29.0			22.5	
Approach LOS		D			D			C			C	

Intersection Summary

- HCM 2000 Control Delay 36.2 HCM 2000 Level of Service D
- HCM 2000 Volume to Capacity ratio 0.61
- Actuated Cycle Length (s) 130.0 Sum of lost time (s) 16.0
- Intersection Capacity Utilization 79.7% ICU Level of Service D
- Analysis Period (min) 15
- c Critical Lane Group

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Base Year
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	24	786	417	217	928	14	373	15	280	10	8	29
Future Volume (vph)	24	786	417	217	928	14	373	15	280	10	8	29
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0		0.0	80.0		0.0	95.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor			0.95	0.99	1.00		1.00	1.00	0.99	1.00	0.99	
Frt			0.850		0.998				0.850			0.881
Flt Protected	0.950			0.950			0.950	0.956		0.950		
Satd. Flow (prot)	1662	3292	1473	1630	3284	0	1548	1561	1473	1662	1524	0
Flt Permitted	0.183			0.106			0.950	0.956		0.950		
Satd. Flow (perm)	320	3292	1396	181	3284	0	1545	1557	1452	1660	1524	0
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)			416		1				295			31
Link Speed (k/h)		50			50			50				50
Link Distance (m)		692.3			616.3			360.6				181.9
Travel Time (s)		49.8			44.4			26.0				13.1
Confl. Peds. (#/hr)	10		16	16		10	3		2	2		3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	2%	0%	1%	0%	0%	0%
Adj. Flow (vph)	25	827	439	228	977	15	393	16	295	11	8	31
Shared Lane Traffic (%)							48%					
Lane Group Flow (vph)	25	827	439	228	992	0	204	205	295	11	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0		10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0		0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0


Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Base Year
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	23.0	43.0	43.0	23.0	43.0		41.0	41.0	41.0	23.0	23.0	
Total Split (%)	17.7%	33.1%	33.1%	17.7%	33.1%		31.5%	31.5%	31.5%	17.7%	17.7%	
Maximum Green (s)	20.0	35.0	35.0	20.0	35.0		32.0	32.0	32.0	14.0	14.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	47.3	41.9	36.9	62.0	56.2		37.0	37.0	37.0	19.0	19.0	
Actuated g/C Ratio	0.36	0.32	0.28	0.48	0.43		0.28	0.28	0.28	0.15	0.15	
v/c Ratio	0.15	0.78	0.63	0.86	0.70		0.46	0.46	0.47	0.05	0.16	
Control Delay	13.9	28.5	9.4	58.5	34.1		42.5	42.4	6.6	48.4	21.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	13.9	28.5	9.4	58.5	34.1		42.5	42.4	6.6	48.4	21.7	
LOS	B	C	A	E	C		D	D	A	D	C	
Approach Delay		21.8			38.7			27.4			27.6	
Approach LOS		C			D			C			C	
Intersection Summary												
Area Type: Other												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green												
Natural Cycle: 155												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.86												
Intersection Signal Delay: 29.4						Intersection LOS: C						
Intersection Capacity Utilization 105.8%						ICU Level of Service G						
Analysis Period (min) 15												
Splits and Phases: 2: Oakwood Drive & McLeod Road												

Queues
2: Oakwood Drive & McLeod Road

Base Year
Saturday Peak Hour




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	827	439	228	992	204	205	295	11	39
v/c Ratio	0.15	0.78	0.63	0.86	0.70	0.46	0.46	0.47	0.05	0.16
Control Delay	13.9	28.5	9.4	58.5	34.1	42.5	42.4	6.6	48.4	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	28.5	9.4	58.5	34.1	42.5	42.4	6.6	48.4	21.7
Queue Length 50th (m)	1.7	111.3	68.3	41.9	117.8	47.8	48.0	0.0	2.6	1.9
Queue Length 95th (m)	m2.7	139.6	99.0	#80.4	147.7	74.2	74.3	22.5	8.6	12.8
Internal Link Dist (m)	668.3			592.3			336.6			157.9
Turn Bay Length (m)	50.0	80.0			95.0			20.0		
Base Capacity (vph)	343	1061	694	298	1419	440	444	624	242	249
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.78	0.63	0.77	0.70	0.46	0.46	0.47	0.05	0.16

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Base Year
Saturday Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	24	786	417	217	928	14	373	15	280	10	8	29
Future Volume (vph)	24	786	417	217	928	14	373	15	280	10	8	29
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1662	3292	1396	1629	3283		1548	1560	1452	1662	1523	
Flt Permitted	0.18	1.00	1.00	0.11	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	320	3292	1396	183	3283		1548	1560	1452	1662	1523	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	827	439	228	977	15	393	16	295	11	8	31
RTOR Reduction (vph)	0	0	298	0	1	0	0	0	211	0	26	0
Lane Group Flow (vph)	25	827	141	228	991	0	204	205	84	11	13	0
Conf. Peds. (#/hr)	10	16	16	16	10		3		2	2		3
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	41.9	37.9	37.9	58.0	51.0		32.0	32.0	32.0	14.0	14.0	
Effective Green, g (s)	39.9	41.9	36.9	57.0	55.0		37.0	37.0	37.0	19.0	19.0	
Actuated g/C Ratio	0.31	0.32	0.28	0.44	0.42		0.28	0.28	0.28	0.15	0.15	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	129	1061	396	259	1388		440	444	413	242	222	
v/s Ratio Prot	0.00	0.25		c0.11	0.30		c0.13	0.13		0.01	c0.01	
v/s Ratio Perm	0.05		0.10	c0.28					0.06			
v/c Ratio	0.19	0.78	0.36	0.88	0.71		0.46	0.46	0.20	0.05	0.06	
Uniform Delay, d1	32.4	39.9	37.1	34.0	31.0		38.3	38.3	35.3	47.7	47.8	
Progression Factor	0.64	0.58	1.21	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	4.5	1.9	27.3	3.2		3.5	3.4	1.1	0.4	0.5	
Delay (s)	21.3	27.7	46.7	61.3	34.2		41.8	41.7	36.4	48.1	48.3	
Level of Service	C	C	D	E	C		D	D	D	D	D	
Approach Delay (s)	34.1			39.2			39.5			48.2		
Approach LOS	C			D			D			D		

Intersection Summary
 HCM 2000 Control Delay 37.4 HCM 2000 Level of Service D
 HCM 2000 Volume to Capacity ratio 0.59
 Actuated Cycle Length (s) 130.0 Sum of lost time (s) 16.0
 Intersection Capacity Utilization 105.8% ICU Level of Service G
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Base Year
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	260	673	77	49	654	83	197	106	46	100	106	266
Future Volume (vph)	260	673	77	49	654	83	197	106	46	100	106	266
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0	0.0	15.0	0.0	30.0	0.0	30.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	0
Taper Length (m)	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00	0.99	0.99	1.00	0.99	1.00	0.99	0.98	0.98	0.98	0.98
Frt	0.985			0.983			0.955			0.893		
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3224	0	1662	3221	0	1630	1653	0	1662	1523	0
Fit Permitted	0.203			0.333			0.139			0.596		
Satd. Flow (perm)	346	3224	0	580	3221	0	237	1653	0	1024	1523	0
Right Turn on Red		Yes		Yes			Yes			Yes		Yes
Satd. Flow (RTOR)		10		11			19			110		50
Link Speed (k/h)		50		50			50			50		50
Link Distance (m)		616.3		1045.5			348.9			308.0		308.0
Travel Time (s)		44.4		75.3			25.1			22.2		22.2
Confl. Peds. (#/hr)	13		11	11		13	9		21	21		9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%
Adj. Flow (vph)	268	694	79	51	674	86	203	109	47	103	109	274
Shared Lane Traffic (%)												
Lane Group Flow (vph)	268	773	0	51	760	0	203	156	0	103	383	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Base Year
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.4		9.5	30.4		9.5	37.7		9.5	37.7	
Total Split (s)	28.0	35.4		28.0	35.4		15.0	42.7		15.0	42.7	
Total Split (%)	23.1%	29.2%		23.1%	29.2%		12.4%	35.3%		12.4%	35.3%	
Maximum Green (s)	25.0	29.0		25.0	29.0		12.0	36.0		12.0	36.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.3		0.0	2.3		0.0	2.6		0.0	2.6	
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		9.0			9.0			12.0			12.0	
Flash Dont Walk (s)		15.0			15.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	67.6	59.0		53.5	47.2		43.2	32.4		39.6	30.5	
Actuated g/C Ratio	0.56	0.49		0.44	0.39		0.36	0.27		0.33	0.25	
v/c Ratio	0.73	0.49		0.16	0.60		0.96	0.34		0.27	0.82	
Control Delay	28.8	24.1		17.1	34.3		83.3	32.2		25.3	44.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.8	24.1		17.1	34.3		83.3	32.2		25.3	44.4	
LOS	C	C		B	C		F	C		C	D	
Approach Delay		25.3			33.2			61.1			40.3	
Approach LOS		C			C			E			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.96											
Intersection Signal Delay:	35.2						Intersection LOS: D					
Intersection Capacity Utilization:	88.3%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											
<p>The diagram shows the timing for 8 lanes. Lane 1 (EBL) has a split of 15s. Lane 2 (EBT) has a split of 42.7s. Lane 3 (EBR) has a split of 28s. Lane 4 (WBL) has a split of 35.4s. Lane 5 (WBT) has a split of 28s. Lane 6 (WBR) has a split of 42.7s. Lane 7 (NBL) has a split of 28s. Lane 8 (NBT) has a split of 35.4s. Phases are indicated by arrows: Ø1 (left), Ø2 (up), Ø3 (right), Ø4 (down), Ø5 (left), Ø6 (up), Ø7 (right), Ø8 (down). Right-turn lanes (EBR, WBR, NBR, SBR) are marked with (R).</p>												

Queues
3: Dorchester Road & McLeod Road

Base Year
Saturday Peak Hour

	↖	→	↘	←	↙	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	268	773	51	760	203	156	103	383
v/c Ratio	0.73	0.49	0.16	0.60	0.96	0.34	0.27	0.82
Control Delay	28.8	24.1	17.1	34.3	83.3	32.2	25.3	44.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	24.1	17.1	34.3	83.3	32.2	25.3	44.4
Queue Length 50th (m)	34.5	68.7	5.7	78.3	35.4	27.4	16.8	65.9
Queue Length 95th (m)	62.9	101.3	13.7	#131.8	#77.2	43.8	26.7	97.4
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	447	1575	533	1262	211	541	408	561
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	0.60	0.49	0.10	0.60	0.96	0.29	0.25	0.68

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Base Year
Saturday Peak Hour

	↖	→	↘	↙	←	↗	↖	↗	↑	↘	↙	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗			
Traffic Volume (vph)	260	673	77	49	654	83	197	106	46	100	106	266		
Future Volume (vph)	260	673	77	49	654	83	197	106	46	100	106	266		
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.95		1.00	0.95		1.00	0.89
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1628	3223		1658	3221		1629	1653		1644	1522		1644	1522
Flt Permitted	0.20	1.00		0.33	1.00		0.14	1.00		0.60	1.00		0.60	1.00
Satd. Flow (perm)	348	3223		582	3221		239	1653		1032	1522		1032	1522
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	268	694	79	51	674	86	203	109	47	103	109	274		
RTOR Reduction (vph)	0	5	0	0	7	0	0	14	0	0	82	0		
Lane Group Flow (vph)	268	768	0	51	753	0	203	142	0	103	301	0		
Conf. Peds. (#/hr)	13		11	11		13	9		21	21		9		
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%		
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA
Protected Phases	7	4		3	8		5	2		1	6			
Permitted Phases	4			8			2			6				
Actuated Green, G (s)	65.2	56.0		51.0	44.8		41.7	29.7		37.9	27.8			
Effective Green, g (s)	64.2	58.4		49.0	47.2		39.7	32.4		35.9	30.5			
Actuated g/C Ratio	0.53	0.48		0.40	0.39		0.33	0.27		0.30	0.25			
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7			
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	357	1554		281	1255		204	442		351	383			
v/s Ratio Prot	c0.10	0.24		0.01	0.23		c0.09	0.09		0.02	0.20			
v/s Ratio Perm	c0.30			0.07			c0.24			0.06				
v/c Ratio	0.75	0.49		0.18	0.60		1.00	0.32		0.29	0.79			
Uniform Delay, d1	19.2	21.3		22.2	29.4		34.7	35.5		32.0	42.2			
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00			
Incremental Delay, d2	8.6	1.1		0.3	2.1		61.3	0.4		0.5	10.1			
Delay (s)	27.8	22.4		22.5	31.6		96.0	36.0		32.5	52.4			
Level of Service	C	C		C	C		F	D		C	D			
Approach Delay (s)		23.8			31.0			69.9			48.2			
Approach LOS		C			C			E			D			

Intersection Summary

HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c	Critical Lane Group		

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Base Year
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔		↔		
Traffic Volume (vph)	198	466	72	10	601	130	81	76	29	138	90	181
Future Volume (vph)	198	466	72	10	601	130	81	76	29	138	90	181
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			0.99			0.99			0.98		0.99
Frt	0.985			0.974			0.979			0.990		
Flt Protected	0.987			0.999			0.979			0.950		
Satd. Flow (prot)	0	3202	0	0	3184	0	0	1647	0	1646	1541	0
Flt Permitted	0.597			0.944			0.565			0.591		
Satd. Flow (perm)	0	1933	0	0	3008	0	0	948	0	1006	1541	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			32			9			98	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1045.5			1070.0			834.0			207.0	
Travel Time (s)		75.3			77.0			60.0			14.9	
Confl. Peds. (#/hr)	12		2	2		12	8		22	22		8
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	3%	0%	1%	2%	0%
Adj. Flow (vph)	204	480	74	10	620	134	84	78	30	142	93	187
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	758	0	0	764	0	0	192	0	142	280	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Base Year
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8				2			6	
Detector Phase	7	4		8	8			2	2		6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0			8.0	8.0		8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5			30.8	30.8		30.8	30.8
Total Split (s)	18.0	51.5		51.5	51.5			33.8	33.8		33.8	33.8
Total Split (%)	17.4%	49.9%		49.9%	49.9%			32.7%	32.7%		32.7%	32.7%
Maximum Green (s)	15.0	45.0		45.0	45.0			27.0	27.0		27.0	27.0
Yellow Time (s)	3.0	4.1		4.1	4.1			4.1	4.1		4.1	4.1
All-Red Time (s)	0.0	2.4		2.4	2.4			2.7	2.7		2.7	2.7
Lost Time Adjust (s)		-2.5			-2.5			-2.8	-2.8		-2.8	-2.8
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Recall Mode	None	C-Max		C-Max	C-Max			Max	Max		Max	Max
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)		65.5			65.5			29.8	29.8		29.8	29.8
Actuated g/C Ratio		0.63			0.63			0.29	0.29		0.29	0.29
v/c Ratio		0.61			0.40			0.69	0.69		0.49	0.54
Control Delay		13.6			9.5			45.5	45.5		37.3	24.3
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		13.6			9.5			45.5	45.5		37.3	24.3
LOS		B			A			D	D		D	C
Approach Delay		13.6			9.5			45.5	45.5		28.7	
Approach LOS		B			A			D	D		C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	103.3											
Actuated Cycle Length:	103.3											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	75											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.69											
Intersection Signal Delay:	18.0						Intersection LOS: B					
Intersection Capacity Utilization:	99.1%						ICU Level of Service F					
Analysis Period (min):	15											
Splits and Phases:	4: Drummond Road & McLeod Road											

Queues
4: Drummond Road & McLeod Road

Base Year
Saturday Peak Hour

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	758	764	192	142	280
v/c Ratio	0.61	0.40	0.69	0.49	0.54
Control Delay	13.6	9.5	45.5	37.3	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	9.5	45.5	37.3	24.3
Queue Length 50th (m)	44.8	36.2	34.3	24.8	31.8
Queue Length 95th (m)	63.9	48.0	#66.7	45.3	58.9
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	1233	1919	279	290	514
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	0.40	0.69	0.49	0.54

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Base Year
Saturday Peak Hour

	↘	→	↙	↗	←	↖	↑	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕		↘	↙	
Traffic Volume (vph)	198	466	72	10	601	130	81	76	29	138	90	181
Future Volume (vph)	198	466	72	10	601	130	81	76	29	138	90	181
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Frbp, ped/bikes		1.00			0.99			0.99		1.00		0.99
Flpb, ped/bikes		1.00			1.00			1.00		0.98		1.00
Frt		0.99			0.97			0.98		1.00		0.90
Flt Protected		0.99			1.00			0.98		0.95		1.00
Satd. Flow (prot)		3195			3184			1642		1617		1541
Flt Permitted		0.60			0.94			0.57		0.59		1.00
Satd. Flow (perm)		1933			3007			949		1005		1541
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	204	480	74	10	620	134	84	78	30	142	93	187
RTOR Reduction (vph)	0	8	0	0	12	0	0	6	0	0	70	0
Lane Group Flow (vph)	0	750	0	0	752	0	0	186	0	142	210	0
Confl. Peds. (#/hr)	12		2	2		12	8		22	22		8
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	3%	0%	1%	2%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7	4		8			2			6	
Permitted Phases		4		8			2			6		
Actuated Green, G (s)		63.0			63.0			27.0		27.0		27.0
Effective Green, g (s)		65.5			65.5			29.8		29.8		29.8
Actuated g/C Ratio		0.63			0.63			0.29		0.29		0.29
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5
Lane Grp Cap (vph)		1225			1906			273		289		444
v/s Ratio Prot												0.14
v/s Ratio Perm		c0.39			0.25			c0.20		0.14		
v/c Ratio		0.61			0.39			0.68		0.49		0.47
Uniform Delay, d1		11.3			9.2			32.5		30.5		30.3
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		0.8			0.6			12.9		5.9		3.6
Delay (s)		12.1			9.8			45.4		36.3		33.9
Level of Service		B			A			D		D		C
Approach Delay (s)		12.1			9.8			45.4				34.7
Approach LOS		B			A			D				C
Intersection Summary												
HCM 2000 Control Delay			18.7								B	
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			103.3					Sum of lost time (s)		11.0		
Intersection Capacity Utilization			99.1%					ICU Level of Service		F		
Analysis Period (min)			15									
c	Critical Lane Group											

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	60	403	1	10	581	240	3	11	7	185	14	64
Future Volume (vph)	60	403	1	10	581	240	3	11	7	185	14	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			7.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00		0.99		0.99	
Frt			0.850			0.850			0.955		0.876	
Flt Protected	0.950			0.950			0.993		0.950			
Satd. Flow (prot)	1662	3325	1488	1662	3292	1430	0	1660	0	1614	1513	0
Flt Permitted	0.286			0.509			0.993		0.950			
Satd. Flow (perm)	500	3325	1455	890	3292	1399	0	1659	0	1614	1513	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			95			247		7		66		66
Link Speed (k/h)		50			50			50		50		50
Link Distance (m)		1070.0			261.8			326.3		294.0		294.0
Travel Time (s)		77.0			18.8			23.5		21.2		21.2
Conf. Peds. (#/hr)	1		1	1		1	3					3
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	62	415	1	10	599	247	3	11	7	191	14	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	415	1	10	599	247	0	21	0	191	80	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		3.6
Link Offset(m)		0.0			0.0			0.0		0.0		0.0
Crosswalk Width(m)		4.8			4.8			4.8		4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4		9.4		9.4
Detector 2 Size(m)		0.6			0.6			0.6		0.6		0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0		0.0		0.0

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	Split	NA
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	15.0	57.2	57.2	42.2	42.2	42.2	37.2	37.2		37.2	37.2	
Total Split (%)	11.4%	43.5%	43.5%	32.1%	32.1%	32.1%	28.3%	28.3%		28.3%	28.3%	
Maximum Green (s)	12.0	50.0	50.0	35.0	35.0	35.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	61.5	61.5	61.5	52.5	52.5	52.5		33.2		24.9	24.9	
Actuated g/C Ratio	0.47	0.47	0.47	0.40	0.40	0.40		0.25		0.19	0.19	
v/c Ratio	0.21	0.27	0.00	0.03	0.46	0.35		0.05		0.63	0.24	
Control Delay	23.1	22.8	0.0	29.8	32.4	5.3		28.6		57.7	14.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	23.1	22.8	0.0	29.8	32.4	5.3		28.6		57.7	14.6	
LOS	C	C	A	C	C	A		C		E	B	
Approach Delay		22.8			24.5			28.6			44.9	
Approach LOS		C			C			C			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	131.6											
Actuated Cycle Length:	131.6											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	125											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.63											
Intersection Signal Delay:	27.5						Intersection LOS: C					
Intersection Capacity Utilization:	61.8%						ICU Level of Service B					
Analysis Period (min):	15											
Splits and Phases:	5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway											

Queues Base Year
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	62	415	1	10	599	247	21	191	80
v/c Ratio	0.21	0.27	0.00	0.03	0.46	0.35	0.05	0.63	0.24
Control Delay	23.1	22.8	0.0	29.8	32.4	5.3	28.6	57.7	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	22.8	0.0	29.8	32.4	5.3	28.6	57.7	14.6
Queue Length 50th (m)	9.2	35.5	0.0	1.7	63.9	0.0	2.9	48.5	3.2
Queue Length 95th (m)	20.0	52.8	0.0	6.5	93.0	19.9	9.9	70.0	16.4
Internal Link Dist (m)	1046.0			237.8			302.3		
Turn Bay Length (m)	60.0	50.0	25.0	80.0					
Base Capacity (vph)	330	1554	730	355	1313	706	424	407	431
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	0.19	0.27	0.00	0.03	0.46	0.35	0.05	0.47	0.19
Intersection Summary									

HCM Signalized Intersection Capacity Analysis Base Year
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔		↔	↔	↔	↔	↔
Traffic Volume (vph)	60	403	1	10	581	240	3	11	7	185	14	64
Future Volume (vph)	60	403	1	10	581	240	3	11	7	185	14	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0		4.0		4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00		1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98		1.00		1.00		0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95		1.00		0.88
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95		1.00
Satd. Flow (prot)	1662	3325	1455	1661	3292	1399		1659		1614		1513
Flt Permitted	0.29	1.00	1.00	0.51	1.00	1.00		0.99		0.95		1.00
Satd. Flow (perm)	501	3325	1455	890	3292	1399		1659		1614		1513
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	62	415	1	10	599	247	3	11	7	191	14	66
RTOR Reduction (vph)	0	0	1	0	0	150	0	5	0	0	54	0
Lane Group Flow (vph)	62	415	0	10	599	97	0	16	0	191	26	0
Confl. Peds. (#/hr)	1		1	1		1	3					3
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	3%	0%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	
Protected Phases	7	4			8		2	2		6		6
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	58.3	58.3	58.3	48.7	48.7	48.7		30.0		21.7		21.7
Effective Green, g (s)	57.3	61.5	61.5	51.9	51.9	51.9		33.2		24.9		24.9
Actuated g/C Ratio	0.44	0.47	0.47	0.39	0.39	0.39		0.25		0.19		0.19
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2		7.2		7.2		7.2
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5		4.0		4.0		4.0
Lane Grp Cap (vph)	267	1553	679	350	1298	551		418		305		286
v/s Ratio Prot	0.01	c0.12			c0.18			c0.01		c0.12		0.02
v/s Ratio Perm	0.09		0.00	0.01		0.07						
v/c Ratio	0.23	0.27	0.00	0.03	0.46	0.18		0.04		0.63		0.09
Uniform Delay, d1	23.0	21.3	18.7	24.4	29.5	25.9		37.1		49.1		44.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00		1.00
Incremental Delay, d2	0.3	0.4	0.0	0.2	1.2	0.7		0.2		4.5		0.2
Delay (s)	23.2	21.8	18.7	24.6	30.7	26.6		37.3		53.6		44.2
Level of Service	C	C	B	C	C	C		D		D		D
Approach Delay (s)	21.9			29.4			37.3			50.8		
Approach LOS	C			C			D			D		
Intersection Summary												
HCM 2000 Control Delay	30.9			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.38											
Actuated Cycle Length (s)	131.6			Sum of lost time (s)			19.2					
Intersection Capacity Utilization	61.8%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Base Year
Saturday Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↗	↖	↔↔	↗↖	↗
Traffic Volume (vph)	495	94	18	689	143	28
Future Volume (vph)	495	94	18	689	143	28
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor		0.98	1.00			0.99
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3292	1458	1421	3292	3162	1390
Flt Permitted			0.371		0.950	
Satd. Flow (perm)	3292	1428	554	3292	3162	1372
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		98				29
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Confl. Peds. (#/hr)		1	1			1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	17%	1%	2%	7%
Adj. Flow (vph)	516	98	19	718	149	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	516	98	19	718	149	29
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Base Year
Saturday Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	42.5	42.5	42.5	42.5	36.5	36.5
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.2%	46.2%
Maximum Green (s)	35.0	35.0	35.0	35.0	30.0	30.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	26.9	26.9	26.9	26.9	44.1	44.1
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.56	0.56
v/c Ratio	0.46	0.18	0.10	0.64	0.08	0.04
Control Delay	21.1	4.3	16.9	24.2	9.5	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	4.3	16.9	24.2	9.5	4.4
LOS	C	A	B	C	A	A
Approach Delay	18.4			24.0	8.6	
Approach LOS	B			C	A	
Intersection Summary						
Area Type:	Other					
Cycle Length: 79						
Actuated Cycle Length: 79						
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green						
Natural Cycle: 65						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.64						
Intersection Signal Delay: 20.0	Intersection LOS: B					
Intersection Capacity Utilization 54.0%	ICU Level of Service A					
Analysis Period (min) 15						
Splits and Phases: 6: Stanley Avenue & Marineland Parkway						
↖ Ø2 (R)	→ Ø4				↖ Ø8	
36.5 s	42.5 s				42.5 s	

Queues
6: Stanley Avenue & Marineland Parkway

Base Year
Saturday Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	516	98	19	718	149	29
v/c Ratio	0.46	0.18	0.10	0.64	0.08	0.04
Control Delay	21.1	4.3	16.9	24.2	9.5	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	4.3	16.9	24.2	9.5	4.4
Queue Length 50th (m)	32.7	0.0	2.0	49.1	5.2	0.0
Queue Length 95th (m)	40.6	8.4	6.0	58.7	11.3	4.2
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1604	746	269	1604	1763	777
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.13	0.07	0.45	0.08	0.04
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Base Year
Saturday Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	495	94	18	689	143	28
Future Volume (vph)	495	94	18	689	143	28
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3292	1427	1419	3292	3162	1372
Flt Permitted	1.00	1.00	0.37	1.00	0.95	1.00
Satd. Flow (perm)	3292	1427	554	3292	3162	1372
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	516	98	19	718	149	29
RTOR Reduction (vph)	0	65	0	0	0	13
Lane Group Flow (vph)	516	33	19	718	149	16
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	1%	2%	17%	1%	2%	7%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	23.4	23.4	23.4	23.4	41.6	41.6
Effective Green, g (s)	26.9	26.9	26.9	26.9	44.1	44.1
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.56	0.56
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	1120	485	188	1120	1765	765
v/s Ratio Prot	0.16			c0.22	c0.05	
v/s Ratio Perm		0.02	0.03			0.01
v/c Ratio	0.46	0.07	0.10	0.64	0.08	0.02
Uniform Delay, d1	20.4	17.6	17.8	22.0	8.1	7.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.2	1.2	0.1	0.1
Delay (s)	20.7	17.6	18.0	23.2	8.2	7.9
Level of Service	C	B	B	C	A	A
Approach Delay (s)	20.2			23.1	8.1	
Approach LOS	C			C	A	
Intersection Summary						
HCM 2000 Control Delay		20.2			HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.30				
Actuated Cycle Length (s)		79.0			Sum of lost time (s)	8.0
Intersection Capacity Utilization		54.0%			ICU Level of Service	A
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings

7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year

Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	23	116	3	430	219	74	5	140	296	145	191	54
Future Volume (vph)	23	116	3	430	219	74	5	140	296	145	191	54
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.986			0.909			0.981	
Flt Protected		0.992			0.971			0.999			0.982	
Satd. Flow (prot)	0	1676	0	0	1620	0	0	1529	0	0	1636	0
Flt Permitted		0.875			0.724			0.996			0.608	
Satd. Flow (perm)	0	1478	0	0	1208	0	0	1524	0	0	1013	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			7			147			12	
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		507.4			421.7			216.1			150.6	
Travel Time (s)		22.8			19.0			13.0			9.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Adj. Flow (vph)	25	126	3	467	238	80	5	152	322	158	208	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	154	0	0	785	0	0	479	0	0	425	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			8			2	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												

Lanes, Volumes, Timings

7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year

Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.3	26.3		26.3	26.3		31.3	31.3		31.3	31.3	
Total Split (s)	46.3	46.3		46.3	46.3		51.3	51.3		51.3	51.3	
Total Split (%)	47.4%	47.4%		47.4%	47.4%		52.6%	52.6%		52.6%	52.6%	
Maximum Green (s)	40.0	40.0		40.0	40.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	4.1	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		-2.3			-2.3			-2.3			-2.3	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		42.3			42.3			47.3			47.3	
Actuated g/C Ratio		0.43			0.43			0.48			0.48	
v/c Ratio		0.24			1.49			0.59			0.86	
Control Delay		18.7			255.8			15.6			40.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.7			255.8			15.6			40.4	
LOS		B			F			B			D	
Approach Delay		18.7			255.8			15.6			40.4	
Approach LOS		B			F			B			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	97.6											
Actuated Cycle Length:	97.6											
Offset:	0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green											
Natural Cycle:	80											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.49											
Intersection Signal Delay:	123.9						Intersection LOS: F					
Intersection Capacity Utilization:	111.1%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	7: Montrose Road & Biggar Road/Lyons Creek Road											

Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year
Saturday Peak Hour

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	154	785	479	425
v/c Ratio	0.24	1.49	0.59	0.86
Control Delay	18.7	255.8	15.6	40.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.7	255.8	15.6	40.4
Queue Length 50th (m)	18.7	~218.4	44.8	69.8
Queue Length 95th (m)	32.9	#292.3	77.3	#132.2
Internal Link Dist (m)	483.4	397.7	192.1	126.6
Turn Bay Length (m)				
Base Capacity (vph)	641	527	814	497
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	1.49	0.59	0.86

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Base Year
Saturday Peak Hour

	↖	→	↘	↙	←	↗	↖	↑	↘	↙	↓	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	23	116	3	430	219	74	5	140	296	145	191	54
Future Volume (vph)	23	116	3	430	219	74	5	140	296	145	191	54
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Fr		1.00			0.99			0.91			0.98	
Fit Protected		0.99			0.97			1.00			0.98	
Satd. Flow (prot)		1676			1621			1530			1636	
Fit Permitted		0.88			0.72			1.00			0.61	
Satd. Flow (perm)		1479			1209			1525			1014	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	126	3	467	238	80	5	152	322	158	208	59
RTOR Reduction (vph)	0	1	0	0	4	0	0	76	0	0	6	0
Lane Group Flow (vph)	0	153	0	0	781	0	0	403	0	0	419	0
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
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)		40.0			40.0			45.0			45.0	
Effective Green, g (s)		42.3			42.3			47.3			47.3	
Actuated g/C Ratio		0.43			0.43			0.48			0.48	
Clearance Time (s)		6.3			6.3			6.3			6.3	
Vehicle Extension (s)		6.0			6.0			6.0			6.0	
Lane Grp Cap (vph)		641			523			739			491	
v/s Ratio Prot												
v/s Ratio Perm		0.10			0.65			0.26			0.41	
v/c Ratio		0.24			1.49			0.55			0.85	
Uniform Delay, d1		17.5			27.6			17.6			22.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			232.0			2.9			16.9	
Delay (s)		18.0			259.6			20.5			39.0	
Level of Service		B			F			C			D	
Approach Delay (s)		18.0			259.6			20.5			39.0	
Approach LOS		B			F			C			D	

Intersection Summary

- HCM 2000 Control Delay 126.4 HCM 2000 Level of Service F
- HCM 2000 Volume to Capacity ratio 1.15
- Actuated Cycle Length (s) 97.6 Sum of lost time (s) 8.0
- Intersection Capacity Utilization 111.1% ICU Level of Service H
- Analysis Period (min) 15
- c Critical Lane Group

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Base Year
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	45	3	3	3	9	9	3	160	2	3	155	39
Future Volume (vph)	45	3	3	3	9	9	3	160	2	3	155	39
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.941			0.998			0.973	
Flt Protected		0.957			0.994			0.999			0.999	
Satd. Flow (prot)	0	1632	0	0	1637	0	0	1686	0	0	1691	0
Flt Permitted		0.957			0.994			0.999			0.999	
Satd. Flow (perm)	0	1632	0	0	1637	0	0	1686	0	0	1691	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	2		8	8		2	11		5	5		11
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	33%	3%	0%	0%	0%	3%
Adj. Flow (vph)	48	3	3	3	10	10	3	172	2	3	167	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	23	0	0	177	0	0	212	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	30.7%											
Analysis Period (min)	15											
	ICU Level of Service A											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Base Year
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	45	3	3	3	9	9	3	160	2	3	155	39
Future Volume (vph)	45	3	3	3	9	9	3	160	2	3	155	39
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	48	3	3	3	10	10	3	172	2	3	167	42
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	54	23	177	212								
Volume Left (vph)	48	3	3	3								
Volume Right (vph)	3	10	2	42								
Hadj (s)	0.17	-0.23	0.06	-0.11								
Departure Headway (s)	5.0	4.6	4.4	4.2								
Degree Utilization, x	0.07	0.03	0.21	0.25								
Capacity (veh/h)	665	708	798	831								
Control Delay (s)	8.4	7.7	8.6	8.5								
Approach Delay (s)	8.4	7.7	8.6	8.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	8.5											
Level of Service	A											
Intersection Capacity Utilization	30.7%											
Analysis Period (min)	15											
	ICU Level of Service A											

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Base Year
Saturday Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	15	58	70	14	76	62
Future Volume (vph)	15	58	70	14	76	62
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.893		0.977			
Fit Protected	0.990					0.973
Satd. Flow (prot)	1511	0	1710	0	0	1693
Fit Permitted	0.990					0.973
Satd. Flow (perm)	1511	0	1710	0	0	1693
Link Speed (k/h)	50		60			60
Link Distance (m)	1040.1		438.6			461.8
Travel Time (s)	74.9		26.3			27.7
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	0%	3%	0%	0%	1%	0%
Adj. Flow (vph)	19	73	88	18	95	78
Shared Lane Traffic (%)						
Lane Group Flow (vph)	92	0	106	0	0	173
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Base Year
Saturday Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	15	58	70	14	76	62
Future Volume (vph)	15	58	70	14	76	62
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	19	72	88	18	95	78
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	91	106	173			
Volume Left (vph)	19	0	95			
Volume Right (vph)	72	18	0			
Hadj (s)	-0.39	-0.10	0.12			
Departure Headway (s)	4.1	4.2	4.3			
Degree Utilization, x	0.10	0.12	0.21			
Capacity (veh/h)	809	829	811			
Control Delay (s)	7.6	7.8	8.5			
Approach Delay (s)	7.6	7.8	8.5			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.1			
Level of Service			A			
Intersection Capacity Utilization		26.2%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Base Year
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				↕
Traffic Volume (vph)	2	13	21	9	13	2	18	152	6	2	93	2
Future Volume (vph)	2	13	21	9	13	2	18	152	6	2	93	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.920			0.990			0.995			0.998	
Fit Protected		0.998			0.981			0.995			0.999	
Satd. Flow (prot)	0	1607	0	0	1700	0	0	1718	0	0	1745	0
Fit Permitted		0.998			0.981			0.995			0.999	
Satd. Flow (perm)	0	1607	0	0	1700	0	0	1718	0	0	1745	0
Link Speed (k/h)		60			60			70			60	
Link Distance (m)		372.3			519.4			156.9			312.6	
Travel Time (s)		22.3			31.2			8.1			18.8	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	2	15	25	11	15	2	21	181	7	2	111	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	28	0	0	209	0	0	115	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Base Year
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				↕
Traffic Volume (veh/h)	2	13	21	9	13	2	18	152	6	2	93	2
Future Volume (Veh/h)	2	13	21	9	13	2	18	152	6	2	93	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	2	15	25	11	15	2	21	181	7	2	111	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	352	346	112	375	344	184	113				188	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	352	346	112	375	344	184	113				188	
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	97	97	98	97	100	99				100	
cM capacity (veh/h)	586	571	947	552	573	863	1489				1398	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	42	28	209	115								
Volume Left	2	11	21	2								
Volume Right	25	2	7	2								
cSH	749	579	1489	1398								
Volume to Capacity	0.06	0.05	0.01	0.00								
Queue Length 95th (m)	1.4	1.2	0.3	0.0								
Control Delay (s)	10.1	11.5	0.9	0.1								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.1	11.5	0.9	0.1								
Approach LOS	B	B										

Intersection Summary	
Average Delay	2.4
Intersection Capacity Utilization	28.3%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Base Year
Saturday Peak Hour

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	↗
Traffic Volume (vph)	124	238	225	50	46	74
Future Volume (vph)	124	238	225	50	46	74
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.975			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1646	1750	1700	0	1662	1488
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1646	1750	1700	0	1662	1488
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	133	256	242	54	49	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	133	256	296	0	49	80
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		25		15	25	15
Sign Control		Stop	Stop		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.9%
ICU Level of Service A	
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Base Year
Saturday Peak Hour

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	↗
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	124	238	225	50	46	74
Future Volume (vph)	124	238	225	50	46	74
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	133	256	242	54	49	80
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	133	256	296	49	80	
Volume Left (vph)	133	0	0	49	0	
Volume Right (vph)	0	0	54	0	80	
Hadj (s)	0.52	0.00	-0.10	0.50	-0.70	
Departure Headway (s)	5.7	5.2	5.0	6.6	5.4	
Degree Utilization, x	0.21	0.37	0.41	0.09	0.12	
Capacity (veh/h)	608	678	695	500	602	
Control Delay (s)	9.0	9.9	11.5	9.1	8.0	
Approach Delay (s)	9.6		11.5	8.4		
Approach LOS	A		B	A		
Intersection Summary						
Delay	10.1					
Level of Service	B					
Intersection Capacity Utilization	36.9%		ICU Level of Service		A	
Analysis Period (min)	15					

Queuing and Blocking Report

Base Year
Saturday Peak Hour

Intersection: 1: Montrose Road & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB			
Directions Served	L	T	T	TR	L	T	T	R	L	T	R	L			
Maximum Queue (m)	62.4	114.4	118.0	77.5	52.2	105.7	108.0	36.2	23.9	39.9	39.9	51.5			
Average Queue (m)	35.5	68.0	70.0	59.7	24.3	59.6	64.1	16.6	7.4	14.9	12.1	26.7			
95th Queue (m)	72.3	99.1	98.8	82.9	43.8	98.7	102.4	30.3	16.0	32.9	31.1	46.1			
Link Distance (m)	740.7		740.7		669.2		669.2		699.6		699.6				
Upstream Blk Time (%)															
Queuing Penalty (veh)															
Storage Bay Dist (m)	55.0			70.0			155.0			115.0			130.0		
Storage Blk Time (%)	1		15		6		1								
Queuing Penalty (veh)	3		18		21		3								

Intersection: 1: Montrose Road & McLeod Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	36.0	35.2
Average Queue (m)	16.2	14.7
95th Queue (m)	31.4	28.9
Link Distance (m)	194.7	194.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Oakwood Drive & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB				
Directions Served	L	T	T	R	L	T	TR	L	LT	R	L	TR				
Maximum Queue (m)	36.2	134.8	136.7	214.4	87.4	130.6	132.8	95.3	116.1	60.3	15.1	26.7				
Average Queue (m)	7.5	52.5	54.5	43.1	49.9	74.2	77.2	44.5	54.9	26.8	2.9	7.8				
95th Queue (m)	25.6	105.6	105.7	173.3	87.1	127.0	127.9	79.9	91.9	49.4	10.1	18.3				
Link Distance (m)	669.2		669.2		669.2		592.5		592.5		164.6					
Upstream Blk Time (%)																
Queuing Penalty (veh)																
Storage Bay Dist (m)	50.0				80.0				95.0				20.0			
Storage Blk Time (%)	7				0				7				0			
Queuing Penalty (veh)	2				1				14				0			

Queuing and Blocking Report

Base Year
Saturday Peak Hour

Intersection: 3: Dorchester Road & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB		
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR		
Maximum Queue (m)	62.5	122.9	127.0	57.3	112.4	120.7	22.4	147.1	37.4	132.4		
Average Queue (m)	46.3	57.5	60.8	16.9	64.6	69.1	20.7	57.1	23.2	62.1		
95th Queue (m)	74.8	116.9	115.4	48.4	102.8	106.8	25.6	115.5	43.8	112.3		
Link Distance (m)	592.5		592.5		1024.4		1024.4		325.7		294.0	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	55.0			50.0			15.0			30.0		
Storage Blk Time (%)	7		7		0		17		48		26	
Queuing Penalty (veh)	24		19		0		8		73		52	

Intersection: 4: Drummond Road & McLeod Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LTR	L	TR
Maximum Queue (m)	107.7	96.7	82.7	86.5	71.2	27.3	115.7
Average Queue (m)	52.6	42.2	31.6	35.3	35.8	23.2	55.5
95th Queue (m)	91.3	84.3	70.8	77.4	62.0	32.7	104.4
Link Distance (m)	1024.4	1024.4	1047.7	1047.7	811.3		193.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)						20.0	
Storage Blk Time (%)						23	
Queuing Penalty (veh)						62	

Intersection: 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	
Directions Served	L	T	T	R	L	T	T	R	LTR	L	TR	
Maximum Queue (m)	28.9	53.3	54.8	1.8	27.2	77.8	79.0	16.8	13.6	86.6	28.3	
Average Queue (m)	11.0	26.1	31.2	0.2	2.8	46.3	47.3	0.6	2.3	43.0	11.0	
95th Queue (m)	23.7	45.5	50.0	2.0	14.5	73.9	72.7	11.9	8.3	72.7	22.0	
Link Distance (m)	1047.7		1047.7		239.8		239.8		307.6		277.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0				50.0		25.0		80.0			
Storage Blk Time (%)	0				0		28		0			
Queuing Penalty (veh)	0				0		3		0			

Queuing and Blocking Report

Base Year
Saturday Peak Hour

Intersection: 6: Stanley Avenue & Marineland Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	L	T	T	L	L	R
Maximum Queue (m)	77.6	80.2	43.4	17.8	77.4	76.5	20.8	28.5	15.0
Average Queue (m)	36.7	41.6	1.9	4.4	43.3	40.5	4.3	10.6	3.3
95th Queue (m)	65.6	68.3	21.2	13.2	65.1	64.0	14.3	22.1	11.7
Link Distance (m)	239.8	239.8			155.4	155.4			485.6
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)			65.0	105.0			160.0		80.0
Storage Blk Time (%)		2	0		0				
Queuing Penalty (veh)		1	0		0				

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	42.4	431.5	112.5	156.9
Average Queue (m)	17.9	420.2	45.5	117.8
95th Queue (m)	33.7	438.2	87.3	180.9
Link Distance (m)	498.6	412.9	207.4	141.8
Upstream Blk Time (%)		97		35
Queuing Penalty (veh)		0		0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Dorchester Road & Jill Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	15.5	9.9	23.1	19.1
Average Queue (m)	7.4	4.7	12.7	11.7
95th Queue (m)	14.2	11.7	19.4	17.8
Link Distance (m)	110.7	156.1	446.2	325.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Base Year
Saturday Peak Hour

Intersection: 9: Dorchester Road & Oldfield Road

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	20.0	16.7	18.6
Average Queue (m)	10.1	9.8	9.6
95th Queue (m)	17.6	16.0	13.3
Link Distance (m)	1023.2	423.0	446.2
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Stanley Avenue & Chippawa Parkway

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	16.4	10.7	9.5	3.3
Average Queue (m)	6.9	4.3	0.5	0.1
95th Queue (m)	14.5	11.7	3.9	1.7
Link Distance (m)	355.4	511.0	139.9	295.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: Lyons Creek Road & Stanley Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (m)	21.2	22.1	31.4	13.2	12.2
Average Queue (m)	11.1	13.0	16.8	4.2	3.5
95th Queue (m)	17.3	20.0	27.5	10.0	9.5
Link Distance (m)		442.7	589.0		785.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	55.0			25.0	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 397

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	116	985	23	84	845	239	25	71	143	187	82	88
Future Volume (vph)	116	985	23	84	845	239	25	71	143	187	82	88
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0		0.0	115.0		0.0	130.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			7.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00					0.99
Frt		0.997				0.850			0.850			0.922
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	4485	0	1484	3228	1430	1662	3023	1340	1583	2890	0
Fit Permitted	0.137			0.162			0.636			0.639		
Satd. Flow (perm)	216	4485	0	253	3228	1430	1111	3023	1340	1065	2890	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				257			154			95
Link Speed (k/h)		50			50			50				50
Link Distance (m)		759.2			692.3			721.0				213.3
Travel Time (s)		54.7			49.8			51.9				15.4
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	6%	15%	12%	3%	4%	0%	10%	11%	5%	11%	0%
Adj. Flow (vph)	125	1059	25	90	909	257	27	76	154	201	88	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	125	1084	0	90	909	257	27	76	154	201	183	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1		2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		2	6	
Permitted Phases	4			8		8	2			2	6	
Detector Phase	7	4		3	8	8	5	2		2	1	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0		8.0	6.0	8.0
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0		46.0	9.5	46.0
Total Split (s)	18.4	54.5		15.0	51.1	51.1	9.5	46.0		46.0	14.5	51.0
Total Split (%)	14.2%	41.9%		11.5%	39.3%	39.3%	7.3%	35.4%		35.4%	11.2%	39.2%
Maximum Green (s)	15.4	46.5		12.0	43.1	43.1	6.5	38.0		38.0	11.5	43.0
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0		4.0	0.0	4.0
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0		-4.0	1.0	-4.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	None	Max
Walk Time (s)		12.0			12.0	12.0		14.0		14.0		14.0
Flash Dont Walk (s)		20.0			20.0	20.0		24.0		24.0		24.0
Pedestrian Calls (#/hr)		0			0	0		0		0		0
Act Effct Green (s)	63.3	53.4		59.7	51.6	51.6	47.5	42.3		42.3	56.5	50.9
Actuated g/C Ratio	0.49	0.41		0.46	0.40	0.40	0.37	0.33		0.33	0.43	0.39
v/c Ratio	0.62	0.59		0.47	0.71	0.36	0.06	0.08		0.29	0.40	0.15
Control Delay	31.1	31.6		12.5	17.5	4.7	22.0	30.9		6.2	26.7	13.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	31.1	31.6		12.5	17.5	4.7	22.0	30.9		6.2	26.7	13.4
LOS	C	C		B	B	A	C	C		A	C	B
Approach Delay		31.5			14.6			15.1				20.4
Approach LOS		C			B			B				C
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	105											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.71											
Intersection Signal Delay:	21.9						Intersection LOS: C					
Intersection Capacity Utilization:	74.0%						ICU Level of Service D					
Analysis Period (min):	15											
Splits and Phases:	1: Montrose Road & McLeod Road											

Queues
1: Montrose Road & McLeod Road

Future Background
AM Peak Hour

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	125	1084	90	909	257	27	76	154	201	183
v/c Ratio	0.62	0.59	0.47	0.71	0.36	0.06	0.08	0.29	0.40	0.15
Control Delay	31.1	31.6	12.5	17.5	4.7	22.0	30.9	6.2	26.7	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	31.6	12.5	17.5	4.7	22.0	30.9	6.2	26.7	13.4
Queue Length 50th (m)	17.7	81.9	2.7	109.1	14.9	4.1	7.4	0.0	34.6	8.1
Queue Length 95th (m)	30.0	101.4	m3.3	144.8	m20.7	10.2	13.6	15.7	53.8	16.7
Internal Link Dist (m)		735.2		668.3			697.0			189.3
Turn Bay Length (m)	55.0		155.0			115.0			130.0	
Base Capacity (vph)	250	1844	225	1280	722	431	982	539	504	1188
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.59	0.40	0.71	0.36	0.06	0.08	0.29	0.40	0.15
Intersection Summary										
m Volume for 95th percentile queue is metered by upstream signal.										

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Future Background
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	116	985	23	84	845	239	25	71	143	187	82	88
Future Volume (vph)	116	985	23	84	845	239	25	71	143	187	82	88
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	
Ftpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1498	4483		1484	3228	1430	1661	3023	1340	1583	2891	
Flt Permitted	0.14	1.00		0.16	1.00	1.00	0.64	1.00	1.00	0.64	1.00	
Satd. Flow (perm)	216	4483		252	3228	1430	1113	3023	1340	1064	2891	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	125	1059	25	90	909	257	27	76	154	201	88	95
RTOR Reduction (vph)	0	2	0	0	0	157	0	0	102	0	58	0
Lane Group Flow (vph)	125	1082	0	90	909	100	27	76	52	201	125	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	11%	6%	15%	12%	3%	4%	0%	10%	11%	5%	11%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	59.1	48.2		55.5	46.4	46.4	43.3	39.5	39.5	53.7	46.9	
Effective Green, g (s)	57.1	52.2		53.5	50.4	50.4	41.3	43.5	43.5	52.7	50.9	
Actuated g/C Ratio	0.44	0.40		0.41	0.39	0.39	0.32	0.33	0.33	0.41	0.39	
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	192	1800		180	1251	554	365	1011	448	472	1131	
v/s Ratio Prot	c0.05	0.24		0.03	c0.28		0.00	0.03		c0.03	0.04	
v/s Ratio Perm	0.24			0.17		0.07	0.02		0.04	c0.14		
v/c Ratio	0.65	0.60		0.50	0.73	0.18	0.07	0.08	0.12	0.43	0.11	
Uniform Delay, d1	25.9	30.7		25.3	33.9	26.2	30.8	29.5	29.9	26.7	25.2	
Progression Factor	1.00	1.00		0.43	0.46	1.19	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.9	1.5		1.0	2.3	0.4	0.1	0.1	0.5	0.5	0.2	
Delay (s)	32.8	32.2		11.8	17.8	31.5	30.8	29.7	30.5	27.1	25.4	
Level of Service	C	C		B	B	C	C	C	C	C	C	
Approach Delay (s)		32.2			20.2			30.3			26.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.5			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			74.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	43	791	308	174	1236	22	193	18	167	13	5	19
Future Volume (vph)	43	791	308	174	1236	22	193	18	167	13	5	19
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0		0.0	80.0		0.0	95.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		1.00	1.00				0.99
Frt			0.850		0.997				0.850		0.881	
Flt Protected	0.950			0.950			0.950	0.960		0.950		
Satd. Flow (prot)	1583	3167	1365	1511	3216	0	1462	1496	1403	1662	1388	0
Flt Permitted	0.085			0.189			0.950	0.960		0.950		
Satd. Flow (perm)	142	3167	1365	301	3216	0	1461	1495	1403	1662	1388	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			314		1				170		19	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		692.3			616.3			360.6			181.9	
Travel Time (s)		49.8			44.4			26.0			13.1	
Confl. Peds. (#/hr)	2					2	1					1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	5%	9%	10%	3%	5%	8%	0%	6%	0%	25%	6%
Adj. Flow (vph)	44	807	314	178	1261	22	197	18	170	13	5	19
Shared Lane Traffic (%)							46%					
Lane Group Flow (vph)	44	807	314	178	1283	0	106	109	170	13	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	25.0	49.0	49.0	25.0	49.0		28.0	28.0	28.0	28.0	28.0	
Total Split (%)	19.2%	37.7%	37.7%	19.2%	37.7%		21.5%	21.5%	21.5%	21.5%	21.5%	
Maximum Green (s)	22.0	41.0	41.0	22.0	41.0		19.0	19.0	19.0	19.0	19.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	59.1	53.2	48.2	70.0	61.9		24.0	24.0	24.0	24.0	24.0	
Actuated g/C Ratio	0.45	0.41	0.37	0.54	0.48		0.18	0.18	0.18	0.18	0.18	
v/c Ratio	0.34	0.62	0.45	0.63	0.84		0.39	0.39	0.43	0.04	0.09	
Control Delay	28.3	20.6	7.0	26.4	36.5		51.6	51.6	10.1	44.2	21.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	28.3	20.6	7.0	26.4	36.5		51.6	51.6	10.1	44.2	21.9	
LOS	C	C	A	C	D		D	D	B	D	C	
Approach Delay		17.2			35.3			33.2			29.7	
Approach LOS		B			D			C			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.84											
Intersection Signal Delay:	28.0						Intersection LOS: C					
Intersection Capacity Utilization:	89.5%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	2: Oakwood Drive & McLeod Road											

Queues
2: Oakwood Drive & McLeod Road

Future Background
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	44	807	314	178	1283	106	109	170	13	24
v/c Ratio	0.34	0.62	0.45	0.63	0.84	0.39	0.39	0.43	0.04	0.09
Control Delay	28.3	20.6	7.0	26.4	36.5	51.6	51.6	10.1	44.2	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.3	20.6	7.0	26.4	36.5	51.6	51.6	10.1	44.2	21.9
Queue Length 50th (m)	3.3	94.0	34.6	24.2	159.0	26.7	27.4	0.0	2.9	1.1
Queue Length 95th (m)	m9.0	132.3	70.1	38.4	198.1	46.8	47.5	20.4	9.1	9.2
Internal Link Dist (m)		668.3		592.3		336.6			157.9	
Turn Bay Length (m)	50.0			80.0		95.0			20.0	
Base Capacity (vph)	308	1295	703	357	1531	269	276	397	306	271
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.62	0.45	0.50	0.84	0.39	0.39	0.43	0.04	0.09
Intersection Summary										
m Volume for 95th percentile queue is metered by upstream signal.										

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Future Background
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	43	791	308	174	1236	22	193	18	167	13	5	19
Future Volume (vph)	43	791	308	174	1236	22	193	18	167	13	5	19
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	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		1.00	1.00	0.85	1.00	0.88	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3167	1365	1511	3217		1462	1496	1403	1662	1388	1388
Flt Permitted	0.09	1.00	1.00	0.19	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	142	3167	1365	301	3217		1462	1496	1403	1662	1388	1388
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	44	807	314	178	1261	22	197	18	170	13	5	19
RTOR Reduction (vph)	0	0	198	0	1	0	0	0	139	0	15	0
Lane Group Flow (vph)	44	807	116	178	1282	0	106	109	31	13	9	0
Confl. Peds. (#/hr)	2					2	1					1
Heavy Vehicles (%)	5%	5%	9%	10%	3%	5%	8%	0%	6%	0%	25%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	NA
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	54.9	49.2	49.2	66.0	57.3		19.0	19.0	19.0	19.0	19.0	19.0
Effective Green, g (s)	52.9	53.2	48.2	65.0	61.3		24.0	24.0	24.0	24.0	24.0	24.0
Actuated g/C Ratio	0.41	0.41	0.37	0.50	0.47		0.18	0.18	0.18	0.18	0.18	0.18
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	9.0
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	109	1296	506	269	1516		269	276	259	306	256	256
v/s Ratio Prot	0.01	0.25		c0.06	c0.40		0.07	c0.07		c0.01	0.01	
v/s Ratio Perm	0.15		0.09	0.26					0.02			
v/c Ratio	0.40	0.62	0.23	0.66	0.85		0.39	0.39	0.12	0.04	0.03	
Uniform Delay, d1	27.2	30.4	28.1	21.6	30.2		46.6	46.6	44.2	43.6	43.5	
Progression Factor	1.40	0.59	1.49	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	1.9	0.9	5.4	6.0		4.3	4.2	1.0	0.3	0.2	
Delay (s)	39.6	19.9	42.9	27.0	36.2		50.9	50.8	45.2	43.8	43.7	
Level of Service	D	B	D	C	D		D	D	D	D	D	
Approach Delay (s)		26.8			35.1			48.3			43.8	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			33.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			89.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	264	658	74	71	744	173	306	195	99	174	108	302
Future Volume (vph)	264	658	74	71	744	173	306	195	99	174	108	302
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0	0.0	15.0	0.0	15.0	0.0	30.0	0.0	30.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	0
Taper Length (m)	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99	0.99	0.99	0.99	1.00	0.98	0.97	0.98	0.97	0.98	0.98
Frt	0.985			0.972			0.949			0.890		
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1554	3147	0	1599	3056	0	1599	1558	0	1568	1438	0
Fit Permitted	0.105			0.276			0.120			0.419		
Satd. Flow (perm)	172	3147	0	458	3056	0	201	1558	0	672	1438	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			24			22			115	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		616.3			1045.5			348.9			308.0	
Travel Time (s)		44.4			75.3			25.1			22.2	
Confl. Peds. (#/hr)	7		21	21		7	10		44	44		10
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%
Adj. Flow (vph)	290	723	81	78	818	190	336	214	109	191	119	332
Shared Lane Traffic (%)												
Lane Group Flow (vph)	290	804	0	78	1008	0	336	323	0	191	451	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.4		9.5	30.4		9.5	37.7		9.5	37.7	
Total Split (s)	20.0	50.1		11.3	41.4		22.0	43.0		16.7	37.7	
Total Split (%)	16.5%	41.4%		9.3%	34.2%		18.2%	35.5%		13.8%	31.1%	
Maximum Green (s)	17.0	43.7		8.3	35.0		19.0	36.3		13.7	31.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.3		0.0	2.3		0.0	2.6		0.0	2.6	
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		9.0			9.0			12.0			12.0	
Flash Dont Walk (s)		15.0			15.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	58.1	49.2		44.1	37.4		55.0	39.3		44.7	33.0	
Actuated g/C Ratio	0.48	0.41		0.36	0.31		0.45	0.32		0.37	0.27	
v/c Ratio	1.06	0.63		0.34	1.05		1.12	0.62		0.57	0.95	
Control Delay	104.3	31.8		22.7	82.9		121.5	38.4		28.6	62.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	104.3	31.8		22.7	82.9		121.5	38.4		28.6	62.9	
LOS	F	C		C	F		F	D		C	E	
Approach Delay		51.0			78.6			80.8			52.7	
Approach LOS		D			E			F			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	120											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.12											
Intersection Signal Delay:	65.6						Intersection LOS: E					
Intersection Capacity Utilization:	103.2%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											

Queues
3: Dorchester Road & McLeod Road

Future Background
AM Peak Hour

	↖	→	↘	←	↙	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	290	804	78	1008	336	323	191	451
v/c Ratio	1.06	0.63	0.34	1.05	1.12	0.62	0.57	0.95
Control Delay	104.3	31.8	22.7	82.9	121.5	38.4	28.6	62.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.3	31.8	22.7	82.9	121.5	38.4	28.6	62.9
Queue Length 50th (m)	-66.6	85.8	10.5	-142.5	-80.3	63.9	28.7	86.4
Queue Length 95th (m)	#124.4	108.7	19.8	#186.0	#140.6	96.8	45.8	#153.1
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	273	1284	237	960	299	520	347	483
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	1.06	0.63	0.33	1.05	1.12	0.62	0.55	0.93

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Future Background
AM Peak Hour

	↖	→	↘	↙	←	↗	↖	↗	↑	↘	↙	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖	↖	
Traffic Volume (vph)	264	658	74	71	744	173	306	195	99	174	108	302	
Future Volume (vph)	264	658	74	71	744	173	306	195	99	174	108	302	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.98		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00		
Frt	1.00	0.98		1.00	0.97		1.00	0.95		1.00	0.89		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1554	3147		1593	3055		1598	1559		1551	1437		
Flt Permitted	0.11	1.00		0.28	1.00		0.12	1.00		0.42	1.00		
Satd. Flow (perm)	172	3147		462	3055		202	1559		683	1437		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	290	723	81	78	818	190	336	214	109	191	119	332	
RTOR Reduction (vph)	0	7	0	0	17	0	0	15	0	0	84	0	
Lane Group Flow (vph)	290	797	0	78	991	0	336	308	0	191	367	0	
Conf. Peds. (#/hr)	7		21	21		7	10		44	44		10	
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA		
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4			8			2			6			
Actuated Green, G (s)	55.7	46.2		41.5	35.0		52.3	36.6		43.0	30.3		
Effective Green, g (s)	54.7	48.6		39.5	37.4		51.3	39.3		41.0	33.0		
Actuated g/C Ratio	0.45	0.40		0.33	0.31		0.42	0.32		0.34	0.27		
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	268	1262		202	943		293	505		315	391		
v/s Ratio Prot	c0.15	0.25		0.02	0.32		c0.17	0.20		0.06	0.26		
v/s Ratio Perm	c0.34			0.11			c0.32			0.15			
v/c Ratio	1.08	0.63		0.39	1.05		1.15	0.61		0.61	0.94		
Uniform Delay, d1	36.7	29.1		29.1	41.9		36.2	34.4		30.5	43.1		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	78.6	2.4		1.2	43.7		98.3	2.2		3.3	30.1		
Delay (s)	115.3	31.5		30.4	85.6		134.5	36.6		33.8	73.2		
Level of Service	F	C		C	F		F	D		C	E		
Approach Delay (s)		53.7			81.6			86.5			61.5		
Approach LOS		D			F			F			E		

Intersection Summary

- HCM 2000 Control Delay: 70.1, HCM 2000 Level of Service: E
- HCM 2000 Volume to Capacity ratio: 1.09
- Actuated Cycle Length (s): 121.1, Sum of lost time (s): 16.0
- Intersection Capacity Utilization: 103.2%, ICU Level of Service: G
- Analysis Period (min): 15
- c Critical Lane Group

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	176	595	122	53	596	192	277	234	134	132	108	178
Future Volume (vph)	176	595	122	53	596	192	277	234	134	132	108	178
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	1	0	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99			0.99		1.00	0.99	
Frt	0.979				0.966			0.972		0.907		
Flt Protected	0.990				0.997			0.979		0.950		
Satd. Flow (prot)	0	3122	0	0	2961	0	0	1588	0	1646	1469	0
Flt Permitted	0.543				0.722			0.606		0.409		
Satd. Flow (perm)	0	1711	0	0	2144	0	0	982	0	706	1469	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			41			17		109		
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		1045.5			1070.0			834.0		207.0		
Travel Time (s)		75.3			77.0			60.0		14.9		
Confl. Peds. (#/hr)	7		3	3		7	4		13	13		4
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
Heavy Vehicles (%)	5%	2%	4%	56%	4%	4%	4%	7%	0%	1%	10%	5%
Adj. Flow (vph)	196	661	136	59	662	213	308	260	149	147	120	198
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	993	0	0	934	0	0	717	0	147	318	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		
Link Offset(m)		0.0			0.0			0.0		0.0		
Crosswalk Width(m)		4.8			4.8			4.8		4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	30.5		30.5	30.5		30.8	30.8		30.8	30.8	
Total Split (s)	9.5	50.3		40.8	40.8		53.0	53.0		53.0	53.0	
Total Split (%)	9.2%	48.7%		39.5%	39.5%		51.3%	51.3%		51.3%	51.3%	
Maximum Green (s)	6.5	43.8		34.3	34.3		46.2	46.2		46.2	46.2	
Yellow Time (s)	3.0	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	2.4		2.4	2.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		-2.5			-2.5			-2.8			-2.8	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)		9.0		9.0	9.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)		15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)		46.3			46.3			49.0			49.0	
Actuated g/C Ratio		0.45			0.45			0.47			0.47	
v/c Ratio		1.27			0.95			1.51			0.44	0.42
Control Delay		160.8			46.1			266.3			23.3	13.3
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		160.8			46.1			266.3			23.3	13.3
LOS		F			D			F			C	B
Approach Delay		160.8			46.1			266.3			16.4	
Approach LOS		F			D			F			B	
Intersection Summary												
Area Type:	Other											
Cycle Length:	103.3											
Actuated Cycle Length:	103.3											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	80											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.51											
Intersection Signal Delay:	129.1						Intersection LOS: F					
Intersection Capacity Utilization:	126.5%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	4: Drummond Road & McLeod Road											

Queues
4: Drummond Road & McLeod Road

Future Background
AM Peak Hour

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	993	934	717	147	318
v/c Ratio	1.27	0.95	1.51	0.44	0.42
Control Delay	160.8	46.1	266.3	23.3	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	160.8	46.1	266.3	23.3	13.3
Queue Length 50th (m)	~139.7	93.8	~211.9	19.9	26.8
Queue Length 95th (m)	#181.4	#141.0	#284.8	38.8	49.1
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	779	983	474	334	754
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.27	0.95	1.51	0.44	0.42

Intersection Summary
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Future Background
AM Peak Hour

	↘	→	↙	↗	←	↖	↑	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↔	↔	
Traffic Volume (vph)	176	595	122	53	596	192	277	234	134	132	108	178
Future Volume (vph)	176	595	122	53	596	192	277	234	134	132	108	178
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Frbp, ped/bikes		1.00			0.99			0.99		1.00		0.99
Flpb, ped/bikes		1.00			1.00			1.00		1.00		1.00
Frt		0.98			0.97			0.97		1.00		0.91
Flt Protected		0.99			1.00			0.98		0.95		1.00
Satd. Flow (prot)		3122			2960			1586		1640		1469
Flt Permitted		0.54			0.72			0.61		0.41		1.00
Satd. Flow (perm)		1712			2144			981		706		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)	196	661	136	59	662	213	308	260	149	147	120	198
RTOR Reduction (vph)	0	12	0	0	23	0	0	9	0	0	57	0
Lane Group Flow (vph)	0	981	0	0	911	0	0	708	0	147	261	0
Confl. Peds. (#/hr)	7		3	3		7	4		13	13		4
Heavy Vehicles (%)	5%	2%	4%	56%	4%	4%	4%	7%	0%	1%	10%	5%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7	4			8			2			6
Permitted Phases		4			8			2			6	
Actuated Green, G (s)		43.8			43.8			46.2		46.2		46.2
Effective Green, g (s)		46.3			46.3			49.0		49.0		49.0
Actuated g/C Ratio		0.45			0.45			0.47		0.47		0.47
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5
Lane Grp Cap (vph)		767			960			465		334		696
v/s Ratio Prot												0.18
v/s Ratio Perm		c0.57			0.43			c0.72		0.21		
v/c Ratio		1.28			0.95			1.52		0.44		0.37
Uniform Delay, d1		28.5			27.4			27.1		18.0		17.4
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		135.4			19.1			246.0		4.2		1.5
Delay (s)		163.9			46.5			273.2		22.2		18.9
Level of Service		F			D			F		C		B
Approach Delay (s)		163.9			46.5			273.2				19.9
Approach LOS		F			D			F				B
Intersection Summary												
HCM 2000 Control Delay			132.3									F
HCM 2000 Volume to Capacity ratio			1.45									
Actuated Cycle Length (s)			103.3							11.0		
Intersection Capacity Utilization			126.5%									H
Analysis Period (min)			15									

c Critical Lane Group


Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	137	528	14	4	688	264	73	30	11	184	12	69
Future Volume (vph)	137	528	14	4	688	264	73	30	11	184	12	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00						0.98					
Frt			0.850			0.850		0.987			0.872	
Flt Protected	0.950			0.950			0.969		0.950			
Satd. Flow (prot)	1599	3228	1488	1662	3137	1417	0	1674	0	1539	1363	0
Flt Permitted	0.161			0.431			0.969		0.950			
Satd. Flow (perm)	271	3228	1488	754	3137	1385	0	1674	0	1539	1363	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			95			293		4		77		
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		1070.0			261.8			326.3		294.0		
Travel Time (s)		77.0			18.8			23.5		21.2		
Confl. Peds. (#/hr)	1				1							
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
Heavy Vehicles (%)	4%	3%	0%	0%	6%	5%	0%	0%	0%	8%	0%	14%
Adj. Flow (vph)	152	587	16	4	764	293	81	33	12	204	13	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	587	16	4	764	293	0	126	0	204	90	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0		0.0		
Crosswalk Width(m)		4.8			4.8			4.8		4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	Split	NA
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	16.0	57.2	57.2	41.2	41.2	41.2	37.2	37.2		37.2	37.2	
Total Split (%)	12.2%	43.5%	43.5%	31.3%	31.3%	31.3%	28.3%	28.3%		28.3%	28.3%	
Maximum Green (s)	13.0	50.0	50.0	34.0	34.0	34.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	60.0	60.0	60.0	45.1	45.1	45.1		33.2		26.4	26.4	
Actuated g/C Ratio	0.46	0.46	0.46	0.34	0.34	0.34		0.25		0.20	0.20	
v/c Ratio	0.65	0.40	0.02	0.02	0.71	0.44		0.30		0.66	0.27	
Control Delay	37.1	25.7	0.1	33.8	43.4	6.2		40.8		58.4	13.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	37.1	25.7	0.1	33.8	43.4	6.2		40.8		58.4	13.4	
LOS	D	C	A	C	D	A		D		E	B	
Approach Delay		27.5			33.1			40.8			44.6	
Approach LOS		C			C			D			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	131.6											
Actuated Cycle Length:	131.6											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	125											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.71											
Intersection Signal Delay:	33.1						Intersection LOS: C					
Intersection Capacity Utilization:	60.6%						ICU Level of Service B					
Analysis Period (min):	15											
Splits and Phases:	5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway											


Queues Future Background
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	152	587	16	4	764	293	126	204	90
v/c Ratio	0.65	0.40	0.02	0.02	0.71	0.44	0.30	0.66	0.27
Control Delay	37.1	25.7	0.1	33.8	43.4	6.2	40.8	58.4	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	25.7	0.1	33.8	43.4	6.2	40.8	58.4	13.4
Queue Length 50th (m)	24.6	55.3	0.0	0.7	96.4	0.0	27.0	51.7	2.9
Queue Length 95th (m)	#44.1	77.9	0.0	3.8	#136.9	22.9	45.9	74.6	17.0
Internal Link Dist (m)	1046.0			237.8			302.3		
Turn Bay Length (m)	60.0	50.0		25.0	80.0				
Base Capacity (vph)	248	1471	730	258	1075	667	425	388	401
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	0.61	0.40	0.02	0.02	0.71	0.44	0.30	0.53	0.22

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

HCM Signalized Intersection Capacity Analysis Future Background
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↔	↕	↕	↔	↕	↕	↔	↕	↕
Traffic Volume (vph)	137	528	14	4	688	264	73	30	11	184	12	69
Future Volume (vph)	137	528	14	4	688	264	73	30	11	184	12	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	0.99	1.00	0.87	1.00	0.87	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.97	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1598	3228	1488	1662	3137	1385	1674	1539	1362	1674	1539	1362
Flt Permitted	0.16	1.00	1.00	0.43	1.00	1.00	0.97	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	272	3228	1488	753	3137	1385	1674	1539	1362	1674	1539	1362
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)	152	587	16	4	764	293	81	33	12	204	13	77
RTOR Reduction (vph)	0	0	9	0	0	193	0	3	0	0	62	0
Lane Group Flow (vph)	152	587	7	4	764	100	0	123	0	204	28	0
Confl. Peds. (#/hr)	1						1					
Heavy Vehicles (%)	4%	3%	0%	0%	6%	5%	0%	0%	0%	8%	0%	14%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	Split	NA
Protected Phases	7	4			8			2	2			6
Permitted Phases	4			4	8			8				
Actuated Green, G (s)	56.8	56.8	56.8	41.9	41.9	41.9	30.0		23.2	23.2		
Effective Green, g (s)	55.8	60.0	60.0	45.1	45.1	45.1	33.2		26.4	26.4		
Actuated g/C Ratio	0.42	0.46	0.46	0.34	0.34	0.34	0.25		0.20	0.20		
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2	7.2		7.2	7.2		
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0		4.0	4.0		
Lane Grp Cap (vph)	225	1471	678	258	1075	474	422		308	273		
v/s Ratio Prot	c0.06	0.18			c0.24			c0.07	c0.13	0.02		
v/s Ratio Perm	0.23	0.00		0.01	0.07							
v/c Ratio	0.68	0.40	0.01	0.02	0.71	0.21	0.29		0.66	0.10		
Uniform Delay, d1	27.3	23.8	19.6	28.6	37.6	30.7	39.7		48.5	42.9		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	6.7	0.8	0.0	0.1	4.0	1.0	1.7		5.8	0.2		
Delay (s)	34.0	24.6	19.6	28.7	41.6	31.7	41.5		54.3	43.2		
Level of Service	C	C	B	C	D	C	D		D	D		
Approach Delay (s)	26.4			38.8			41.5			50.9		
Approach LOS	C			D			D			D		

Intersection Summary
 HCM 2000 Control Delay 36.3 HCM 2000 Level of Service D
 HCM 2000 Volume to Capacity ratio 0.59
 Actuated Cycle Length (s) 131.6 Sum of lost time (s) 19.2
 Intersection Capacity Utilization 60.6% ICU Level of Service B
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Future Background
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	358	363	43	514	437	46
Future Volume (vph)	358	363	43	514	437	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						0.99
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3228	1390	1385	3228	2880	1316
Flt Permitted			0.445		0.950	
Satd. Flow (perm)	3228	1390	649	3228	2880	1300
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		399				51
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	7%	20%	3%	12%	13%
Adj. Flow (vph)	393	399	47	565	480	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	393	399	47	565	480	51
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Future Background
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	37.0	37.0	37.0	37.0	42.0	42.0
Total Split (%)	46.8%	46.8%	46.8%	46.8%	53.2%	53.2%
Maximum Green (s)	29.5	29.5	29.5	29.5	35.5	35.5
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	22.9	22.9	22.9	22.9	48.1	48.1
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.61	0.61
v/c Ratio	0.42	0.58	0.25	0.60	0.27	0.06
Control Delay	23.4	6.0	23.5	26.5	8.5	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	6.0	23.5	26.5	8.5	2.9
LOS	C	A	C	C	A	A
Approach Delay	14.6			26.3	7.9	
Approach LOS	B			C	A	
Intersection Summary						
Area Type:	Other					
Cycle Length: 79						
Actuated Cycle Length: 79						
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green						
Natural Cycle: 65						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.60						
Intersection Signal Delay: 16.5	Intersection LOS: B					
Intersection Capacity Utilization 55.7%	ICU Level of Service B					
Analysis Period (min) 15						
Splits and Phases: 6: Stanley Avenue & Marineland Parkway						

Queues
6: Stanley Avenue & Marineland Parkway

Future Background
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	393	399	47	565	480	51
v/c Ratio	0.42	0.58	0.25	0.60	0.27	0.06
Control Delay	23.4	6.0	23.5	26.5	8.5	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	6.0	23.5	26.5	8.5	2.9
Queue Length 50th (m)	26.3	0.0	5.7	40.2	16.2	0.0
Queue Length 95th (m)	34.8	18.0	13.3	50.7	29.2	4.7
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1348	812	271	1348	1751	810
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.49	0.17	0.42	0.27	0.06
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Future Background
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	358	363	43	514	437	46
Future Volume (vph)	358	363	43	514	437	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3228	1390	1385	3228	2880	1300
Flt Permitted	1.00	1.00	0.45	1.00	0.95	1.00
Satd. Flow (perm)	3228	1390	649	3228	2880	1300
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	393	399	47	565	480	51
RTOR Reduction (vph)	0	283	0	0	0	20
Lane Group Flow (vph)	393	116	47	565	480	31
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	3%	7%	20%	3%	12%	13%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	19.4	19.4	19.4	19.4	45.6	45.6
Effective Green, g (s)	22.9	22.9	22.9	22.9	48.1	48.1
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.61	0.61
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	935	402	188	935	1753	791
v/s Ratio Prot	0.12			c0.18	c0.17	
v/s Ratio Perm		0.08	0.07			0.02
v/c Ratio	0.42	0.29	0.25	0.60	0.27	0.04
Uniform Delay, d1	22.7	21.7	21.5	24.1	7.3	6.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.4	0.7	1.1	0.4	0.1
Delay (s)	23.0	22.1	22.1	25.2	7.6	6.3
Level of Service	C	C	C	C	A	A
Approach Delay (s)	22.5			25.0	7.5	
Approach LOS	C			C	A	
Intersection Summary						
HCM 2000 Control Delay			19.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			79.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			55.7%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

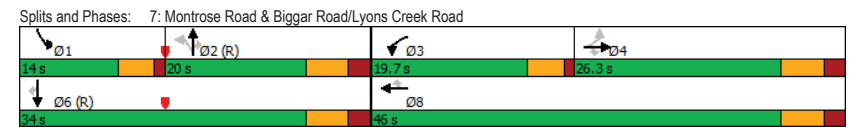
Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road
Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	↔	↔	↔↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	44	190	1	344	184	109	4	180	490	67	89	13
Future Volume (vph)	44	190	1	344	184	109	4	180	490	67	89	13
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5		7.5			7.5			7.5			7.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1614	3197	744	2959	3107	1377	1662	3137	1458	2757	2891	1365
Fit Permitted	0.626			0.950			0.691			0.950		
Satd. Flow (perm)	1064	3197	744	2959	3107	1377	1209	3137	1458	2757	2891	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168			118			533			106
Link Speed (k/h)		80			80			60				60
Link Distance (m)		507.4			421.7			216.1				150.6
Travel Time (s)		22.8			19.0			13.0				9.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	100%	9%	7%	8%	0%	6%	2%	17%	15%	9%
Adj. Flow (vph)	48	207	1	374	200	118	4	196	533	73	97	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	207	1	374	200	118	4	196	533	73	97	14
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					9.4				9.4			9.4
Detector 2 Size(m)					0.6				0.6			0.6
Detector 2 Type					CI+Ex				CI+Ex			CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0				0.0			0.0
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8			2		1		6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road
Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4		3	8	8	2	2	2	1	6
Detector Phase	4	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	19.7	46.0	46.0	20.0	20.0	20.0	14.0	34.0	34.0
Total Split (%)	32.9%	32.9%	32.9%	24.6%	57.5%	57.5%	25.0%	25.0%	25.0%	17.5%	42.5%	42.5%
Maximum Green (s)	20.0	20.0	20.0	15.2	39.7	39.7	13.7	13.7	13.7	9.5	27.7	27.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	13.5	15.8	13.5	14.0	34.2	31.9	25.5	27.8	25.5	7.5	37.8	35.5
Actuated g/C Ratio	0.17	0.20	0.17	0.18	0.43	0.40	0.32	0.35	0.32	0.09	0.47	0.44
v/c Ratio	0.27	0.33	0.00	0.72	0.15	0.19	0.01	0.18	0.64	0.28	0.07	0.02
Control Delay	32.1	28.5	0.0	39.7	13.5	3.5	24.0	21.6	7.0	36.0	13.1	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	0.0
Total Delay	32.1	28.5	0.0	39.7	13.5	3.5	24.0	21.6	7.0	36.0	13.1	0.1
LOS	C	C	A	D	B	A	C	C	C	A	D	B
Approach Delay		29.1			26.0			11.0				21.2
Approach LOS		C			C			B				C

Intersection Summary	
Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBL and 6:SBT, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	20.0
Intersection Capacity Utilization:	57.8%
ICU Level of Service:	B
Analysis Period (min):	15



Queues

7: Montrose Road & Biggar Road/Lyons Creek Road

Future Background

AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	48	207	1	374	200	118	4	196	533	73	97	14
v/c Ratio	0.27	0.33	0.00	0.72	0.15	0.19	0.01	0.18	0.64	0.28	0.07	0.02
Control Delay	32.1	28.5	0.0	39.7	13.5	3.5	24.0	21.6	7.0	36.0	13.1	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	0.0
Total Delay	32.1	28.5	0.0	39.7	13.5	3.5	24.0	21.6	7.0	36.0	13.1	0.1
Queue Length 50th (m)	6.8	15.1	0.0	28.8	9.6	0.0	0.5	12.0	0.0	5.7	4.3	0.0
Queue Length 95th (m)	15.9	23.4	0.0	43.2	14.6	8.5	3.0	22.5	29.9	11.7	9.4	0.0
Internal Link Dist (m)	483.4			397.7				192.1		126.6		
Turn Bay Length (m)	130.0	120.0		150.0	225.0			80.0	60.0	80.0	50.0	
Base Capacity (vph)	266	891	312	562	1631	742	384	1088	827	327	1364	664
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	0.18	0.23	0.00	0.67	0.12	0.16	0.01	0.18	0.64	0.22	0.07	0.02

Intersection Summary

Intersection Summary												
HCM 2000 Control Delay	24.7		HCM 2000 Level of Service						C			
HCM 2000 Volume to Capacity ratio	0.42											
Actuated Cycle Length (s)	80.0						Sum of lost time (s)			17.0		
Intersection Capacity Utilization	57.8%						ICU Level of Service			B		
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: Montrose Road & Biggar Road/Lyons Creek Road

Future Background

AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖↖	↖↖	↖	↖	↖↖	↖	↖↖	↖↖	↖
Traffic Volume (vph)	44	190	1	344	184	109	4	180	490	67	89	13
Future Volume (vph)	44	190	1	344	184	109	4	180	490	67	89	13
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit 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)	1614	3197	744	2959	3107	1377	1662	3137	1458	2757	2891	1365
Fit Permitted	0.63	1.00	1.00	0.95	1.00	1.00	0.69	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1064	3197	744	2959	3107	1377	1209	3137	1458	2757	2891	1365
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	207	1	374	200	118	4	196	533	73	97	14
RTOR Reduction (vph)	0	0	1	0	0	71	0	0	370	0	0	8
Lane Group Flow (vph)	48	207	0	374	200	47	4	196	163	73	97	6
Heavy Vehicles (%)	3%	4%	100%	9%	7%	8%	0%	6%	2%	17%	15%	9%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	4		3		8		2		1		6	
Permitted Phases	4		4		8		2		2		6	
Actuated Green, G (s)	13.5	13.5	13.5	14.0	32.0	32.0	24.5	24.5	24.5	6.4	35.4	35.4
Effective Green, g (s)	13.5	15.8	13.5	14.0	34.3	32.0	24.5	26.8	24.5	6.4	37.7	35.4
Actuated g/C Ratio	0.17	0.20	0.17	0.18	0.43	0.40	0.31	0.34	0.31	0.08	0.47	0.44
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	179	631	125	517	1332	550	370	1050	446	220	1362	604
v/s Ratio Prot	c0.06		c0.13		0.06		0.06		c0.03		0.03	
v/s Ratio Perm	0.05		0.00		0.03		0.00		c0.11		0.00	
v/c Ratio	0.27	0.33	0.00	0.72	0.15	0.09	0.01	0.19	0.37	0.33	0.07	0.01
Uniform Delay, d1	28.9	27.5	27.6	31.2	14.0	14.9	19.3	18.9	21.7	34.8	11.6	12.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.9	0.0	5.0	0.1	0.2	0.1	0.4	2.3	0.9	0.1	0.0
Delay (s)	31.2	28.4	27.7	36.1	14.1	15.1	19.4	19.3	24.0	35.7	11.7	12.5
Level of Service	C	C	C	D	B	B	B	B	C	D	B	B
Approach Delay (s)	28.9			26.2				22.7		21.3		
Approach LOS	C			C				C		C		

Intersection Summary												
HCM 2000 Control Delay	24.7		HCM 2000 Level of Service						C			
HCM 2000 Volume to Capacity ratio	0.42											
Actuated Cycle Length (s)	80.0						Sum of lost time (s)			17.0		
Intersection Capacity Utilization	57.8%						ICU Level of Service			B		
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Background
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	55	23	0	1	3	4	3	357	8	0	115	27
Future Volume (vph)	55	23	0	1	3	4	3	357	8	0	115	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.997			0.974	
Flt Protected		0.966			0.995							
Satd. Flow (prot)	0	1621	0	0	1443	0	0	1597	0	0	1557	0
Flt Permitted		0.966			0.995							
Satd. Flow (perm)	0	1621	0	0	1443	0	0	1597	0	0	1557	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	8		16	16		8	17		8	8		17
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	4%	5%	0%	0%	0%	25%	100%	8%	29%	0%	6%	24%
Adj. Flow (vph)	72	30	0	1	4	5	4	470	11	0	151	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	102	0	0	10	0	0	485	0	0	187	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	42.3%											
Analysis Period (min)	15											
	ICU Level of Service A											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Future Background
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	55	23	0	1	3	4	3	357	8	0	115	27
Future Volume (vph)	55	23	0	1	3	4	3	357	8	0	115	27
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	72	30	0	1	4	5	4	470	11	0	151	36
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	102	10	485	187								
Volume Left (vph)	72	1	4	0								
Volume Right (vph)	0	5	11	36								
Hadj (s)	0.21	-0.07	0.15	0.05								
Departure Headway (s)	5.7	5.6	4.6	4.8								
Degree Utilization, x	0.16	0.02	0.62	0.25								
Capacity (veh/h)	565	547	766	709								
Control Delay (s)	9.8	8.7	14.9	9.5								
Approach Delay (s)	9.8	8.7	14.9	9.5								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay	12.8											
Level of Service	B											
Intersection Capacity Utilization	42.3%											
Analysis Period (min)	15											
	ICU Level of Service A											

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Background
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	T	T	T
Traffic Volume (vph)	16	78	251	39	29	100
Future Volume (vph)	16	78	251	39	29	100
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.887			0.850		
Fit Protected	0.992				0.950	
Satd. Flow (prot)	1369	0	1750	1488	1397	1750
Fit Permitted	0.992				0.950	
Satd. Flow (perm)	1369	0	1750	1488	1397	1750
Link Speed (k/h)	50		60		60	
Link Distance (m)	1040.1		438.6		461.8	
Travel Time (s)	74.9		26.3		27.7	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	25%	10%	0%	0%	19%	0%
Adj. Flow (vph)	18	90	289	45	33	115
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	289	45	33	115
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	33.9%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Future Background
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	T	T	T
Sign Control	Stop		Stop		Stop	Stop
Traffic Volume (vph)	16	78	251	39	29	100
Future Volume (vph)	16	78	251	39	29	100
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	18	90	289	45	33	115
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total (vph)	108	289	45	33	115	
Volume Left (vph)	18	0	0	33	0	
Volume Right (vph)	90	0	45	0	0	
Hadj (s)	-0.25	0.00	-0.70	0.82	0.00	
Departure Headway (s)	4.7	4.9	4.2	5.9	5.1	
Degree Utilization, x	0.14	0.39	0.05	0.05	0.16	
Capacity (veh/h)	695	716	827	588	686	
Control Delay (s)	8.5	9.9	6.2	8.0	7.8	
Approach Delay (s)	8.5	9.4		7.9		
Approach LOS	A	A		A		
Intersection Summary						
Delay			8.9			
Level of Service			A			
Intersection Capacity Utilization	33.9%		ICU Level of Service		A	
Analysis Period (min)	15					

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Background
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔		↔				↔			↔		
Traffic Volume (vph)	4	18	199	8	5	15	79	556	9	13	291	6	
Future Volume (vph)	4	18	199	8	5	15	79	556	9	13	291	6	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt		0.879			0.927			0.998			0.997		
Flt Protected		0.999			0.986			0.994			0.998		
Satd. Flow (prot)	0	1315	0	0	1526	0	0	1612	0	0	1259	0	
Flt Permitted		0.999			0.986			0.994			0.998		
Satd. Flow (perm)	0	1315	0	0	1526	0	0	1612	0	0	1259	0	
Link Speed (k/h)		60			60			70			60		
Link Distance (m)		372.3			519.4			156.9			312.6		
Travel Time (s)		22.3			31.2			8.1			18.8		
Confl. Peds. (#/hr)	6					6							
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	
Heavy Vehicles (%)	33%	0%	18%	17%	0%	0%	18%	6%	20%	9%	40%	20%	
Adj. Flow (vph)	6	25	276	11	7	21	110	772	13	18	404	8	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	307	0	0	39	0	0	895	0	0	430	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)		0.0			0.0			0.0			0.0		
Link Offset(m)		0.0			0.0			0.0			0.0		
Crosswalk Width(m)		4.8			4.8			4.8			4.8		
Two way Left Turn Lane													
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	
Turning Speed (k/h)	25	15	15	25	25	15	25	15	25	15	25	15	
Sign Control		Stop			Stop			Free			Free		
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	79.7%					ICU Level of Service D							
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Future Background
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔		↔				↔			↔		
Traffic Volume (veh/h)	4	18	199	8	5	15	79	556	9	13	291	6	
Future Volume (Veh/h)	4	18	199	8	5	15	79	556	9	13	291	6	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	
Hourly flow rate (vph)	6	25	276	11	7	21	110	772	12	18	404	8	
Pedestrians												6	
Lane Width (m)												3.6	
Walking Speed (m/s)												1.2	
Percent Blockage												1	
Right turn flare (veh)													
Median type								None				None	
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	1472	1448	408	1730	1446	784	412				784		
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1472	1448	408	1730	1446	784	412				784		
tC, single (s)	7.4	6.5	6.4	7.3	6.5	6.2	4.3				4.2		
tC, 2 stage (s)													
tF (s)	3.8	4.0	3.5	3.7	4.0	3.3	2.4				2.3		
p0 queue free %	92	78	55	58	94	95	90				98		
cM capacity (veh/h)	73	116	610	26	117	394	1066				804		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	307	39	894	430									
Volume Left	6	11	110	18									
Volume Right	276	21	12	8									
eSH	409	74	1066	804									
Volume to Capacity	0.75	0.53	0.10	0.02									
Queue Length 95th (m)	48.8	17.9	2.8	0.5									
Control Delay (s)	35.8	99.5	2.6	0.7									
Lane LOS	E	F	A	A									
Approach Delay (s)	35.8	99.5	2.6	0.7									
Approach LOS	E	F											
Intersection Summary													
Average Delay				10.5									
Intersection Capacity Utilization	79.7%					ICU Level of Service D							
Analysis Period (min)	15												

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Background
AM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↔	↕
Traffic Volume (vph)	345	201	393	100	63	400
Future Volume (vph)	345	201	393	100	63	400
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.973			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1554	1683	1666	0	1250	1094
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1554	1683	1666	0	1250	1094
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	7%	4%	1%	7%	33%	36%
Adj. Flow (vph)	406	236	462	118	74	471
Shared Lane Traffic (%)						
Lane Group Flow (vph)	406	236	580	0	74	471
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		25		15	25	15
Sign Control		Stop	Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	63.6%		ICU Level of Service B			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Future Background
AM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↔	↕
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	345	201	393	100	63	400
Future Volume (vph)	345	201	393	100	63	400
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	406	236	462	118	74	471
Direction, Lane #						
	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	406	236	580	74	471	
Volume Left (vph)	406	0	0	74	0	
Volume Right (vph)	0	0	118	0	471	
Hadj (s)	0.62	0.07	-0.08	1.06	-0.09	
Departure Headway (s)	8.2	7.6	7.3	8.7	7.5	
Degree Utilization, x	0.92	0.50	1.18	0.18	0.98	
Capacity (veh/h)	435	465	495	409	471	
Control Delay (s)	53.7	16.9	125.9	12.3	63.3	
Approach Delay (s)	40.2		125.9		56.4	
Approach LOS	E		F		F	
Intersection Summary						
Delay	73.3					
Level of Service	F					
Intersection Capacity Utilization	63.6%		ICU Level of Service B			
Analysis Period (min)	15					

Queuing and Blocking Report

Future Background
AM Peak Hour

Intersection: 1: Montrose Road & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	R	L	T	T	R
Maximum Queue (m)	62.3	101.8	105.8	77.4	38.0	93.5	97.8	50.4	16.6	18.6	16.4	20.1
Average Queue (m)	26.1	56.3	58.3	46.5	14.6	52.3	57.1	16.7	4.0	6.0	3.8	2.6
95th Queue (m)	56.2	85.4	85.6	74.3	31.0	87.5	90.1	35.0	11.6	14.1	11.8	12.8
Link Distance (m)	740.7		740.7		665.6		665.6		665.6		699.7	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	55.0			70.0			155.0			115.0		
Storage Blk Time (%)	0		7		3		0					
Queuing Penalty (veh)	1	8		9		1						

Intersection: 1: Montrose Road & McLeod Road

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	60.0	36.7	36.8
Average Queue (m)	29.7	9.9	12.5
95th Queue (m)	52.8	24.8	27.4
Link Distance (m)	194.3		194.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	130.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Oakwood Drive & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	L	TR
Maximum Queue (m)	57.2	107.0	104.1	215.5	87.4	137.1	137.4	51.4	60.1	40.2	12.4	21.8
Average Queue (m)	14.1	49.7	48.8	34.3	42.3	82.3	87.9	19.9	33.3	16.1	2.4	5.6
95th Queue (m)	40.7	92.0	87.8	164.5	83.8	128.9	129.5	44.5	53.3	32.6	8.9	16.0
Link Distance (m)	665.6		665.6		665.6		592.5		592.5		342.6	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	50.0				80.0				95.0		20.0	
Storage Blk Time (%)	6			0			8			0		
Queuing Penalty (veh)	3		0		14		0		0		1	

Queuing and Blocking Report

Future Background
AM Peak Hour

Intersection: 3: Dorchester Road & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR	
Maximum Queue (m)	62.5	459.1	465.3	57.3	211.5	209.5	22.4	328.3	37.4	263.2	
Average Queue (m)	56.0	156.3	150.2	23.9	111.2	116.6	21.8	246.8	33.5	155.5	
95th Queue (m)	75.8	398.3	394.3	59.1	207.2	211.5	26.5	346.6	46.1	296.6	
Link Distance (m)	592.5		592.5		1024.4		1024.4		325.7		
Upstream Blk Time (%)	1	1					6		11		
Queuing Penalty (veh)	4		4				24		0		
Storage Bay Dist (m)	55.0			50.0			15.0			30.0	
Storage Blk Time (%)	23		29		0		38		52		
Queuing Penalty (veh)	74	77	0		27		154		166		

Intersection: 4: Drummond Road & McLeod Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LTR	L	TR
Maximum Queue (m)	1030.1	1031.4	267.8	273.0	428.8	27.3	98.6
Average Queue (m)	624.2	623.3	126.4	130.4	368.7	21.3	40.8
95th Queue (m)	1168.3	1172.2	261.7	264.5	506.3	32.1	76.3
Link Distance (m)	1024.4	1024.4	1047.7	1047.7	811.3	193.4	
Upstream Blk Time (%)	9		11				
Queuing Penalty (veh)	43		52				
Storage Bay Dist (m)						20.0	
Storage Blk Time (%)						10	
Queuing Penalty (veh)						29	

Intersection: 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB	
Directions Served	L	T	T	R	L	T	T	R	LTR	L	TR	
Maximum Queue (m)	47.2	52.5	74.9	28.5	22.2	108.7	115.6	87.4	43.6	88.3	39.6	
Average Queue (m)	18.0	20.5	37.8	1.8	1.1	58.8	60.9	10.2	17.3	44.3	13.8	
95th Queue (m)	36.1	42.2	69.0	13.5	8.8	89.7	93.4	55.7	35.5	74.1	28.1	
Link Distance (m)	1047.7		1047.7		239.8		239.8		307.6		277.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0				50.0		25.0		80.0			
Storage Blk Time (%)	0		5		0		33		2		0	
Queuing Penalty (veh)	0	1	0		1		5		0			

Queuing and Blocking Report

Future Background
AM Peak Hour

Intersection: 6: Stanley Avenue & Marineland Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	L	T	T	L	L	R
Maximum Queue (m)	60.0	57.0	40.4	35.3	62.6	62.0	38.1	51.3	22.0
Average Queue (m)	24.9	25.1	4.2	10.2	37.9	33.9	15.3	25.0	5.0
95th Queue (m)	46.5	45.2	21.9	24.9	56.6	54.8	33.2	42.8	15.5
Link Distance (m)	239.8	239.8			155.4	155.4		485.6	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)			65.0	105.0			160.0		80.0
Storage Blk Time (%)		0	0						
Queuing Penalty (veh)		0	0						

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L
Maximum Queue (m)	24.1	36.1	28.7	2.3	57.9	69.3	32.0	27.3	16.6	6.6
Average Queue (m)	8.0	20.0	7.3	0.1	26.0	42.8	10.1	8.2	5.7	0.8
95th Queue (m)	18.1	32.1	19.2	1.6	53.5	62.4	23.1	21.1	12.4	4.0
Link Distance (m)		488.7	488.7				403.0	403.0		196.3
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	130.0			120.0	150.0	150.0			225.0	80.0
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	T
Maximum Queue (m)	62.9	9.4	34.5	23.1	13.5
Average Queue (m)	29.1	0.4	13.1	7.2	1.5
95th Queue (m)	52.5	5.0	28.6	17.6	7.5
Link Distance (m)				130.6	130.6
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	60.0	80.0	80.0		50.0
Storage Blk Time (%)	1				
Queuing Penalty (veh)	0				

Queuing and Blocking Report

Future Background
AM Peak Hour

Intersection: 8: Dorchester Road & Jill Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	22.8	11.9	73.6	24.7
Average Queue (m)	10.2	1.9	27.3	12.5
95th Queue (m)	18.8	8.1	61.9	20.0
Link Distance (m)	110.7	156.1	446.2	325.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Dorchester Road & Oldfield Road

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	R	L	T
Maximum Queue (m)	22.2	28.6	19.9	21.2	10.6
Average Queue (m)	9.8	15.8	8.4	6.6	8.9
95th Queue (m)	18.6	23.2	18.3	16.3	11.5
Link Distance (m)	1018.8	424.6			446.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			15.0	15.0	
Storage Blk Time (%)		4	0	0	0
Queuing Penalty (veh)		1	0	0	0

Intersection: 10: Stanley Avenue & Chippawa Parkway

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	58.7	20.4	52.5	24.3
Average Queue (m)	23.0	6.5	10.6	1.9
95th Queue (m)	41.3	16.0	32.4	11.7
Link Distance (m)	355.4	511.0	139.9	295.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Future Background
AM Peak Hour

Intersection: 11: Lyons Creek Road & Stanley Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (m)	57.9	83.6	312.5	32.4	173.4
Average Queue (m)	33.8	23.9	161.3	17.4	62.7
95th Queue (m)	57.5	65.1	346.7	39.0	136.3
Link Distance (m)		442.7	589.0		785.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	55.0			25.0	
Storage Blk Time (%)	6	0		0	41
Queuing Penalty (veh)	12	0		1	26

Zone Summary

Zone wide Queuing Penalty: 946

Lanes, Volumes, Timings

1: Montrose Road & McLeod Road

Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	1209	52	170	1116	297	56	134	392	377	192	132
Future Volume (vph)	132	1209	52	170	1116	297	56	134	392	377	192	132
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0		0.0	115.0		0.0	130.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		1.00		1.00		0.99	0.99		0.99	1.00	0.99	
Frt		0.994				0.850			0.850		0.939	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1599	4648	0	1599	3292	1430	1630	3167	1444	1630	2995	0
Fit Permitted	0.084			0.088			0.547			0.578		
Satd. Flow (perm)	141	4648	0	148	3292	1410	931	3167	1425	991	2995	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				260			248			139
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		759.2			692.3			721.0			213.3	
Travel Time (s)		54.7			49.8			51.9			15.4	
Confl. Peds. (#/hr)	2		1	1		2	13		1	1		13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	2%	5%	4%	1%	4%	2%	5%	3%	2%	4%	2%
Adj. Flow (vph)	139	1273	55	179	1175	313	59	141	413	397	202	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	139	1328	0	179	1175	313	59	141	413	397	341	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

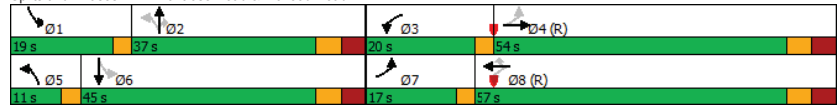
Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0	8.0	6.0	8.0	
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0	46.0	9.5	46.0	
Total Split (s)	17.0	54.0		20.0	57.0	57.0	11.0	37.0	37.0	19.0	45.0	
Total Split (%)	13.1%	41.5%		15.4%	43.8%	43.8%	8.5%	28.5%	28.5%	14.6%	34.6%	
Maximum Green (s)	14.0	46.0		17.0	49.0	49.0	8.0	29.0	29.0	16.0	37.0	
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0	-4.0	1.0	-4.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		12.0			12.0	12.0		14.0	14.0		14.0	
Flash Dont Walk (s)		20.0			20.0	20.0		24.0	24.0		24.0	
Pedestrian Calls (#/hr)		0			0	0		0	0		0	
Act Effct Green (s)	63.2	53.1		68.8	55.8	55.8	39.3	33.0	33.0	52.0	43.5	
Actuated g/C Ratio	0.49	0.41		0.53	0.43	0.43	0.30	0.25	0.25	0.40	0.33	
v/c Ratio	0.76	0.70		0.81	0.83	0.42	0.19	0.18	0.76	0.84	0.31	
Control Delay	52.1	34.6		49.3	37.0	6.0	26.5	38.6	27.3	50.5	20.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	52.1	34.6		49.3	37.0	6.0	26.5	38.6	27.3	50.5	20.0	
LOS	D	C		D	D	A	C	D	C	D	C	
Approach Delay		36.3			32.5			29.8			36.4	
Approach LOS		D			C			C			D	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 34.0
 Intersection LOS: C
 Intersection Capacity Utilization 109.1%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 1: Montrose Road & McLeod Road



Queues
1: Montrose Road & McLeod Road

Future Background
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	139	1328	179	1175	313	59	141	413	397	341
v/c Ratio	0.76	0.70	0.81	0.83	0.42	0.18	0.76	0.84	0.31	0.31
Control Delay	52.1	34.6	49.3	37.0	6.0	26.5	38.6	27.3	50.5	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	34.6	49.3	37.0	6.0	26.5	38.6	27.3	50.5	20.0
Queue Length 50th (m)	20.4	108.3	24.5	160.7	12.5	9.8	15.6	42.4	84.0	21.0
Queue Length 95th (m)	#44.8	130.1	m44.7	195.6	m17.7	19.5	25.2	85.6	#135.7	34.5
Internal Link Dist (m)		735.2		668.3		697.0			189.3	
Turn Bay Length (m)	55.0		155.0		115.0			130.0		
Base Capacity (vph)	217	1900	258	1414	753	324	803	546	470	1093
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.70	0.69	0.83	0.42	0.18	0.18	0.76	0.84	0.31

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Future Background
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	132	1209	52	170	1116	297	56	134	392	377	192	132	
Future Volume (vph)	132	1209	52	170	1116	297	56	134	392	377	192	132	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1599	4647		1599	3292	1410	1623	3167	1425	1629	2994		
Flt Permitted	0.08	1.00		0.09	1.00	1.00	0.55	1.00	1.00	0.58	1.00		
Satd. Flow (perm)	142	4647		149	3292	1410	934	3167	1425	992	2994		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	139	1273	55	179	1175	313	59	141	413	397	202	139	
RTOR Reduction (vph)	0	4	0	0	0	150	0	0	184	0	92	0	
Lane Group Flow (vph)	139	1324	0	179	1175	163	59	141	229	397	249	0	
Confl. Peds. (#/hr)	2		1	1		2	13		1	1		13	
Heavy Vehicles (%)	4%	2%	5%	4%	1%	4%	2%	5%	3%	2%	4%	2%	
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA			
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4			8		2		2		6			
Actuated Green, G (s)	59.7	48.5		65.1	51.2	51.2	35.7	29.6	29.6	48.6	39.5		
Effective Green, g (s)	57.7	52.5		63.1	55.2	55.2	33.7	33.6	33.6	47.6	43.5		
Actuated g/C Ratio	0.44	0.40		0.49	0.42	0.42	0.26	0.26	0.26	0.37	0.33		
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	3.0	8.0	8.0		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		
Lane Grp Cap (vph)	177	1876		216	1397	598	269	818	368	436	1001		
v/s Ratio Prot	0.06	0.29		c0.08	c0.36		0.01	0.04		c0.10	0.08		
v/s Ratio Perm	0.29			0.32		0.12	0.05		0.16	c0.23			
v/c Ratio	0.79	0.71		0.83	0.84	0.27	0.22	0.17	0.62	0.91	0.25		
Uniform Delay, d1	27.9	32.3		30.4	33.5	24.3	37.0	37.4	42.6	37.4	31.4		
Progression Factor	1.00	1.00		1.18	0.98	0.90	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	19.4	2.3		15.4	4.2	0.7	0.3	0.5	7.7	22.9	0.6		
Delay (s)	47.3	34.6		51.3	37.0	22.7	37.3	37.9	50.3	60.4	32.0		
Level of Service	D	C		D	C	D	D	D	D	E	C		
Approach Delay (s)		35.8			35.8			46.2			47.3		
Approach LOS		D			D			D			D		
Intersection Summary													
HCM 2000 Control Delay		39.1		HCM 2000 Level of Service					D				
HCM 2000 Volume to Capacity ratio		0.87											
Actuated Cycle Length (s)		130.0		Sum of lost time (s)					16.0				
Intersection Capacity Utilization		109.1%		ICU Level of Service					H				
Analysis Period (min)		15											
c Critical Lane Group													

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	43	1419	418	252	1365	20	407	5	369	28	15	97
Future Volume (vph)	43	1419	418	252	1365	20	407	5	369	28	15	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0	0.0	80.0		0.0	95.0		0.0	20.0		0.0	
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor			0.96		1.00		1.00	1.00				0.99
Frt			0.850		0.998				0.850			0.870
Flt Protected	0.950			0.950			0.950	0.953		0.950		
Satd. Flow (prot)	1583	3292	1444	1614	3250	0	1533	1530	1458	1662	1484	0
Flt Permitted	0.121			0.066			0.950	0.953		0.950		
Satd. Flow (perm)	202	3292	1389	112	3250	0	1526	1524	1458	1662	1484	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			296		1				336		99	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		692.3			616.3			360.6			181.9	
Travel Time (s)		49.8			44.4			26.0			13.1	
Confl. Peds. (#/hr)	9		9	9		9	6					6
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Adj. Flow (vph)	44	1448	427	257	1393	20	415	5	377	29	15	99
Shared Lane Traffic (%)	49%											
Lane Group Flow (vph)	44	1448	427	257	1413	0	212	208	377	29	114	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

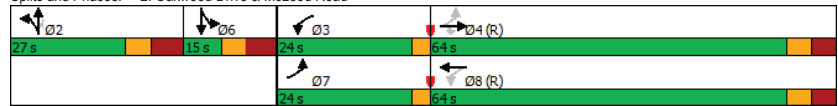
Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	24.0	64.0	64.0	24.0	64.0		27.0	27.0	27.0	15.0	15.0	
Total Split (%)	18.5%	49.2%	49.2%	18.5%	49.2%		20.8%	20.8%	20.8%	11.5%	11.5%	
Maximum Green (s)	21.0	56.0	56.0	21.0	56.0		18.0	18.0	18.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	67.5	61.9	56.9	84.0	76.2		23.0	23.0	23.0	11.0	11.0	
Actuated g/C Ratio	0.52	0.48	0.44	0.65	0.59		0.18	0.18	0.18	0.08	0.08	
v/c Ratio	0.27	0.92	0.55	0.91	0.74		0.78	0.77	0.71	0.21	0.53	
Control Delay	15.7	36.4	8.4	71.4	23.3		71.6	70.6	15.8	59.4	23.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	15.7	36.4	8.4	71.4	23.3		71.6	70.6	15.8	59.4	23.6	
LOS	B	D	A	E	C		E	E	B	E	C	
Approach Delay		29.7			30.7			44.9			30.9	
Approach LOS		C			C			D			C	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 155
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 32.8
 Intersection LOS: C
 Intersection Capacity Utilization 114.1%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 2: Oakwood Drive & McLeod Road



Queues
2: Oakwood Drive & McLeod Road

Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	44	1448	427	257	1413	212	208	377	29	114
v/c Ratio	0.27	0.92	0.55	0.91	0.74	0.78	0.77	0.71	0.21	0.53
Control Delay	15.7	36.4	8.4	71.4	23.3	71.6	70.6	15.8	59.4	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	36.4	8.4	71.4	23.3	71.6	70.6	15.8	59.4	23.6
Queue Length 50th (m)	3.0	198.4	52.0	51.7	144.1	58.1	56.9	9.5	7.4	3.8
Queue Length 95th (m)	m3.7	#248.8	m57.8	#99.0	178.7	#99.2	#97.0	45.8	17.8	23.2
Internal Link Dist (m)		668.3			592.3		336.6			157.9
Turn Bay Length (m)	50.0			80.0		95.0		20.0		
Base Capacity (vph)	338	1568	774	303	1906	271	270	534	140	216
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.92	0.55	0.85	0.74	0.78	0.77	0.71	0.21	0.53

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Future Background
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	43	1419	418	252	1365	20	407	5	369	28	15	97
Future Volume (vph)	43	1419	418	252	1365	20	407	5	369	28	15	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.87	
Fit Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3292	1389	1614	3249		1533	1531	1458	1662	1484	
Fit Permitted	0.12	1.00	1.00	0.07	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	201	3292	1389	112	3249		1533	1531	1458	1662	1484	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	44	1448	427	257	1393	20	415	5	377	29	15	99
RTOR Reduction (vph)	0	0	166	0	0	0	0	0	277	0	91	0
Lane Group Flow (vph)	44	1448	261	257	1413	0	212	208	100	29	23	0
Confl. Peds. (#/hr)	9		9	9		9	6					6
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	63.3	57.9	57.9	80.0	71.6		18.0	18.0	18.0	6.0	6.0	
Effective Green, g (s)	61.3	61.9	56.9	79.0	75.6		23.0	23.0	23.0	11.0	11.0	
Actuated g/C Ratio	0.47	0.48	0.44	0.61	0.58		0.18	0.18	0.18	0.08	0.08	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	141	1567	607	277	1889		271	270	257	140	125	
v/s Ratio Prot	0.01	c0.44		c0.13	0.43		c0.14	0.14		c0.02	0.02	
v/s Ratio Perm	0.14		0.19	0.44				0.07				
v/c Ratio	0.31	0.92	0.43	0.93	0.75		0.78	0.77	0.39	0.21	0.19	
Uniform Delay, d1	20.6	31.9	25.3	42.0	20.1		51.1	51.0	47.3	55.4	55.3	
Progression Factor	1.27	0.88	0.79	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	7.5	1.5	35.0	2.8		19.8	18.9	4.4	3.3	3.3	
Delay (s)	26.7	35.6	21.5	77.0	22.9		71.0	69.9	51.7	58.8	58.6	
Level of Service	C	D	C	E	C		E	E	D	E	E	
Approach Delay (s)		32.2			31.2			61.6			58.7	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay		37.9					HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		130.0					Sum of lost time (s)				16.0	
Intersection Capacity Utilization		114.1%					ICU Level of Service				H	
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	327	1096	236	96	906	155	348	164	65	294	168	341
Future Volume (vph)	327	1096	236	96	906	155	348	164	65	294	168	341
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0		0.0	15.0		0.0	30.0		0.0	
Storage Lanes	1	0	1		0	1		0	1		0	
Taper Length (m)	7.5		7.5		7.5			7.5			7.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			0.99		0.99		0.99		0.99	0.98	
Frt	0.973			0.978		0.978		0.957		0.957	0.899	
Fit Protected	0.950			0.950		0.950		0.950		0.950		
Satd. Flow (prot)	1630	3157	0	1630	3197	0	1614	1658	0	1662	1505	0
Fit Permitted	0.103			0.114		0.125		0.474		0.474		
Satd. Flow (perm)	177	3157	0	196	3197	0	212	1658	0	817	1505	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		25			17			17			84	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		616.3			1045.5			348.9			308.0	
Travel Time (s)		44.4			75.3			25.1			22.2	
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Adj. Flow (vph)	337	1130	243	99	934	160	359	169	67	303	173	352
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	1373	0	99	1094	0	359	236	0	303	525	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

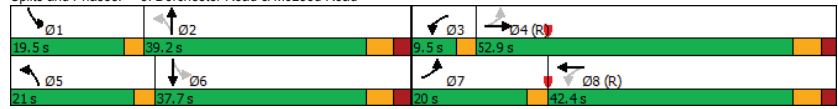
Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.4		9.5	30.4		9.5	37.7		9.5	37.7	
Total Split (s)	20.0	52.9		9.5	42.4		21.0	39.2		19.5	37.7	
Total Split (%)	16.5%	43.7%		7.8%	35.0%		17.3%	32.4%		16.1%	31.1%	
Maximum Green (s)	17.0	46.5		6.5	36.0		18.0	32.5		16.5	31.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.3		0.0	2.3		0.0	2.6		0.0	2.6	
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		9.0			9.0			12.0			12.0	
Flash Dont Walk (s)		15.0			15.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	58.4	48.9		43.9	38.4		52.7	35.8		48.6	33.7	
Actuated g/C Ratio	0.48	0.40		0.36	0.32		0.44	0.30		0.40	0.28	
v/c Ratio	1.22	1.07		0.73	1.07		1.24	0.47		0.70	1.10	
Control Delay	156.2	79.1		51.2	87.2		165.4	36.2		33.3	104.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	156.2	79.1		51.2	87.2		165.4	36.2		33.3	104.8	
LOS	F	E		D	F		F	D		C	F	
Approach Delay		94.3			84.2			114.1			78.6	
Approach LOS		F			F			F			E	

Intersection Summary

Area Type: Other
 Cycle Length: 121.1
 Actuated Cycle Length: 121.1
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.24
 Intersection Signal Delay: 91.3
 Intersection LOS: F
 Intersection Capacity Utilization 120.4%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 3: Dorchester Road & McLeod Road



Queues
3: Dorchester Road & McLeod Road

Future Background
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	337	1373	99	1094	359	236	303	525
v/c Ratio	1.22	1.07	0.73	1.07	1.24	0.47	0.70	1.10
Control Delay	156.2	79.1	51.2	87.2	165.4	36.2	33.3	104.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	156.2	79.1	51.2	87.2	165.4	36.2	33.3	104.8
Queue Length 50th (m)	-87.1	-197.7	13.3	-158.0	-95.9	45.1	49.8	-132.6
Queue Length 95th (m)	#148.0	#242.9	#35.4	#202.0	#157.9	71.1	73.8	#203.1
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	277	1289	136	1025	289	501	440	479
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	1.22	1.07	0.73	1.07	1.24	0.47	0.69	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.

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Future Background
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔	
Traffic Volume (vph)	327	1096	236	96	906	155	348	164	65	294	168	341	
Future Volume (vph)	327	1096	236	96	906	155	348	164	65	294	168	341	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.98		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00		
Frt	1.00	0.97		1.00	0.98		1.00	0.96		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)	1630	3158		1630	3198		1614	1659		1651	1506		
Flt Permitted	0.10	1.00		0.11	1.00		0.12	1.00		0.47	1.00		
Satd. Flow (perm)	176	3158		196	3198		212	1659		823	1506		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	337	1130	243	99	934	160	359	169	67	303	173	352	
RTOR Reduction (vph)	0	15	0	0	12	0	0	12	0	0	61	0	
Lane Group Flow (vph)	337	1358	0	99	1082	0	359	224	0	303	464	0	
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21	
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA		
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4			8			2			6			
Actuated Green, G (s)	56.0	46.5		42.5	36.0		51.1	33.1		46.9	31.0		
Effective Green, g (s)	55.0	48.9		40.5	38.4		49.1	35.8		44.9	33.7		
Actuated g/C Ratio	0.45	0.40		0.33	0.32		0.41	0.30		0.37	0.28		
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	272	1275		130	1014		282	490		407	419		
v/s Ratio Prot	c0.16	0.43		0.03	0.34		c0.18	0.14		0.09	0.31		
v/s Ratio Perm	c0.40			0.22			c0.34			0.18			
v/c Ratio	1.24	1.07		0.76	1.07		1.27	0.46		0.74	1.11		
Uniform Delay, d1	36.7	36.1		32.8	41.3		35.6	34.7		30.5	43.7		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	134.9	44.5		22.8	48.1		147.6	0.7		7.2	76.7		
Delay (s)	171.6	80.6		55.5	89.4		183.3	35.4		37.7	120.4		
Level of Service	F	F		E	F		F	D		D	F		
Approach Delay (s)		98.6			86.6			124.6			90.1		
Approach LOS		F			F			F			F		
Intersection Summary													
HCM 2000 Control Delay		97.2			HCM 2000 Level of Service					F			
HCM 2000 Volume to Capacity ratio		1.23											
Actuated Cycle Length (s)		121.1			Sum of lost time (s)					16.0			
Intersection Capacity Utilization		120.4%			ICU Level of Service					H			
Analysis Period (min)		15											
c Critical Lane Group													

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	259	811	291	145	876	222	206	164	106	267	226	223
Future Volume (vph)	259	811	291	145	876	222	206	164	106	267	226	223
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	0	0	1	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.99			0.99			1.00	0.99
Frt		0.968			0.973			0.970			0.925	
Flt Protected		0.991			0.994			0.979			0.950	
Satd. Flow (prot)	0	3117	0	0	3145	0	0	1591	0	1662	1570	0
Flt Permitted		0.501			0.494			0.356		0.454		
Satd. Flow (perm)	0	1576	0	0	1563	0	0	578	0	792	1570	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48			31			17		59		
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		1045.5			1070.0			834.0		207.0		
Travel Time (s)		75.3			77.0			60.0		14.9		
Confl. Peds. (#/hr)	8		6	6		8	8		8	8		8
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
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	5%	2%	5%	0%	2%	2%
Adj. Flow (vph)	288	901	323	161	973	247	229	182	118	297	251	248
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1512	0	0	1381	0	0	529	0	297	499	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		
Link Offset(m)		0.0			0.0			0.0		0.0		
Crosswalk Width(m)		4.8			4.8			4.8		4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4		9.4		
Detector 2 Size(m)		0.6			0.6			0.6		0.6		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0		0.0		

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

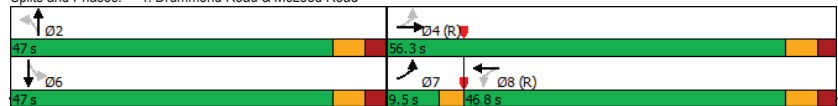
Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	30.5		30.5	30.5		30.8	30.8		30.8	30.8	
Total Split (s)	9.5	56.3		46.8	46.8		47.0	47.0		47.0	47.0	
Total Split (%)	9.2%	54.5%		45.3%	45.3%		45.5%	45.5%		45.5%	45.5%	
Maximum Green (s)	6.5	49.8		40.3	40.3		40.2	40.2		40.2	40.2	
Yellow Time (s)	3.0	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	2.4		2.4	2.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		-2.5			-2.5			-2.8			-2.8	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag	Lead			Lag								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)		9.0		9.0	9.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)		15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)		52.3			52.3			43.0			43.0	
Actuated g/c Ratio		0.51			0.51			0.42			0.42	
v/c Ratio		3.03dl			1.96dl			2.12			0.90	0.73
Control Delay		405.4			349.2			536.7			60.5	29.4
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		405.4			349.2			536.7			60.5	29.4
LOS		F			F			F			E	C
Approach Delay		405.4			349.2			536.7			41.0	
Approach LOS		F			F			F			D	

Intersection Summary

Area Type: Other
 Cycle Length: 103.3
 Actuated Cycle Length: 103.3
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.12
 Intersection Signal Delay: 334.7 Intersection LOS: F
 Intersection Capacity Utilization 151.9% ICU Level of Service H
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 4: Drummond Road & McLeod Road



Queues
4: Drummond Road & McLeod Road

Future Background
PM Peak Hour

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1512	1381	529	297	499
v/c Ratio	3.03dl	1.96dl	2.12	0.90	0.73
Control Delay	405.4	349.2	536.7	60.5	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	405.4	349.2	536.7	60.5	29.4
Queue Length 50th (m)	~256.2	~228.0	~178.5	57.4	76.7
Queue Length 95th (m)	#301.0	#272.3	#194.9	#111.8	118.4
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	821	806	250	329	687
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.84	1.71	2.12	0.90	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Future Background
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔		↔				↔		↔			
Traffic Volume (vph)	259	811	291	145	876	222	206	164	106	267	226	223	
Future Volume (vph)	259	811	291	145	876	222	206	164	106	267	226	223	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0	
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00	
Frbp, ped/bikes		0.99			0.99			1.00		1.00		0.99	
Flpb, ped/bikes		1.00			1.00			1.00		1.00		1.00	
Frt		0.97			0.97			0.97		1.00		0.93	
Flt Protected		0.99			0.99			0.98		0.95		1.00	
Satd. Flow (prot)		3115			3146			1588		1657		1570	
Flt Permitted		0.50			0.49			0.36		0.45		1.00	
Satd. Flow (perm)		1577			1563			577		792		1570	
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)	288	901	323	161	973	247	229	182	118	297	251	248	
RTOR Reduction (vph)	0	24	0	0	15	0	0	10	0	0	34	0	
Lane Group Flow (vph)	0	1488	0	0	1366	0	0	519	0	297	465	0	
Confl. Peds. (#/hr)	8		6	6		8	8		8	8		8	
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	5%	2%	5%	0%	2%	2%	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases	7	4			8			2				6	
Permitted Phases	4			8			2			6			
Actuated Green, G (s)		49.8			49.8			40.2		40.2		40.2	
Effective Green, g (s)		52.3			52.3			43.0		43.0		43.0	
Actuated g/C Ratio		0.51			0.51			0.42		0.42		0.42	
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8	
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5	
Lane Grp Cap (vph)		798			791			240		329		653	
v/s Ratio Prot										0.30			
v/s Ratio Perm		c0.94			0.87			c0.90		0.38			
v/c Ratio		3.03dl			1.96dl			2.16		0.90		0.71	
Uniform Delay, d1		25.5			25.5			30.1		28.2		25.0	
Progression Factor		1.00			1.00			1.00		1.00		1.00	
Incremental Delay, d2		394.1			332.3			536.9		30.1		6.5	
Delay (s)		419.6			357.8			567.0		58.3		31.5	
Level of Service		F			F			F		E		C	
Approach Delay (s)		419.6			357.8			567.0				41.5	
Approach LOS		F			F			F				D	
Intersection Summary													
HCM 2000 Control Delay		346.5			HCM 2000 Level of Service						F		
HCM 2000 Volume to Capacity ratio		2.06											
Actuated Cycle Length (s)		103.3			Sum of lost time (s)						11.0		
Intersection Capacity Utilization		151.9%			ICU Level of Service						H		
Analysis Period (min)		15											
dl	Defacto Left Lane. Recode with 1 though lane as a left lane.												
c	Critical Lane Group												

Lanes, Volumes, Timings

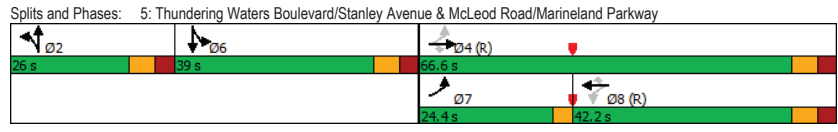
5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway
Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	124	795	35	18	920	314	44	22	10	335	38	174
Future Volume (vph)	124	795	35	18	920	314	44	22	10	335	38	174
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								1.00				0.99
Frt			0.850			0.850		0.981				0.877
Flt Protected	0.950			0.950				0.972		0.950		
Satd. Flow (prot)	1599	3260	1488	1662	3260	1417	0	1669	0	1554	1518	0
Flt Permitted	0.101			0.311				0.972		0.950		
Satd. Flow (perm)	170	3260	1488	544	3260	1417	0	1668	0	1554	1518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			276		5		170		
Link Speed (k/h)		50			50			50		50		50
Link Distance (m)		1070.0			261.8			326.3		294.0		
Travel Time (s)		77.0			18.8			23.5		21.2		
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	2%	0%	0%	2%	5%	0%	0%	0%	7%	0%	0%
Adj. Flow (vph)	131	837	37	19	968	331	46	23	11	353	40	183
Shared Lane Traffic (%)												
Lane Group Flow (vph)	131	837	37	19	968	331	0	80	0	353	223	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		3.6
Link Offset(m)		0.0			0.0			0.0		0.0		0.0
Crosswalk Width(m)		4.8			4.8			4.8		4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4		9.4		9.4
Detector 2 Size(m)		0.6			0.6			0.6		0.6		0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0		0.0		0.0

Lanes, Volumes, Timings Future Background
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	NA	NA
Protected Phases	7	4				8	2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	24.4	66.6	66.6	42.2	42.2	42.2	26.0	26.0		39.0	39.0	
Total Split (%)	18.5%	50.6%	50.6%	32.1%	32.1%	32.1%	19.8%	19.8%		29.6%	29.6%	
Maximum Green (s)	21.4	59.4	59.4	35.0	35.0	35.0	18.8	18.8		31.8	31.8	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	63.6	63.6	63.6	49.4	49.4	49.4		22.0		34.0	34.0	
Actuated g/C Ratio	0.48	0.48	0.48	0.38	0.38	0.38		0.17		0.26	0.26	
v/c Ratio	0.68	0.53	0.05	0.09	0.79	0.47		0.28		0.88	0.43	
Control Delay	39.7	25.4	0.1	30.8	43.0	8.9		47.9		70.1	13.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	39.7	25.4	0.1	30.8	43.0	8.9		47.9		70.1	13.4	
LOS	D	C	A	C	D	A		D		E	B	
Approach Delay		26.4			34.3			47.9			48.1	
Approach LOS		C			C			D			D	

Intersection Summary	
Area Type:	Other
Cycle Length:	131.6
Actuated Cycle Length:	131.6
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle:	125
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	34.7
Intersection LOS:	C
Intersection Capacity Utilization:	75.4%
ICU Level of Service:	D
Analysis Period (min):	15



Queues Future Background
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	131	837	37	19	968	331	80	353	223
v/c Ratio	0.68	0.53	0.05	0.09	0.79	0.47	0.28	0.88	0.43
Control Delay	39.7	25.4	0.1	30.8	43.0	8.9	47.9	70.1	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	25.4	0.1	30.8	43.0	8.9	47.9	70.1	13.4
Queue Length 50th (m)	20.0	83.0	0.0	3.4	123.9	9.8	18.1	92.0	11.1
Queue Length 95th (m)	37.5	102.8	0.0	10.3	#171.5	37.9	34.2	#146.0	34.3
Internal Link Dist (m)		1046.0			237.8		302.3		270.0
Turn Bay Length (m)	60.0		50.0	25.0		80.0			
Base Capacity (vph)	303	1574	767	204	1223	704	283	413	528
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	0.43	0.53	0.05	0.09	0.79	0.47	0.28	0.85	0.42

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

HCM Signalized Intersection Capacity Analysis
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway
 Future Background
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕	↔	↕	↕	↕	↕	↕
Traffic Volume (vph)	124	795	35	18	920	314	44	22	10	335	38	174
Future Volume (vph)	124	795	35	18	920	314	44	22	10	335	38	174
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	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	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	0.98	1.00	0.88	1.00	0.88	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.97	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1599	3260	1488	1662	3260	1417	1670	1554	1518	1670	1554	1518
Flt Permitted	0.10	1.00	1.00	0.31	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Satd. Flow (perm)	169	3260	1488	544	3260	1417	1670	1554	1518	1670	1554	1518
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	131	837	37	19	968	331	46	23	11	353	40	183
RTOR Reduction (vph)	0	0	19	0	0	172	0	4	0	0	126	0
Lane Group Flow (vph)	131	837	18	19	968	159	0	76	0	353	97	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	4%	2%	0%	0%	2%	5%	0%	0%	0%	7%	0%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	NA	NA
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	60.4	60.4	60.4	46.2	46.2	46.2	18.8		30.8	30.8		
Effective Green, g (s)	59.4	63.6	63.6	49.4	49.4	49.4	22.0		34.0	34.0		
Actuated g/C Ratio	0.45	0.48	0.48	0.38	0.38	0.38	0.17		0.26	0.26		
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2	7.2		7.2	7.2		
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0		4.0	4.0		
Lane Grp Cap (vph)	187	1575	719	204	1223	531	279		401	392		
v/s Ratio Prot	c0.05	0.26			c0.30		c0.05		c0.23	0.06		
v/s Ratio Perm	0.26		0.01	0.03		0.11						
v/c Ratio	0.70	0.53	0.02	0.09	0.79	0.30	0.27		0.88	0.25		
Uniform Delay, d1	27.0	23.6	17.8	26.6	36.5	28.9	47.8		46.8	38.7		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	10.0	1.3	0.1	0.9	5.3	1.4	2.4		20.0	0.5		
Delay (s)	37.0	24.9	17.8	27.5	41.8	30.4	50.2		66.9	39.1		
Level of Service	D	C	B	C	D	C	D		E	D		
Approach Delay (s)		26.2			38.7		50.2			56.1		
Approach LOS		C			D		D			E		
Intersection Summary												
HCM 2000 Control Delay		38.2			HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		131.6			Sum of lost time (s)				19.2			
Intersection Capacity Utilization		75.4%			ICU Level of Service				D			
Analysis Period (min)		15										
c	Critical Lane Group											

Lanes, Volumes, Timings
 6: Stanley Avenue & Marineland Parkway
 Future Background
 PM Peak Hour

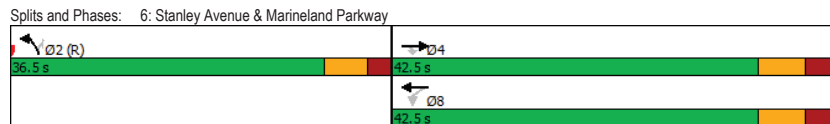
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	621	526	59	571	648	57
Future Volume (vph)	621	526	59	571	648	57
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt		0.850			0.850	
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3228	1390	1554	3228	3162	1316
Flt Permitted			0.285		0.950	
Satd. Flow (perm)	3228	1390	466	3228	3162	1316
Right Turn on Red		Yes			Yes	
Satd. Flow (RTOR)		548			59	
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	7%	7%	3%	2%	13%
Adj. Flow (vph)	647	548	61	595	675	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	647	548	61	595	675	59
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Future Background
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	42.5	42.5	42.5	42.5	36.5	36.5
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.2%	46.2%
Maximum Green (s)	35.0	35.0	35.0	35.0	30.0	30.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	27.1	27.1	27.1	27.1	43.9	43.9
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.56	0.56
v/c Ratio	0.58	0.66	0.38	0.54	0.38	0.08
Control Delay	23.0	5.8	25.5	22.1	11.7	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	5.8	25.5	22.1	11.7	3.6
LOS	C	A	C	C	B	A
Approach Delay	15.1			22.4	11.0	
Approach LOS	B			C	B	

Intersection Summary	
Area Type:	Other
Cycle Length:	79
Actuated Cycle Length:	79
Offset:	0 (0%), Referenced to phase 2:NBL and 6: Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	15.8
Intersection Capacity Utilization:	57.0%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	B



Queues
6: Stanley Avenue & Marineland Parkway

Future Background
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	647	548	61	595	675	59
v/c Ratio	0.58	0.66	0.38	0.54	0.38	0.08
Control Delay	23.0	5.8	25.5	22.1	11.7	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	5.8	25.5	22.1	11.7	3.6
Queue Length 50th (m)	43.2	0.0	7.1	39.0	28.8	0.0
Queue Length 95th (m)	51.8	18.0	16.2	47.2	48.9	6.0
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1573	958	227	1573	1756	757
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.57	0.27	0.38	0.38	0.08

Intersection Summary

Intersection Summary	
Area Type:	Other
Cycle Length:	79
Actuated Cycle Length:	79
Offset:	0 (0%), Referenced to phase 2:NBL and 6: Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	15.8
Intersection Capacity Utilization:	57.0%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	B

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Future Background
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	621	526	59	571	648	57
Future Volume (vph)	621	526	59	571	648	57
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Fr	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3228	1390	1554	3228	3162	1316
Flt Permitted	1.00	1.00	0.28	1.00	0.95	1.00
Satd. Flow (perm)	3228	1390	465	3228	3162	1316
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	647	548	61	595	675	59
RTOR Reduction (vph)	0	360	0	0	0	26
Lane Group Flow (vph)	647	188	61	595	675	33
Heavy Vehicles (%)	3%	7%	7%	3%	2%	13%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	23.6	23.6	23.6	23.6	41.4	41.4
Effective Green, g (s)	27.1	27.1	27.1	27.1	43.9	43.9
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.56	0.56
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	1107	476	159	1107	1757	731
v/s Ratio Prot	c0.20			0.18	c0.21	
v/s Ratio Perm		0.14	0.13			0.02
v/c Ratio	0.58	0.39	0.38	0.54	0.38	0.04
Uniform Delay, d1	21.3	19.7	19.6	20.9	9.9	8.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.5	1.5	0.5	0.6	0.1
Delay (s)	22.1	20.2	21.1	21.4	10.6	8.1
Level of Service	C	C	C	C	B	A
Approach Delay (s)	21.2			21.4	10.4	
Approach LOS	C			C	B	
Intersection Summary						
HCM 2000 Control Delay		18.2			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.46				
Actuated Cycle Length (s)		79.0			Sum of lost time (s)	8.0
Intersection Capacity Utilization		57.0%			ICU Level of Service	B
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Background
PM Peak Hour

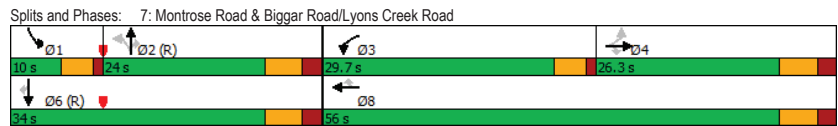
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	↔	↔	↔↔	↔	↔↔	↔	↔
Traffic Volume (vph)	25	235	3	545	277	80	5	152	538	157	207	58
Future Volume (vph)	25	235	3	545	277	80	5	152	538	157	207	58
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Flt Permitted	0.568			0.950			0.611			0.950		
Satd. Flow (perm)	994	3197	1488	3131	3228	1390	1069	3197	1430	3101	3260	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			95			585			95
Link Speed (k/h)		80			80			60				60
Link Distance (m)		507.4			421.7			216.1				150.6
Travel Time (s)		22.8			19.0			13.0				9.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Adj. Flow (vph)	27	255	3	592	301	87	5	165	585	171	225	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	255	3	592	301	87	5	165	585	171	225	63
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Channel												
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4			3			8				2
												1
												6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4			8	2		2			6
Detector Phase	4	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	29.7	56.0	56.0	24.0	24.0	24.0	10.0	34.0	34.0
Total Split (%)	29.2%	29.2%	29.2%	33.0%	62.2%	62.2%	26.7%	26.7%	26.7%	11.1%	37.8%	37.8%
Maximum Green (s)	20.0	20.0	20.0	25.2	49.7	49.7	17.7	17.7	17.7	5.5	27.7	27.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	15.4	17.7	15.4	21.6	43.8	41.5	22.2	24.5	22.2	9.3	38.2	35.9
Actuated g/C Ratio	0.17	0.20	0.17	0.24	0.49	0.46	0.25	0.27	0.25	0.10	0.42	0.40
v/c Ratio	0.16	0.41	0.01	0.79	0.19	0.13	0.02	0.19	0.74	0.54	0.16	0.10
Control Delay	32.8	33.1	0.0	40.0	12.6	2.5	29.4	27.7	9.6	46.5	18.0	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	33.1	0.0	40.0	12.6	2.5	29.4	27.7	9.6	46.5	18.0	2.5
LOS	C	C	A	D	B	A	C	C	A	D	B	A
Approach Delay	32.7			28.3			13.7			26.5		
Approach LOS	C			C			B			C		

Intersection Summary
 Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 24.0 Intersection LOS: C
 Intersection Capacity Utilization 61.7% ICU Level of Service B
 Analysis Period (min) 15



Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	255	3	592	301	87	5	165	585	171	225	63
v/c Ratio	0.16	0.41	0.01	0.79	0.19	0.13	0.02	0.19	0.74	0.54	0.16	0.10
Control Delay	32.8	33.1	0.0	40.0	12.6	2.5	29.4	27.7	9.6	46.5	18.0	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	33.1	0.0	40.0	12.6	2.5	29.4	27.7	9.6	46.5	18.0	2.5
Queue Length 50th (m)	4.3	21.5	0.0	51.7	15.5	0.0	0.7	12.5	0.0	15.1	13.0	0.0
Queue Length 95th (m)	11.3	31.3	0.0	67.7	19.1	5.8	3.8	22.0	#36.8	#33.7	23.9	4.6
Internal Link Dist (m)	483.4			397.7			192.1			126.6		
Turn Bay Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Base Capacity (vph)	220	792	446	876	1865	810	263	868	793	319	1385	628
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	0.12	0.32	0.01	0.68	0.16	0.11	0.02	0.19	0.74	0.54	0.16	0.10

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

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Background
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↕	↔	↕	↕	↕	↔	↕	↕	↕	↕	↕	
Traffic Volume (vph)	25	235	3	545	277	80	5	152	538	157	207	58	
Future Volume (vph)	25	235	3	545	277	80	5	152	538	157	207	58	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	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)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430	
Flt Permitted	0.57	1.00	1.00	0.95	1.00	1.00	0.61	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	994	3197	1488	3131	3228	1390	1070	3197	1430	3101	3260	1430	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	27	255	3	592	301	87	5	165	585	171	225	63	
RTOR Reduction (vph)	0	0	2	0	0	47	0	0	441	0	0	38	
Lane Group Flow (vph)	27	255	1	592	301	40	5	165	144	171	225	25	
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%	
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	
Protected Phases		4		3	8			2		1		6	
Permitted Phases	4		4			8	2		2			6	
Actuated Green, G (s)	15.4	15.4	15.4	21.6	41.5	41.5	22.1	22.1	22.1	9.3	35.9	35.9	
Effective Green, g (s)	15.4	17.7	15.4	21.6	43.8	41.5	22.1	24.4	22.1	9.3	38.2	35.9	
Actuated g/C Ratio	0.17	0.20	0.17	0.24	0.49	0.46	0.25	0.27	0.25	0.10	0.42	0.40	
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3	
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0	
Lane Grp Cap (vph)	170	628	254	751	1570	640	262	866	351	320	1383	570	
v/s Ratio Prot		c0.08		c0.19	0.09			0.05		c0.06		0.07	
v/s Ratio Perm	0.03		0.00			0.03	0.00		c0.10			0.02	
v/c Ratio	0.16	0.41	0.00	0.79	0.19	0.06	0.02	0.19	0.41	0.53	0.16	0.04	
Uniform Delay, d1	31.8	31.6	30.9	32.1	13.1	13.5	25.7	25.2	28.5	38.3	16.0	16.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	1.2	0.0	5.5	0.2	0.1	0.1	0.5	3.5	1.7	0.3	0.1	
Delay (s)	33.0	32.8	30.9	37.6	13.2	13.6	25.9	25.7	32.0	40.0	16.3	16.7	
Level of Service	C	C	C	D	B	B	C	C	C	D	B	B	
Approach Delay (s)		32.8			28.0			30.6			25.2		
Approach LOS		C			C			C			C		
Intersection Summary													
HCM 2000 Control Delay				28.8	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio				0.52									
Actuated Cycle Length (s)				90.0	Sum of lost time (s)				17.0				
Intersection Capacity Utilization				61.7%	ICU Level of Service				B				
Analysis Period (min)	15												
c Critical Lane Group													

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	73	8	10	1	5	5	10	309	0	6	382	45
Future Volume (vph)	73	8	10	1	5	5	10	309	0	6	382	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt				0.986			0.938			0.986		
Flt Protected	0.961			0.996			0.998			0.999		
Satd. Flow (prot)	0	1645	0	0	1635	0	0	1697	0	0	1711	0
Flt Permitted	0.961			0.996			0.998			0.999		
Satd. Flow (perm)	0	1645	0	0	1635	0	0	1697	0	0	1711	0
Link Speed (k/h)	50			50			50			50		
Link Distance (m)	121.4			166.8			461.8			348.9		
Travel Time (s)	8.7			12.0			33.2			25.1		
Confl. Peds. (#/hr)	3		2	2		3	1		5	5		1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	0%	0%	0%	0%	33%	2%	0%	0%	0%	0%	7%
Adj. Flow (vph)	84	9	11	1	6	6	11	355	0	7	439	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	13	0	0	366	0	0	498	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0			0.0			3.6			3.6		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	4.8			4.8			4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Stop			Stop			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	46.5%						ICU Level of Service A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Future Background
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕				↕			↕	
Sign Control	Stop			Stop				Stop			Stop	
Traffic Volume (vph)	73	8	10	1	5	5	10	309	0	6	382	45
Future Volume (vph)	73	8	10	1	5	5	10	309	0	6	382	45
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	84	9	11	1	6	6	11	355	0	7	439	52
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	104	13	366	498								
Volume Left (vph)	84	1	11	7								
Volume Right (vph)	11	6	0	52								
Hadj (s)	0.11	-0.26	0.06	-0.05								
Departure Headway (s)	6.1	5.9	4.9	4.7								
Degree Utilization, x	0.17	0.02	0.50	0.65								
Capacity (veh/h)	524	504	710	751								
Control Delay (s)	10.3	9.1	12.8	15.9								
Approach Delay (s)	10.3	9.1	12.8	15.9								
Approach LOS	B	A	B	C								
Intersection Summary												
Delay	14.0											
Level of Service	B											
Intersection Capacity Utilization	46.5%		ICU Level of Service	A								
Analysis Period (min)	15											

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Background
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕	↕	↕	↕
Traffic Volume (vph)	55	75	206	30	76	295
Future Volume (vph)	55	75	206	30	76	295
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.922		0.850			
Fit Protected	0.979			0.950		
Satd. Flow (prot)	1544	0	1750	1488	1614	1750
Fit Permitted	0.979			0.950		
Satd. Flow (perm)	1544	0	1750	1488	1614	1750
Link Speed (k/h)	50		60	60		
Link Distance (m)	1040.1		438.6	461.8		
Travel Time (s)	74.9		26.3	27.7		
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%
Adj. Flow (vph)	64	87	240	35	88	343
Shared Lane Traffic (%)						
Lane Group Flow (vph)	151	0	240	35	88	343
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	34.7%		ICU Level of Service		A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Future Background
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑	↔	↔	↑
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	55	75	206	30	76	295
Future Volume (vph)	55	75	206	30	76	295
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	64	87	240	35	88	343
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total (vph)	151	240	35	88	343	
Volume Left (vph)	64	0	0	88	0	
Volume Right (vph)	87	0	35	0	0	
Hadj (s)	-0.22	0.00	-0.70	0.55	0.00	
Departure Headway (s)	5.3	5.4	4.7	5.8	5.2	
Degree Utilization, x	0.22	0.36	0.05	0.14	0.50	
Capacity (veh/h)	619	646	732	601	673	
Control Delay (s)	9.8	10.2	6.7	8.5	12.0	
Approach Delay (s)	9.8	9.7		11.3		
Approach LOS	A	A		B		
Intersection Summary						
Delay			10.5			
Level of Service			B			
Intersection Capacity Utilization			34.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Background
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	6	23	152	14	22	4	207	499	22	11	736	9
Future Volume (vph)	6	23	152	14	22	4	207	499	22	11	736	9
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.887				0.986		0.996					0.998
Fit Protected	0.998				0.983		0.986					0.999
Satd. Flow (prot)	0	1549	0	0	1639	0	0	1598	0	0	1646	0
Fit Permitted	0.998				0.983		0.986					0.999
Satd. Flow (perm)	0	1549	0	0	1639	0	0	1598	0	0	1646	0
Link Speed (k/h)	60				60		70					60
Link Distance (m)	372.3				519.4		156.9					312.6
Travel Time (s)	22.3				31.2		8.1					18.8
Confl. Peds. (#/hr)									2	2		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	33%	0%	11%	0%	0%	6%	13%
Adj. Flow (vph)	7	27	177	16	26	5	241	580	26	13	856	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	211	0	0	47	0	0	847	0	0	879	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0				0.0		0.0					0.0
Link Offset(m)	0.0				0.0		0.0					0.0
Crosswalk Width(m)	4.8				4.8		4.8					4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Stop				Stop		Free					Free
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization			107.7%				ICU Level of Service		G			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Future Background
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Volume (veh/h)	6	23	152	14	22	4	207	499	22	11	736	9	
Future Volume (Veh/h)	6	23	152	14	22	4	207	499	22	11	736	9	
Sign Control	Stop			Stop			Free			Free			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	
Hourly flow rate (vph)	7	27	177	16	26	5	241	580	26	13	856	10	
Pedestrians	2												
Lane Width (m)	3.6												
Walking Speed (m/s)	1.2												
Percent Blockage	0												
Right turn flare (veh)													
Median type	None					None							
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	1980	1977	861	2154	1969	595	866						608
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1980	1977	861	2154	1969	595	866						608
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.5	4.1						4.1
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.6	2.2						2.2
p0 queue free %	63	37	51	0	40	99	69						99
cM capacity (veh/h)	19	43	358	7	43	450	786						979
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	211	47	847	879									
Volume Left	7	16	241	13									
Volume Right	177	5	26	10									
cSH	141	16	786	979									
Volume to Capacity	1.50	2.94	0.31	0.01									
Queue Length 95th (m)	114.4	52.5	10.4	0.3									
Control Delay (s)	314.9	1367.3	7.3	0.4									
Lane LOS	F	F	A	A									
Approach Delay (s)	314.9	1367.3	7.3	0.4									
Approach LOS	F	F											
Intersection Summary													
Average Delay	69.1												
Intersection Capacity Utilization	107.7%			ICU Level of Service	G								
Analysis Period (min)	15												

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Background
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔		↔	↔
Traffic Volume (vph)	489	549	373	110	140	515
Future Volume (vph)	489	549	373	110	140	515
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.969			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1511	1733	1664	0	1662	1390
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1511	1733	1664	0	1662	1390
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	1%	5%	0%	7%
Adj. Flow (vph)	515	578	393	116	147	542
Shared Lane Traffic (%)						
Lane Group Flow (vph)	515	578	509	0	147	542
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	3.6	3.6			3.6	
Link Offset(m)	0.0	0.0			0.0	
Crosswalk Width(m)	4.8	4.8			4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control		Stop	Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	76.4%			ICU Level of Service D		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Future Background
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑	↔		↔	↔
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	489	549	373	110	140	515
Future Volume (vph)	489	549	373	110	140	515
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	515	578	393	116	147	542
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	515	578	509	147	542	
Volume Left (vph)	515	0	0	147	0	
Volume Right (vph)	0	0	116	0	542	
Hadj (s)	0.67	0.02	-0.10	0.50	-0.58	
Departure Headway (s)	8.3	7.7	7.3	8.3	7.2	
Degree Utilization, x	1.19	1.23	1.03	0.34	1.08	
Capacity (veh/h)	439	477	499	430	510	
Control Delay (s)	131.1	143.7	74.6	14.3	90.3	
Approach Delay (s)	137.8		74.6	74.0		
Approach LOS	F		F	F		
Intersection Summary						
Delay			104.6			
Level of Service			F			
Intersection Capacity Utilization			76.4%	ICU Level of Service	D	
Analysis Period (min)			15			

Queuing and Blocking Report

Future Background
PM Peak Hour

Intersection: 1: Montrose Road & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	R	L	T	T	R
Maximum Queue (m)	62.4	624.2	622.8	77.5	45.3	104.3	104.4	54.0	26.8	406.6	477.6	556.3
Average Queue (m)	25.9	309.3	309.9	63.2	16.4	50.8	54.4	16.4	8.7	58.0	121.0	194.2
95th Queue (m)	68.7	812.5	810.6	92.0	35.4	95.2	96.9	34.8	20.5	277.8	427.0	585.3
Link Distance (m)	740.7		740.7	665.6		665.6	665.6	699.7		699.7	699.7	
Upstream Blk Time (%)	27		26	0		0	0		0	0	2	
Queuing Penalty (veh)	0		0	0		0	0		0	0	0	
Storage Bay Dist (m)	55.0		70.0		155.0	115.0						
Storage Blk Time (%)	0		49	44	31							
Queuing Penalty (veh)	0		64	199	123							

Intersection: 1: Montrose Road & McLeod Road

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	137.4	200.4	188.5
Average Queue (m)	113.2	121.9	48.1
95th Queue (m)	167.2	263.3	149.4
Link Distance (m)	194.3		194.3
Upstream Blk Time (%)	43		0
Queuing Penalty (veh)	0		0
Storage Bay Dist (m)	130.0		
Storage Blk Time (%)	53		0
Queuing Penalty (veh)	51		0

Intersection: 2: Oakwood Drive & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	L	TR
Maximum Queue (m)	57.3	672.3	671.8	598.2	87.3	133.1	126.3	102.5	353.9	353.2	27.2	164.7
Average Queue (m)	6.9	377.8	378.6	357.4	39.3	47.7	51.4	72.4	325.2	309.4	16.3	60.7
95th Queue (m)	28.6	837.7	838.1	880.1	81.4	110.4	113.6	140.0	408.7	442.0	31.3	158.2
Link Distance (m)	665.6		665.6	665.6	592.5		592.5	342.6		342.6	164.6	
Upstream Blk Time (%)	36		36	39	0		0	71		69	13	
Queuing Penalty (veh)	234		239	255	0		0	0		0	0	
Storage Bay Dist (m)	50.0		80.0		95.0		20.0					
Storage Blk Time (%)	0		57	1	3	19	52	42		19		
Queuing Penalty (veh)	0		25	6	8	39	105	48		5		

Queuing and Blocking Report

Future Background
PM Peak Hour

Intersection: 3: Dorchester Road & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	62.5	534.2	540.0	57.3	197.3	203.2	22.7	323.5	37.4	307.5
Average Queue (m)	42.3	441.9	443.4	23.9	89.8	94.4	18.9	245.2	35.9	291.0
95th Queue (m)	88.5	739.7	739.8	58.5	179.5	184.8	32.1	379.6	42.6	349.1
Link Distance (m)		592.5	592.5		1024.4	1024.4		325.7		294.0
Upstream Blk Time (%)		39	41					23		86
Queuing Penalty (veh)		357	372					91		0
Storage Bay Dist (m)	55.0			50.0			15.0		30.0	
Storage Blk Time (%)	15	71		0	24		43	59	59	35
Queuing Penalty (veh)	80	231		0	23		99	206	300	102

Intersection: 4: Drummond Road & McLeod Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LTR	L	TR
Maximum Queue (m)	939.7	939.2	605.0	612.7	431.5	27.4	205.1
Average Queue (m)	797.3	798.5	416.7	421.0	389.1	26.2	191.1
95th Queue (m)	1311.5	1310.5	936.8	939.5	495.7	31.1	234.0
Link Distance (m)	1024.4	1024.4	1047.7	1047.7	811.3		193.4
Upstream Blk Time (%)	41	44	10	12			68
Queuing Penalty (veh)	299	319	56	69			0
Storage Bay Dist (m)						20.0	
Storage Blk Time (%)						33	54
Queuing Penalty (veh)						149	143

Intersection: 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	L	TR
Maximum Queue (m)	37.2	59.9	68.1	46.9	32.2	150.0	148.3	87.5	58.3	173.8	116.8
Average Queue (m)	13.5	24.2	35.5	5.6	4.8	98.1	99.8	25.5	18.5	98.2	56.9
95th Queue (m)	31.8	53.1	68.0	28.9	20.6	201.1	202.2	90.8	65.4	194.5	175.4
Link Distance (m)		1047.7	1047.7			239.8	239.8		307.6	277.4	277.4
Upstream Blk Time (%)						12	12			7	3
Queuing Penalty (veh)						72	74			0	0
Storage Bay Dist (m)	60.0			50.0	25.0			80.0			
Storage Blk Time (%)	0	0	5	0		46	18	0			
Queuing Penalty (veh)	0	0	2	0		8	58	1			

Queuing and Blocking Report

Future Background
PM Peak Hour

Intersection: 6: Stanley Avenue & Marineland Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B57	B30
Directions Served	T	T	R	L	T	T	L	L	R	T	T
Maximum Queue (m)	66.6	74.3	65.0	45.1	94.0	90.2	68.6	150.4	35.8	281.4	27.8
Average Queue (m)	31.8	32.0	6.2	12.6	54.9	51.0	38.9	87.9	6.1	71.3	1.0
95th Queue (m)	58.2	58.7	30.8	31.6	118.1	114.8	113.7	328.4	24.8	496.9	19.8
Link Distance (m)	239.8	239.8			155.4	155.4		485.6		1385.3	295.8
Upstream Blk Time (%)					10	10		9		1	
Queuing Penalty (veh)					0	0		48		5	
Storage Bay Dist (m)			65.0	105.0			160.0		80.0		
Storage Blk Time (%)		0	0		11		4	13	0		
Queuing Penalty (veh)		1	0		6		16	48	0		

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	
Directions Served	L	T	T	R	L	L	T	T	R	L	T
Maximum Queue (m)	16.6	44.4	40.5	5.5	72.9	82.2	25.8	30.2	18.6	9.0	58.7
Average Queue (m)	3.9	25.2	11.8	0.5	41.3	54.6	10.6	12.2	5.1	1.0	18.4
95th Queue (m)	11.8	41.3	30.7	3.1	66.6	74.1	22.6	24.7	12.1	4.9	45.0
Link Distance (m)		488.7	488.7				403.0	403.0			196.3
Upstream Blk Time (%)											4
Queuing Penalty (veh)											0
Storage Bay Dist (m)	130.0			120.0	150.0	150.0			225.0	80.0	
Storage Blk Time (%)											0
Queuing Penalty (veh)											1

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (m)	67.3	52.2	57.7	37.8	22.3	11.1
Average Queue (m)	44.2	10.1	30.0	15.3	5.8	3.1
95th Queue (m)	75.2	37.5	50.3	30.2	15.2	8.2
Link Distance (m)				130.6	130.6	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	60.0	80.0	80.0		50.0	
Storage Blk Time (%)	15					
Queuing Penalty (veh)	12					

Queuing and Blocking Report

Future Background
PM Peak Hour

Intersection: 8: Dorchester Road & Jill Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	49.3	16.3	241.0	24.1
Average Queue (m)	15.7	3.4	83.9	13.5
95th Queue (m)	41.6	11.6	283.1	21.8
Link Distance (m)	110.7	156.1	446.2	325.7
Upstream Blk Time (%)	4			
Queuing Penalty (veh)	11			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Dorchester Road & Oldfield Road

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	R	L	T
Maximum Queue (m)	27.6	62.9	22.1	14.3	17.2
Average Queue (m)	9.6	20.7	7.2	7.2	9.8
95th Queue (m)	21.2	57.2	17.8	14.2	14.0
Link Distance (m)	1018.8	424.6			446.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)	15.0		15.0		
Storage Blk Time (%)	8		0		1
Queuing Penalty (veh)	2		0		0

Intersection: 10: Stanley Avenue & Chippawa Parkway

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	48.1	23.4	81.9	27.1
Average Queue (m)	17.0	9.5	29.3	2.8
95th Queue (m)	35.8	20.8	62.6	14.0
Link Distance (m)	355.4	511.0	139.9	295.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Future Background
PM Peak Hour

Intersection: 11: Lyons Creek Road & Stanley Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (m)	62.5	461.3	465.3	32.4	153.5
Average Queue (m)	62.4	447.3	315.7	23.6	74.1
95th Queue (m)	62.4	489.2	572.5	43.3	188.4
Link Distance (m)	442.7		589.0		785.7
Upstream Blk Time (%)	82		7		
Queuing Penalty (veh)	0		0		
Storage Bay Dist (m)	55.0			25.0	
Storage Blk Time (%)	84		12		46
Queuing Penalty (veh)	459		58		65

Zone Summary

Zone wide Queuing Penalty: 5249

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Future Background
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	141	1185	45	176	900	274	62	112	350	330	190	80
Future Volume (vph)	141	1185	45	176	900	274	62	112	350	330	190	80
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0			0.0	115.0		0.0	130.0	0.0
Storage Lanes	1		1	1			1	1		1	1	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00				1.00	
Frt		0.994				0.850			0.850		0.955	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1539	4518	0	1599	3228	1444	1662	3107	1403	1599	3055	0
Fit Permitted	0.103			0.093			0.567			0.604		
Satd. Flow (perm)	167	4518	0	156	3228	1444	991	3107	1403	1016	3055	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		4				280			348		58	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		759.2			692.3			721.0			213.3	
Travel Time (s)		54.7			49.8			51.9			15.4	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	5%	8%	4%	3%	3%	0%	7%	6%	4%	5%	0%
Adj. Flow (vph)	158	1331	51	198	1011	308	70	126	393	371	213	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	158	1382	0	198	1011	308	70	126	393	371	303	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25			15	25			15	25
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	


Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Future Background
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		2	6	
Permitted Phases	4			8		8	2			2	6	
Detector Phase	7	4		3	8	8	5	2		2	1	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0		46.0	9.5	46.0
Total Split (s)	15.0	43.0		24.0	52.0	52.0	9.6	44.0		44.0	19.0	53.4
Total Split (%)	11.5%	33.1%		18.5%	40.0%	40.0%	7.4%	33.8%		33.8%	14.6%	41.1%
Maximum Green (s)	12.0	35.0		21.0	44.0	44.0	6.6	36.0		36.0	16.0	45.4
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0		4.0	0.0	4.0
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0		-4.0	1.0	-4.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	None	Max
Walk Time (s)		12.0			12.0	12.0		14.0		14.0		14.0
Flash Dont Walk (s)		20.0			20.0	20.0		24.0		24.0		24.0
Pedestrian Calls (#/hr)		0			0	0		0		0		0
Act Effct Green (s)	54.8	44.6		61.7	48.8	48.8	45.5	40.0		40.0	59.0	51.3
Actuated g/C Ratio	0.42	0.34		0.47	0.38	0.38	0.35	0.31		0.31	0.45	0.39
v/c Ratio	0.89	0.89		0.85	0.83	0.43	0.19	0.13		0.58	0.70	0.24
Control Delay	73.5	49.1		54.1	41.0	6.2	22.5	33.0		9.6	34.6	22.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	73.5	49.1		54.1	41.0	6.2	22.5	33.0		9.6	34.6	22.2
LOS	E	D		D	D	A	C	C		A	C	C
Approach Delay		51.6			35.6			16.1				29.0
Approach LOS		D			D			B				C
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	105											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.89											
Intersection Signal Delay:	37.6						Intersection LOS: D					
Intersection Capacity Utilization:	86.5%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	1: Montrose Road & McLeod Road											

Queues
1: Montrose Road & McLeod Road

Future Background
Saturday Peak Hour




Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	158	1382	198	1011	308	70	126	393	371	303
v/c Ratio	0.89	0.89	0.85	0.83	0.43	0.19	0.13	0.58	0.70	0.24
Control Delay	73.5	49.1	54.1	41.0	6.2	22.5	33.0	9.6	34.6	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.5	49.1	54.1	41.0	6.2	22.5	33.0	9.6	34.6	22.2
Queue Length 50th (m)	25.7	128.4	31.3	138.7	11.8	10.6	12.8	8.7	69.8	23.3
Queue Length 95th (m)	#68.9	#172.1	m53.9	163.7	m13.7	19.7	20.7	37.9	98.8	34.3
Internal Link Dist (m)		735.2		668.3			697.0			189.3
Turn Bay Length (m)	55.0		155.0			115.0			130.0	
Base Capacity (vph)	187	1552	297	1211	716	376	956	672	528	1240
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.89	0.67	0.83	0.43	0.19	0.13	0.58	0.70	0.24

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

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Future Background
Saturday Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	141	1185	45	176	900	274	62	112	350	330	190	80
Future Volume (vph)	141	1185	45	176	900	274	62	112	350	330	190	80
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ftbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1539	4520		1599	3228	1444	1661	3107	1403	1599	3056	
Flt Permitted	0.10	1.00		0.09	1.00	1.00	0.57	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	166	4520		157	3228	1444	992	3107	1403	1017	3056	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	158	1331	51	198	1011	308	70	126	393	371	213	90
RTOR Reduction (vph)	0	3	0	0	0	176	0	0	239	0	35	0
Lane Group Flow (vph)	158	1379	0	198	1011	132	70	126	154	371	268	0
Conf. Peds. (#/hr)							2					2
Heavy Vehicles (%)	8%	5%	8%	4%	3%	3%	0%	7%	6%	4%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	51.2	40.0		58.4	44.2	44.2	41.9	36.6	36.6	55.6	47.3	
Effective Green, g (s)	49.2	44.0		57.4	48.2	48.2	39.9	40.6	40.6	54.6	51.3	
Actuated g/C Ratio	0.38	0.34		0.44	0.37	0.37	0.31	0.31	0.31	0.42	0.39	
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	170	1529		229	1196	535	326	970	438	494	1205	
v/s Ratio Prot	0.07	c0.31		c0.10	0.31		0.01	0.04		c0.09	0.09	
v/s Ratio Perm	0.28			0.29		0.09	0.06		0.11	c0.23		
v/c Ratio	0.93	0.90		0.86	0.85	0.25	0.21	0.13	0.35	0.75	0.22	
Uniform Delay, d1	31.8	40.9		34.8	37.5	28.3	32.6	32.0	34.5	30.2	26.1	
Progression Factor	1.00	1.00		1.05	0.96	1.06	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	48.3	9.0		20.2	5.3	0.8	0.2	0.3	2.2	6.0	0.4	
Delay (s)	80.1	50.0		56.8	41.2	30.8	32.8	32.3	36.7	36.3	26.5	
Level of Service	F	D		E	D	C	C	C	D	D	C	
Approach Delay (s)		53.0			41.1			35.3			31.9	
Approach LOS		D			D			D			C	

Intersection Summary
 HCM 2000 Control Delay 43.1 HCM 2000 Level of Service D
 HCM 2000 Volume to Capacity ratio 0.81
 Actuated Cycle Length (s) 130.0 Sum of lost time (s) 16.0
 Intersection Capacity Utilization 86.5% ICU Level of Service E
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Background
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	28	1239	489	262	1242	16	437	18	344	12	9	34
Future Volume (vph)	28	1239	489	262	1242	16	437	18	344	12	9	34
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0		0.0	80.0		0.0	95.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.95		1.00		1.00		0.99	1.00		0.99
Frt			0.850		0.998				0.850			0.880
Fit Protected	0.950			0.950			0.950	0.956		0.950		
Satd. Flow (prot)	1662	3292	1473	1630	3284	0	1548	1561	1473	1662	1522	0
Fit Permitted	0.160			0.067			0.950	0.956		0.950		
Satd. Flow (perm)	279	3292	1396	115	3284	0	1545	1557	1452	1660	1522	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			386		2				344		36	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		692.3			616.3			360.6			181.9	
Travel Time (s)		49.8			44.4			26.0			13.1	
Confl. Peds. (#/hr)	10		16	16		10	3		2	2		3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	2%	0%	1%	0%	0%	0%
Adj. Flow (vph)	29	1304	515	276	1307	17	460	19	362	13	9	36
Shared Lane Traffic (%)							48%					
Lane Group Flow (vph)	29	1304	515	276	1324	0	239	240	362	13	45	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	


Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Background
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	12.0	62.0	62.0	26.0	76.0		28.0	28.0	28.0	14.0	14.0	
Total Split (%)	9.2%	47.7%	47.7%	20.0%	58.5%		21.5%	21.5%	21.5%	10.8%	10.8%	
Maximum Green (s)	9.0	54.0	54.0	23.0	68.0		19.0	19.0	19.0	5.0	5.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	65.8	60.6	55.6	84.0	78.4		24.0	24.0	24.0	10.0	10.0	
Actuated g/C Ratio	0.51	0.47	0.43	0.65	0.60		0.18	0.18	0.18	0.08	0.08	
v/c Ratio	0.15	0.85	0.63	0.92	0.67		0.84	0.83	0.66	0.10	0.30	
Control Delay	9.4	28.0	9.8	71.3	19.9		76.2	75.4	12.4	57.9	28.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	9.4	28.0	9.8	71.3	19.9		76.2	75.4	12.4	57.9	28.1	
LOS	A	C	A	E	B		E	E	B	E	C	
Approach Delay		22.6			28.8			48.5			34.8	
Approach LOS		C			C			D			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.92											
Intersection Signal Delay:	30.1						Intersection LOS: C					
Intersection Capacity Utilization:	116.4%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	2: Oakwood Drive & McLeod Road											

Queues
2: Oakwood Drive & McLeod Road

Future Background
Saturday Peak Hour




Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	1304	515	276	1324	239	240	362	13	45
v/c Ratio	0.15	0.85	0.63	0.92	0.67	0.84	0.83	0.66	0.10	0.30
Control Delay	9.4	28.0	9.8	71.3	19.9	76.2	75.4	12.4	57.9	28.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	28.0	9.8	71.3	19.9	76.2	75.4	12.4	57.9	28.1
Queue Length 50th (m)	2.3	180.1	82.2	56.3	126.9	66.1	66.3	4.1	3.3	2.3
Queue Length 95th (m)	m2.2	206.2	m104.3	#103.7	155.7	#113.8	#113.7	36.2	10.4	15.0
Internal Link Dist (m)	668.3			592.3			336.6			157.9
Turn Bay Length (m)	50.0	80.0			95.0			20.0		
Base Capacity (vph)	232	1534	818	330	1981	285	288	548	127	150
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.85	0.63	0.84	0.67	0.84	0.83	0.66	0.10	0.30

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Future Background
Saturday Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	28	1239	489	262	1242	16	437	18	344	12	9	34
Future Volume (vph)	28	1239	489	262	1242	16	437	18	344	12	9	34
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1662	3292	1396	1630	3284		1548	1561	1452	1662	1522	
Flt Permitted	0.16	1.00	1.00	0.07	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	279	3292	1396	115	3284		1548	1561	1452	1662	1522	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	1304	515	276	1307	17	460	19	362	13	9	36
RTOR Reduction (vph)	0	0	221	0	1	0	0	0	280	0	33	0
Lane Group Flow (vph)	29	1304	294	276	1323	0	239	240	82	13	12	0
Confl. Peds. (#/hr)	10	16	16			10	3		2	2		3
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	60.4	56.6	56.6	80.0	73.2		19.0	19.0	19.0	5.0	5.0	
Effective Green, g (s)	58.4	60.6	55.6	79.0	77.2		24.0	24.0	24.0	10.0	10.0	
Actuated g/C Ratio	0.45	0.47	0.43	0.61	0.59		0.18	0.18	0.18	0.08	0.08	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	155	1534	597	295	1950		285	288	268	127	117	
v/s Ratio Prot	0.00	0.40		c0.14	0.40		c0.15	0.15		c0.01	0.01	
v/s Ratio Perm	0.08		0.21	c0.43					0.06			
v/c Ratio	0.19	0.85	0.49	0.94	0.68		0.84	0.83	0.30	0.10	0.10	
Uniform Delay, d1	20.7	30.7	27.0	41.4	18.0		51.1	51.1	45.8	55.8	55.8	
Progression Factor	0.83	0.76	1.03	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	3.6	1.7	35.4	1.9		24.5	23.7	2.9	1.6	1.7	
Delay (s)	17.4	27.0	29.5	76.9	19.9		75.7	74.8	48.7	57.4	57.5	
Level of Service	B	C	C	E	B		E	E	D	E	E	
Approach Delay (s)	27.6		29.7			63.8			57.5			
Approach LOS	C		C			E			E			

Intersection Summary
 HCM 2000 Control Delay 35.8 HCM 2000 Level of Service D
 HCM 2000 Volume to Capacity ratio 0.82
 Actuated Cycle Length (s) 130.0 Sum of lost time (s) 16.0
 Intersection Capacity Utilization 116.4% ICU Level of Service H
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Background
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	305	1071	226	104	855	147	305	154	79	275	178	312
Future Volume (vph)	305	1071	226	104	855	147	305	154	79	275	178	312
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0	0.0	15.0	0.0	30.0	0.0	30.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	0	0
Taper Length (m)	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	0.0	0.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.974	0.974	0.974	0.974	0.974	0.974	0.974	0.974	0.974	0.974	0.974	0.974
Fit Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1630	3175	0	1662	3200	0	1630	1641	0	1662	1546	0
Fit Permitted	0.110	0.110	0.110	0.110	0.110	0.110	0.110	0.110	0.110	0.110	0.110	0.110
Satd. Flow (perm)	189	3175	0	215	3200	0	209	1641	0	829	1546	0
Right Turn on Red		Yes		Yes		Yes		Yes		Yes		Yes
Satd. Flow (RTOR)	24	24	24	16	16	16	21	21	21	72	72	72
Link Speed (k/h)	50	50	50	50	50	50	50	50	50	50	50	50
Link Distance (m)	616.3	616.3	616.3	1045.5	1045.5	1045.5	348.9	348.9	348.9	308.0	308.0	308.0
Travel Time (s)	44.4	44.4	44.4	75.3	75.3	75.3	25.1	25.1	25.1	22.2	22.2	22.2
Confl. Peds. (#/hr)	13	11	11	11	13	9	21	21	21	9	9	9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%
Adj. Flow (vph)	314	1104	233	107	881	152	314	159	81	284	184	322
Shared Lane Traffic (%)												
Lane Group Flow (vph)	314	1337	0	107	1033	0	314	240	0	284	506	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	25	15	25	15	25	15	25	15	25	15
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Detector 2 Size(m)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0


Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Background
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6	6	6	6	6
Permitted Phases	4	8	2	6	6	6	6	6	6	6	6	6
Detector Phase	7	4	3	8	5	2	1	6	6	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	8.0	5.0	8.0	5.0	8.0	5.0	8.0
Minimum Split (s)	9.5	30.4	9.5	30.4	9.5	37.7	9.5	37.7	9.5	37.7	9.5	37.7
Total Split (s)	21.8	51.8	9.8	39.8	21.8	39.3	20.2	37.7	20.2	37.7	20.2	37.7
Total Split (%)	18.0%	42.8%	8.1%	32.9%	18.0%	32.5%	16.7%	31.1%	16.7%	31.1%	16.7%	31.1%
Maximum Green (s)	18.8	45.4	6.8	33.4	18.8	32.6	17.2	31.0	17.2	31.0	17.2	31.0
Yellow Time (s)	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1
All-Red Time (s)	0.0	2.3	0.0	2.3	0.0	2.6	0.0	2.6	0.0	2.6	0.0	2.6
Lost Time Adjust (s)	1.0	-2.4	1.0	-2.4	1.0	-2.7	1.0	-2.7	1.0	-2.7	1.0	-2.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None	None	None
Walk Time (s)	9.0	9.0	9.0	9.0	9.0	12.0	9.0	12.0	9.0	12.0	9.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	19.0	15.0	19.0	15.0	19.0	15.0	19.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	57.6	47.8	41.6	35.8	53.8	36.4	48.8	33.7	48.8	33.7	48.8	33.7
Actuated g/C Ratio	0.48	0.39	0.34	0.30	0.44	0.30	0.40	0.28	0.40	0.28	0.40	0.28
v/c Ratio	1.04	1.06	0.75	1.08	1.04	0.47	0.65	1.05	0.65	1.05	0.65	1.05
Control Delay	96.2	76.6	52.9	93.1	96.3	35.4	29.9	91.4	29.9	91.4	29.9	91.4
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	96.2	76.6	52.9	93.1	96.3	35.4	29.9	91.4	29.9	91.4	29.9	91.4
LOS	F	E	D	F	F	D	C	F	C	F	C	F
Approach Delay	80.3	80.3	89.4	89.4	70.0	70.0	69.3	69.3	69.3	69.3	69.3	69.3
Approach LOS	F	F	F	F	E	E	E	E	E	E	E	E
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	130											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.08											
Intersection Signal Delay:	79.3						Intersection LOS: E					
Intersection Capacity Utilization:	112.5%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											

Queues
3: Dorchester Road & McLeod Road

Future Background
Saturday Peak Hour




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	314	1337	107	1033	314	240	284	506
v/c Ratio	1.04	1.06	0.75	1.08	1.04	0.47	0.65	1.05
Control Delay	96.2	76.6	52.9	93.1	96.3	35.4	29.9	91.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.2	76.6	52.9	93.1	96.3	35.4	29.9	91.4
Queue Length 50th (m)	-68.3	-190.9	14.6	-150.6	-69.0	45.2	45.4	-124.2
Queue Length 95th (m)	#127.6	#236.1	#38.9	#194.1	#128.3	71.3	68.0	#193.5
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	301	1267	143	957	301	507	453	482
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	1.04	1.06	0.75	1.08	1.04	0.47	0.63	1.05

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Future Background
Saturday Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	305	1071	226	104	855	147	305	154	79	275	178	312
Future Volume (vph)	305	1071	226	104	855	147	305	154	79	275	178	312
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.95		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)	1630	3174		1662	3199		1630	1641		1651	1545	
Flt Permitted	0.11	1.00		0.12	1.00		0.12	1.00		0.48	1.00	
Satd. Flow (perm)	189	3174		216	3199		210	1641		836	1545	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	314	1104	233	107	881	152	314	159	81	284	184	322
RTOR Reduction (vph)	0	15	0	0	11	0	0	15	0	0	52	0
Lane Group Flow (vph)	314	1322	0	107	1022	0	314	225	0	284	454	0
Confl. Peds. (#/hr)	13		11	11		13	9		21	21		9
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.2	45.4		40.2	33.4		52.5	33.7		47.1	31.0	
Effective Green, g (s)	54.2	47.8		38.2	35.8		50.5	36.4		45.1	33.7	
Actuated g/C Ratio	0.45	0.39		0.32	0.30		0.42	0.30		0.37	0.28	
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	296	1252		137	945		296	493		412	429	
v/s Ratio Prot	c0.16	c0.42		0.04	0.32		c0.16	0.14		0.09	c0.29	
v/s Ratio Perm	0.32			0.21			0.29			0.17		
v/c Ratio	1.06	1.06		0.78	1.08		1.06	0.46		0.69	1.06	
Uniform Delay, d1	36.7	36.6		33.9	42.6		36.0	34.3		29.3	43.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	69.3	41.7		24.5	53.8		69.3	0.7		4.8	59.7	
Delay (s)	106.0	78.4		58.3	96.4		105.3	35.0		34.0	103.4	
Level of Service	F	E		E	F		F	D		C	F	
Approach Delay (s)		83.6			92.8			74.9			78.5	
Approach LOS		F			F			E			E	

Intersection Summary

HCM 2000 Control Delay	84.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	112.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

4: Drummond Road & McLeod Road

Future Background

Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	232	847	248	136	890	202	199	152	117	264	210	212
Future Volume (vph)	232	847	248	136	890	202	199	152	117	264	210	212
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99			0.99		0.99		0.99
Frt	0.972				0.975			0.966		0.924		
Flt Protected	0.991				0.995			0.979		0.950		
Satd. Flow (prot)	0	3162	0	0	3179	0	0	1623	0	1646	1583	0
Flt Permitted	0.503				0.515			0.412		0.462		
Satd. Flow (perm)	0	1605	0	0	1645	0	0	682	0	793	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41			28			19		59		
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		1045.5			1070.0			834.0		207.0		
Travel Time (s)		75.3			77.0			60.0		14.9		
Confl. Peds. (#/hr)	12		2	2		12	8		22	22		8
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	3%	0%	1%	2%	0%
Adj. Flow (vph)	239	873	256	140	918	208	205	157	121	272	216	219
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1368	0	0	1266	0	0	483	0	272	435	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		
Link Offset(m)		0.0			0.0			0.0		0.0		
Crosswalk Width(m)		4.8			4.8			4.8		4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings

4: Drummond Road & McLeod Road

Future Background

Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	30.5		30.5	30.5		30.8	30.8		30.8	30.8	
Total Split (s)	9.5	58.3		48.8	48.8		45.0	45.0		45.0	45.0	
Total Split (%)	9.2%	56.4%		47.2%	47.2%		43.6%	43.6%		43.6%	43.6%	
Maximum Green (s)	6.5	51.8		42.3	42.3		38.2	38.2		38.2	38.2	
Yellow Time (s)	3.0	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	2.4		2.4	2.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		-2.5			-2.5			-2.8			-2.8	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)		9.0			9.0			9.0			9.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)		54.3			54.3			41.0			41.0	
Actuated g/C Ratio		0.53			0.53			0.40			0.40	
v/c Ratio		1.87d			1.44			1.71			0.87	0.66
Control Delay		292.1			230.2			359.9			56.8	27.4
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		292.1			230.2			359.9			56.8	27.4
LOS		F			F			F			E	C
Approach Delay		292.1			230.2			359.9			38.7	
Approach LOS		F			F			F			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	103.3											
Actuated Cycle Length:	103.3											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	80											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.71											
Intersection Signal Delay:	233.3						Intersection LOS: F					
Intersection Capacity Utilization:	148.3%						ICU Level of Service H					
Analysis Period (min):	15											
dl	Defacto Left Lane. Recode with 1 though lane as a left lane.											
Splits and Phases:	4: Drummond Road & McLeod Road											
	45 s				58.3 s				45 s			
	45 s				9.5 s				48.8 s			

Queues

4: Drummond Road & McLeod Road

Future Background

Saturday Peak Hour

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1368	1266	483	272	435
v/c Ratio	1.87dl	1.44	1.71	0.87	0.66
Control Delay	292.1	230.2	359.9	56.8	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	292.1	230.2	359.9	56.8	27.4
Queue Length 50th (m)	-217.6	-192.3	-150.1	51.8	63.9
Queue Length 95th (m)	#261.6	#236.2	#214.5	#102.3	99.8
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	863	877	282	314	663
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.59	1.44	1.71	0.87	0.66

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.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM Signalized Intersection Capacity Analysis

4: Drummond Road & McLeod Road

Future Background

Saturday Peak Hour

	↘	→	↙	↗	←	↖	↑	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↔	↔	
Traffic Volume (vph)	232	847	248	136	890	202	199	152	117	264	210	212
Future Volume (vph)	232	847	248	136	890	202	199	152	117	264	210	212
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Frbp, ped/bikes		1.00			0.99			0.99		1.00		0.99
Flpb, ped/bikes		1.00			1.00			1.00		0.99		1.00
Frt		0.97			0.98			0.97		1.00		0.92
Flt Protected		0.99			0.99			0.98		0.95		1.00
Satd. Flow (prot)		3163			3178			1621		1631		1584
Flt Permitted		0.50			0.51			0.41		0.46		1.00
Satd. Flow (perm)		1606			1645			681		794		1584
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	239	873	256	140	918	208	205	157	121	272	216	219
RTOR Reduction (vph)	0	19	0	0	13	0	0	11	0	0	36	0
Lane Group Flow (vph)	0	1349	0	0	1253	0	0	472	0	272	399	0
Confl. Peds. (#/hr)	12		2	2		12	8		22	22		8
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	3%	0%	1%	2%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		51.8			51.8			38.2		38.2		38.2
Effective Green, g (s)		54.3			54.3			41.0		41.0		41.0
Actuated g/C Ratio		0.53			0.53			0.40		0.40		0.40
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5
Lane Grp Cap (vph)		844			864			270		315		628
v/s Ratio Prot												0.25
v/s Ratio Perm		c0.84			0.76			c0.69		0.34		
v/c Ratio		1.87dl			1.45			1.75		0.86		0.64
Uniform Delay, d1		24.5			24.5			31.1		28.6		25.1
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		274.6			209.0			350.8		25.5		4.9
Delay (s)		299.1			233.5			382.0		54.1		30.0
Level of Service		F			F			F		D		C
Approach Delay (s)		299.1			233.5			382.0				39.3
Approach LOS		F			F			F				D

Intersection Summary

- HCM 2000 Control Delay 239.8 HCM 2000 Level of Service F
- HCM 2000 Volume to Capacity ratio 1.71
- Actuated Cycle Length (s) 103.3 Sum of lost time (s) 11.0
- Intersection Capacity Utilization 148.3% ICU Level of Service H
- Analysis Period (min) 15
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.
- c Critical Lane Group


Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	139	827	25	18	957	331	44	23	11	288	39	182
Future Volume (vph)	139	827	25	18	957	331	44	23	11	288	39	182
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			7.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00		0.99			0.99
Frt			0.850			0.850			0.981			0.876
Flt Protected	0.950			0.950			0.973		0.950			
Satd. Flow (prot)	1662	3325	1488	1662	3292	1430	0	1670	0	1614	1513	0
Flt Permitted	0.085			0.300			0.973		0.950			
Satd. Flow (perm)	149	3325	1455	525	3292	1399	0	1668	0	1614	1513	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			286		5				174
Link Speed (k/h)		50			50			50				50
Link Distance (m)		1070.0			261.8			326.3				294.0
Travel Time (s)		77.0			18.8			23.5				21.2
Conf. Peds. (#/hr)	1		1	1		1	3					3
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	143	853	26	19	987	341	45	24	11	297	40	188
Shared Lane Traffic (%)												
Lane Group Flow (vph)	143	853	26	19	987	341	0	80	0	297	228	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	Split	NA
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	18.6	63.2	63.2	44.6	44.6	44.6	30.0	30.0		38.4	38.4	
Total Split (%)	14.1%	48.0%	48.0%	33.9%	33.9%	33.9%	22.8%	22.8%		29.2%	29.2%	
Maximum Green (s)	15.6	56.0	56.0	37.4	37.4	37.4	22.8	22.8		31.2	31.2	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	62.5	62.5	62.5	48.0	48.0	48.0		26.0		31.1	31.1	
Actuated g/C Ratio	0.47	0.47	0.47	0.36	0.36	0.36		0.20		0.24	0.24	
v/c Ratio	0.75	0.54	0.04	0.10	0.82	0.49		0.24		0.78	0.46	
Control Delay	49.9	26.6	0.1	33.1	45.8	9.5		43.9		61.4	14.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	49.9	26.6	0.1	33.1	45.8	9.5		43.9		61.4	14.2	
LOS	D	C	A	C	D	A		D		E	B	
Approach Delay		29.2			36.4			43.9			40.9	
Approach LOS		C			D			D			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	131.6											
Actuated Cycle Length:	131.6											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	125											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.82											
Intersection Signal Delay:	34.9						Intersection LOS: C					
Intersection Capacity Utilization:	75.1%						ICU Level of Service D					
Analysis Period (min):	15											
Splits and Phases:	5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway											


Queues Future Background
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	143	853	26	19	987	341	80	297	228
v/c Ratio	0.75	0.54	0.04	0.10	0.82	0.49	0.24	0.78	0.46
Control Delay	49.9	26.6	0.1	33.1	45.8	9.5	43.9	61.4	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	26.6	0.1	33.1	45.8	9.5	43.9	61.4	14.2
Queue Length 50th (m)	22.7	87.5	0.0	3.5	131.4	10.1	17.4	74.7	11.5
Queue Length 95th (m)	45.9	110.1	0.0	10.7	#186.1	40.1	32.8	108.2	35.2
Internal Link Dist (m)	1046.0			237.8			302.3		
Turn Bay Length (m)	60.0	50.0		25.0	80.0				
Base Capacity (vph)	238	1578	740	191	1201	692	333	421	524
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	0.60	0.54	0.04	0.10	0.82	0.49	0.24	0.71	0.44

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

HCM Signalized Intersection Capacity Analysis Future Background
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	139	827	25	18	957	331	44	23	11	288	39	182
Traffic Volume (vph)	139	827	25	18	957	331	44	23	11	288	39	182
Future Volume (vph)	139	827	25	18	957	331	44	23	11	288	39	182
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99	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	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	0.98	1.00	0.88	1.00	0.88	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.97	0.97	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1662	3325	1455	1662	3292	1399	1671	1671	1614	1513	1513	1513
Flt Permitted	0.09	1.00	1.00	0.30	1.00	1.00	0.97	0.97	0.95	1.00	0.95	1.00
Satd. Flow (perm)	149	3325	1455	525	3292	1399	1671	1671	1614	1513	1513	1513
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	143	853	26	19	987	341	45	24	11	297	40	188
RTOR Reduction (vph)	0	0	14	0	0	181	0	4	0	0	133	0
Lane Group Flow (vph)	143	853	12	19	987	160	0	76	0	297	95	0
Confl. Peds. (#/hr)	1	1	1	1	1	1	3	3	3	3	3	3
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	3%	0%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	NA	NA
Protected Phases	7	4			8		2	2	6	6		
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	59.3	59.3	59.3	44.9	44.9	44.9	22.8	22.8	27.9	27.9		
Effective Green, g (s)	58.3	62.5	62.5	48.1	48.1	48.1	26.0	26.0	31.1	31.1		
Actuated g/C Ratio	0.44	0.47	0.47	0.37	0.37	0.37	0.20	0.20	0.24	0.24		
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2		
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0	4.0	4.0		
Lane Grp Cap (vph)	185	1579	691	191	1203	511	330	330	381	357		
v/s Ratio Prot	c0.06	0.26			c0.30		c0.05	c0.05	c0.18	0.06		
v/s Ratio Perm	0.28		0.01	0.04		0.11						
v/c Ratio	0.77	0.54	0.02	0.10	0.82	0.31	0.23	0.23	0.78	0.27		
Uniform Delay, d1	28.4	24.4	18.3	27.5	37.8	29.9	44.4	44.4	47.0	41.0		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	17.0	1.3	0.0	1.0	6.3	1.6	1.6	1.6	10.3	0.5		
Delay (s)	45.4	25.7	18.3	28.5	44.2	31.5	46.0	46.0	57.3	41.5		
Level of Service	D	C	B	C	D	C	D	D	E	D		
Approach Delay (s)	28.3			40.7			46.0			50.4		
Approach LOS	C			D			D			D		

Intersection Summary
 HCM 2000 Control Delay 38.3 HCM 2000 Level of Service D
 HCM 2000 Volume to Capacity ratio 0.69
 Actuated Cycle Length (s) 131.6 Sum of lost time (s) 19.2
 Intersection Capacity Utilization 75.1% ICU Level of Service D
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Future Background
Saturday Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	674	445	51	911	395	65
Future Volume (vph)	674	445	51	911	395	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor		0.98	1.00			0.99
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3292	1458	1421	3292	3162	1390
Flt Permitted			0.290		0.950	
Satd. Flow (perm)	3292	1428	433	3292	3162	1372
Right Turn on Red		Yes			Yes	
Satd. Flow (RTOR)		464				68
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Confl. Peds. (#/hr)		1	1			1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	17%	1%	2%	7%
Adj. Flow (vph)	702	464	53	949	411	68
Shared Lane Traffic (%)						
Lane Group Flow (vph)	702	464	53	949	411	68
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4		9.4		
Detector 2 Size(m)		0.6		0.6		
Detector 2 Type		CI+Ex		CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)		0.0		0.0		

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Future Background
Saturday Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	42.5	42.5	42.5	42.5	36.5	36.5
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.2%	46.2%
Maximum Green (s)	35.0	35.0	35.0	35.0	30.0	30.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	32.6	32.6	32.6	32.6	38.4	38.4
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.49	0.49
v/c Ratio	0.52	0.54	0.30	0.70	0.27	0.10
Control Delay	18.2	3.9	18.9	21.8	13.6	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	3.9	18.9	21.8	13.6	4.3
LOS	B	A	B	C	B	A
Approach Delay	12.5			21.6	12.3	
Approach LOS	B			C	B	
Intersection Summary						
Area Type:	Other					
Cycle Length: 79						
Actuated Cycle Length: 79						
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green						
Natural Cycle: 65						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.70						
Intersection Signal Delay: 15.9	Intersection LOS: B					
Intersection Capacity Utilization 65.2%	ICU Level of Service C					
Analysis Period (min) 15						
Splits and Phases: 6: Stanley Avenue & Marineland Parkway						
↖ Ø2 (R)	→ Ø4				↖ Ø8	
36.5 s	42.5 s				42.5 s	

Queues
6: Stanley Avenue & Marineland Parkway

Future Background
Saturday Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	702	464	53	949	411	68
v/c Ratio	0.52	0.54	0.30	0.70	0.27	0.10
Control Delay	18.2	3.9	18.9	21.8	13.6	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	3.9	18.9	21.8	13.6	4.3
Queue Length 50th (m)	41.5	0.0	5.4	62.1	19.0	0.0
Queue Length 95th (m)	49.7	14.7	12.9	72.5	32.4	7.2
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1604	933	211	1604	1537	702
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.50	0.25	0.59	0.27	0.10

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Future Background
Saturday Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕	↕	↕	↕↕	↕↕	↕
Traffic Volume (vph)	674	445	51	911	395	65
Future Volume (vph)	674	445	51	911	395	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frbp, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3292	1427	1420	3292	3162	1372
Flt Permitted	1.00	1.00	0.29	1.00	0.95	1.00
Satd. Flow (perm)	3292	1427	434	3292	3162	1372
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	702	464	53	949	411	68
RTOR Reduction (vph)	0	273	0	0	0	35
Lane Group Flow (vph)	702	191	53	949	411	33
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	1%	2%	17%	1%	2%	7%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	29.1	29.1	29.1	29.1	35.9	35.9
Effective Green, g (s)	32.6	32.6	32.6	32.6	38.4	38.4
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.49	0.49
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	1358	588	179	1358	1536	666
v/s Ratio Prot	0.21			c0.29	c0.13	
v/s Ratio Perm		0.13	0.12			0.02
v/c Ratio	0.52	0.33	0.30	0.70	0.27	0.05
Uniform Delay, d1	17.3	15.7	15.5	19.1	12.0	10.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.3	0.9	1.6	0.4	0.1
Delay (s)	17.6	16.0	16.4	20.7	12.4	10.8
Level of Service	B	B	B	C	B	B
Approach Delay (s)	17.0			20.5	12.2	
Approach LOS	B			C	B	

Intersection Summary

HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Background
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	25	235	3	540	275	80	5	152	539	157	207	58
Future Volume (vph)	25	235	3	540	275	80	5	152	539	157	207	58
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5		7.5			7.5			7.5			7.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Fit Permitted	0.569			0.950			0.611			0.950		
Satd. Flow (perm)	996	3197	1488	3131	3228	1390	1069	3197	1430	3101	3260	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			95			586			95
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		507.4			421.7			216.1			150.6	
Travel Time (s)		22.8			19.0			13.0			9.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Adj. Flow (vph)	27	255	3	587	299	87	5	165	586	171	225	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	255	3	587	299	87	5	165	586	171	225	63
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8			2		1		6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

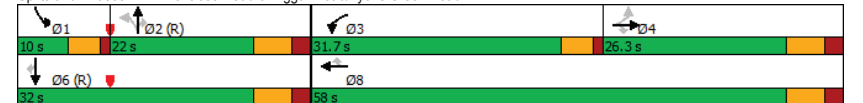
Future Background
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4		3	8	8	2	2	2	1	6
Detector Phase	4	4	4	4	3	8	8	2	2	2	1	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	31.7	58.0	58.0	22.0	22.0	22.0	10.0	32.0	32.0
Total Split (%)	29.2%	29.2%	29.2%	35.2%	64.4%	64.4%	24.4%	24.4%	24.4%	11.1%	35.6%	35.6%
Maximum Green (s)	20.0	20.0	20.0	27.2	51.7	51.7	15.7	15.7	15.7	5.5	25.7	25.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	15.4	17.7	15.4	22.0	44.1	41.8	21.4	23.7	21.4	9.7	37.9	35.6
Actuated g/C Ratio	0.17	0.20	0.17	0.24	0.49	0.46	0.24	0.26	0.24	0.11	0.42	0.40
v/c Ratio	0.16	0.41	0.01	0.77	0.19	0.12	0.02	0.20	0.75	0.51	0.16	0.10
Control Delay	32.8	33.1	0.0	38.6	12.3	2.4	30.8	28.7	10.1	45.3	18.4	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	33.1	0.0	38.6	12.3	2.4	30.8	28.7	10.1	45.3	18.4	2.7
LOS	C	C	A	D	B	A	C	C	C	B	D	B
Approach Delay		32.7			27.3			14.3				26.3
Approach LOS		C			C			B				C

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBL and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	23.7
Intersection Capacity Utilization:	61.8%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 7: Montrose Road & Biggar Road/Lyons Creek Road



Queues

7: Montrose Road & Biggar Road/Lyons Creek Road

Future Background

Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	255	3	587	299	87	5	165	586	171	225	63
v/c Ratio	0.16	0.41	0.01	0.77	0.19	0.12	0.02	0.20	0.75	0.51	0.16	0.10
Control Delay	32.8	33.1	0.0	38.6	12.3	2.4	30.8	28.7	10.1	45.3	18.4	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	33.1	0.0	38.6	12.3	2.4	30.8	28.7	10.1	45.3	18.4	2.7
Queue Length 50th (m)	4.3	21.5	0.0	51.1	15.3	0.0	0.7	12.5	0.0	15.1	13.0	0.0
Queue Length 95th (m)	11.3	31.3	0.0	64.7	17.8	5.5	3.9	22.6	#51.6	#33.7	24.8	4.7
Internal Link Dist (m)	483.4		397.7				192.1		126.6			
Turn Bay Length (m)	130.0	120.0		150.0	225.0		80.0	60.0	80.0	50.0		
Base Capacity (vph)	221	792	446	946	1936	838	254	842	786	333	1371	622
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	0.12	0.32	0.01	0.62	0.15	0.10	0.02	0.20	0.75	0.51	0.16	0.10

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

7: Montrose Road & Biggar Road/Lyons Creek Road

Future Background

Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↖↖	↘	↖↖	↖↖	↘	↖↖	↖↖	↘	↖↖	↖↖	↘
Traffic Volume (vph)	25	235	3	540	275	80	5	152	539	157	207	58
Future Volume (vph)	25	235	3	540	275	80	5	152	539	157	207	58
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit 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)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Fit Permitted	0.57	1.00	1.00	0.95	1.00	1.00	0.61	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	996	3197	1488	3131	3228	1390	1070	3197	1430	3101	3260	1430
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	255	3	587	299	87	5	165	586	171	225	63
RTOR Reduction (vph)	0	0	2	0	0	46	0	0	447	0	0	38
Lane Group Flow (vph)	27	255	1	587	299	41	5	165	139	171	225	25
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	4		3		8		2		1		6	
Permitted Phases	4		8		2		2		6			
Actuated Green, G (s)	15.4	15.4	15.4	22.0	41.9	41.9	21.3	21.3	9.7	35.5	35.5	
Effective Green, g (s)	15.4	17.7	15.4	22.0	44.2	41.9	21.3	23.6	21.3	9.7	37.8	35.5
Actuated g/C Ratio	0.17	0.20	0.17	0.24	0.49	0.47	0.24	0.26	0.24	0.11	0.42	0.39
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	170	628	254	765	1585	647	253	838	338	334	1369	564
v/s Ratio Prot	c0.08		c0.19		0.09		0.05		c0.06		0.07	
v/s Ratio Perm	0.03		0.00		0.03		0.00		c0.10		0.02	
v/c Ratio	0.16	0.41	0.00	0.77	0.19	0.06	0.02	0.20	0.41	0.51	0.16	0.04
Uniform Delay, d1	31.8	31.6	30.9	31.6	12.8	13.2	26.3	25.8	29.0	37.9	16.3	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	1.2	0.0	4.6	0.2	0.1	0.1	0.5	3.7	1.3	0.3	0.1
Delay (s)	33.0	32.8	30.9	36.3	13.0	13.4	26.5	26.4	32.7	39.2	16.5	16.9
Level of Service	C	C	C	D	B	B	C	C	C	D	B	B
Approach Delay (s)	32.8			27.1			31.3			25.0		
Approach LOS	C			C			C			C		

Intersection Summary

HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Background
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	49	3	3	3	10	10	3	302	2	3	405	42
Future Volume (vph)	49	3	3	3	10	10	3	302	2	3	405	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.993			0.941			0.999			0.987	
Flt Protected		0.957			0.994							
Satd. Flow (prot)	0	1634	0	0	1637	0	0	1693	0	0	1722	0
Flt Permitted		0.957			0.994							
Satd. Flow (perm)	0	1634	0	0	1637	0	0	1693	0	0	1722	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	2		8	8		2	11		5	5		11
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	33%	3%	0%	0%	0%	3%
Adj. Flow (vph)	53	3	3	3	11	11	3	325	2	3	435	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	0	0	25	0	0	330	0	0	483	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	45.5%				ICU Level of Service A							
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Future Background
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	49	3	3	3	10	10	3	302	2	3	405	42
Future Volume (vph)	49	3	3	3	10	10	3	302	2	3	405	42
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	53	3	3	3	11	11	3	325	2	3	435	45
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	59	25	330	483								
Volume Left (vph)	53	3	3	3								
Volume Right (vph)	3	11	2	45								
Hadj (s)	0.18	-0.24	0.05	-0.05								
Departure Headway (s)	6.0	5.6	4.7	4.5								
Degree Utilization, x	0.10	0.04	0.43	0.60								
Capacity (veh/h)	525	539	735	782								
Control Delay (s)	9.6	8.9	11.3	14.1								
Approach Delay (s)	9.6	8.9	11.3	14.1								
Approach LOS	A	A	B	B								
Intersection Summary												
Delay	12.6											
Level of Service	B											
Intersection Capacity Utilization	45.5%				ICU Level of Service A							
Analysis Period (min)	15											

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Background
Saturday Peak Hour

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑	↗	↘	↑
Traffic Volume (vph)	55	63	205	36	82	304
Future Volume (vph)	55	63	205	36	82	304
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.928			0.850		
Fit Protected	0.977				0.950	
Satd. Flow (prot)	1562	0	1750	1488	1646	1750
Fit Permitted	0.977				0.950	
Satd. Flow (perm)	1562	0	1750	1488	1646	1750
Link Speed (k/h)	50		60		60	
Link Distance (m)	1040.1		438.6		461.8	
Travel Time (s)	74.9		26.3		27.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	0%	3%	0%	0%	1%	0%
Adj. Flow (vph)	69	79	256	45	103	380
Shared Lane Traffic (%)						
Lane Group Flow (vph)	148	0	256	45	103	380
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	34.2%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Future Background
Saturday Peak Hour

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑	↗	↘	↑
Sign Control	Stop		Stop		Stop	Stop
Traffic Volume (vph)	55	63	205	36	82	304
Future Volume (vph)	55	63	205	36	82	304
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	69	79	256	45	102	380
Direction, Lane #						
	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total (vph)	148	256	45	102	380	
Volume Left (vph)	69	0	0	102	0	
Volume Right (vph)	79	0	45	0	0	
Hadj (s)	-0.20	0.00	-0.70	0.52	0.00	
Departure Headway (s)	5.4	5.4	4.7	5.8	5.2	
Degree Utilization, x	0.22	0.39	0.06	0.16	0.55	
Capacity (veh/h)	599	639	722	602	671	
Control Delay (s)	10.0	10.6	6.8	8.7	13.4	
Approach Delay (s)	10.0	10.1		12.4		
Approach LOS	B	B		B		
Intersection Summary						
Delay	11.2					
Level of Service	B					
Intersection Capacity Utilization	34.2%		ICU Level of Service		A	
Analysis Period (min)	15					

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Background
Saturday Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	2	24	134	13	31	2	206	504	10	2	494	2
Future Volume (vph)	2	24	134	13	31	2	206	504	10	2	494	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.887			0.995			0.998			0.998	
Fit Protected		0.999			0.986			0.986			0.986	
Satd. Flow (prot)	0	1551	0	0	1717	0	0	1710	0	0	1750	0
Fit Permitted		0.999			0.986			0.986			0.986	
Satd. Flow (perm)	0	1551	0	0	1717	0	0	1710	0	0	1750	0
Link Speed (k/h)		60			60			70			60	
Link Distance (m)		372.3			519.4			156.9			312.6	
Travel Time (s)		22.3			31.2			8.1			18.8	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	2	29	160	15	37	2	245	600	12	2	588	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	191	0	0	54	0	0	857	0	0	592	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	91.9%
Analysis Period (min)	15
	ICU Level of Service F

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Future Background
Saturday Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	2	24	134	13	31	2	206	504	10	2	494	2
Future Volume (Veh/h)	2	24	134	13	31	2	206	504	10	2	494	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	2	29	160	15	37	2	245	600	12	2	588	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None				None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1710	1695	589	1864	1690	606	590				612	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1710	1695	589	1864	1690	606	590				612	
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 %	94	59	69	31	48	100	75				100	
cM capacity (veh/h)	35	70	512	22	71	501	995				977	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	191	54	857	592								
Volume Left	2	15	245	2								
Volume Right	160	2	12	2								
cSH	245	44	995	977								
Volume to Capacity	0.78	1.22	0.25	0.00								
Queue Length 95th (m)	46.0	41.1	7.8	0.0								
Control Delay (s)	57.6	351.5	5.5	0.1								
Lane LOS	F	F	A	A								
Approach Delay (s)	57.6	351.5	5.5	0.1								
Approach LOS	F	F										

Intersection Summary	
Average Delay	20.5
Intersection Capacity Utilization	91.9%
Analysis Period (min)	15
	ICU Level of Service F

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Background
Saturday Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔	↔	↔	↕
Traffic Volume (vph)	479	518	444	117	109	284
Future Volume (vph)	479	518	444	117	109	284
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.972			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1646	1750	1694	0	1662	1488
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1646	1750	1694	0	1662	1488
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	515	557	477	126	117	305
Shared Lane Traffic (%)						
Lane Group Flow (vph)	515	557	603	0	117	305
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		25		15	25	15
Sign Control		Stop	Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	78.5%		ICU Level of Service D			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Future Background
Saturday Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔	↔	↔	↕
Sign Control		Stop	Stop		Stop	Stop
Traffic Volume (vph)	479	518	444	117	109	284
Future Volume (vph)	479	518	444	117	109	284
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	515	557	477	126	117	305
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	515	557	603	117	305	
Volume Left (vph)	515	0	0	117	0	
Volume Right (vph)	0	0	126	0	305	
Hadj (s)	0.52	0.00	-0.12	0.50	-0.70	
Departure Headway (s)	7.4	6.9	6.6	8.3	7.1	
Degree Utilization, x	1.05	1.06	1.10	0.27	0.60	
Capacity (veh/h)	482	533	550	430	495	
Control Delay (s)	81.9	81.1	95.0	13.1	19.0	
Approach Delay (s)	81.5		95.0		17.3	
Approach LOS	F		F		C	
Intersection Summary						
Delay	72.4					
Level of Service	F					
Intersection Capacity Utilization	78.5%		ICU Level of Service D			
Analysis Period (min)	15					

Queuing and Blocking Report

Future Background
Saturday Peak Hour

Intersection: 1: Montrose Road & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	R	L	T	T	R
Maximum Queue (m)	62.4	507.2	509.3	77.5	55.8	98.8	105.4	53.0	33.1	181.7	206.3	332.2
Average Queue (m)	38.9	215.1	217.3	69.7	22.6	50.5	54.3	17.6	10.7	22.8	36.4	94.9
95th Queue (m)	79.9	627.5	627.0	88.8	44.7	89.0	93.7	37.4	25.7	127.1	189.4	343.0
Link Distance (m)		740.7	740.7			665.6	665.6	665.6		699.7	699.7	699.7
Upstream Blk Time (%)		14	14									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (m)	55.0			70.0	155.0				115.0			
Storage Blk Time (%)	0	41	31	20								
Queuing Penalty (veh)	1	57	137	80								

Intersection: 1: Montrose Road & McLeod Road

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	121.6	143.4	132.2
Average Queue (m)	69.6	55.5	25.1
95th Queue (m)	131.2	173.4	79.9
Link Distance (m)		194.3	194.3
Upstream Blk Time (%)		18	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	130.0		
Storage Blk Time (%)	19	0	
Queuing Penalty (veh)	18	0	

Intersection: 2: Oakwood Drive & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	L	TR
Maximum Queue (m)	48.9	589.7	591.1	611.3	87.4	215.9	219.4	102.5	352.1	353.5	20.5	40.7
Average Queue (m)	11.0	285.7	287.6	260.0	47.0	61.2	64.4	78.7	306.6	283.3	7.1	9.6
95th Queue (m)	41.8	706.4	706.9	723.5	92.1	154.9	157.1	135.9	438.8	467.0	20.0	30.2
Link Distance (m)		665.6	665.6	665.6		592.5	592.5		342.6	342.6		164.6
Upstream Blk Time (%)		16	17	21					63	62		
Queuing Penalty (veh)		102	109	134					0	0		
Storage Bay Dist (m)	50.0				80.0			95.0			20.0	
Storage Blk Time (%)		51			4	7		18	60		13	1
Queuing Penalty (veh)		14			28	18		43	131		6	0

Queuing and Blocking Report

Future Background
Saturday Peak Hour

Intersection: 3: Dorchester Road & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	62.4	586.0	589.7	57.3	196.2	196.6	22.6	302.5	37.4	303.8
Average Queue (m)	47.0	444.9	446.6	25.2	80.8	83.6	20.8	221.6	36.1	298.1
95th Queue (m)	87.4	705.7	706.4	60.5	162.2	164.2	29.6	321.8	43.2	308.2
Link Distance (m)		592.5	592.5		1024.4	1024.4		325.7		294.0
Upstream Blk Time (%)		21	23					8		87
Queuing Penalty (veh)		166	185					29		0
Storage Bay Dist (m)	55.0			50.0			15.0		30.0	
Storage Blk Time (%)	14	58		0	21			48	56	46
Queuing Penalty (veh)	74	177		0	22		113	170	226	128

Intersection: 4: Drummond Road & McLeod Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LTR	L	TR
Maximum Queue (m)	944.6	945.6	815.7	816.3	428.9	27.4	205.8
Average Queue (m)	779.1	781.4	606.1	609.3	332.7	26.4	186.2
95th Queue (m)	1238.8	1237.8	1073.1	1075.2	510.7	31.1	240.3
Link Distance (m)	1024.4	1024.4	1047.7	1047.7	811.3		193.4
Upstream Blk Time (%)	24	25	12	14			57
Queuing Penalty (veh)	172	179	70	80			0
Storage Bay Dist (m)						20.0	
Storage Blk Time (%)						38	52
Queuing Penalty (veh)						162	138

Intersection: 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	L	TR
Maximum Queue (m)	57.2	75.5	79.4	38.8	27.2	199.4	195.8	87.5	51.0	186.6	157.3
Average Queue (m)	18.4	33.0	43.6	4.3	4.1	114.9	117.3	39.7	16.2	87.5	66.7
95th Queue (m)	41.7	67.1	79.2	22.9	18.5	219.3	221.6	111.0	45.2	200.1	199.0
Link Distance (m)		1047.7	1047.7			239.8	239.8		307.6	277.4	277.4
Upstream Blk Time (%)						13	13			9	8
Queuing Penalty (veh)						85	84			0	0
Storage Bay Dist (m)	60.0			50.0	25.0			80.0			
Storage Blk Time (%)	0	1	7	0		53	28	0			
Queuing Penalty (veh)	1	2	2	0		9	91	1			

Queuing and Blocking Report

Future Background
Saturday Peak Hour

Intersection: 6: Stanley Avenue & Marineland Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B57
Directions Served	T	T	R	L	T	T	L	L	R	T
Maximum Queue (m)	75.1	79.4	58.9	78.0	128.0	121.4	87.7	227.8	51.0	88.4
Average Queue (m)	34.6	35.4	8.0	13.5	68.7	67.6	33.6	68.3	9.0	9.4
95th Queue (m)	64.2	63.8	36.4	44.4	135.4	136.1	108.4	284.0	35.3	95.9
Link Distance (m)	239.8	239.8			155.4	155.4		485.6		1385.3
Upstream Blk Time (%)					13	13		4		
Queuing Penalty (veh)					0	0		22		
Storage Bay Dist (m)			65.0	105.0			160.0		80.0	
Storage Blk Time (%)		0	0	0	14		0	12	0	
Queuing Penalty (veh)		2	0	0	7		0	33	0	

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	T
Maximum Queue (m)	19.5	44.1	38.7	5.6	73.7	86.6	34.2	29.0	14.1	6.6	86.0
Average Queue (m)	5.5	25.1	12.8	0.6	41.6	53.9	11.2	11.2	4.5	0.7	21.2
95th Queue (m)	14.7	40.5	29.2	3.5	66.9	75.6	25.7	23.6	10.7	3.8	49.0
Link Distance (m)		488.7	488.7				403.0	403.0			196.3
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	130.0			120.0	150.0	150.0			225.0	80.0	
Storage Blk Time (%)											0
Queuing Penalty (veh)											1

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (m)	67.5	48.8	53.0	36.8	21.3	19.8
Average Queue (m)	43.0	8.7	28.9	15.7	5.7	3.9
95th Queue (m)	71.2	34.7	47.5	28.9	15.1	11.6
Link Distance (m)			130.6	130.6		
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	60.0	80.0	80.0		50.0	
Storage Blk Time (%)	12					
Queuing Penalty (veh)	9					

Queuing and Blocking Report

Future Background
Saturday Peak Hour

Intersection: 8: Dorchester Road & Jill Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	30.4	17.2	117.9	32.6
Average Queue (m)	9.2	5.6	30.3	15.2
95th Queue (m)	22.4	16.8	108.4	24.2
Link Distance (m)	110.7	156.1	446.2	325.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Dorchester Road & Oldfield Road

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	R	L	T
Maximum Queue (m)	21.1	30.0	22.4	14.2	17.0
Average Queue (m)	9.1	16.5	7.8	7.0	10.1
95th Queue (m)	16.7	25.7	18.6	14.0	14.5
Link Distance (m)	1018.8	424.6			446.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			15.0	15.0	
Storage Blk Time (%)		4	0	0	1
Queuing Penalty (veh)		1	0	1	1

Intersection: 10: Stanley Avenue & Chippawa Parkway

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	34.6	17.1	46.8	1.8
Average Queue (m)	13.9	8.4	16.1	0.1
95th Queue (m)	25.4	16.5	36.9	1.3
Link Distance (m)	355.4	511.0	139.9	295.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Future Background
Saturday Peak Hour

Intersection: 11: Lyons Creek Road & Stanley Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (m)	62.5	420.0	571.2	29.3	43.1
Average Queue (m)	61.5	344.4	392.0	9.3	14.9
95th Queue (m)	69.4	562.1	665.2	20.7	30.1
Link Distance (m)		442.7	589.0		785.7
Upstream Blk Time (%)		41	24		
Queuing Penalty (veh)		0	0		
Storage Bay Dist (m)	55.0			25.0	
Storage Blk Time (%)	84	5		0	2
Queuing Penalty (veh)	435	25		0	2

Zone Summary

Zone wide Queuing Penalty: 3781

Lanes, Volumes, Timings

1: Montrose Road & McLeod Road

Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	996	23	103	857	260	25	71	160	208	82	88
Future Volume (vph)	116	996	23	103	857	260	25	71	160	208	82	88
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0		0.0	115.0		0.0	130.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00					0.99
Frt		0.997				0.850			0.850			0.922
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	4485	0	1484	3228	1430	1662	3023	1340	1583	2890	0
Fit Permitted	0.136			0.151			0.636			0.638		
Satd. Flow (perm)	214	4485	0	236	3228	1430	1111	3023	1340	1063	2890	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				279			172			95
Link Speed (k/h)		50			50				50			50
Link Distance (m)		759.2			692.3			721.0				213.3
Travel Time (s)		54.7			49.8			51.9				15.4
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	6%	15%	12%	3%	4%	0%	10%	11%	5%	11%	0%
Adj. Flow (vph)	125	1071	25	111	922	280	27	76	172	224	88	95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	125	1096	0	111	922	280	27	76	172	224	183	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1		2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left		Thru
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0		10.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0		0.6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

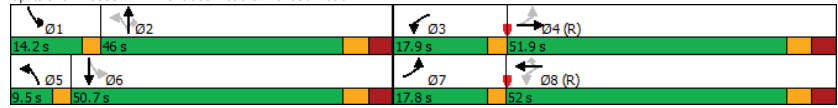
Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0	8.0	6.0	8.0	
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0	46.0	9.5	46.0	
Total Split (s)	17.8	51.9		17.9	52.0	52.0	9.5	46.0	46.0	14.2	50.7	
Total Split (%)	13.7%	39.9%		13.8%	40.0%	40.0%	7.3%	35.4%	35.4%	10.9%	39.0%	
Maximum Green (s)	14.8	43.9		14.9	44.0	44.0	6.5	38.0	38.0	11.2	42.7	
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0	-4.0	1.0	-4.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		12.0			12.0	12.0		14.0	14.0		14.0	
Flash Dont Walk (s)		20.0			20.0	20.0		24.0	24.0		24.0	
Pedestrian Calls (#/hr)		0			0	0		0	0		0	
Act Effct Green (s)	62.5	52.6		61.1	51.9	51.9	47.2	42.0	42.0	56.2	50.6	
Actuated g/C Ratio	0.48	0.40		0.47	0.40	0.40	0.36	0.32	0.32	0.43	0.39	
v/c Ratio	0.62	0.60		0.56	0.72	0.38	0.06	0.08	0.31	0.45	0.15	
Control Delay	31.7	32.5		17.0	16.8	4.7	22.1	30.9	6.1	28.0	13.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	31.7	32.5		17.0	16.8	4.7	22.1	30.9	6.1	28.0	13.5	
LOS	C	C		B	B	A	C	C	A	C	B	
Approach Delay		32.4			14.2			14.5			21.5	
Approach LOS		C			B			B			C	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	22.1
Intersection LOS:	C
Intersection Capacity Utilization:	74.4%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 1: Montrose Road & McLeod Road



Queues
1: Montrose Road & McLeod Road

Future Total
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	125	1096	111	922	280	27	76	172	224	183
v/c Ratio	0.62	0.60	0.56	0.72	0.38	0.06	0.08	0.31	0.45	0.15
Control Delay	31.7	32.5	17.0	16.8	4.7	22.1	30.9	6.1	28.0	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	32.5	17.0	16.8	4.7	22.1	30.9	6.1	28.0	13.5
Queue Length 50th (m)	17.7	83.9	3.4	101.0	14.8	4.1	7.4	0.0	39.3	8.1
Queue Length 95th (m)	29.8	105.0	m3.7	m139.1	m20.7	10.2	13.6	16.6	60.2	16.8
Internal Link Dist (m)		735.2		668.3			697.0			189.3
Turn Bay Length (m)	55.0		155.0			115.0				130.0
Base Capacity (vph)	243	1816	250	1289	738	429	976	549	500	1182
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.60	0.44	0.72	0.38	0.06	0.08	0.31	0.45	0.15

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Future Total
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	116	996	23	103	857	260	25	71	160	208	82	88	
Future Volume (vph)	116	996	23	103	857	260	25	71	160	208	82	88	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	
Ftpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1498	4483		1484	3228	1430	1661	3023	1340	1583	2891		
Flt Permitted	0.14	1.00		0.15	1.00	1.00	0.64	1.00	1.00	0.64	1.00		
Satd. Flow (perm)	215	4483		236	3228	1430	1113	3023	1340	1064	2891		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	125	1071	25	111	922	280	27	76	172	224	88	95	
RTOR Reduction (vph)	0	2	0	0	0	170	0	0	115	0	58	0	
Lane Group Flow (vph)	125	1094	0	111	922	110	27	76	57	224	125	0	
Confl. Peds. (#/hr)							2					2	
Heavy Vehicles (%)	11%	6%	15%	12%	3%	4%	0%	10%	11%	5%	11%	0%	
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA			
Protected Phases	7	4		3	8		5	2		1		6	
Permitted Phases	4			8		8	2		2		6		
Actuated Green, G (s)	58.3	47.4		56.9	46.7	46.7	43.0	39.2	39.2	53.4	46.6		
Effective Green, g (s)	56.3	51.4		54.9	50.7	50.7	41.0	43.2	43.2	52.4	50.6		
Actuated g/C Ratio	0.43	0.40		0.42	0.39	0.39	0.32	0.33	0.33	0.40	0.39		
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		
Lane Grp Cap (vph)	190	1772		187	1258	557	362	1004	445	469	1125		
v/s Ratio Prot	c0.05	0.24		0.04	c0.29		0.00	0.03		c0.04	0.04		
v/s Ratio Perm	0.23			0.21		0.08	0.02		0.04	c0.15			
v/c Ratio	0.66	0.62		0.59	0.73	0.20	0.07	0.08	0.13	0.48	0.11		
Uniform Delay, d1	26.3	31.4		25.2	33.9	26.2	31.0	29.7	30.3	27.7	25.3		
Progression Factor	1.00	1.00		0.63	0.44	1.21	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	7.1	1.6		2.2	2.1	0.4	0.1	0.1	0.6	0.6	0.2		
Delay (s)	33.4	33.1		18.0	17.1	32.1	31.0	29.9	30.9	28.3	25.5		
Level of Service	C	C		B	B	C	C	C	C	C	C		
Approach Delay (s)		33.1			20.4			30.6			27.0		
Approach LOS		C			C			C			C		
Intersection Summary													
HCM 2000 Control Delay		26.9		HCM 2000 Level of Service				C					
HCM 2000 Volume to Capacity ratio		0.60											
Actuated Cycle Length (s)		130.0	Sum of lost time (s)				16.0						
Intersection Capacity Utilization		74.4%	ICU Level of Service				D						
Analysis Period (min)		15											
c Critical Lane Group													

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	43	882	308	186	1332	22	193	18	178	13	5	19
Future Volume (vph)	43	882	308	186	1332	22	193	18	178	13	5	19
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0	0.0	80.0	0.0	95.0	0.0	95.0	0.0	20.0	0.0	0.0	0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5		7.5			7.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		1.00	1.00				0.99
Frt			0.850		0.998				0.850			0.881
Flt Protected	0.950			0.950			0.950	0.960		0.950		
Satd. Flow (prot)	1583	3167	1365	1511	3219	0	1462	1496	1403	1662	1388	0
Flt Permitted	0.087			0.139			0.950	0.960		0.950		
Satd. Flow (perm)	145	3167	1365	221	3219	0	1461	1495	1403	1662	1388	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			291		1				182		19	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		692.3			616.3			360.6			181.9	
Travel Time (s)		49.8			44.4			26.0			13.1	
Confl. Peds. (#/hr)	2				2		1					1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	5%	9%	10%	3%	5%	8%	0%	6%	0%	25%	6%
Adj. Flow (vph)	44	900	314	190	1359	22	197	18	182	13	5	19
Shared Lane Traffic (%)	46%											
Lane Group Flow (vph)	44	900	314	190	1381	0	106	109	182	13	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

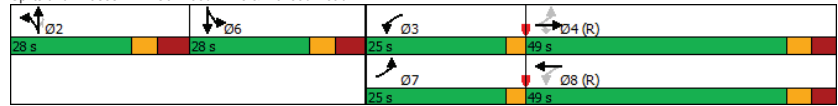
Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	25.0	49.0	49.0	25.0	49.0		28.0	28.0	28.0	28.0	28.0	
Total Split (%)	19.2%	37.7%	37.7%	19.2%	37.7%		21.5%	21.5%	21.5%	21.5%	21.5%	
Maximum Green (s)	22.0	41.0	41.0	22.0	41.0		19.0	19.0	19.0	19.0	19.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	57.1	51.2	46.2	70.0	61.9		24.0	24.0	24.0	24.0	24.0	
Actuated g/C Ratio	0.44	0.39	0.36	0.54	0.48		0.18	0.18	0.18	0.18	0.18	
v/c Ratio	0.34	0.72	0.47	0.71	0.90		0.39	0.39	0.45	0.04	0.09	
Control Delay	32.0	24.9	7.3	34.1	41.2		51.6	51.6	10.0	44.2	21.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	32.0	24.9	7.3	34.1	41.2		51.6	51.6	10.0	44.2	21.9	
LOS	C	C	A	C	D		D	D	B	D	C	
Approach Delay		20.8			40.4			32.5			29.7	
Approach LOS		C			D			C			C	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 155
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 31.7
 Intersection LOS: C
 Intersection Capacity Utilization 92.4%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 2: Oakwood Drive & McLeod Road



Queues
2: Oakwood Drive & McLeod Road

Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	44	900	314	190	1381	106	109	182	13	24
v/c Ratio	0.34	0.72	0.47	0.71	0.90	0.39	0.39	0.45	0.04	0.09
Control Delay	32.0	24.9	7.3	34.1	41.2	51.6	51.6	10.0	44.2	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	24.9	7.3	34.1	41.2	51.6	51.6	10.0	44.2	21.9
Queue Length 50th (m)	2.5	112.3	40.1	26.1	180.1	26.7	27.4	0.0	2.9	1.1
Queue Length 95th (m)	m9.3	148.3	70.0	48.5	#238.6	46.8	47.5	21.0	9.1	9.2
Internal Link Dist (m)		668.3			592.3		336.6			157.9
Turn Bay Length (m)	50.0			80.0		95.0			20.0	
Base Capacity (vph)	309	1246	672	327	1532	269	276	407	306	271
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.72	0.47	0.58	0.90	0.39	0.39	0.45	0.04	0.09

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Future Total
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↗	↔	↕	↗	↔	↕	↗	↔	↕	↗
Traffic Volume (vph)	43	882	308	186	1332	22	193	18	178	13	5	19
Future Volume (vph)	43	882	308	186	1332	22	193	18	178	13	5	19
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.88	
Fit Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3167	1365	1511	3218		1462	1496	1403	1662	1388	
Fit Permitted	0.09	1.00	1.00	0.14	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	144	3167	1365	221	3218		1462	1496	1403	1662	1388	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	44	900	314	190	1359	22	197	18	182	13	5	19
RTOR Reduction (vph)	0	0	188	0	1	0	0	0	148	0	15	0
Lane Group Flow (vph)	44	900	126	190	1380	0	106	109	34	13	9	0
Confl. Peds. (#/hr)	2					2	1					1
Heavy Vehicles (%)	5%	5%	9%	10%	3%	5%	8%	0%	6%	0%	25%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Split	NA	Perm	Split	NA	NA	NA
Protected Phases	7	4		3	8	2	2		6	6		
Permitted Phases	4		4	8				2				
Actuated Green, G (s)	52.9	47.2	47.2	66.0	57.3	19.0	19.0	19.0	19.0	19.0		
Effective Green, g (s)	50.9	51.2	46.2	65.0	61.3	24.0	24.0	24.0	24.0	24.0		
Actuated g/C Ratio	0.39	0.39	0.36	0.50	0.47	0.18	0.18	0.18	0.18	0.18		
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0	9.0	9.0	9.0	9.0	9.0		
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		
Lane Grp Cap (vph)	108	1247	485	257	1517	269	276	259	306	256		
v/s Ratio Prot	0.01	0.28		c0.08	c0.43	0.07	c0.07		c0.01	0.01		
v/s Ratio Perm	0.14		0.09	0.28				0.02				
v/c Ratio	0.41	0.72	0.26	0.74	0.91	0.39	0.39	0.13	0.04	0.03		
Uniform Delay, d1	29.2	33.4	29.8	23.5	31.8	46.6	46.6	44.3	43.6	43.5		
Progression Factor	1.58	0.63	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	1.5	3.1	1.1	10.0	9.7	4.3	4.2	1.0	0.3	0.2		
Delay (s)	47.8	24.0	32.2	33.5	41.5	50.9	50.8	45.3	43.8	43.7		
Level of Service	D	C	C	C	D	D	D	D	D	D		
Approach Delay (s)		26.9			40.5		48.3			43.8		
Approach LOS		C			D		D			D		

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↗	↔	↕	↗	↔	↕	↗	↔	↕	↗
Traffic Volume (vph)	264	658	176	71	744	173	414	239	136	174	152	302
Future Volume (vph)	264	658	176	71	744	173	414	239	136	174	152	302
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0	0.0	15.0	0.0	30.0	0.0	30.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	0
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.99	0.99		0.98		0.98		0.97	0.98	
Frt	0.968			0.972		0.946		0.900				
Fit Protected	0.950			0.950		0.950		0.950		0.950		
Satd. Flow (prot)	1554	3059	0	1599	3056	0	1599	1549	0	1568	1458	0
Fit Permitted	0.111			0.173		0.118		0.405				
Satd. Flow (perm)	182	3059	0	288	3056	0	199	1549	0	651	1458	0
Right Turn on Red		Yes			Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)	31			23			27		82			
Link Speed (k/h)	50			50			50		50			
Link Distance (m)	616.3			1045.5			348.9		308.0			
Travel Time (s)	44.4			75.3			25.1		22.2			
Confl. Peds. (#/hr)	7		21	21		7	10		44	44		10
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	7%	3%	6%	4%	5%	4%	3%	7%	6%	5%	7%	
Adj. Flow (vph)	290	723	193	78	818	190	455	263	149	191	167	332
Shared Lane Traffic (%)												
Lane Group Flow (vph)	290	916	0	78	1008	0	455	412	0	191	499	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6			3.6			3.6		3.6		3.6	
Link Offset(m)	0.0			0.0			0.0		0.0		0.0	
Crosswalk Width(m)	4.8			4.8			4.8		4.8		4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)	9.4			9.4			9.4			9.4		
Detector 2 Size(m)	0.6			0.6			0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0			0.0		

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

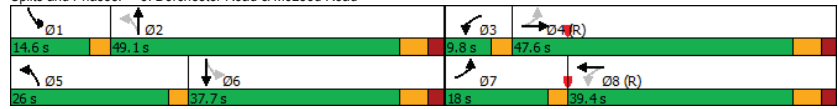
Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA		
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases	4		8		2		6					
Detector Phase	7	4	3	8	5	2	1	6				
Switch Phase												
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	8.0	5.0	8.0				
Minimum Split (s)	9.5	30.4	9.5	30.4	9.5	37.7	9.5	37.7				
Total Split (s)	18.0	47.6	9.8	39.4	26.0	49.1	14.6	37.7				
Total Split (%)	14.9%	39.3%	8.1%	32.5%	21.5%	40.5%	12.1%	31.1%				
Maximum Green (s)	15.0	41.2	6.8	33.0	23.0	42.4	11.6	31.0				
Yellow Time (s)	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1				
All-Red Time (s)	0.0	2.3	0.0	2.3	0.0	2.6	0.0	2.6				
Lost Time Adjust (s)	1.0	-2.4	1.0	-2.4	1.0	-2.7	1.0	-2.7				
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None				
Walk Time (s)		9.0		9.0		12.0		12.0				
Flash Dont Walk (s)		15.0		15.0		19.0		19.0				
Pedestrian Calls (#/hr)		0		0		0		0				
Act Effct Green (s)	53.4	45.6	41.1	35.4	59.7	45.5	43.9	33.7				
Actuated g/C Ratio	0.44	0.38	0.34	0.29	0.49	0.38	0.61	0.28				
v/c Ratio	1.22	0.78	0.49	1.11	1.29	0.69	0.61	1.08				
Control Delay	159.5	38.5	32.3	103.7	181.9	36.9	29.4	98.8				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Total Delay	159.5	38.5	32.3	103.7	181.9	36.9	29.4	98.8				
LOS	F	D	C	F	F	D	C	F				
Approach Delay		67.6		98.6		113.0		79.6				
Approach LOS		E		F		F		E				

Intersection Summary

Area Type: Other
 Cycle Length: 121.1
 Actuated Cycle Length: 121.1
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.29
 Intersection Signal Delay: 88.7 Intersection LOS: F
 Intersection Capacity Utilization 112.1% ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 3: Dorchester Road & McLeod Road



Queues
3: Dorchester Road & McLeod Road

Future Total
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	290	916	78	1008	455	412	191	499
v/c Ratio	1.22	0.78	0.49	1.11	1.29	0.69	0.61	1.08
Control Delay	159.5	38.5	32.3	103.7	181.9	36.9	29.4	98.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	159.5	38.5	32.3	103.7	181.9	36.9	29.4	98.8
Queue Length 50th (m)	-73.3	105.4	11.3	-149.7	-129.4	81.1	26.8	-123.2
Queue Length 95th (m)	#131.0	132.8	21.2	#193.2	#196.1	120.2	42.7	#192.0
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	238	1170	160	909	352	599	318	464
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	1.22	0.78	0.49	1.11	1.29	0.69	0.60	1.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Future Total
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	264	658	176	71	744	173	414	239	136	174	152	302
Future Volume (vph)	264	658	176	71	744	173	414	239	136	174	152	302
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.95		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)	1554	3060		1596	3055		1599	1549		1553	1458	
Flt Permitted	0.11	1.00		0.17	1.00		0.12	1.00		0.41	1.00	
Satd. Flow (perm)	182	3060		291	3055		198	1549		663	1458	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	290	723	193	78	818	190	455	263	149	191	167	332
RTOR Reduction (vph)	0	19	0	0	16	0	0	17	0	0	59	0
Lane Group Flow (vph)	290	897	0	78	992	0	455	395	0	191	440	0
Confl. Peds. (#/hr)	7		21	21		7	10		44	44		10
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	51.0	42.6		38.4	33.0		57.0	42.8		42.2	31.0	
Effective Green, g (s)	50.0	45.0		36.4	35.4		56.0	45.5		40.2	33.7	
Actuated g/C Ratio	0.41	0.37		0.30	0.29		0.46	0.38		0.33	0.28	
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	233	1137		134	893		346	581		295	405	
v/s Ratio Prot	c0.14	0.29		0.02	0.32		c0.24	0.26		0.05	0.30	
v/s Ratio Perm	c0.37			0.15			c0.37			0.16		
v/c Ratio	1.24	0.79		0.58	1.11		1.32	0.68		0.65	1.09	
Uniform Delay, d1	35.0	33.8		32.1	42.8		37.0	31.7		31.7	43.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	140.8	5.6		6.3	65.2		160.9	3.3		4.8	69.8	
Delay (s)	175.8	39.4		38.4	108.0		197.9	35.0		36.5	113.5	
Level of Service	F	D		D	F		F	C		D	F	
Approach Delay (s)		72.2			103.0			120.5			92.2	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	95.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	112.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	176	632	122	53	596	192	277	278	134	132	148	178
Future Volume (vph)	176	632	122	53	596	192	277	278	134	132	148	178
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			0.99			0.99			1.00	0.99	
Frt	0.980			0.966			0.974			0.974	0.918	
Flt Protected	0.991			0.997			0.980			0.950		
Satd. Flow (prot)	0	3129	0	0	2961	0	0	1591	0	1646	1484	0
Flt Permitted	0.543			0.700			0.578			0.388		
Satd. Flow (perm)	0	1714	0	0	2079	0	0	937	0	670	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			41			16			82	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1045.5			1070.0			834.0			207.0	
Travel Time (s)		75.3			77.0			60.0			14.9	
Confl. Peds. (#/hr)	7		3	3		7	4		13	13		4
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
Heavy Vehicles (%)	5%	2%	4%	56%	4%	4%	4%	7%	0%	1%	10%	5%
Adj. Flow (vph)	196	702	136	59	662	213	308	309	149	147	164	198
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1034	0	0	934	0	0	766	0	147	362	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

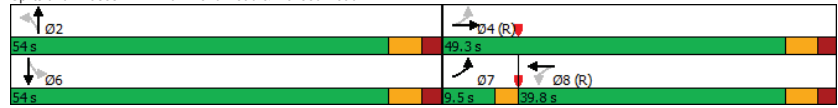
Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4				8			2			6
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	30.5		30.5	30.5		30.8	30.8		30.8	30.8	
Total Split (s)	9.5	49.3		39.8	39.8		54.0	54.0		54.0	54.0	
Total Split (%)	9.2%	47.7%		38.5%	38.5%		52.3%	52.3%		52.3%	52.3%	
Maximum Green (s)	6.5	42.8		33.3	33.3		47.2	47.2		47.2	47.2	
Yellow Time (s)	3.0	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	2.4		2.4	2.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		-2.5			-2.5			-2.8			-2.8	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag	Lead			Lag			Lag					
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)		9.0		9.0	9.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)		15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)		45.3			45.3			50.0			50.0	
Actuated g/C Ratio		0.44			0.44			0.48			0.48	
v/c Ratio		1.36			1.00			1.66			0.45	0.48
Control Delay		195.3			58.2			330.9			23.3	15.9
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		195.3			58.2			330.9			23.3	15.9
LOS		F			E			F			C	B
Approach Delay		195.3			58.2			330.9			18.1	
Approach LOS		F			E			F			B	

Intersection Summary

Area Type:	Other
Cycle Length:	103.3
Actuated Cycle Length:	103.3
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.66
Intersection Signal Delay:	160.0
Intersection LOS:	F
Intersection Capacity Utilization:	130.7%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 4: Drummond Road & McLeod Road



Queues
4: Drummond Road & McLeod Road

Future Total
AM Peak Hour

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1034	934	766	147	362
v/c Ratio	1.36	1.00	1.66	0.45	0.48
Control Delay	195.3	58.2	330.9	23.3	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	195.3	58.2	330.9	23.3	15.9
Queue Length 50th (m)	~151.4	98.2	~237.1	19.8	37.6
Queue Length 95th (m)	#193.3	#146.8	#311.8	39.1	62.8
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	763	934	461	324	760
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.36	1.00	1.66	0.45	0.48

Intersection Summary

~	Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Future Total
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	176	632	122	53	596	192	277	278	134	132	148	178
Future Volume (vph)	176	632	122	53	596	192	277	278	134	132	148	178
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0				4.0				4.0			
Lane Util. Factor	0.95				0.95				1.00			
Frbp, ped/bikes	1.00				0.99				1.00			
Flpb, ped/bikes	1.00				1.00				1.00			
Frt	0.98				0.97				1.00			
Flt Protected	0.99				1.00				0.98			
Satd. Flow (prot)	3127				2960				1589		1641	
Flt Permitted	0.54				0.70				0.58		0.39	
Satd. Flow (perm)	1713				2079				937		669	
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)	196	702	136	59	662	213	308	309	149	147	164	198
RTOR Reduction (vph)	0	12	0	0	23	0	0	8	0	0	42	0
Lane Group Flow (vph)	0	1022	0	0	911	0	0	758	0	147	320	0
Confl. Peds. (#/hr)	7		3	3		7	4		13	13		4
Heavy Vehicles (%)	5%	2%	4%	56%	4%	4%	4%	7%	0%	1%	10%	5%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2				6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.8				42.8				47.2		47.2	
Effective Green, g (s)	45.3				45.3				50.0		50.0	
Actuated g/C Ratio	0.44				0.44				0.48		0.48	
Clearance Time (s)	6.5				6.5				6.8		6.8	
Vehicle Extension (s)	2.5				2.5				2.5		2.5	
Lane Grp Cap (vph)	751				911				453		323	
v/s Ratio Prot											0.22	
v/s Ratio Perm	c0.60				0.44				c0.81		0.22	
v/c Ratio	1.36				1.00				1.67		0.46	
Uniform Delay, d1	29.0				29.0				26.6		17.6	
Progression Factor	1.00				1.00				1.00		1.00	
Incremental Delay, d2	171.1				29.8				312.3		4.6	
Delay (s)	200.1				58.8				339.0		22.2	
Level of Service	F				E				F		C	
Approach Delay (s)	200.1				58.8				339.0		20.3	
Approach LOS	F				E				F		C	
Intersection Summary												
HCM 2000 Control Delay	164.0				HCM 2000 Level of Service				F			
HCM 2000 Volume to Capacity ratio	1.57											
Actuated Cycle Length (s)	103.3				Sum of lost time (s)				11.0			
Intersection Capacity Utilization	130.7%				ICU Level of Service				H			
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings

5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

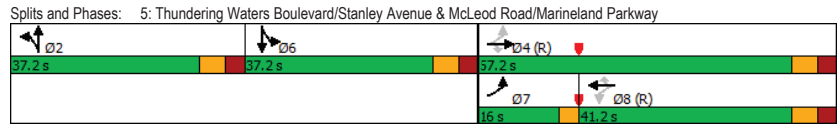
Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	167	535	14	4	688	264	73	30	11	213	12	69
Future Volume (vph)	167	535	14	4	688	264	73	30	11	213	12	69
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.98				0.98			
Frt			0.850				0.850		0.987		0.872	
Flt Protected	0.950				0.950				0.969		0.950	
Satd. Flow (prot)	1599		3228		1488		1662		3137		1417	
Flt Permitted	0.127				0.428				0.969		0.950	
Satd. Flow (perm)	214		3228		1488		749		3137		1385	
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)			95				293				4	
Link Speed (k/h)			50				50				50	
Link Distance (m)			1070.0				261.8				326.3	
Travel Time (s)			77.0				18.8				23.5	
Confl. Peds. (#/hr)	1						1					
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
Heavy Vehicles (%)	4%	3%	0%	0%	6%	5%	0%	0%	0%	8%	0%	14%
Adj. Flow (vph)	186	594	16	4	764	293	81	33	12	237	13	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	186	594	16	4	764	293	0	126	0	237	90	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6				3.6				3.6		3.6	
Link Offset(m)	0.0				0.0				0.0		0.0	
Crosswalk Width(m)	4.8				4.8				4.8		4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15		25		15		25		15	
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	2
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4				9.4				9.4		9.4	
Detector 2 Size(m)	0.6				0.6				0.6		0.6	
Detector 2 Type	Cl+Ex				Cl+Ex				Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0				0.0				0.0		0.0	

Lanes, Volumes, Timings Future Total
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	NA	
Protected Phases	7	4				8	2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	16.0	57.2	57.2	41.2	41.2	41.2	37.2	37.2		37.2	37.2	
Total Split (%)	12.2%	43.5%	43.5%	31.3%	31.3%	31.3%	28.3%	28.3%		28.3%	28.3%	
Maximum Green (s)	13.0	50.0	50.0	34.0	34.0	34.0	30.0	30.0		30.0	30.0	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	57.9	57.9	57.9	40.7	40.7	40.7		33.2		28.5	28.5	
Actuated g/C Ratio	0.44	0.44	0.44	0.31	0.31	0.31		0.25		0.22	0.22	
v/c Ratio	0.80	0.42	0.02	0.02	0.79	0.47		0.30		0.71	0.25	
Control Delay	51.2	27.2	0.1	34.5	49.3	6.6		40.8		59.6	12.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	51.2	27.2	0.1	34.5	49.3	6.6		40.8		59.6	12.9	
LOS	D	C	A	C	D	A		D		E	B	
Approach Delay		32.2			37.4			40.8			46.8	
Approach LOS		C			D			D			D	

Intersection Summary
 Area Type: Other
 Cycle Length: 131.6
 Actuated Cycle Length: 131.6
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 37.1
 Intersection LOS: D
 Intersection Capacity Utilization 64.8%
 ICU Level of Service C
 Analysis Period (min) 15



Queues Future Total
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	186	594	16	4	764	293	126	237	90
v/c Ratio	0.80	0.42	0.02	0.02	0.79	0.47	0.30	0.71	0.25
Control Delay	51.2	27.2	0.1	34.5	49.3	6.6	40.8	59.6	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	27.2	0.1	34.5	49.3	6.6	40.8	59.6	12.9
Queue Length 50th (m)	32.1	58.4	0.0	0.8	104.4	0.0	27.0	59.9	2.8
Queue Length 95th (m)	#75.5	79.0	0.0	3.8	#136.9	22.9	45.9	87.0	17.0
Internal Link Dist (m)		1046.0			237.8		302.3		270.0
Turn Bay Length (m)	60.0		50.0	25.0		80.0			
Base Capacity (vph)	234	1421	708	231	969	630	425	388	401
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	0.79	0.42	0.02	0.02	0.79	0.47	0.30	0.61	0.22

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

HCM Signalized Intersection Capacity Analysis
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway
 Future Total AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔		↔		↔	↔	↔	
Traffic Volume (vph)	167	535	14	4	688	264	73	30	11	213	12	69	
Future Volume (vph)	167	535	14	4	688	264	73	30	11	213	12	69	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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		
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	1.00	0.85		0.99		1.00	0.87		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00		
Satd. Flow (prot)	1599	3228	1488	1662	3137	1385		1674		1539	1362		
Flt Permitted	0.13	1.00	1.00	0.43	1.00	1.00		0.97		0.95	1.00		
Satd. Flow (perm)	214	3228	1488	748	3137	1385		1674		1539	1362		
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)	186	594	16	4	764	293	81	33	12	237	13	77	
RTOR Reduction (vph)	0	0	9	0	0	203	0	3	0	0	60	0	
Lane Group Flow (vph)	186	594	7	4	764	90	0	123	0	237	30	0	
Confl. Peds. (#/hr)	1				1								
Heavy Vehicles (%)	4%	3%	0%	0%	6%	5%	0%	0%	0%	8%	0%	14%	
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA		
Protected Phases	7	4			8		2	2		6	6		
Permitted Phases	4		4	8		8							
Actuated Green, G (s)	54.7	54.7	54.7	37.4	37.4	37.4		30.0		25.3	25.3		
Effective Green, g (s)	53.7	57.9	57.9	40.6	40.6	40.6		33.2		28.5	28.5		
Actuated g/C Ratio	0.41	0.44	0.44	0.31	0.31	0.31		0.25		0.22	0.22		
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2		7.2		7.2	7.2		
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5		4.0		4.0	4.0		
Lane Grp Cap (vph)	227	1420	654	230	967	427		422		333	294		
v/s Ratio Prot	c0.08	0.18			c0.24			c0.07		c0.15	0.02		
v/s Ratio Perm	0.25		0.00	0.01		0.07							
v/c Ratio	0.82	0.42	0.01	0.02	0.79	0.21		0.29		0.71	0.10		
Uniform Delay, d1	29.8	25.3	20.7	31.6	41.6	33.7		39.7		47.7	41.3		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	19.4	0.9	0.0	0.1	6.6	1.1		1.7		7.5	0.2		
Delay (s)	49.3	26.2	20.8	31.8	48.2	34.8		41.5		55.2	41.5		
Level of Service	D	C	C	C	D	C		D		E	D		
Approach Delay (s)		31.5			44.4			41.5			51.5		
Approach LOS		C			D			D			D		
Intersection Summary													
HCM 2000 Control Delay			40.8		HCM 2000 Level of Service							D	
HCM 2000 Volume to Capacity ratio			0.65										
Actuated Cycle Length (s)			131.6		Sum of lost time (s)						19.2		
Intersection Capacity Utilization			64.8%		ICU Level of Service						C		
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 6: Stanley Avenue & Marineland Parkway
 Future Total AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	365	392	48	514	437	46
Future Volume (vph)	365	392	48	514	437	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						0.99
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3228	1390	1385	3228	2880	1316
Flt Permitted			0.438		0.950	
Satd. Flow (perm)	3228	1390	639	3228	2880	1300
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		431				51
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	7%	20%	3%	12%	13%
Adj. Flow (vph)	401	431	53	565	480	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	401	431	53	565	480	51
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

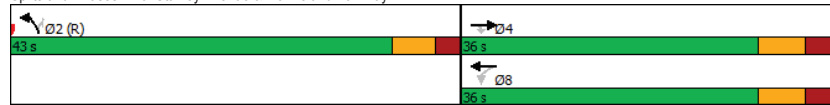
Future Total
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	36.0	36.0	36.0	36.0	43.0	43.0
Total Split (%)	45.6%	45.6%	45.6%	45.6%	54.4%	54.4%
Maximum Green (s)	28.5	28.5	28.5	28.5	36.5	36.5
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	22.9	22.9	22.9	22.9	48.1	48.1
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.61	0.61
v/c Ratio	0.43	0.61	0.29	0.60	0.27	0.06
Control Delay	23.6	6.2	24.7	26.6	8.4	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	6.2	24.7	26.6	8.4	2.8
LOS	C	A	C	C	A	A
Approach Delay	14.6			26.4	7.9	
Approach LOS	B			C	A	

Intersection Summary

Area Type: Other
 Cycle Length: 79
 Actuated Cycle Length: 79
 Offset: 0 (0%), Referenced to phase 2:NBL and 6:; Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 16.5
 Intersection LOS: B
 Intersection Capacity Utilization 56.0%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 6: Stanley Avenue & Marineland Parkway



Queues
6: Stanley Avenue & Marineland Parkway

Future Total
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	401	431	53	565	480	51
v/c Ratio	0.43	0.61	0.29	0.60	0.27	0.06
Control Delay	23.6	6.2	24.7	26.6	8.4	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	6.2	24.7	26.6	8.4	2.8
Queue Length 50th (m)	27.0	0.0	6.5	40.4	16.2	0.0
Queue Length 95th (m)	35.5	18.8	14.9	50.8	29.1	4.7
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1307	819	258	1307	1755	811
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.53	0.21	0.43	0.27	0.06

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Future Total
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	365	392	48	514	437	46
Future Volume (vph)	365	392	48	514	437	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3228	1390	1385	3228	2880	1300
Flt Permitted	1.00	1.00	0.44	1.00	0.95	1.00
Satd. Flow (perm)	3228	1390	639	3228	2880	1300
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	401	431	53	565	480	51
RTOR Reduction (vph)	0	306	0	0	0	20
Lane Group Flow (vph)	401	125	53	565	480	31
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	3%	7%	20%	3%	12%	13%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	19.4	19.4	19.4	19.4	45.6	45.6
Effective Green, g (s)	22.9	22.9	22.9	22.9	48.1	48.1
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.61	0.61
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	935	402	185	935	1753	791
v/s Ratio Prot	0.12			c0.18	c0.17	
v/s Ratio Perm		0.09	0.08			0.02
v/c Ratio	0.43	0.31	0.29	0.60	0.27	0.04
Uniform Delay, d1	22.7	21.9	21.7	24.1	7.3	6.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.4	0.8	1.1	0.4	0.1
Delay (s)	23.0	22.3	22.5	25.2	7.6	6.3
Level of Service	C	C	C	C	A	A
Approach Delay (s)	22.7			25.0	7.5	
Approach LOS	C			C	A	
Intersection Summary						
HCM 2000 Control Delay			19.3		HCM 2000 Level of Service B	
HCM 2000 Volume to Capacity ratio			0.38			
Actuated Cycle Length (s)			79.0		Sum of lost time (s) 8.0	
Intersection Capacity Utilization			56.0%		ICU Level of Service B	
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	44	201	1	368	196	109	4	180	513	67	89	13
Future Volume (vph)	44	201	1	368	196	109	4	180	513	67	89	13
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0			120.0	150.0			225.0	80.0	60.0	80.0	50.0
Storage Lanes	1			1	2			1	1	1	2	1
Taper Length (m)	7.5			7.5				7.5			7.5	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950		0.950			0.950
Satd. Flow (prot)	1614	3197	744	2959	3107	1377	1662	3137	1458	2757	2891	1365
Flt Permitted	0.618			0.950			0.691		0.950			0.950
Satd. Flow (perm)	1050	3197	744	2959	3107	1377	1209	3137	1458	2757	2891	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168			118			558			106
Link Speed (k/h)		80			80			60				60
Link Distance (m)		507.4			421.7			216.1				150.6
Travel Time (s)		22.8			19.0			13.0				9.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	100%	9%	7%	8%	0%	6%	2%	17%	15%	9%
Adj. Flow (vph)	48	218	1	400	213	118	4	196	558	73	97	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	218	1	400	213	118	4	196	558	73	97	14
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	7.2				7.2			7.2				7.2
Link Offset(m)	0.0				0.0			0.0				0.0
Crosswalk Width(m)	4.8				4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4			3			8			2	
												1
												6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

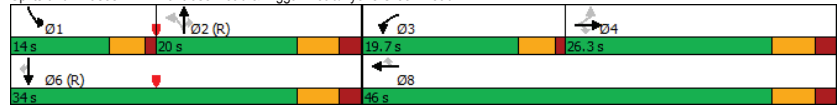
Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4			8	2		2			6
Detector Phase	4	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	19.7	46.0	46.0	20.0	20.0	20.0	14.0	34.0	34.0
Total Split (%)	32.9%	32.9%	32.9%	24.6%	57.5%	57.5%	25.0%	25.0%	25.0%	17.5%	42.5%	42.5%
Maximum Green (s)	20.0	20.0	20.0	15.2	39.7	39.7	13.7	13.7	13.7	9.5	27.7	27.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	13.7	16.0	13.7	14.2	34.8	32.5	24.9	27.2	24.9	7.5	37.2	34.9
Actuated g/C Ratio	0.17	0.20	0.17	0.18	0.44	0.41	0.31	0.34	0.31	0.09	0.46	0.44
v/c Ratio	0.27	0.34	0.00	0.76	0.16	0.19	0.01	0.18	0.67	0.28	0.07	0.02
Control Delay	31.8	28.4	0.0	41.4	13.3	3.5	24.2	21.9	7.4	36.0	13.3	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	0.0
Total Delay	31.8	28.4	0.0	41.4	13.3	3.5	24.2	21.9	7.4	36.0	13.3	0.1
LOS	C	C	A	D	B	A	C	C	A	D	B	A
Approach Delay	28.9			27.1			11.2			21.3		
Approach LOS	C			C			B			C		

Intersection Summary

Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBL and 6:SBT, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	20.6
Intersection Capacity Utilization:	59.3%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 7: Montrose Road & Biggar Road/Lyons Creek Road



Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	48	218	1	400	213	118	4	196	558	73	97	14
v/c Ratio	0.27	0.34	0.00	0.76	0.16	0.19	0.01	0.18	0.67	0.28	0.07	0.02
Control Delay	31.8	28.4	0.0	41.4	13.3	3.5	24.2	21.9	7.4	36.0	13.3	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	0.0
Total Delay	31.8	28.4	0.0	41.4	13.3	3.5	24.2	21.9	7.4	36.0	13.3	0.1
Queue Length 50th (m)	6.8	15.9	0.0	31.1	10.3	0.0	0.5	12.1	0.0	5.7	4.4	0.0
Queue Length 95th (m)	15.8	24.4	0.0	46.3	15.3	8.5	3.0	22.6	31.5	11.7	9.5	0.0
Internal Link Dist (m)	483.4			397.7			192.1			126.6		
Turn Bay Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Base Capacity (vph)	262	891	312	562	1631	742	376	1068	838	327	1346	655
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	0.18	0.24	0.00	0.71	0.13	0.16	0.01	0.18	0.67	0.22	0.07	0.02

Intersection Summary

Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBL and 6:SBT, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	20.6
Intersection Capacity Utilization:	59.3%
ICU Level of Service:	B
Analysis Period (min):	15

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	44	201	1	368	196	109	4	180	513	67	89	13
Future Volume (vph)	44	201	1	368	196	109	4	180	513	67	89	13
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	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
Fit 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)	1614	3197	744	2959	3107	1377	1662	3137	1458	2757	2891	1365
Fit Permitted	0.62	1.00	1.00	0.95	1.00	1.00	0.69	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1051	3197	744	2959	3107	1377	1209	3137	1458	2757	2891	1365
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	218	1	400	213	118	4	196	558	73	97	14
RTOR Reduction (vph)	0	0	1	0	0	70	0	0	391	0	0	8
Lane Group Flow (vph)	48	218	0	400	213	48	4	196	167	73	97	6
Heavy Vehicles (%)	3%	4%	100%	9%	7%	8%	0%	6%	2%	17%	15%	9%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8			2		1		6
Permitted Phases	4		4			8	2		2			6
Actuated Green, G (s)	13.8	13.8	13.8	14.2	32.5	32.5	24.0	24.0	24.0	6.4	34.9	34.9
Effective Green, g (s)	13.8	16.1	13.8	14.2	34.8	32.5	24.0	26.3	24.0	6.4	37.2	34.9
Actuated g/C Ratio	0.17	0.20	0.17	0.18	0.43	0.41	0.30	0.33	0.30	0.08	0.47	0.44
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	181	643	128	525	1351	559	362	1031	437	220	1344	595
v/s Ratio Prot		c0.07		c0.14	0.07			0.06		c0.03		0.03
v/s Ratio Perm	0.05		0.00			0.03	0.00		c0.11			0.00
v/c Ratio	0.27	0.34	0.00	0.76	0.16	0.09	0.01	0.19	0.38	0.33	0.07	0.01
Uniform Delay, d1	28.7	27.4	27.4	31.3	13.7	14.6	19.7	19.2	22.1	34.8	11.8	12.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.9	0.0	6.5	0.2	0.2	0.1	0.4	2.5	0.9	0.1	0.0
Delay (s)	30.9	28.3	27.4	37.7	13.9	14.8	19.7	19.6	24.7	35.7	12.0	12.8
Level of Service	C	C	C	D	B	B	B	B	C	D	B	B
Approach Delay (s)		28.7			27.1			23.3			21.4	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			25.3		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			80.0		Sum of lost time (s)				17.0			
Intersection Capacity Utilization			59.3%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	55	23	0	1	3	4	3	546	8	0	261	27
Future Volume (vph)	55	23	0	1	3	4	3	546	8	0	261	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998			0.987	
Fit Protected		0.966			0.995							
Satd. Flow (prot)	0	1621	0	0	1443	0	0	1605	0	0	1604	0
Fit Permitted		0.966			0.995							
Satd. Flow (perm)	0	1621	0	0	1443	0	0	1605	0	0	1604	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	8		16	16		8	17		8	8		17
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	4%	5%	0%	0%	0%	25%	100%	8%	29%	0%	6%	24%
Adj. Flow (vph)	72	30	0	1	4	5	4	718	11	0	343	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	102	0	0	10	0	0	733	0	0	379	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	53.1%						ICU Level of Service A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Future Total
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	55	23	0	1	3	4	3	546	8	0	261	27
Future Volume (vph)	55	23	0	1	3	4	3	546	8	0	261	27
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	72	30	0	1	4	5	4	718	11	0	343	36
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	102	10	733	379								
Volume Left (vph)	72	1	4	0								
Volume Right (vph)	0	5	11	36								
Hadj (s)	0.21	-0.07	0.14	0.07								
Departure Headway (s)	6.7	6.8	5.0	5.2								
Degree Utilization, x	0.19	0.02	1.01	0.55								
Capacity (veh/h)	513	487	733	678								
Control Delay (s)	11.3	9.9	57.9	14.5								
Approach Delay (s)	11.3	9.9	57.9	14.5								
Approach LOS	B	A	F	B								
Intersection Summary												
Delay	40.2											
Level of Service	E											
Intersection Capacity Utilization	53.1%		ICU Level of Service		A							
Analysis Period (min)	15											

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Total
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕	↕	↕	↕
Traffic Volume (vph)	56	78	440	83	29	246
Future Volume (vph)	56	78	440	83	29	246
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.921		0.850			
Fit Protected	0.980				0.950	
Satd. Flow (prot)	1359	0	1750	1488	1397	1750
Fit Permitted	0.980				0.950	
Satd. Flow (perm)	1359	0	1750	1488	1397	1750
Link Speed (k/h)	50		60		60	
Link Distance (m)	1040.1		438.6		461.8	
Travel Time (s)	74.9		26.3		27.7	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	25%	10%	0%	0%	19%	0%
Adj. Flow (vph)	64	90	506	95	33	283
Shared Lane Traffic (%)						
Lane Group Flow (vph)	154	0	506	95	33	283
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.4%		ICU Level of Service		A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Future Total
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑	↔	↔	↑
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	56	78	440	83	29	246
Future Volume (vph)	56	78	440	83	29	246
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	64	90	506	95	33	283
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total (vph)	154	506	95	33	283	
Volume Left (vph)	64	0	0	33	0	
Volume Right (vph)	90	0	95	0	0	
Hadj (s)	0.01	0.00	-0.70	0.82	0.00	
Departure Headway (s)	6.0	5.4	4.7	6.5	5.6	
Degree Utilization, x	0.26	0.75	0.12	0.06	0.44	
Capacity (veh/h)	548	657	748	531	618	
Control Delay (s)	11.1	21.8	7.1	8.7	11.9	
Approach Delay (s)	11.1	19.4		11.5		
Approach LOS	B	C		B		
Intersection Summary						
Delay			15.9			
Level of Service			C			
Intersection Capacity Utilization			41.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Volume (vph)	4	25	267	8	10	15	144	556	9	13	291	40	
Future Volume (vph)	4	25	267	8	10	15	144	556	9	13	291	40	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt			0.878			0.938			0.998				0.984
Fit Protected			0.999			0.988			0.990				0.998
Satd. Flow (prot)	0	1315	0	0	1558	0	0	1592	0	0	1259	0	
Fit Permitted			0.999			0.988			0.990				0.998
Satd. Flow (perm)	0	1315	0	0	1558	0	0	1592	0	0	1259	0	
Link Speed (k/h)			60			60			70				60
Link Distance (m)			372.3			519.4			156.9				312.6
Travel Time (s)			22.3			31.2			8.1				18.8
Confl. Peds. (#/hr)			6						6				
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	
Heavy Vehicles (%)	33%	0%	18%	17%	0%	0%	18%	6%	20%	9%	40%	20%	
Adj. Flow (vph)	6	35	371	11	14	21	200	772	13	18	404	56	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	412	0	0	46	0	0	985	0	0	478	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)			0.0			0.0			0.0				0.0
Link Offset(m)			0.0			0.0			0.0				0.0
Crosswalk Width(m)			4.8			4.8			4.8				4.8
Two way Left Turn Lane													
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	
Turning Speed (k/h)	25		15	25		15	25		15	25		15	
Sign Control			Stop			Stop			Free				Free
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	90.9%					ICU Level of Service E							
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Future Total
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Volume (veh/h)	4	25	267	8	10	15	144	556	9	13	291	40	
Future Volume (Veh/h)	4	25	267	8	10	15	144	556	9	13	291	40	
Sign Control	Stop			Stop			Free			Free			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	
Hourly flow rate (vph)	6	35	371	11	14	21	200	772	12	18	404	56	
Pedestrians	6												
Lane Width (m)	3.6												
Walking Speed (m/s)	1.2												
Percent Blockage	1												
Right turn flare (veh)													
Median type	None						None						
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	1680	1652	432	2034	1674	784	460						784
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1680	1652	432	2034	1674	784	460						784
tC, single (s)	7.4	6.5	6.4	7.3	6.5	6.2	4.3						4.2
tC, 2 stage (s)													
tF (s)	3.8	4.0	3.5	3.7	4.0	3.3	2.4						2.3
p0 queue free %	86	55	37	0	82	95	80						98
cM capacity (veh/h)	43	78	591	8	76	394	1022						804
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	412	46	984	478									
Volume Left	6	11	200	18									
Volume Right	371	21	12	56									
eSH	339	28	1022	804									
Volume to Capacity	1.21	1.64	0.20	0.02									
Queue Length 95th (m)	142.3	43.4	5.8	0.5									
Control Delay (s)	154.1	615.4	4.6	0.6									
Lane LOS	F	F	A	A									
Approach Delay (s)	154.1	615.4	4.6	0.6									
Approach LOS	F	F											
Intersection Summary													
Average Delay				50.3									
Intersection Capacity Utilization				90.9%	ICU Level of Service							E	
Analysis Period (min)				15									

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Total
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔		↔	↔
Traffic Volume (vph)	405	201	393	105	67	464
Future Volume (vph)	405	201	393	105	67	464
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.971			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1554	1683	1662	0	1250	1094
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1554	1683	1662	0	1250	1094
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	7%	4%	1%	7%	33%	36%
Adj. Flow (vph)	476	236	462	124	79	546
Shared Lane Traffic (%)						
Lane Group Flow (vph)	476	236	586	0	79	546
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	3.6	3.6			3.6	
Link Offset(m)	0.0	0.0			0.0	
Crosswalk Width(m)	4.8	4.8			4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 67.8%				ICU Level of Service C		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Future Total
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	405	201	393	105	67	464
Future Volume (vph)	405	201	393	105	67	464
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	476	236	462	124	79	546
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	476	236	586	79	546	
Volume Left (vph)	476	0	0	79	0	
Volume Right (vph)	0	0	124	0	546	
Hadj (s)	0.62	0.07	-0.09	1.06	-0.09	
Departure Headway (s)	8.2	7.7	7.2	8.7	7.6	
Degree Utilization, x	1.09	0.50	1.18	0.19	1.15	
Capacity (veh/h)	447	466	502	407	479	
Control Delay (s)	95.9	17.0	124.7	12.6	114.1	
Approach Delay (s)	69.8		124.7	101.2		
Approach LOS	F		F	F		
Intersection Summary						
Delay			96.7			
Level of Service			F			
Intersection Capacity Utilization			67.8%	ICU Level of Service	C	
Analysis Period (min)			15			

Lanes, Volumes, Timings
12: Dorchester Road & Street J

Future Total
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	211	312	0	174	128
Future Volume (vph)	0	211	312	0	174	128
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fit Protected						0.972
Satd. Flow (prot)	1484	0	1716	0	0	1668
Fit Permitted	0.972					
Satd. Flow (perm)	1484	0	1716	0	0	1668
Link Speed (k/h)	50	60		60		
Link Distance (m)	156.0	129.0		684.0		
Travel Time (s)	11.2	7.7		41.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	229	339	0	189	139
Shared Lane Traffic (%)						
Lane Group Flow (vph)	229	0	339	0	0	328
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6	0.0		0.0		
Link Offset(m)	0.0	0.0		0.0		
Crosswalk Width(m)	4.8	4.8		4.8		
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	15	15	25	25
Sign Control	Stop	Free		Free		
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	59.8%		ICU Level of Service B			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Dorchester Road & Street J

Future Total
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕		↔	↕
Traffic Volume (veh/h)	0	211	312	0	174	128
Future Volume (Veh/h)	0	211	312	0	174	128
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	229	339	0	189	139
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	856	339			339	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	856	339			339	
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	67			85	
cM capacity (veh/h)	277	703			1220	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	229	339	328			
Volume Left	0	0	189			
Volume Right	229	0	0			
eSH	703	1700	1220			
Volume to Capacity	0.33	0.20	0.15			
Queue Length 95th (m)	11.3	0.0	4.4			
Control Delay (s)	12.6	0.0	5.5			
Lane LOS	B		A			
Approach Delay (s)	12.6	0.0	5.5			
Approach LOS	B					
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization			59.8%		ICU Level of Service	B
Analysis Period (min)			15			

Lanes, Volumes, Timings
13: Internal Road & Street J

Future Total
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕		↔	↕	↕	
Traffic Volume (vph)	13	161	0	50	161	0
Future Volume (vph)	13	161	0	50	161	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.875					
Fit Protected					0.950	
Satd. Flow (prot)	1501	0	0	1716	1630	0
Fit Permitted					0.950	
Satd. Flow (perm)	1501	0	0	1716	1630	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	156.0			269.0	59.7	
Travel Time (s)	11.2			19.4	4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	175	0	54	175	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	189	0	0	54	175	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
13: Internal Road & Street J

Future Total
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	13	161	0	50	161	0
Future Volume (Veh/h)	13	161	0	50	161	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	175	0	54	175	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			189		156	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			189		156	102
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		79	100
cM capacity (veh/h)			1385		836	954
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	189	54	175			
Volume Left	0	0	175			
Volume Right	175	0	0			
cSH	1700	1385	836			
Volume to Capacity	0.11	0.00	0.21			
Queue Length 95th (m)	0.0	0.0	6.3			
Control Delay (s)	0.0	0.0	10.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay			4.4			
Intersection Capacity Utilization		27.9%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
14: Dorchester Road & Internal Road

Future Total
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Volume (vph)	51	0	312	37	0	128
Future Volume (vph)	51	0	312	37	0	128
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.986			
Fit Protected	0.950					
Satd. Flow (prot)	1630	0	1692	0	0	1716
Fit Permitted	0.950					
Satd. Flow (perm)	1630	0	1692	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	88.3		186.5			129.0
Travel Time (s)	6.4		11.2			7.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	0	339	40	0	139
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	0	379	0	0	139
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	30.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
14: Dorchester Road & Internal Road

Future Total
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		R			L
Traffic Volume (veh/h)	51	0	312	37	0	128
Future Volume (Veh/h)	51	0	312	37	0	128
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	0	339	40	0	139
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	498	359			379	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	498	359			379	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	100			100	
cM capacity (veh/h)	532	685			1179	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	55	379	139			
Volume Left	55	0	0			
Volume Right	0	40	0			
eSH	532	1700	1179			
Volume to Capacity	0.10	0.22	0.00			
Queue Length 95th (m)	2.8	0.0	0.0			
Control Delay (s)	12.5	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	12.5	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization		30.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
15: Dorchester Road & Retail South Access

Future Total
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		R			L
Traffic Volume (vph)	7	22	327	59	5	174
Future Volume (vph)	7	22	327	59	5	174
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.899		0.979			
Fit Protected	0.988					0.999
Satd. Flow (prot)	1524	0	1680	0	0	1714
Fit Permitted	0.988					0.999
Satd. Flow (perm)	1524	0	1680	0	0	1714
Link Speed (k/h)	50		60			60
Link Distance (m)	131.1		281.9			186.5
Travel Time (s)	9.4		16.9			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	24	355	64	5	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	0	419	0	0	194
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
15: Dorchester Road & Retail South Access

Future Total
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	R
Traffic Volume (veh/h)	7	22	327	59	5	174
Future Volume (Veh/h)	7	22	327	59	5	174
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	24	355	64	5	189
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	586	387			419	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	586	387			419	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			100	
cM capacity (veh/h)	471	661			1140	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	32	419	194			
Volume Left	8	0	5			
Volume Right	24	64	0			
eSH	600	1700	1140			
Volume to Capacity	0.05	0.25	0.00			
Queue Length 95th (m)	1.3	0.0	0.1			
Control Delay (s)	11.3	0.0	0.2			
Lane LOS	B		A			
Approach Delay (s)	11.3	0.0	0.2			
Approach LOS	B					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization		32.6%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings
16: Dorchester Road & Street K

Future Total
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	R
Traffic Volume (vph)	17	0	386	8	7	174
Future Volume (vph)	17	0	386	8	7	174
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.997			
Fit Protected	0.950					0.998
Satd. Flow (prot)	1630	0	1711	0	0	1712
Fit Permitted	0.950					0.998
Satd. Flow (perm)	1630	0	1711	0	0	1712
Link Speed (k/h)	50		60			60
Link Distance (m)	454.1		240.5			281.9
Travel Time (s)	32.7		14.4			16.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	0	420	9	8	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	429	0	0	197
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
16: Dorchester Road & Street K

Future Total
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Volume (veh/h)	17	0	386	8	7	174
Future Volume (Veh/h)	17	0	386	8	7	174
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	0	420	9	8	189
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	630	424			429	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	630	424			429	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	100			99	
cM capacity (veh/h)	443	630			1130	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	429	197			
Volume Left	18	0	8			
Volume Right	0	9	0			
eSH	443	1700	1130			
Volume to Capacity	0.04	0.25	0.01			
Queue Length 95th (m)	1.0	0.0	0.2			
Control Delay (s)	13.5	0.0	0.4			
Lane LOS	B		A			
Approach Delay (s)	13.5	0.0	0.4			
Approach LOS	B					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization		32.6%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
17: Street K & Retirement Home South Access

Future Total
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (vph)	1	14	15	0	0	2
Future Volume (vph)	1	14	15	0	0	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.865	
Fit Protected		0.997				
Satd. Flow (prot)	0	1711	1716	0	1484	0
Fit Permitted		0.997				
Satd. Flow (perm)	0	1711	1716	0	1484	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		454.1	129.4		65.9	
Travel Time (s)		32.7	9.3		4.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	15	16	0	0	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	16	16	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
17: Street K & Retirement Home South Access

Future Total
AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	1	14	15	0	0	2
Future Volume (Veh/h)	1	14	15	0	0	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	15	16	0	0	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	16				33	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	16				33	16
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)	1602				980	1063
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	16	16	2			
Volume Left	1	0	0			
Volume Right	0	0	2			
cSH	1602	1700	1063			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.5	0.0	8.4			
Lane LOS	A		A			
Approach Delay (s)	0.5	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
18: Street J & Townhouse Access

Future Total
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	↕
Traffic Volume (vph)	8	25	4	10	0	7
Future Volume (vph)	8	25	4	10	0	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.899		0.901			
Fit Protected	0.988					
Satd. Flow (prot)	1524	0	1546	0	0	1716
Fit Permitted	0.988					
Satd. Flow (perm)	1524	0	1546	0	0	1716
Link Speed (k/h)	50		50			50
Link Distance (m)	95.4		27.1			46.1
Travel Time (s)	6.9		2.0			3.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	27	4	11	0	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	0	15	0	0	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
18: Street J & Townhouse Access

Future Total
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	25	4	10	0	7
Future Volume (Veh/h)	8	25	4	10	0	7
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	27	4	11	0	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	18	10	15			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	18	10	15			
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	97	100			
cM capacity (veh/h)	1000	1072	1603			
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	36	15	8			
Volume Left	9	0	0			
Volume Right	27	11	0			
eSH	1053	1700	1603			
Volume to Capacity	0.03	0.01	0.00			
Queue Length 95th (m)	0.8	0.0	0.0			
Control Delay (s)	8.5	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.5	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
19: Street J & Retirement Home North Access

Future Total
AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	7	4	25	0	13
Future Volume (vph)	25	7	4	25	0	13
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.969		0.865			
Fit Protected	0.963		0.994			
Satd. Flow (prot)	1601	0	0	1705	1484	0
Fit Permitted	0.963		0.994			
Satd. Flow (perm)	1601	0	0	1705	1484	0
Link Speed (k/h)	50		50			
Link Distance (m)	50.7		46.1		138.5	
Travel Time (s)	3.7		3.3		10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	8	4	27	0	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	0	0	31	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		0.0			
Link Offset(m)	0.0		0.0			
Crosswalk Width(m)	4.8		4.8			
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15		25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.1%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
19: Street J & Retirement Home North Access

Future Total
AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↑	↑	
Traffic Volume (veh/h)	25	7	4	25	0	13
Future Volume (Veh/h)	25	7	4	25	0	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	8	4	27	0	14
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	42	7	14			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	42	7	14			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	100			
cM capacity (veh/h)	967	1075	1604			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	35	31	14			
Volume Left	27	4	0			
Volume Right	8	0	14			
cSH	990	1604	1700			
Volume to Capacity	0.04	0.00	0.01			
Queue Length 95th (m)	0.9	0.1	0.0			
Control Delay (s)	8.8	1.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	1.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			4.2			
Intersection Capacity Utilization		15.1%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
20: Retail West Access/Hotel West Access & Internal Road

Future Total
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	37	0	0	0	0	0	22	0	0	0	0	29
Future Volume (vph)	37	0	0	0	0	0	22	0	0	0	0	29
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t												0.865
Fit Protected		0.950						0.950				
Satd. Flow (prot)	0	1630	0	0	1716	0	0	1630	0	0	1484	0
Fit Permitted		0.950						0.950				
Satd. Flow (perm)	0	1630	0	0	1716	0	0	1630	0	0	1484	0
Link Speed (k/h)		50			50			50				50
Link Distance (m)		88.3			73.6			40.4				49.4
Travel Time (s)		6.4			5.3			2.9				3.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	0	0	0	0	0	24	0	0	0	0	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	0	0	0	24	0	0	32	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop				Stop
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	18.0%						ICU Level of Service A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 20: Retail West Access/Hotel West Access & Internal Road

Future Total
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔				↔
Traffic Volume (veh/h)	37	0	0	0	0	0	22	0	0	0	0	29
Future Volume (Veh/h)	37	0	0	0	0	0	22	0	0	0	0	29
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	0	0	0	0	0	24	0	0	0	0	32
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	0			0			112	80	0	80	80	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			0			112	80	0	80	80	0
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 %	98			100			97	100	100	100	100	97
cM capacity (veh/h)	1623			1623			824	790	1085	891	790	1085
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	40	0	24	32								
Volume Left	40	0	24	0								
Volume Right	0	0	0	32								
cSH	1623	1700	824	1085								
Volume to Capacity	0.02	0.00	0.03	0.03								
Queue Length 95th (m)	0.6	0.0	0.7	0.7								
Control Delay (s)	7.3	0.0	9.5	8.4								
Lane LOS	A		A	A								
Approach Delay (s)	7.3	0.0	9.5	8.4								
Approach LOS			A	A								
Intersection Summary												
Average Delay				8.2								
Intersection Capacity Utilization				18.0%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings
 21: Internal Road & Hotel East Access/Retail East Access

Future Total
 AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔				↔
Traffic Volume (vph)	86	0	0	0	0	75	0	0	0	96	0	65
Future Volume (vph)	86	0	0	0	0	75	0	0	0	96	0	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t				0.865						0.945		
Fit Protected				0.950						0.971		
Satd. Flow (prot)	0	1630	0	0	1484	0	0	1716	0	0	1574	0
Fit Permitted				0.950						0.971		
Satd. Flow (perm)	0	1630	0	0	1484	0	0	1716	0	0	1574	0
Link Speed (k/h)				50						50		
Link Distance (m)				43.1						59.6		
Travel Time (s)				3.1						4.3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	0	0	0	0	82	0	0	0	104	0	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	93	0	0	82	0	0	0	0	0	175	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)				0.0						0.0		
Link Offset(m)				0.0						0.0		
Crosswalk Width(m)				4.8						4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Stop				Stop		Free				Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization				28.6%			ICU Level of Service			A		
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 21: Internal Road & Hotel East Access/Retail East Access

Future Total
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Volume (veh/h)	86	0	0	0	0	75	0	0	0	96	0	65	
Future Volume (Veh/h)	86	0	0	0	0	75	0	0	0	96	0	65	
Sign Control	Stop			Stop			Free			Free			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	93	0	0	0	0	82	0	0	0	104	0	71	
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	326	244	36	244	279	0	71						0
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	326	244	36	244	279	0	71						0
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 %	83	100	100	100	100	92	100						94
cM capacity (veh/h)	552	616	1037	676	589	1085	1529						1623
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	93	82	0	175									
Volume Left	93	0	0	104									
Volume Right	0	82	0	71									
cSH	552	1085	1700	1623									
Volume to Capacity	0.17	0.08	0.00	0.06									
Queue Length 95th (m)	4.8	2.0	0.0	1.6									
Control Delay (s)	12.8	8.6	0.0	4.6									
Lane LOS	B	A		A									
Approach Delay (s)	12.8	8.6	0.0	4.6									
Approach LOS	B	A											
Intersection Summary													
Average Delay	7.7												
Intersection Capacity Utilization	28.6%			ICU Level of Service			A						
Analysis Period (min)	15												

Queuing and Blocking Report

Future Total
 AM Peak Hour

Intersection: 1: Montrose Road & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	R	L	T	T	R
Maximum Queue (m)	62.3	95.0	105.7	77.5	38.9	84.6	96.4	67.8	14.3	16.9	15.8	17.9
Average Queue (m)	27.2	57.4	58.5	47.7	15.7	47.2	54.4	18.6	3.3	6.6	3.6	2.1
95th Queue (m)	59.6	86.7	89.3	77.3	32.7	79.2	84.6	44.5	10.3	15.2	10.9	10.6
Link Distance (m)	740.7		740.7		665.6		665.6		665.6		699.7	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	55.0			70.0			155.0			115.0		
Storage Blk Time (%)	0			8			2			0		
Queuing Penalty (veh)	0			9			7			1		

Intersection: 1: Montrose Road & McLeod Road

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	71.3	30.4	35.8
Average Queue (m)	32.8	9.6	13.0
95th Queue (m)	60.2	23.6	27.7
Link Distance (m)	194.3		194.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	130.0		
Storage Blk Time (%)	94		
Queuing Penalty (veh)			

Intersection: 2: Oakwood Drive & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	L	TR
Maximum Queue (m)	57.3	375.1	387.4	435.8	87.4	139.2	134.8	55.8	63.9	113.0	16.6	26.6
Average Queue (m)	14.7	94.6	96.8	64.4	40.0	84.1	88.4	20.5	34.1	29.1	3.3	6.2
95th Queue (m)	43.2	291.8	297.0	287.4	84.4	134.3	137.3	46.1	55.2	102.4	10.8	17.3
Link Distance (m)	665.6		665.6		665.6		592.5		592.5		342.6	
Upstream Blk Time (%)	0			0			0					
Queuing Penalty (veh)	1			2			1					
Storage Bay Dist (m)	50.0			80.0			95.0			20.0		
Storage Blk Time (%)	0			18			0			9		
Queuing Penalty (veh)	0			8			0			16		

Queuing and Blocking Report

Future Total
AM Peak Hour

Intersection: 3: Dorchester Road & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	62.5	593.8	591.6	57.3	190.6	193.8	22.6	330.9	37.4	309.6
Average Queue (m)	56.2	223.3	222.3	25.9	106.4	111.4	20.7	322.5	33.0	239.5
95th Queue (m)	81.6	538.1	538.9	61.8	180.3	184.4	29.9	357.1	47.2	351.8
Link Distance (m)		592.5	592.5		1024.4	1024.4		325.7		294.0
Upstream Blk Time (%)		7	10					40		38
Queuing Penalty (veh)		40	55					240		0
Storage Bay Dist (m)	55.0			50.0			15.0		30.0	
Storage Blk Time (%)	32	39		0	38		50	52	35	51
Queuing Penalty (veh)	104	103		0	27		188	213	158	88

Intersection: 4: Drummond Road & McLeod Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LTR	L	TR
Maximum Queue (m)	1031.0	1033.0	223.9	223.8	436.5	27.3	112.0
Average Queue (m)	686.8	685.6	121.1	124.0	398.5	21.5	47.4
95th Queue (m)	1217.1	1221.2	239.5	240.2	490.5	33.1	87.3
Link Distance (m)	1024.4	1024.4	1047.7	1047.7	811.3		193.4
Upstream Blk Time (%)	20	22					
Queuing Penalty (veh)	95	108					
Storage Bay Dist (m)						20.0	
Storage Blk Time (%)						13	23
Queuing Penalty (veh)						43	31

Intersection: 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	L	TR
Maximum Queue (m)	45.4	54.6	76.0	38.0	14.3	101.9	111.4	87.4	41.2	108.2	37.9
Average Queue (m)	20.0	21.8	37.6	2.3	0.8	60.4	64.0	15.5	19.5	53.4	14.2
95th Queue (m)	39.5	48.0	72.1	16.2	7.3	89.2	95.7	70.0	36.6	90.1	29.0
Link Distance (m)		1047.7	1047.7				239.8	239.8	307.6	277.4	277.4
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	60.0			50.0	25.0				80.0		
Storage Blk Time (%)		0	5			37	3	0			
Queuing Penalty (veh)		0	1			1	8	0			

Queuing and Blocking Report

Future Total
AM Peak Hour

Intersection: 6: Stanley Avenue & Marineland Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	L	T	T	L	L	R
Maximum Queue (m)	49.1	47.0	41.0	31.8	72.7	62.1	37.7	51.5	22.2
Average Queue (m)	22.0	23.0	4.4	12.3	38.4	32.6	16.0	25.9	4.5
95th Queue (m)	40.4	42.1	22.4	27.2	59.6	51.7	33.3	45.3	15.0
Link Distance (m)	239.8	239.8			155.4	155.4		485.6	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)			65.0	105.0			160.0	80.0	
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L
Maximum Queue (m)	25.5	40.1	32.1	12.7	65.3	77.1	31.1	21.7	19.4	5.2
Average Queue (m)	7.9	21.5	9.6	0.9	29.3	43.3	10.9	8.7	7.2	0.3
95th Queue (m)	18.9	34.9	23.6	5.9	56.6	64.2	24.0	19.2	15.1	2.3
Link Distance (m)		488.7	488.7				403.0	403.0		196.3
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	130.0			120.0	150.0	150.0			225.0	80.0
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (m)	65.9	14.9	37.1	29.3	10.0	6.5
Average Queue (m)	31.7	0.5	14.1	8.3	1.2	1.1
95th Queue (m)	57.9	6.6	28.8	20.8	5.7	4.7
Link Distance (m)				130.6	130.6	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	60.0	80.0	80.0		50.0	
Storage Blk Time (%)	2					
Queuing Penalty (veh)	1					

Queuing and Blocking Report

Future Total
AM Peak Hour

Intersection: 8: Dorchester Road & Jill Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	50.6	16.1	449.4	29.4
Average Queue (m)	16.1	2.7	283.3	16.3
95th Queue (m)	44.2	10.7	541.3	26.2
Link Distance (m)	110.7	156.1	446.2	325.7
Upstream Blk Time (%)	1		16	
Queuing Penalty (veh)	0		85	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Dorchester Road & Oldfield Road

Movement	WB	NB	NB	B29	SB	SB
Directions Served	LR	T	R	T	L	T
Maximum Queue (m)	130.8	317.9	22.5	88.5	19.3	21.6
Average Queue (m)	27.5	77.3	14.1	5.7	6.1	10.7
95th Queue (m)	86.0	280.7	26.3	52.2	15.5	16.8
Link Distance (m)	1018.8	424.6		670.7		446.2
Upstream Blk Time (%)		6				
Queuing Penalty (veh)		30				
Storage Bay Dist (m)			15.0		15.0	
Storage Blk Time (%)		33	1		0	1
Queuing Penalty (veh)		27	2		1	0

Intersection: 10: Stanley Avenue & Chippawa Parkway

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	74.6	19.2	62.8	34.9
Average Queue (m)	29.1	6.8	18.4	3.8
95th Queue (m)	55.4	15.9	44.9	19.1
Link Distance (m)	355.4	511.0	139.9	295.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Future Total
AM Peak Hour

Intersection: 11: Lyons Creek Road & Stanley Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (m)	62.5	195.1	455.5	32.4	288.6
Average Queue (m)	50.0	78.7	301.7	26.7	155.5
95th Queue (m)	75.4	217.4	540.4	45.6	303.8
Link Distance (m)		442.7	589.0		785.7
Upstream Blk Time (%)			3		
Queuing Penalty (veh)			0		
Storage Bay Dist (m)	55.0			25.0	
Storage Blk Time (%)	40	1		1	81
Queuing Penalty (veh)	80	4		5	54

Intersection: 12: Dorchester Road & Street J

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	27.6	28.6
Average Queue (m)	13.9	8.1
95th Queue (m)	23.2	20.1
Link Distance (m)	137.0	670.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Internal Road & Street J

Movement	NB
Directions Served	LR
Maximum Queue (m)	21.7
Average Queue (m)	11.2
95th Queue (m)	17.5
Link Distance (m)	42.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Future Total
AM Peak Hour

Intersection: 14: Dorchester Road & Internal Road

Movement	WB
Directions Served	LR
Maximum Queue (m)	15.5
Average Queue (m)	7.6
95th Queue (m)	14.2
Link Distance (m)	68.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 15: Dorchester Road & Retail South Access

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.6	10.0
Average Queue (m)	5.5	0.4
95th Queue (m)	11.8	3.9
Link Distance (m)	120.4	167.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 16: Dorchester Road & Street K

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.2	10.2
Average Queue (m)	2.9	0.5
95th Queue (m)	8.7	4.0
Link Distance (m)	432.8	259.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Future Total
AM Peak Hour

Intersection: 17: Street K & Retirement Home South Access

Movement	SB
Directions Served	LR
Maximum Queue (m)	3.0
Average Queue (m)	0.3
95th Queue (m)	1.7
Link Distance (m)	47.3
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 18: Street J & Townhouse Access

Movement	WB
Directions Served	LR
Maximum Queue (m)	15.2
Average Queue (m)	5.6
95th Queue (m)	13.0
Link Distance (m)	86.3
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 19: Street J & Retirement Home North Access

Movement	EB
Directions Served	LR
Maximum Queue (m)	14.4
Average Queue (m)	5.9
95th Queue (m)	13.3
Link Distance (m)	41.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Future Total
AM Peak Hour

Intersection: 20: Retail West Access/Hotel West Access & Internal Road

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (m)	9.9	12.9
Average Queue (m)	4.4	5.5
95th Queue (m)	11.2	13.0
Link Distance (m)	30.9	40.9
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 21: Internal Road & Hotel East Access/Retail East Access

Movement	EB	WB
Directions Served	LTR	LTR
Maximum Queue (m)	18.1	19.5
Average Queue (m)	9.3	9.5
95th Queue (m)	15.8	16.5
Link Distance (m)	34.4	59.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1841

Lanes, Volumes, Timings

1: Montrose Road & McLeod Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	1221	52	188	1129	317	56	134	410	399	192	132
Future Volume (vph)	132	1221	52	188	1129	317	56	134	410	399	192	132
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0		0.0	115.0		0.0	130.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor		1.00		1.00		0.99	0.99		0.99	1.00		0.99
Frt		0.994				0.850			0.850			0.939
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1599	4648	0	1599	3292	1430	1630	3167	1444	1630	2995	0
Fit Permitted	0.086			0.081			0.547			0.578		
Satd. Flow (perm)	145	4648	0	136	3292	1410	931	3167	1425	991	2995	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				275			245			139
Link Speed (k/h)		50			50			50				50
Link Distance (m)		759.2			692.3			721.0				213.3
Travel Time (s)		54.7			49.8			51.9				15.4
Confl. Peds. (#/hr)	2		1	1		2	13		1	1		13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	2%	5%	4%	1%	4%	2%	5%	3%	2%	4%	2%
Adj. Flow (vph)	139	1285	55	198	1188	334	59	141	432	420	202	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	139	1340	0	198	1188	334	59	141	432	420	341	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1		2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left		Thru
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0		10.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0		0.6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0	8.0	6.0	8.0	
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0	46.0	9.5	46.0	
Total Split (s)	17.0	54.0		20.0	57.0	57.0	11.0	37.0	37.0	19.0	45.0	
Total Split (%)	13.1%	41.5%		15.4%	43.8%	43.8%	8.5%	28.5%	28.5%	14.6%	34.6%	
Maximum Green (s)	14.0	46.0		17.0	49.0	49.0	8.0	29.0	29.0	16.0	37.0	
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0	-4.0	1.0	-4.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		12.0			12.0	12.0		14.0	14.0		14.0	
Flash Dont Walk (s)		20.0			20.0	20.0		24.0	24.0		24.0	
Pedestrian Calls (#/hr)		0			0	0		0	0		0	
Act Effct Green (s)	62.3	52.1		69.3	55.8	55.8	39.3	33.0	33.0	52.0	43.5	
Actuated g/C Ratio	0.48	0.40		0.53	0.43	0.43	0.30	0.25	0.25	0.40	0.33	
v/c Ratio	0.76	0.72		0.86	0.84	0.44	0.19	0.18	0.79	0.89	0.31	
Control Delay	51.3	35.7		57.8	34.2	5.4	26.5	38.6	31.0	56.7	20.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	51.3	35.7		57.8	34.2	5.4	26.5	38.6	31.0	56.7	20.0	
LOS	D	D		E	C	A	C	D	C	E	C	
Approach Delay		37.2			31.3			32.3			40.3	
Approach LOS		D			C			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 115

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 34.8

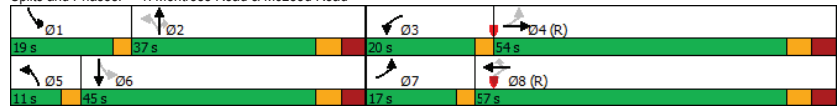
Intersection LOS: C

Intersection Capacity Utilization 110.8%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 1: Montrose Road & McLeod Road



Queues
1: Montrose Road & McLeod Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	139	1340	198	1188	334	59	141	432	420	341
v/c Ratio	0.76	0.72	0.86	0.84	0.44	0.19	0.18	0.79	0.89	0.31
Control Delay	51.3	35.7	57.8	34.2	5.4	26.5	38.6	31.0	56.7	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	35.7	57.8	34.2	5.4	26.5	38.6	31.0	56.7	20.0
Queue Length 50th (m)	20.5	112.7	31.6	158.6	11.7	9.8	15.6	49.6	90.6	21.0
Queue Length 95th (m)	#43.8	131.7	m#52.6	192.7	m15.1	19.5	25.2	#98.7	#154.8	34.5
Internal Link Dist (m)		735.2		668.3		697.0			189.3	
Turn Bay Length (m)	55.0		155.0			115.0			130.0	
Base Capacity (vph)	217	1864	253	1413	762	324	803	544	470	1093
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.72	0.78	0.84	0.44	0.18	0.18	0.79	0.89	0.31

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Future Total
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	132	1221	52	188	1129	317	56	134	410	399	192	132	
Future Volume (vph)	132	1221	52	188	1129	317	56	134	410	399	192	132	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1599	4647		1599	3292	1410	1623	3167	1425	1629	2994		
Flt Permitted	0.09	1.00		0.08	1.00	1.00	0.55	1.00	1.00	0.58	1.00		
Satd. Flow (perm)	145	4647		136	3292	1410	934	3167	1425	992	2994		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	139	1285	55	198	1188	334	59	141	432	420	202	139	
RTOR Reduction (vph)	0	4	0	0	0	158	0	0	182	0	92	0	
Lane Group Flow (vph)	139	1336	0	198	1188	176	59	141	250	420	249	0	
Confl. Peds. (#/hr)	2		1	1		2	13		1	1		13	
Heavy Vehicles (%)	4%	2%	5%	4%	1%	4%	2%	5%	3%	2%	4%	2%	
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA			
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4			8		2		2		6			
Actuated Green, G (s)	58.7	47.5		65.4	51.2	51.2	35.7	29.6	29.6	48.6	39.5		
Effective Green, g (s)	56.7	51.5		64.1	55.2	55.2	33.7	33.6	33.6	47.6	43.5		
Actuated g/C Ratio	0.44	0.40		0.49	0.42	0.42	0.26	0.26	0.26	0.37	0.33		
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		
Lane Grp Cap (vph)	177	1840		223	1397	598	269	818	368	436	1001		
v/s Ratio Prot	0.06	0.29		c0.09	c0.36		0.01	0.04		c0.11	0.08		
v/s Ratio Perm	0.28			0.34		0.12	0.05		0.18	c0.24			
v/c Ratio	0.79	0.73		0.89	0.85	0.29	0.22	0.17	0.68	0.96	0.25		
Uniform Delay, d1	28.3	33.3		35.3	33.7	24.6	37.0	37.4	43.4	38.7	31.4		
Progression Factor	1.00	1.00		1.18	0.89	0.77	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	19.4	2.5		21.8	4.2	0.8	0.3	0.5	9.7	33.5	0.6		
Delay (s)	47.7	35.8		63.2	34.0	19.7	37.3	37.9	53.1	72.2	32.0		
Level of Service	D	D		E	C	B	D	D	D	E	C		
Approach Delay (s)		36.9			34.6			48.2			54.2		
Approach LOS		D			C			D			D		
Intersection Summary													
HCM 2000 Control Delay	40.5		HCM 2000 Level of Service					D					
HCM 2000 Volume to Capacity ratio	0.91												
Actuated Cycle Length (s)	130.0		Sum of lost time (s)					16.0					
Intersection Capacity Utilization	110.8%		ICU Level of Service					H					
Analysis Period (min)	15												
c Critical Lane Group													

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	43	1516	418	263	1460	20	407	5	382	28	15	97
Future Volume (vph)	43	1516	418	263	1460	20	407	5	382	28	15	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0	0.0	80.0		0.0	95.0		0.0	20.0		0.0	
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96		1.00		1.00	1.00					0.99
Frt		0.850		0.998					0.850			0.870
Flt Protected	0.950			0.950			0.950	0.953		0.950		
Satd. Flow (prot)	1583	3292	1444	1614	3250	0	1533	1530	1458	1662	1484	0
Flt Permitted	0.103			0.064			0.950	0.953		0.950		
Satd. Flow (perm)	172	3292	1389	109	3250	0	1526	1524	1458	1662	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			289		1				315		99	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		692.3			616.3			360.6			181.9	
Travel Time (s)		49.8			44.4			26.0			13.1	
Confl. Peds. (#/hr)	9		9	9		9	6					6
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Adj. Flow (vph)	44	1547	427	268	1490	20	415	5	390	29	15	99
Shared Lane Traffic (%)	49%											
Lane Group Flow (vph)	44	1547	427	268	1510	0	212	208	390	29	114	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

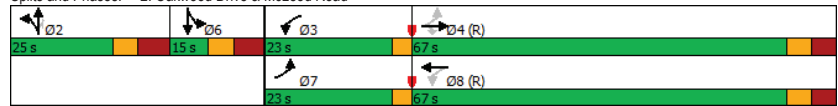
Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	23.0	67.0	67.0	23.0	67.0		25.0	25.0	25.0	15.0	15.0	
Total Split (%)	17.7%	51.5%	51.5%	17.7%	51.5%		19.2%	19.2%	19.2%	11.5%	11.5%	
Maximum Green (s)	20.0	59.0	59.0	20.0	59.0		16.0	16.0	16.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	69.2	63.7	58.7	86.0	78.3		21.0	21.0	21.0	11.0	11.0	
Actuated g/C Ratio	0.53	0.49	0.45	0.66	0.60		0.16	0.16	0.16	0.08	0.08	
v/c Ratio	0.29	0.96	0.54	0.95	0.77		0.86	0.84	0.78	0.21	0.53	
Control Delay	16.5	39.1	8.1	78.1	23.2		83.5	81.3	23.2	59.4	23.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	16.5	39.1	8.1	78.1	23.2		83.5	81.3	23.2	59.4	23.6	
LOS	B	D	A	E	C		F	F	C	E	C	
Approach Delay		32.0			31.5			53.9			30.9	
Approach LOS		C			C			D			C	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 155
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 35.5
 Intersection LOS: D
 Intersection Capacity Utilization 117.8%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 2: Oakwood Drive & McLeod Road



Queues
2: Oakwood Drive & McLeod Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	44	1547	427	268	1510	212	208	390	29	114
v/c Ratio	0.29	0.96	0.54	0.95	0.77	0.86	0.84	0.78	0.21	0.53
Control Delay	16.5	39.1	8.1	78.1	23.2	83.5	81.3	23.2	59.4	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	39.1	8.1	78.1	23.2	83.5	81.3	23.2	59.4	23.6
Queue Length 50th (m)	2.6	212.1	38.9	55.5	155.6	59.2	58.0	18.1	7.4	3.8
Queue Length 95th (m)	m3.3	#266.7	m52.3	#109.4	193.1	#106.2	#104.0	#62.6	17.8	23.2
Internal Link Dist (m)		668.3			592.3		336.6			157.9
Turn Bay Length (m)	50.0			80.0		95.0		20.0		
Base Capacity (vph)	315	1614	785	292	1957	247	247	499	140	216
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.96	0.54	0.92	0.77	0.86	0.84	0.78	0.21	0.53

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Future Total
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↗	↖	↕	↔	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	43	1516	418	263	1460	20	407	5	382	28	15	97
Future Volume (vph)	43	1516	418	263	1460	20	407	5	382	28	15	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00	1.00	1.00	0.99	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		1.00	1.00	0.85	1.00	0.87	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3292	1389	1614	3250		1533	1531	1458	1662	1484	1484
Fit Permitted	0.10	1.00	1.00	0.06	1.00		0.95	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	172	3292	1389	108	3250		1533	1531	1458	1662	1484	1484
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	44	1547	427	268	1490	20	415	5	390	29	15	99
RTOR Reduction (vph)	0	0	159	0	0	0	0	0	264	0	91	0
Lane Group Flow (vph)	44	1547	268	268	1510	0	212	208	126	29	23	0
Confl. Peds. (#/hr)	9		9	9		9	6					6
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	65.0	59.7	59.7	82.0	73.7		16.0	16.0	16.0	6.0	6.0	
Effective Green, g (s)	63.0	63.7	58.7	81.0	77.7		21.0	21.0	21.0	11.0	11.0	
Actuated g/C Ratio	0.48	0.49	0.45	0.62	0.60		0.16	0.16	0.16	0.08	0.08	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	130	1613	627	279	1942		247	247	235	140	125	
v/s Ratio Prot	0.01	c0.47		c0.14	0.46		c0.14	0.14		c0.02	0.02	
v/s Ratio Perm	0.15		0.19	0.46				0.09				
v/c Ratio	0.34	0.96	0.43	0.96	0.78		0.86	0.84	0.54	0.21	0.19	
Uniform Delay, d1	20.2	31.9	24.2	43.4	19.6		53.1	52.9	50.0	55.4	55.3	
Progression Factor	1.40	0.88	0.80	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	10.3	1.3	43.0	3.1		30.0	27.9	8.5	3.3	3.3	
Delay (s)	29.0	38.5	20.8	86.3	22.8		83.1	80.8	58.5	58.8	58.6	
Level of Service	C	D	C	F	C		F	F	E	E	E	
Approach Delay (s)		34.5			32.4			70.7			58.7	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay		40.6					HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		130.0					Sum of lost time (s)				16.0	
Intersection Capacity Utilization		117.8%					ICU Level of Service				H	
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↗	↖	↕	↔	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	327	1025	417	96	859	155	501	208	172	294	213	341
Future Volume (vph)	327	1025	417	96	859	155	501	208	172	294	213	341
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0		0.0	15.0		0.0	30.0		0.0	0.0
Storage Lanes	1	0	1		0	1		0	1		0	0
Taper Length (m)	7.5		7.5		7.5			7.5			7.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.99			0.98		0.99		0.98
Frt		0.957			0.977			0.932		0.932		0.908
Fit Protected		0.950			0.950			0.950		0.950		0.950
Satd. Flow (prot)		1630	3076	0	1630	3193	0	1614	1605	0	1662	1523
Fit Permitted		0.106			0.119			0.115		0.259		0.259
Satd. Flow (perm)		182	3076	0	204	3193	0	195	1605	0	449	1523
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		57			18			36			68	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		616.3			1045.5			348.9			308.0	
Travel Time (s)		44.4			75.3			25.1			22.2	
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Adj. Flow (vph)	337	1057	430	99	886	160	516	214	177	303	220	352
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	1487	0	99	1046	0	516	391	0	303	572	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

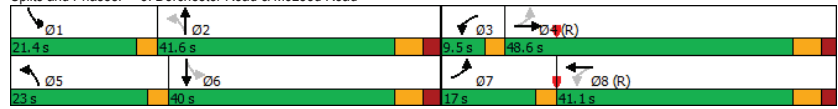
Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	NA	NA
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.4		9.5	30.4		9.5	37.7		9.5	37.7	
Total Split (s)	17.0	48.6		9.5	41.1		23.0	41.6		21.4	40.0	
Total Split (%)	14.0%	40.1%		7.8%	33.9%		19.0%	34.4%		17.7%	33.0%	
Maximum Green (s)	14.0	42.2		6.5	34.7		20.0	34.9		18.4	33.3	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.3		0.0	2.3		0.0	2.6		0.0	2.6	
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		9.0			9.0			12.0			12.0	
Flash Dont Walk (s)		15.0			15.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.1	44.6		42.6	37.1		57.1	38.4		52.6	36.0	
Actuated g/C Ratio	0.45	0.37		0.35	0.31		0.47	0.32		0.43	0.30	
v/c Ratio	1.43	1.27		0.73	1.06		1.64	0.73		0.84	1.14	
Control Delay	242.4	162.2		53.2	84.8		330.1	42.9		42.2	121.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	242.4	162.2		53.2	84.8		330.1	42.9		42.2	121.1	
LOS	F	F		D	F		F	D		D	F	
Approach Delay		177.1			82.1			206.3			93.8	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
 Cycle Length: 121.1
 Actuated Cycle Length: 121.1
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.64
 Intersection Signal Delay: 144.4 Intersection LOS: F
 Intersection Capacity Utilization 131.2% ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 3: Dorchester Road & McLeod Road



Queues
3: Dorchester Road & McLeod Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	337	1487	99	1046	516	391	303	572
v/c Ratio	1.43	1.27	0.73	1.06	1.64	0.73	0.84	1.14
Control Delay	242.4	162.2	53.2	84.8	330.1	42.9	42.2	121.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	242.4	162.2	53.2	84.8	330.1	42.9	42.2	121.1
Queue Length 50th (m)	-98.1	-243.6	14.3	-149.3	-172.5	80.3	46.2	-155.3
Queue Length 95th (m)	#159.0	#289.1	#35.4	#192.8	#242.4	119.3	#81.9	#227.3
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	236	1168	136	990	314	534	372	500
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	1.43	1.27	0.73	1.06	1.64	0.73	0.81	1.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Future Total
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	327	1025	417	96	859	155	501	208	172	294	213	341
Future Volume (vph)	327	1025	417	96	859	155	501	208	172	294	213	341
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	0.93		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	3075		1630	3193		1614	1605		1659	1523	
Flt Permitted	0.11	1.00		0.12	1.00		0.12	1.00		0.26	1.00	
Satd. Flow (perm)	182	3075		204	3193		196	1605		452	1523	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	337	1057	430	99	886	160	516	214	177	303	220	352
RTOR Reduction (vph)	0	36	0	0	12	0	0	25	0	0	48	0
Lane Group Flow (vph)	337	1451	0	99	1034	0	516	366	0	303	524	0
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	51.7	42.2		41.2	34.7		55.7	35.7		50.9	33.3	
Effective Green, g (s)	50.7	44.6		39.2	37.1		53.7	38.4		48.9	36.0	
Actuated g/C Ratio	0.42	0.37		0.32	0.31		0.44	0.32		0.40	0.30	
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	231	1132		130	978		309	508		347	452	
v/s Ratio Prot	c0.16	0.47		0.03	0.32		c0.26	0.23		0.12	0.34	
v/s Ratio Perm	c0.45			0.21			c0.48			0.23		
v/c Ratio	1.46	1.28		0.76	1.06		1.67	0.72		0.87	1.16	
Uniform Delay, d1	34.7	38.2		33.4	42.0		36.7	36.6		28.0	42.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	228.8	133.7		22.8	45.0		315.3	5.0		20.7	94.0	
Delay (s)	263.5	171.9		56.1	87.0		352.0	41.6		48.8	136.6	
Level of Service	F	F		E	F		F	D		D	F	
Approach Delay (s)		188.8			84.3			218.2			106.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	154.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.54		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	259	847	291	145	829	222	206	208	106	267	271	223
Future Volume (vph)	259	847	291	145	829	222	206	208	106	267	271	223
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			0.99			0.99			0.99		0.99
Frt	0.969			0.972			0.972			0.972		0.932
Flt Protected	0.991			0.994			0.981			0.950		
Satd. Flow (prot)	0	3120	0	0	3141	0	0	1600	0	1662	1583	0
Flt Permitted	0.502			0.498			0.334			0.427		
Satd. Flow (perm)	0	1581	0	0	1574	0	0	544	0	745	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		44			31		16			51		
Link Speed (k/h)		50			50		50			50		
Link Distance (m)		1045.5			1070.0		834.0			207.0		
Travel Time (s)		75.3			77.0		60.0			14.9		
Confl. Peds. (#/hr)	8		6	6		8	8		8	8		8
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
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	5%	2%	5%	0%	2%	2%
Adj. Flow (vph)	288	941	323	161	921	247	229	231	118	297	301	248
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1552	0	0	1329	0	0	578	0	297	549	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		
Link Offset(m)		0.0			0.0			0.0		0.0		0.0
Crosswalk Width(m)		4.8			4.8			4.8		4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

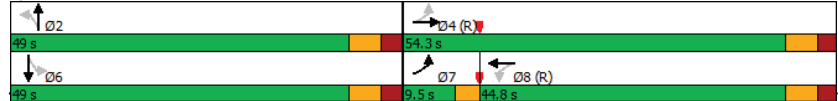
Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	30.5		30.5	30.5		30.8	30.8		30.8	30.8	
Total Split (s)	9.5	54.3		44.8	44.8		49.0	49.0		49.0	49.0	
Total Split (%)	9.2%	52.6%		43.4%	43.4%		47.4%	47.4%		47.4%	47.4%	
Maximum Green (s)	6.5	47.8		38.3	38.3		42.2	42.2		42.2	42.2	
Yellow Time (s)	3.0	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	2.4		2.4	2.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		-2.5			-2.5			-2.8			-2.8	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag	Lead			Lag								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)		9.0		9.0	9.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)		15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)		50.3			50.3			45.0			45.0	
Actuated g/c Ratio		0.49			0.49			0.44			0.44	
v/c Ratio		3.10dl			1.94dl			2.35			0.92	0.76
Control Delay		457.9			343.6			639.4			62.4	30.7
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		457.9			343.6			639.4			62.4	30.7
LOS		F			F			F			E	C
Approach Delay		457.9			343.6			639.4			41.8	
Approach LOS		F			F			F			D	

Intersection Summary

Area Type: Other
 Cycle Length: 103.3
 Actuated Cycle Length: 103.3
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.35
 Intersection Signal Delay: 365.2
 Intersection LOS: F
 Intersection Capacity Utilization 156.6%
 ICU Level of Service H
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 4: Drummond Road & McLeod Road



Queues
4: Drummond Road & McLeod Road

Future Total
PM Peak Hour

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1552	1329	578	297	549
v/c Ratio	3.10dl	1.94dl	2.35	0.92	0.76
Control Delay	457.9	343.6	639.4	62.4	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	457.9	343.6	639.4	62.4	30.7
Queue Length 50th (m)	~269.3	~218.5	~152.1	57.4	87.5
Queue Length 95th (m)	#314.4	#262.6	#220.6	#112.9	133.7
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	792	782	246	324	718
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.96	1.70	2.35	0.92	0.76

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.
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Future Total
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔		↔		
Traffic Volume (vph)	259	847	291	145	829	222	206	208	106	267	271	223
Future Volume (vph)	259	847	291	145	829	222	206	208	106	267	271	223
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Frbp, ped/bikes		0.99			0.99			1.00		1.00		0.99
Flpb, ped/bikes		1.00			1.00			1.00		1.00		1.00
Frt		0.97			0.97			0.97		1.00		0.93
Flt Protected		0.99			0.99			0.98		0.95		1.00
Satd. Flow (prot)		3119			3141			1599		1658		1583
Flt Permitted		0.50			0.50			0.33		0.43		1.00
Satd. Flow (perm)		1579			1575			544		745		1583
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)	288	941	323	161	921	247	229	231	118	297	301	248
RTOR Reduction (vph)	0	23	0	0	16	0	0	9	0	0	29	0
Lane Group Flow (vph)	0	1529	0	0	1313	0	0	569	0	297	520	0
Confl. Peds. (#/hr)	8		6	6		8	8		8	8		8
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	5%	2%	5%	0%	2%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2				6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		47.8			47.8			42.2		42.2		42.2
Effective Green, g (s)		50.3			50.3			45.0		45.0		45.0
Actuated g/C Ratio		0.49			0.49			0.44		0.44		0.44
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5
Lane Grp Cap (vph)		768			766			236		324		689
v/s Ratio Prot										0.33		
v/s Ratio Perm		c0.97			0.83			c1.05		0.40		
v/c Ratio		3.10dl			1.94dl			2.41		0.92		0.76
Uniform Delay, d1		26.5			26.5			29.1		27.4		24.5
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		450.8			326.9			647.7		32.7		7.5
Delay (s)		477.3			353.4			676.8		60.1		32.1
Level of Service		F			F			F		E		C
Approach Delay (s)		477.3			353.4			676.8				41.9
Approach LOS		F			F			F				D
Intersection Summary												
HCM 2000 Control Delay			380.3			HCM 2000 Level of Service						F
HCM 2000 Volume to Capacity ratio			2.25									
Actuated Cycle Length (s)			103.3			Sum of lost time (s)						11.0
Intersection Capacity Utilization			156.6%			ICU Level of Service						H
Analysis Period (min)			15									
dl	Defacto Left Lane. Recode with 1 though lane as a left lane.											
c	Critical Lane Group											

Lanes, Volumes, Timings
5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

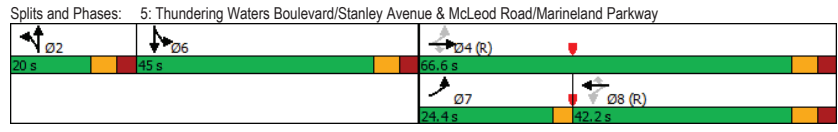
Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔		↔		↔	↔	
Traffic Volume (vph)	155	800	35	18	873	314	44	22	10	366	38	174
Future Volume (vph)	155	800	35	18	873	314	44	22	10	366	38	174
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								1.00				0.99
Frt			0.850			0.850		0.981				0.877
Flt Protected	0.950			0.950				0.972		0.950		
Satd. Flow (prot)	1599	3260	1488	1662	3260	1417	0	1669	0	1554	1518	0
Flt Permitted	0.117			0.325				0.972		0.950		
Satd. Flow (perm)	197	3260	1488	569	3260	1417	0	1668	0	1554	1518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			290		5				182
Link Speed (k/h)		50			50			50				50
Link Distance (m)		1070.0			261.8			326.3				294.0
Travel Time (s)		77.0			18.8			23.5				21.2
Confl. Peds. (#/hr)							1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	2%	0%	0%	2%	5%	0%	0%	0%	7%	0%	0%
Adj. Flow (vph)	163	842	37	19	919	331	46	23	11	385	40	183
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	842	37	19	919	331	0	80	0	385	223	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Future Total
Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	NA	NA
Protected Phases	7	4				8	2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	24.4	66.6	66.6	42.2	42.2	42.2	20.0	20.0		45.0	45.0	
Total Split (%)	18.5%	50.6%	50.6%	32.1%	32.1%	32.1%	15.2%	15.2%		34.2%	34.2%	
Maximum Green (s)	21.4	59.4	59.4	35.0	35.0	35.0	12.8	12.8		37.8	37.8	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	65.1	65.1	65.1	48.9	48.9	48.9		16.0		38.5	38.5	
Actuated g/C Ratio	0.49	0.49	0.49	0.37	0.37	0.37		0.12		0.29	0.29	
v/c Ratio	0.72	0.52	0.05	0.09	0.76	0.47		0.39		0.85	0.39	
Control Delay	39.7	24.6	0.1	32.6	42.4	8.3		55.9		61.5	10.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	39.7	24.6	0.1	32.6	42.4	8.3		55.9		61.5	10.0	
LOS	D	C	A	C	D	A		E		E	B	
Approach Delay		26.1			33.3			55.9			42.6	
Approach LOS		C			C			E			D	

Intersection Summary	
Area Type:	Other
Cycle Length:	131.6
Actuated Cycle Length:	131.6
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle:	125
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.85
Intersection Signal Delay:	33.3
Intersection LOS:	C
Intersection Capacity Utilization:	77.6%
ICU Level of Service:	D
Analysis Period (min):	15



Queues
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Future Total
Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	163	842	37	19	919	331	80	385	223
v/c Ratio	0.72	0.52	0.05	0.09	0.76	0.47	0.39	0.85	0.39
Control Delay	39.7	24.6	0.1	32.6	42.4	8.3	55.9	61.5	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	24.6	0.1	32.6	42.4	8.3	55.9	61.5	10.0
Queue Length 50th (m)	25.4	83.6	0.0	3.4	117.7	7.4	19.1	96.2	7.9
Queue Length 95th (m)	46.3	103.6	0.0	10.7	#170.2	35.7	36.1	#145.8	28.8
Internal Link Dist (m)		1046.0			237.8		302.3		270.0
Turn Bay Length (m)	60.0		50.0	25.0		80.0			
Base Capacity (vph)	315	1613	784	211	1212	708	207	484	598
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	0.52	0.52	0.05	0.09	0.76	0.47	0.39	0.80	0.37

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

HCM Signalized Intersection Capacity Analysis
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Future Total
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↕	↔	↔	↕	↔		↕		↔	↕	↔	
Traffic Volume (vph)	155	800	35	18	873	314	44	22	10	366	38	174	
Future Volume (vph)	155	800	35	18	873	314	44	22	10	366	38	174	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00		
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	0.99		
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	0.88		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00		
Satd. Flow (prot)	1599	3260	1488	1662	3260	1417		1670		1554	1518		
Flt Permitted	0.12	1.00	1.00	0.32	1.00	1.00		0.97		0.95	1.00		
Satd. Flow (perm)	197	3260	1488	568	3260	1417		1670		1554	1518		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	163	842	37	19	919	331	46	23	11	385	40	183	
RTOR Reduction (vph)	0	0	19	0	0	182	0	4	0	0	129	0	
Lane Group Flow (vph)	163	842	18	19	919	149	0	76	0	385	94	0	
Confl. Peds. (#/hr)							1					1	
Heavy Vehicles (%)	4%	2%	0%	0%	2%	5%	0%	0%	0%	7%	0%	0%	
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA		
Protected Phases	7	4			8		2	2		6	6		
Permitted Phases	4		4	8		8							
Actuated Green, G (s)	61.9	61.9	61.9	45.7	45.7	45.7		12.8		35.3	35.3		
Effective Green, g (s)	60.9	65.1	65.1	48.9	48.9	48.9		16.0		38.5	38.5		
Actuated g/C Ratio	0.46	0.49	0.49	0.37	0.37	0.37		0.12		0.29	0.29		
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2		7.2		7.2	7.2		
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5		4.0		4.0	4.0		
Lane Grp Cap (vph)	221	1612	736	211	1211	526		203		454	444		
v/s Ratio Prot	c0.07	0.26			c0.28			c0.05		c0.25	0.06		
v/s Ratio Perm	0.27		0.01	0.03		0.11							
v/c Ratio	0.74	0.52	0.02	0.09	0.76	0.28		0.37		0.85	0.21		
Uniform Delay, d1	26.2	22.7	17.0	26.9	36.2	29.0		53.2		43.8	35.1		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00		
Incremental Delay, d2	11.1	1.2	0.1	0.8	4.5	1.3		5.2		14.2	0.3		
Delay (s)	37.3	23.9	17.1	27.7	40.7	30.4		58.3		58.0	35.4		
Level of Service	D	C	B	C	D	C		E		E	D		
Approach Delay (s)		25.7			37.8			58.3			49.7		
Approach LOS		C			D			E			D		
Intersection Summary													
HCM 2000 Control Delay		36.6			HCM 2000 Level of Service							D	
HCM 2000 Volume to Capacity ratio		0.75											
Actuated Cycle Length (s)		131.6			Sum of lost time (s)						19.2		
Intersection Capacity Utilization		77.6%			ICU Level of Service						D		
Analysis Period (min)		15											
c Critical Lane Group													

Lanes, Volumes, Timings Future Total
PM Peak Hour
 6: Stanley Avenue & Marineland Parkway

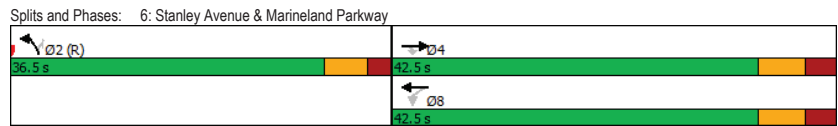
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↔	↕	↔	↕
Traffic Volume (vph)	626	557	111	524	648	57
Future Volume (vph)	626	557	111	524	648	57
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3228	1390	1554	3228	3162	1316
Flt Permitted			0.291		0.950	
Satd. Flow (perm)	3228	1390	476	3228	3162	1316
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		580				59
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	7%	7%	3%	2%	13%
Adj. Flow (vph)	652	580	116	546	675	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	652	580	116	546	675	59
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Future Total
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	42.5	42.5	42.5	42.5	36.5	36.5
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.2%	46.2%
Maximum Green (s)	35.0	35.0	35.0	35.0	30.0	30.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	28.4	28.4	28.4	28.4	42.6	42.6
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.54	0.54
v/c Ratio	0.56	0.67	0.68	0.47	0.40	0.08
Control Delay	21.5	5.5	40.5	20.1	12.9	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	5.5	40.5	20.1	12.9	4.2
LOS	C	A	D	C	B	A
Approach Delay	14.0			23.6	12.2	
Approach LOS	B			C	B	

Intersection Summary
 Area Type: Other
 Cycle Length: 79
 Actuated Cycle Length: 79
 Offset: 0 (0%), Referenced to phase 2:NBL and 6: Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 15.9 Intersection LOS: B
 Intersection Capacity Utilization 57.2% ICU Level of Service B
 Analysis Period (min) 15



Queues
6: Stanley Avenue & Marineland Parkway

Future Total
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	652	580	116	546	675	59
v/c Ratio	0.56	0.67	0.68	0.47	0.40	0.08
Control Delay	21.5	5.5	40.5	20.1	12.9	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	5.5	40.5	20.1	12.9	4.2
Queue Length 50th (m)	43.5	0.0	15.6	35.1	28.9	0.0
Queue Length 95th (m)	46.2	16.2	29.5	37.9	55.3	6.7
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1573	974	231	1573	1706	737
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.60	0.50	0.35	0.40	0.08

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Future Total
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔↔	↔↔	↔↔	↔
Traffic Volume (vph)	626	557	111	524	648	57
Future Volume (vph)	626	557	111	524	648	57
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Fr	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3228	1390	1554	3228	3162	1316
Flt Permitted	1.00	1.00	0.29	1.00	0.95	1.00
Satd. Flow (perm)	3228	1390	477	3228	3162	1316
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	652	580	116	546	675	59
RTOR Reduction (vph)	0	371	0	0	0	27
Lane Group Flow (vph)	652	209	116	546	675	32
Heavy Vehicles (%)	3%	7%	7%	3%	2%	13%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	24.9	24.9	24.9	24.9	40.1	40.1
Effective Green, g (s)	28.4	28.4	28.4	28.4	42.6	42.6
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.54	0.54
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	1160	499	171	1160	1705	709
v/s Ratio Prot	0.20			0.17	c0.21	
v/s Ratio Perm		0.15	c0.24			0.02
v/c Ratio	0.56	0.42	0.68	0.47	0.40	0.04
Uniform Delay, d1	20.3	19.1	21.4	19.5	10.7	8.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	10.0	0.3	0.7	0.1
Delay (s)	20.9	19.6	31.5	19.8	11.4	8.7
Level of Service	C	B	C	B	B	A
Approach Delay (s)	20.3			21.8	11.1	
Approach LOS	C			C	B	
Intersection Summary						
HCM 2000 Control Delay		18.1			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.51				
Actuated Cycle Length (s)		79.0			Sum of lost time (s)	8.0
Intersection Capacity Utilization		57.2%			ICU Level of Service	B
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	↔	↔	↔↔	↔	↔↔	↔	↔
Traffic Volume (vph)	25	248	3	569	288	80	5	152	565	157	207	58
Future Volume (vph)	25	248	3	569	288	80	5	152	565	157	207	58
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Flt Permitted	0.562			0.950			0.611			0.950		
Satd. Flow (perm)	984	3197	1488	3131	3228	1390	1069	3197	1430	3101	3260	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			95			614			95
Link Speed (k/h)		80			80			60				60
Link Distance (m)		507.4			421.7			216.1				150.6
Travel Time (s)		22.8			19.0			13.0				9.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Adj. Flow (vph)	27	270	3	618	313	87	5	165	614	171	225	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	270	3	618	313	87	5	165	614	171	225	63
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Channel												
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4			3			8				2
												1
												6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

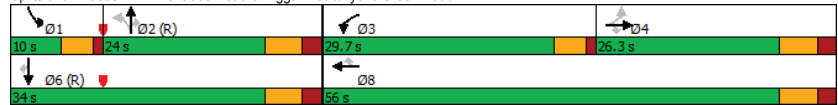
Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4			8	2		2			6
Detector Phase	4	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	29.7	56.0	56.0	24.0	24.0	24.0	10.0	34.0	34.0
Total Split (%)	29.2%	29.2%	29.2%	33.0%	62.2%	62.2%	26.7%	26.7%	26.7%	11.1%	37.8%	37.8%
Maximum Green (s)	20.0	20.0	20.0	25.2	49.7	49.7	17.7	17.7	17.7	5.5	27.7	27.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	15.7	18.0	15.7	22.1	44.7	42.4	21.6	23.9	21.6	8.9	37.3	35.0
Actuated g/C Ratio	0.17	0.20	0.17	0.25	0.50	0.47	0.24	0.27	0.24	0.10	0.41	0.39
v/c Ratio	0.16	0.42	0.01	0.80	0.20	0.12	0.02	0.19	0.76	0.56	0.17	0.10
Control Delay	32.4	33.0	0.0	40.3	12.2	2.4	29.6	28.0	10.1	48.0	18.6	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	32.4	33.0	0.0	40.3	12.2	2.4	29.6	28.0	10.1	48.0	18.6	2.6
LOS	C	C	A	D	B	A	C	C	B	D	B	A
Approach Delay	32.6			28.4			14.0			27.3		
Approach LOS	C			C			B			C		

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 24.3
 Intersection LOS: C
 Intersection Capacity Utilization 63.5%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 7: Montrose Road & Biggar Road/Lyons Creek Road



Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	270	3	618	313	87	5	165	614	171	225	63
v/c Ratio	0.16	0.42	0.01	0.80	0.20	0.12	0.02	0.19	0.76	0.56	0.17	0.10
Control Delay	32.4	33.0	0.0	40.3	12.2	2.4	29.6	28.0	10.1	48.0	18.6	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	32.4	33.0	0.0	40.3	12.2	2.4	29.6	28.0	10.1	48.0	18.6	2.6
Queue Length 50th (m)	4.2	22.8	0.0	53.9	15.7	0.0	0.7	12.8	0.0	15.1	13.3	0.0
Queue Length 95th (m)	11.2	32.7	0.0	71.0	19.4	5.7	3.8	22.0	#42.6	#35.4	24.1	4.6
Internal Link Dist (m)	483.4			397.7			192.1			126.6		
Turn Bay Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Base Capacity (vph)	218	792	446	876	1865	810	256	848	809	307	1351	614
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	0.12	0.34	0.01	0.71	0.17	0.11	0.02	0.19	0.76	0.56	0.17	0.10

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↕	↔	↕	↕	↕	↔	↕	↕	↕	↕	↕	
Traffic Volume (vph)	25	248	3	569	288	80	5	152	565	157	207	58	
Future Volume (vph)	25	248	3	569	288	80	5	152	565	157	207	58	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Fit 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)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430	
Fit Permitted	0.56	1.00	1.00	0.95	1.00	1.00	0.61	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	983	3197	1488	3131	3228	1390	1070	3197	1430	3101	3260	1430	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	27	270	3	618	313	87	5	165	614	171	225	63	
RTOR Reduction (vph)	0	0	2	0	0	46	0	0	467	0	0	39	
Lane Group Flow (vph)	27	270	1	618	313	41	5	165	147	171	225	25	
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%	
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	
Protected Phases		4		3	8			2		1		6	
Permitted Phases	4		4			8		2		2		6	
Actuated Green, G (s)	15.8	15.8	15.8	22.1	42.4	42.4	21.6	21.6	8.9	35.0	35.0	35.0	
Effective Green, g (s)	15.8	18.1	15.8	22.1	44.7	42.4	21.6	23.9	21.6	8.9	37.3	35.0	
Actuated g/C Ratio	0.18	0.20	0.18	0.25	0.50	0.47	0.24	0.27	0.24	0.10	0.41	0.39	
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3	
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0	6.0	
Lane Grp Cap (vph)	172	642	261	768	1603	654	256	848	343	306	1351	556	
v/s Ratio Prot		c0.08		c0.20	0.10			0.05		c0.06		0.07	
v/s Ratio Perm	0.03		0.00			0.03	0.00		c0.10			0.02	
v/c Ratio	0.16	0.42	0.00	0.80	0.20	0.06	0.02	0.19	0.43	0.56	0.17	0.04	
Uniform Delay, d1	31.5	31.4	30.6	31.9	12.6	13.0	26.1	25.6	29.0	38.7	16.6	17.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	1.3	0.0	6.1	0.2	0.1	0.1	0.5	3.9	2.2	0.3	0.1	
Delay (s)	32.7	32.6	30.6	38.1	12.8	13.1	26.3	26.1	32.9	40.9	16.8	17.2	
Level of Service	C	C	C	D	B	B	C	C	C	D	B	B	
Approach Delay (s)		32.6			28.2			31.4			25.9		
Approach LOS		C			C			C			C		
Intersection Summary													
HCM 2000 Control Delay				29.3	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio				0.54									
Actuated Cycle Length (s)				90.0	Sum of lost time (s)				17.0				
Intersection Capacity Utilization				63.5%	ICU Level of Service				B				
Analysis Period (min)	15												
c Critical Lane Group													

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	73	8	10	1	5	5	10	613	0	6	608	45
Future Volume (vph)	73	8	10	1	5	5	10	613	0	6	608	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Fr		0.986			0.938						0.991	
Fit Protected		0.961			0.996			0.999				
Satd. Flow (prot)	0	1645	0	0	1635	0	0	1706	0	0	1726	0
Fit Permitted		0.961			0.996			0.999				
Satd. Flow (perm)	0	1645	0	0	1635	0	0	1706	0	0	1726	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	3		2	2		3	1		5	5		1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	33%	2%	0%	0%	0%	7%
Adj. Flow (vph)	84	9	11	1	6	6	11	705	0	7	699	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	13	0	0	716	0	0	758	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	60.8%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Future Total
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	73	8	10	1	5	5	10	613	0	6	608	45
Future Volume (vph)	73	8	10	1	5	5	10	613	0	6	608	45
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	84	9	11	1	6	6	11	705	0	7	699	52
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	104	13	716	758								
Volume Left (vph)	84	1	11	7								
Volume Right (vph)	11	6	0	52								
Hadj (s)	0.11	-0.26	0.05	-0.03								
Departure Headway (s)	7.2	7.3	5.3	5.2								
Degree Utilization, x	0.21	0.03	1.05	1.09								
Capacity (veh/h)	495	474	691	697								
Control Delay (s)	12.0	10.5	70.2	84.2								
Approach Delay (s)	12.0	10.5	70.2	84.2								
Approach LOS	B	B	F	F								
Intersection Summary												
Delay	72.6											
Level of Service	F											
Intersection Capacity Utilization	60.8%		ICU Level of Service	B								
Analysis Period (min)	15											

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Total
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕	↕	↕	↕
Traffic Volume (vph)	100	75	510	74	76	521
Future Volume (vph)	100	75	510	74	76	521
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.942		0.850			
Fit Protected	0.972			0.950		
Satd. Flow (prot)	1575	0	1750	1488	1614	1750
Fit Permitted	0.972			0.950		
Satd. Flow (perm)	1575	0	1750	1488	1614	1750
Link Speed (k/h)	50		60			
Link Distance (m)	1040.1		438.6	461.8		
Travel Time (s)	74.9		26.3	27.7		
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%
Adj. Flow (vph)	116	87	593	86	88	606
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	0	593	86	88	606
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	54.7%		ICU Level of Service		A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Future Total
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		↑	↑	↑	↑
Sign Control	Stop		Stop		Stop	Stop
Traffic Volume (vph)	100	75	510	74	76	521
Future Volume (vph)	100	75	510	74	76	521
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	116	87	593	86	88	606
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total (vph)	203	593	86	88	606	
Volume Left (vph)	116	0	0	88	0	
Volume Right (vph)	87	0	86	0	0	
Hadj (s)	-0.11	0.00	-0.70	0.55	0.00	
Departure Headway (s)	6.8	6.1	5.4	6.7	6.1	
Degree Utilization, x	0.38	1.01	0.13	0.16	1.03	
Capacity (veh/h)	522	593	653	531	593	
Control Delay (s)	14.0	63.2	8.0	9.7	67.8	
Approach Delay (s)	14.0	56.2		60.4		
Approach LOS	B	F		F		
Intersection Summary						
Delay			52.6			
Level of Service			F			
Intersection Capacity Utilization			54.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	6	28	220	14	27	4	282	499	22	11	736	92
Future Volume (vph)	6	28	220	14	27	4	282	499	22	11	736	92
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.883		0.987		0.996		0.985					
Fit Protected	0.999		0.985		0.983		0.999					
Satd. Flow (prot)	0	1544	0	0	1649	0	0	1604	0	0	1614	0
Fit Permitted	0.999		0.985		0.983		0.999					
Satd. Flow (perm)	0	1544	0	0	1649	0	0	1604	0	0	1614	0
Link Speed (k/h)	60		60		70		60					
Link Distance (m)	372.3		519.4		156.9		312.6					
Travel Time (s)	22.3		31.2		8.1		18.8					
Confl. Peds. (#/hr)			2		2							
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	33%	0%	11%	0%	0%	6%	13%
Adj. Flow (vph)	7	33	256	16	31	5	328	580	26	13	856	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	296	0	0	52	0	0	934	0	0	976	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0					
Link Offset(m)	0.0		0.0		0.0		0.0					
Crosswalk Width(m)	4.8		4.8		4.8		4.8					
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	25	15	25	15	25	15	25	15	25	15
Sign Control	Stop		Stop		Free		Free					
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	122.6%		ICU Level of Service		H							
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Future Total
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Volume (veh/h)	6	28	220	14	27	4	282	499	22	11	736	92	
Future Volume (Veh/h)	6	28	220	14	27	4	282	499	22	11	736	92	
Sign Control	Stop			Stop			Free			Free			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	
Hourly flow rate (vph)	7	33	256	16	31	5	328	580	26	13	856	107	
Pedestrians	2												
Lane Width (m)	3.6												
Walking Speed (m/s)	1.2												
Percent Blockage	0												
Right turn flare (veh)													
Median type	None					None							
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	2205	2200	910	2459	2240	595	963						608
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	2205	2200	910	2459	2240	595	963						608
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.5	4.1						4.1
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.6	2.2						2.2
p0 queue free %	0	0	24	0	0	99	55						99
cM capacity (veh/h)	0	24	336	0	23	450	723						979
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	296	52	934	976									
Volume Left	7	16	328	13									
Volume Right	256	5	26	107									
eSH	0	0	723	979									
Volume to Capacity	Err	Err	0.45	0.01									
Queue Length 95th (m)	Err	Err	19.0	0.3									
Control Delay (s)	Err	Err	11.4	0.4									
Lane LOS	F	F	B	A									
Approach Delay (s)	Err	Err	11.4	0.4									
Approach LOS	F	F											
Intersection Summary													
Average Delay				Err									
Intersection Capacity Utilization	122.6%			ICU Level of Service	H								
Analysis Period (min)	15												

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Total
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔		↔	↔
Traffic Volume (vph)	559	549	373	115	145	578
Future Volume (vph)	559	549	373	115	145	578
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.968			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1511	1733	1662	0	1662	1390
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1511	1733	1662	0	1662	1390
Link Speed (k/h)	50	50			50	
Link Distance (m)	450.7	605.6			812.1	
Travel Time (s)	32.5	43.6			58.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	1%	5%	0%	7%
Adj. Flow (vph)	588	578	393	121	153	608
Shared Lane Traffic (%)						
Lane Group Flow (vph)	588	578	514	0	153	608
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	3.6	3.6			3.6	
Link Offset(m)	0.0	0.0			0.0	
Crosswalk Width(m)	4.8	4.8			4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	81.3%			ICU Level of Service D		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Future Total
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	559	549	373	115	145	578
Future Volume (vph)	559	549	373	115	145	578
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	588	578	393	121	153	608
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	588	578	514	153	608	
Volume Left (vph)	588	0	0	153	0	
Volume Right (vph)	0	0	121	0	608	
Hadj (s)	0.67	0.02	-0.11	0.50	-0.58	
Departure Headway (s)	8.3	7.7	7.3	8.3	7.2	
Degree Utilization, x	1.36	1.23	1.04	0.35	1.22	
Capacity (veh/h)	443	477	500	430	507	
Control Delay (s)	197.4	143.9	77.2	14.5	137.2	
Approach Delay (s)	170.9		77.2	112.5		
Approach LOS	F		F	F		
Intersection Summary						
Delay	133.0					
Level of Service	F					
Intersection Capacity Utilization	81.3%		ICU Level of Service		D	
Analysis Period (min)	15					

Lanes, Volumes, Timings
12: Dorchester Road & Street J

Future Total
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	64	296	288	0	314	307
Future Volume (vph)	64	296	288	0	314	307
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.889					
Fit Protected	0.991					0.975
Satd. Flow (prot)	1512	0	1716	0	0	1673
Fit Permitted	0.991					0.975
Satd. Flow (perm)	1512	0	1716	0	0	1673
Link Speed (k/h)	50		60		60	
Link Distance (m)	156.0		129.0		684.0	
Travel Time (s)	11.2		7.7		41.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	70	322	313	0	341	334
Shared Lane Traffic (%)						
Lane Group Flow (vph)	392	0	313	0	0	675
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15		25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	86.5%		ICU Level of Service		E	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Dorchester Road & Street J

Future Total
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Volume (veh/h)	64	296	288	0	314	307
Future Volume (Veh/h)	64	296	288	0	314	307
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	322	313	0	341	334
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	1329	313			313	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1329	313			313	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	44	56			73	
cM capacity (veh/h)	124	727			1247	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	392	313	675			
Volume Left	70	0	341			
Volume Right	322	0	0			
eSH	389	1700	1247			
Volume to Capacity	1.01	0.18	0.27			
Queue Length 95th (m)	98.3	0.0	8.9			
Control Delay (s)	80.5	0.0	6.0			
Lane LOS	F		A			
Approach Delay (s)	80.5	0.0	6.0			
Approach LOS	F					
Intersection Summary						
Average Delay			25.8			
Intersection Capacity Utilization			86.5%		ICU Level of Service	E
Analysis Period (min)			15			

Lanes, Volumes, Timings
13: Internal Road & Street J

Future Total
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	
Traffic Volume (vph)	13	301	0	24	336	0
Future Volume (vph)	13	301	0	24	336	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.871					
Fit Protected					0.950	
Satd. Flow (prot)	1494	0	0	1716	1630	0
Fit Permitted					0.950	
Satd. Flow (perm)	1494	0	0	1716	1630	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	156.0			269.0	59.7	
Travel Time (s)	11.2			19.4	4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	327	0	26	365	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	341	0	0	26	365	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
13: Internal Road & Street J

Future Total
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	13	301	0	24	336	0
Future Volume (Veh/h)	13	301	0	24	336	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	327	0	26	365	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			341		204	178
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			341		204	178
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		54	100
cM capacity (veh/h)			1218		785	866
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	341	26	365			
Volume Left	0	0	365			
Volume Right	327	0	0			
cSH	1700	1218	785			
Volume to Capacity	0.20	0.00	0.46			
Queue Length 95th (m)	0.0	0.0	19.9			
Control Delay (s)	0.0	0.0	13.5			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	13.5			
Approach LOS			B			
Intersection Summary						
Average Delay			6.7			
Intersection Capacity Utilization		47.8%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
14: Dorchester Road & Internal Road

Future Total
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Volume (vph)	65	126	162	166	0	371
Future Volume (vph)	65	126	162	166	0	371
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.911		0.932			
Fit Protected	0.983					
Satd. Flow (prot)	1536	0	1599	0	0	1716
Fit Permitted	0.983					
Satd. Flow (perm)	1536	0	1599	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	88.3		186.5			129.0
Travel Time (s)	6.4		11.2			7.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	137	176	180	0	403
Shared Lane Traffic (%)						
Lane Group Flow (vph)	208	0	356	0	0	403
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
14: Dorchester Road & Internal Road

Future Total
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		R			T
Traffic Volume (veh/h)	65	126	162	166	0	371
Future Volume (Veh/h)	65	126	162	166	0	371
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	137	176	180	0	403
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	669	266			356	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	669	266			356	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	82			100	
cM capacity (veh/h)	423	773			1203	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	208	356	403			
Volume Left	71	0	0			
Volume Right	137	180	0			
eSH	602	1700	1203			
Volume to Capacity	0.35	0.21	0.00			
Queue Length 95th (m)	12.3	0.0	0.0			
Control Delay (s)	14.1	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	14.1	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization		40.2%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
15: Dorchester Road & Retail South Access

Future Total
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		R			T
Traffic Volume (vph)	1	5	323	62	8	428
Future Volume (vph)	1	5	323	62	8	428
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.887		0.978			
Fit Protected	0.992					0.999
Satd. Flow (prot)	1510	0	1678	0	0	1714
Fit Permitted	0.992					0.999
Satd. Flow (perm)	1510	0	1678	0	0	1714
Link Speed (k/h)	50		60			60
Link Distance (m)	131.1		281.9			186.5
Travel Time (s)	9.4		16.9			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	5	351	67	9	465
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	418	0	0	474
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.4%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
15: Dorchester Road & Retail South Access

Future Total
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (veh/h)	1	5	323	62	8	428
Future Volume (Veh/h)	1	5	323	62	8	428
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	5	351	67	9	465
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	868	384			418	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	868	384			418	
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	99			99	
cM capacity (veh/h)	321	663			1141	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	6	418	474			
Volume Left	1	0	9			
Volume Right	5	67	0			
cSH	563	1700	1141			
Volume to Capacity	0.01	0.25	0.01			
Queue Length 95th (m)	0.3	0.0	0.2			
Control Delay (s)	11.5	0.0	0.2			
Lane LOS	B		A			
Approach Delay (s)	11.5	0.0	0.2			
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization		41.4%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
16: Dorchester Road & Street K

Future Total
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (vph)	7	0	385	14	13	416
Future Volume (vph)	7	0	385	14	13	416
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.995			
Fit Protected	0.950					0.999
Satd. Flow (prot)	1630	0	1707	0	0	1714
Fit Permitted	0.950					0.999
Satd. Flow (perm)	1630	0	1707	0	0	1714
Link Speed (k/h)	50		60			60
Link Distance (m)	454.1		240.5			281.9
Travel Time (s)	32.7		14.4			16.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	0	418	15	14	452
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	0	433	0	0	466
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	45.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
16: Dorchester Road & Street K

Future Total
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Volume (veh/h)	7	0	385	14	13	416
Future Volume (Veh/h)	7	0	385	14	13	416
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	0	418	15	14	452
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	906	426			433	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	906	426			433	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			99	
cM capacity (veh/h)	303	629			1127	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	8	433	466			
Volume Left	8	0	14			
Volume Right	0	15	0			
eSH	303	1700	1127			
Volume to Capacity	0.03	0.25	0.01			
Queue Length 95th (m)	0.6	0.0	0.3			
Control Delay (s)	17.2	0.0	0.4			
Lane LOS	C		A			
Approach Delay (s)	17.2	0.0	0.4			
Approach LOS	C					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization		45.2%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
17: Street K & Retirement Home South Access

Future Total
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (vph)	2	25	6	0	0	1
Future Volume (vph)	2	25	6	0	0	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.865	
Fit Protected		0.997				
Satd. Flow (prot)	0	1711	1716	0	1484	0
Fit Permitted		0.997				
Satd. Flow (perm)	0	1711	1716	0	1484	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		454.1	129.4		65.9	
Travel Time (s)		32.7	9.3		4.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	27	7	0	0	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	29	7	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
17: Street K & Retirement Home South Access

Future Total
PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	25	6	0	0	1
Future Volume (Veh/h)	2	25	6	0	0	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	27	7	0	0	1
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	7				38	7
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	7				38	7
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)	1614				973	1075
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	29	7	1			
Volume Left	2	0	0			
Volume Right	0	0	1			
cSH	1614	1700	1075			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.5	0.0	8.4			
Lane LOS	A		A			
Approach Delay (s)	0.5	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
18: Street J & Townhouse Access

Future Total
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕			↕
Traffic Volume (vph)	3	9	5	20	0	3
Future Volume (vph)	3	9	5	20	0	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.896		0.890			
Fit Protected	0.989					
Satd. Flow (prot)	1520	0	1527	0	0	1716
Fit Permitted	0.989					
Satd. Flow (perm)	1520	0	1527	0	0	1716
Link Speed (k/h)	50		50			50
Link Distance (m)	95.4		27.1			46.1
Travel Time (s)	6.9		2.0			3.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	10	5	22	0	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	27	0	0	3
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
18: Street J & Townhouse Access

Future Total
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (veh/h)	3	9	5	20	0	3
Future Volume (Veh/h)	3	9	5	20	0	3
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	5	22	0	3
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	19	16			27	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	19	16			27	
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	99			100	
cM capacity (veh/h)	998	1063			1587	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	13	27	3			
Volume Left	3	0	0			
Volume Right	10	22	0			
eSH	1048	1700	1587			
Volume to Capacity	0.01	0.02	0.00			
Queue Length 95th (m)	0.3	0.0	0.0			
Control Delay (s)	8.5	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.5	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
19: Street J & Retirement Home North Access

Future Total
PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↕	↕	↕
Traffic Volume (vph)	15	3	5	9	0	13
Future Volume (vph)	15	3	5	9	0	13
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.979				0.865	
Fit Protected	0.960			0.984		
Satd. Flow (prot)	1612	0	0	1688	1484	0
Fit Permitted	0.960			0.984		
Satd. Flow (perm)	1612	0	0	1688	1484	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.7			46.1	138.5	
Travel Time (s)	3.7			3.3	10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	3	5	10	0	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	0	0	15	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
19: Street J & Retirement Home North Access

Future Total
PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	3	5	9	0	13
Future Volume (Veh/h)	15	3	5	9	0	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	3	5	10	0	14
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	27	7	14			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	27	7	14			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	985	1075	1604			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	19	15	14			
Volume Left	16	5	0			
Volume Right	3	0	14			
cSH	998	1604	1700			
Volume to Capacity	0.02	0.00	0.01			
Queue Length 95th (m)	0.5	0.1	0.0			
Control Delay (s)	8.7	2.4	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	2.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			4.2			
Intersection Capacity Utilization		15.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
20: Retail West Access/Hotel West Access & Internal Road

Future Total
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	0	126	0	0	0	165	0	0	0	0	26
Future Volume (vph)	40	0	126	0	0	0	165	0	0	0	0	26
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.897										0.865
Fit Protected		0.988						0.950				
Satd. Flow (prot)	0	1521	0	0	1716	0	0	1630	0	0	1484	0
Fit Permitted		0.988						0.950				
Satd. Flow (perm)	0	1521	0	0	1716	0	0	1630	0	0	1484	0
Link Speed (k/h)		50			50			50				50
Link Distance (m)		88.3			73.6			40.4				49.4
Travel Time (s)		6.4			5.3			2.9				3.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	0	137	0	0	0	179	0	0	0	0	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	180	0	0	0	0	179	0	0	28	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0				0.0
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop				Stop
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	34.1%						ICU Level of Service A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 20: Retail West Access/Hotel West Access & Internal Road

Future Total
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Volume (veh/h)	40	0	126	0	0	0	165	0	0	0	0	26
Future Volume (Veh/h)	40	0	126	0	0	0	165	0	0	0	0	26
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	0	137	0	0	0	179	0	0	0	0	28
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	0			137			182	154	68	154	223	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			137			182	154	68	154	223	0
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			76	100	100	100	100	97
cM capacity (veh/h)	1623			1447			743	718	995	796	658	1085
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	180	0	179	28								
Volume Left	43	0	179	0								
Volume Right	137	0	0	28								
cSH	1623	1700	743	1085								
Volume to Capacity	0.03	0.00	0.24	0.03								
Queue Length 95th (m)	0.7	0.0	7.5	0.6								
Control Delay (s)	1.9	0.0	11.4	8.4								
Lane LOS	A		B	A								
Approach Delay (s)	1.9	0.0	11.4	8.4								
Approach LOS			B	A								
Intersection Summary												
Average Delay				6.8								
Intersection Capacity Utilization				34.1%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings
 21: Internal Road & Hotel East Access/Retail East Access

Future Total
 PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Volume (vph)	79	0	0	0	0	257	0	0	0	233	0	68
Future Volume (vph)	79	0	0	0	0	257	0	0	0	233	0	68
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t							0.865			0.969		
Fit Protected										0.963		
Satd. Flow (prot)	0	1630	0	0	1484	0	0	1716	0	0	1601	0
Fit Permitted										0.963		
Satd. Flow (perm)	0	1630	0	0	1484	0	0	1716	0	0	1601	0
Link Speed (k/h)				50			50			50		
Link Distance (m)				43.1			67.6			59.7		
Travel Time (s)				3.1			4.9			4.3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	0	0	0	0	279	0	0	0	253	0	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	279	0	0	0	0	0	327	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)				0.0			0.0			0.0		
Link Offset(m)				0.0			0.0			0.0		
Crosswalk Width(m)				4.8			4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Stop				Stop		Free				Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	50.5%						ICU Level of Service A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 21: Internal Road & Hotel East Access/Retail East Access

Future Total
 PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Volume (veh/h)	79	0	0	0	0	257	0	0	0	233	0	68	
Future Volume (Veh/h)	79	0	0	0	0	257	0	0	0	233	0	68	
Sign Control	Stop			Stop			Free			Free			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	86	0	0	0	0	279	0	0	0	253	0	74	
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	822	543	37	543	580	0	74						0
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	822	543	37	543	580	0	74						0
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 %	55	100	100	100	100	74	100						84
cM capacity (veh/h)	192	377	1035	397	359	1085	1526						1623
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	86	279	0	327									
Volume Left	86	0	0	253									
Volume Right	0	279	0	74									
sSH	192	1085	1700	1623									
Volume to Capacity	0.45	0.26	0.00	0.16									
Queue Length 95th (m)	16.9	8.2	0.0	4.4									
Control Delay (s)	38.3	9.5	0.0	6.2									
Lane LOS	E	A		A									
Approach Delay (s)	38.3	9.5	0.0	6.2									
Approach LOS	E	A											
Intersection Summary													
Average Delay	11.5												
Intersection Capacity Utilization	50.5%			ICU Level of Service			A						
Analysis Period (min)	15												

Queuing and Blocking Report

Future Total
 PM Peak Hour

Intersection: 1: Montrose Road & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	R	L	T	T	R
Maximum Queue (m)	62.4	748.8	748.2	77.5	45.2	88.2	95.5	42.6	31.7	279.0	458.0	579.5
Average Queue (m)	32.7	337.3	337.1	67.8	19.0	49.1	52.7	16.5	10.2	44.0	84.5	167.4
95th Queue (m)	75.6	827.5	823.1	92.6	36.3	84.7	86.9	32.6	23.0	220.3	349.4	518.0
Link Distance (m)	740.7				740.7				665.6			
Upstream Blk Time (%)	25				26				1			
Queueing Penalty (veh)	0				0				3			
Storage Bay Dist (m)	55.0				70.0				115.0			
Storage Blk Time (%)	0				56				48			
Queueing Penalty (veh)	1				74				220			

Intersection: 1: Montrose Road & McLeod Road

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	137.4	205.2	176.8
Average Queue (m)	109.0	106.3	44.4
95th Queue (m)	164.8	250.9	130.3
Link Distance (m)	194.3		194.3
Upstream Blk Time (%)	35		0
Queueing Penalty (veh)	0		0
Storage Bay Dist (m)	130.0		
Storage Blk Time (%)	46		0
Queueing Penalty (veh)	44		0

Intersection: 2: Oakwood Drive & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	L	TR
Maximum Queue (m)	57.3	674.6	675.9	693.0	86.0	138.8	126.0	102.5	352.1	352.6	27.3	100.8
Average Queue (m)	16.4	526.4	529.1	515.4	40.9	55.8	59.2	80.2	324.4	319.8	12.4	32.8
95th Queue (m)	54.3	845.4	846.6	895.1	86.2	122.1	121.1	134.9	416.6	416.9	28.3	82.2
Link Distance (m)	665.6				665.6				592.5			
Upstream Blk Time (%)	27				30				39			
Queueing Penalty (veh)	186				203				264			
Storage Bay Dist (m)	50.0				80.0				95.0			
Storage Blk Time (%)	0				73				3			
Queueing Penalty (veh)	0				31				21			

Queuing and Blocking Report

Future Total
PM Peak Hour

Intersection: 3: Dorchester Road & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	62.5	597.9	601.5	57.3	148.7	159.4	22.8	330.8	37.4	306.7
Average Queue (m)	45.4	570.5	571.2	25.8	78.7	83.2	19.7	327.3	35.6	299.5
95th Queue (m)	86.7	656.0	656.8	60.7	135.9	142.2	31.2	343.8	43.2	303.8
Link Distance (m)		592.5	592.5		1024.4	1024.4		325.7		294.0
Upstream Blk Time (%)		31	32					54		89
Queuing Penalty (veh)		294	311					373		0
Storage Bay Dist (m)	55.0			50.0			15.0		30.0	
Storage Blk Time (%)	19	61		1	23		49	58	44	47
Queuing Penalty (veh)	96	199		3	22		186	291	241	137

Intersection: 4: Drummond Road & McLeod Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LTR	L	TR
Maximum Queue (m)	1030.5	1032.1	808.4	810.1	433.7	27.3	208.7
Average Queue (m)	768.4	768.3	547.9	552.2	368.7	25.9	198.6
95th Queue (m)	1274.8	1278.1	967.7	973.7	522.4	31.8	207.7
Link Distance (m)	1024.4	1024.4	1047.7	1047.7	811.3		193.4
Upstream Blk Time (%)	27	29	0	1			74
Queuing Penalty (veh)	204	220	2	4			0
Storage Bay Dist (m)							20.0
Storage Blk Time (%)							30
Queuing Penalty (veh)							146
							142

Intersection: 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	L	TR
Maximum Queue (m)	45.0	50.3	72.7	47.8	32.2	152.0	156.4	87.4	36.5	133.7	66.3
Average Queue (m)	15.8	19.7	36.2	4.0	3.9	72.2	72.3	15.0	13.4	80.9	27.6
95th Queue (m)	33.9	43.7	68.3	23.0	17.0	126.1	127.9	69.1	30.4	124.9	54.0
Link Distance (m)		1047.7	1047.7				239.8	239.8	307.6	277.4	277.4
Upstream Blk Time (%)							0	0			
Queuing Penalty (veh)							0	0			
Storage Bay Dist (m)	60.0			50.0	25.0				80.0		
Storage Blk Time (%)		0	4	0	0	38	6	0			
Queuing Penalty (veh)		0	2	0	0	7	18	0			

Queuing and Blocking Report

Future Total
PM Peak Hour

Intersection: 6: Stanley Avenue & Marineland Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	L	T	T	L	L	R
Maximum Queue (m)	64.2	67.1	66.4	49.7	65.9	64.5	43.0	56.3	21.4
Average Queue (m)	30.3	31.9	13.4	22.4	35.6	34.0	19.8	30.8	5.9
95th Queue (m)	54.3	55.9	43.4	41.4	55.4	56.1	38.4	50.5	15.5
Link Distance (m)	239.8	239.8			155.4	155.4		485.6	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)			65.0	105.0			160.0		80.0
Storage Blk Time (%)		0	0						
Queuing Penalty (veh)		1	0						

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L
Maximum Queue (m)	16.7	48.6	43.3	5.6	74.8	88.9	25.6	25.9	17.7	6.5
Average Queue (m)	4.9	25.5	12.9	0.5	44.2	56.9	11.1	12.1	4.6	0.6
95th Queue (m)	13.6	42.4	31.6	2.9	68.1	78.9	22.7	24.2	12.3	3.6
Link Distance (m)		488.7	488.7				403.0	403.0		196.3
Upstream Blk Time (%)										0
Queuing Penalty (veh)										0
Storage Bay Dist (m)	130.0			120.0	150.0	150.0			225.0	80.0
Storage Blk Time (%)										0
Queuing Penalty (veh)										3

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (m)	67.5	47.4	60.5	38.7	33.0	16.9
Average Queue (m)	52.2	9.4	30.8	16.4	7.5	3.2
95th Queue (m)	80.2	36.4	52.4	32.6	21.2	9.8
Link Distance (m)				130.6	130.6	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	60.0	80.0	80.0			50.0
Storage Blk Time (%)	25		0		0	
Queuing Penalty (veh)	19		0		0	

Queuing and Blocking Report

Future Total
PM Peak Hour

Intersection: 8: Dorchester Road & Jill Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	60.7	12.2	450.0	52.7
Average Queue (m)	19.9	3.0	377.2	18.6
95th Queue (m)	49.7	9.8	581.1	40.0
Link Distance (m)	110.7	156.1	446.2	325.7
Upstream Blk Time (%)	1		39	
Queuing Penalty (veh)	0		231	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Dorchester Road & Oldfield Road

Movement	WB	NB	NB	B29	SB	SB
Directions Served	LR	T	R	T	L	T
Maximum Queue (m)	158.7	445.3	22.5	549.5	19.8	21.9
Average Queue (m)	41.4	214.1	13.4	139.5	7.8	12.4
95th Queue (m)	140.0	521.2	29.0	541.4	16.1	19.4
Link Distance (m)	1018.8	424.6		670.7		446.2
Upstream Blk Time (%)		32		8		
Queuing Penalty (veh)		186		48		
Storage Bay Dist (m)			15.0		15.0	
Storage Blk Time (%)		65	0		0	2
Queuing Penalty (veh)		48	2		2	2

Intersection: 10: Stanley Avenue & Chippawa Parkway

Movement	EB	WB	NB	SB	B57
Directions Served	LTR	LTR	LTR	LTR	T
Maximum Queue (m)	152.6	36.8	95.3	25.1	102.0
Average Queue (m)	52.8	14.5	41.7	3.3	6.8
95th Queue (m)	127.5	30.8	78.4	14.9	102.8
Link Distance (m)	355.4	511.0	139.9	295.8	485.6
Upstream Blk Time (%)					0
Queuing Penalty (veh)					0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Queuing and Blocking Report

Future Total
PM Peak Hour

Intersection: 11: Lyons Creek Road & Stanley Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (m)	62.5	460.6	518.0	32.4	388.8
Average Queue (m)	62.4	451.4	353.1	29.2	229.3
95th Queue (m)	62.5	483.6	607.6	43.1	546.4
Link Distance (m)		442.7	589.0		785.7
Upstream Blk Time (%)		90	12		0
Queuing Penalty (veh)		0	0		0
Storage Bay Dist (m)	55.0			25.0	
Storage Blk Time (%)	91	9		1	79
Queuing Penalty (veh)	497	50		3	115

Intersection: 12: Dorchester Road & Street J

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	106.1	56.7	28.4
Average Queue (m)	35.6	8.2	11.4
95th Queue (m)	92.5	51.5	25.1
Link Distance (m)	137.0	110.9	670.7
Upstream Blk Time (%)	7	4	
Queuing Penalty (veh)	26	11	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Internal Road & Street J

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	9.3	36.3
Average Queue (m)	0.6	16.0
95th Queue (m)	6.0	31.2
Link Distance (m)	254.0	42.5
Upstream Blk Time (%)		7
Queuing Penalty (veh)		22
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Future Total
PM Peak Hour

Intersection: 14: Dorchester Road & Internal Road

Movement	WB	NB
Directions Served	LR	TR
Maximum Queue (m)	40.4	49.5
Average Queue (m)	14.3	4.6
95th Queue (m)	32.2	45.2
Link Distance (m)	68.8	167.8
Upstream Blk Time (%)	2	1
Queuing Penalty (veh)	4	4
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: Dorchester Road & Retail South Access

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	7.8	13.3	9.8
Average Queue (m)	1.1	0.8	0.6
95th Queue (m)	5.5	12.3	4.7
Link Distance (m)	120.4	259.4	167.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: Dorchester Road & Street K

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	7.0	17.6
Average Queue (m)	1.8	1.1
95th Queue (m)	6.7	8.0
Link Distance (m)	432.8	259.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Future Total
PM Peak Hour

Intersection: 17: Street K & Retirement Home South Access

Movement	SB
Directions Served	LR
Maximum Queue (m)	1.8
Average Queue (m)	0.1
95th Queue (m)	0.9
Link Distance (m)	47.3
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 18: Street J & Townhouse Access

Movement	WB
Directions Served	LR
Maximum Queue (m)	8.8
Average Queue (m)	3.1
95th Queue (m)	9.8
Link Distance (m)	86.3
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 19: Street J & Retirement Home North Access

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (m)	10.3	1.8
Average Queue (m)	4.2	0.1
95th Queue (m)	11.4	1.3
Link Distance (m)	41.8	31.6
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Future Total
PM Peak Hour

Intersection: 20: Retail West Access/Hotel West Access & Internal Road

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (m)	27.3	17.8
Average Queue (m)	12.7	5.8
95th Queue (m)	22.3	14.3
Link Distance (m)	30.9	40.9
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	0	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 21: Internal Road & Hotel East Access/Retail East Access

Movement	EB	WB
Directions Served	LTR	LTR
Maximum Queue (m)	26.2	48.5
Average Queue (m)	11.4	17.4
95th Queue (m)	21.7	36.5
Link Distance (m)	34.4	59.0
Upstream Blk Time (%)	4	5
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 5544

Lanes, Volumes, Timings

1: Montrose Road & McLeod Road

Future Total
Saturday Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group												
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	141	1202	45	198	914	300	62	112	377	360	190	80
Future Volume (vph)	141	1202	45	198	914	300	62	112	377	360	190	80
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0		0.0	115.0		0.0	130.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00				1.00	
Frts		0.995				0.850			0.850		0.955	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1539	4523	0	1599	3228	1444	1662	3107	1403	1599	3055	0
Fit Permitted	0.143			0.082			0.567			0.589		
Satd. Flow (perm)	232	4523	0	138	3228	1444	991	3107	1403	991	3055	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		5				331			336		53	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		759.2			692.3			721.0			213.3	
Travel Time (s)		54.7			49.8			51.9			15.4	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	5%	8%	4%	3%	3%	0%	7%	6%	4%	5%	0%
Adj. Flow (vph)	158	1351	51	222	1027	337	70	126	424	404	213	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	158	1402	0	222	1027	337	70	126	424	404	303	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

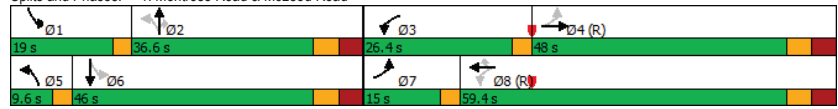
Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	7	4		3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0	8.0	6.0	8.0	
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0	46.0	9.5	46.0	
Total Split (s)	15.0	48.0		26.4	59.4	59.4	9.6	36.6	36.6	19.0	46.0	
Total Split (%)	11.5%	36.9%		20.3%	45.7%	45.7%	7.4%	28.2%	28.2%	14.6%	35.4%	
Maximum Green (s)	12.0	40.0		23.4	51.4	51.4	6.6	28.6	28.6	16.0	38.0	
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0	4.0	0.0	4.0	
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0	-4.0	1.0	-4.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max	Max	None	Max	
Walk Time (s)		12.0			12.0	12.0		14.0	14.0		14.0	
Flash Dont Walk (s)		20.0			20.0	20.0		24.0	24.0		24.0	
Pedestrian Calls (#/hr)		0			0	0		0	0		0	
Act Effct Green (s)	60.3	50.3		69.7	56.4	56.4	38.1	32.6	32.6	51.6	43.9	
Actuated g/C Ratio	0.46	0.39		0.54	0.43	0.43	0.29	0.25	0.25	0.40	0.34	
v/c Ratio	0.76	0.80		0.87	0.73	0.41	0.22	0.16	0.70	0.87	0.28	
Control Delay	44.4	40.3		57.0	30.9	4.2	27.8	38.7	16.8	54.4	27.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.4	40.3		57.0	30.9	4.2	27.8	38.7	16.8	54.4	27.2	
LOS	D	D		E	C	A	C	D	B	D	C	
Approach Delay		40.7			28.9			22.5			42.7	
Approach LOS		D			C			C			D	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 34.3
 Intersection LOS: C
 Intersection Capacity Utilization 88.2%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: Montrose Road & McLeod Road



Queues
1: Montrose Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	158	1402	222	1027	337	70	126	424	404	303
v/c Ratio	0.76	0.80	0.87	0.73	0.41	0.22	0.16	0.70	0.87	0.28
Control Delay	44.4	40.3	57.0	30.9	4.2	27.8	38.7	16.8	54.4	27.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	40.3	57.0	30.9	4.2	27.8	38.7	16.8	54.4	27.2
Queue Length 50th (m)	21.0	121.8	37.7	132.3	8.4	11.8	14.0	19.2	87.0	26.2
Queue Length 95th (m)	#52.4	#151.3	m59.8	144.3	m11.2	21.9	22.6	58.5	#141.8	38.3
Internal Link Dist (m)		735.2		668.3			697.0			189.3
Turn Bay Length (m)	55.0		155.0			115.0				130.0
Base Capacity (vph)	220	1753	326	1399	813	320	779	603	463	1066
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.80	0.68	0.73	0.41	0.22	0.16	0.70	0.87	0.28

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Future Total
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	141	1202	45	198	914	300	62	112	377	360	190	80
Future Volume (vph)	141	1202	45	198	914	300	62	112	377	360	190	80
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ftpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1539	4520		1599	3228	1444	1661	3107	1403	1599	3056	
Flt Permitted	0.14	1.00		0.08	1.00	1.00	0.57	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	232	4520		138	3228	1444	992	3107	1403	990	3056	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	158	1351	51	222	1027	337	70	126	424	404	213	90
RTOR Reduction (vph)	0	3	0	0	0	189	0	0	250	0	35	0
Lane Group Flow (vph)	158	1399	0	222	1027	148	70	126	174	404	268	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	8%	5%	8%	4%	3%	3%	0%	7%	6%	4%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			2	6	
Actuated Green, G (s)	56.7	45.7		65.8	51.8	51.8	34.5	29.2	29.2	48.2	39.9	
Effective Green, g (s)	54.7	49.7		64.8	55.8	55.8	32.5	33.2	33.2	47.2	43.9	
Actuated g/C Ratio	0.42	0.38		0.50	0.43	0.43	0.25	0.26	0.26	0.36	0.34	
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	3.0	8.0	8.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	198	1728		249	1385	619	270	793	358	429	1031	
v/s Ratio Prot	0.06	0.31		c0.11	0.32		0.01	0.04		c0.11	0.09	
v/s Ratio Perm	0.27			c0.33		0.10	0.06		0.12	c0.23		
v/c Ratio	0.80	0.81		0.89	0.74	0.24	0.26	0.16	0.49	0.94	0.26	
Uniform Delay, d1	27.1	35.9		37.1	31.1	23.6	38.2	37.6	41.1	38.5	31.3	
Progression Factor	1.00	1.00		1.09	0.92	1.17	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.1	4.2		21.8	2.4	0.6	0.4	0.4	4.7	29.1	0.6	
Delay (s)	46.2	40.1		62.3	30.8	28.1	38.5	38.0	45.8	67.5	31.9	
Level of Service	D	D		E	C	C	D	D	D	E	C	
Approach Delay (s)		40.8			34.7			43.4			52.2	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay		40.8		HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		130.0		Sum of lost time (s)				16.0				
Intersection Capacity Utilization		88.2%		ICU Level of Service				E				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	28	1375	489	276	1354	16	437	18	361	12	9	34
Future Volume (vph)	28	1375	489	276	1354	16	437	18	361	12	9	34
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0	0.0	80.0	0.0	95.0	0.0	95.0	0.0	20.0	0.0	20.0	0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.95		1.00		1.00		1.00	0.99	1.00	0.99
Frt			0.850		0.998				0.850		0.880	
Flt Protected	0.950			0.950			0.950	0.956		0.950		
Satd. Flow (prot)	1662	3292	1473	1630	3284	0	1548	1561	1473	1662	1522	0
Flt Permitted	0.127			0.068			0.950	0.956		0.950		
Satd. Flow (perm)	222	3292	1396	117	3284	0	1545	1557	1452	1660	1522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			348		1				340		36	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		692.3			616.3			360.6			181.9	
Travel Time (s)		49.8			44.4			26.0			13.1	
Confl. Peds. (#/hr)	10		16	16		10	3		2	2		3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	2%	0%	1%	0%	0%	0%
Adj. Flow (vph)	29	1447	515	291	1425	17	460	19	380	13	9	36
Shared Lane Traffic (%)	48%											
Lane Group Flow (vph)	29	1447	515	291	1442	0	239	240	380	13	45	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

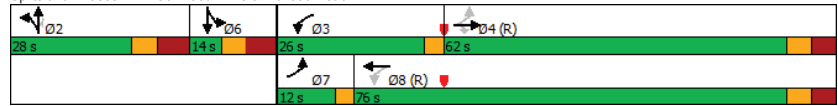
Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	12.0	62.0	62.0	26.0	76.0		28.0	28.0	28.0	14.0	14.0	
Total Split (%)	9.2%	47.7%	47.7%	20.0%	58.5%		21.5%	21.5%	21.5%	10.8%	10.8%	
Maximum Green (s)	9.0	54.0	54.0	23.0	68.0		19.0	19.0	19.0	5.0	5.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	65.0	59.8	54.8	84.0	78.4		24.0	24.0	24.0	10.0	10.0	
Actuated g/C Ratio	0.50	0.46	0.42	0.65	0.60		0.18	0.18	0.18	0.08	0.08	
v/c Ratio	0.17	0.96	0.65	0.94	0.73		0.84	0.83	0.70	0.10	0.30	
Control Delay	11.2	38.3	10.2	74.5	21.7		76.2	75.4	15.1	57.9	28.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	11.2	38.3	10.2	74.5	21.7		76.2	75.4	15.1	57.9	28.1	
LOS	B	D	B	E	C		E	E	B	E	C	
Approach Delay		30.7			30.6			49.0			34.8	
Approach LOS		C			C			D			C	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 155
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 34.1
 Intersection LOS: C
 Intersection Capacity Utilization 120.4%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 2: Oakwood Drive & McLeod Road



Queues
2: Oakwood Drive & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	1447	515	291	1442	239	240	380	13	45
v/c Ratio	0.17	0.96	0.65	0.94	0.73	0.84	0.83	0.70	0.10	0.30
Control Delay	11.2	38.3	10.2	74.5	21.7	76.2	75.4	15.1	57.9	28.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	38.3	10.2	74.5	21.7	76.2	75.4	15.1	57.9	28.1
Queue Length 50th (m)	2.2	201.3	75.5	60.7	147.4	66.1	66.3	9.2	3.3	2.3
Queue Length 95th (m)	m1.9	#256.4	m107.3	#112.8	180.3	#113.8	#113.7	45.0	10.4	15.0
Internal Link Dist (m)		668.3			592.3		336.6			157.9
Turn Bay Length (m)	50.0			80.0		95.0		20.0		
Base Capacity (vph)	204	1514	789	331	1980	285	288	545	127	150
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.96	0.65	0.88	0.73	0.84	0.83	0.70	0.10	0.30

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Future Total
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	28	1375	489	276	1354	16	437	18	361	12	9	34
Future Volume (vph)	28	1375	489	276	1354	16	437	18	361	12	9	34
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.88	
Fit Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1662	3292	1396	1630	3285		1548	1561	1452	1662	1522	
Fit Permitted	0.13	1.00	1.00	0.07	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	221	3292	1396	117	3285		1548	1561	1452	1662	1522	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	1447	515	291	1425	17	460	19	380	13	9	36
RTOR Reduction (vph)	0	0	201	0	0	0	0	0	277	0	33	0
Lane Group Flow (vph)	29	1447	314	291	1442	0	239	240	103	13	12	0
Confl. Peds. (#/hr)	10		16	16		10	3		2	2		3
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	59.6	55.8	55.8	80.0	73.2		19.0	19.0	19.0	5.0	5.0	
Effective Green, g (s)	57.6	59.8	54.8	79.0	77.2		24.0	24.0	24.0	10.0	10.0	
Actuated g/C Ratio	0.44	0.46	0.42	0.61	0.59		0.18	0.18	0.18	0.08	0.08	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	128	1514	588	306	1950		285	288	268	127	117	
v/s Ratio Prot	0.00	c0.44		c0.15	0.44		c0.15	0.15		c0.01	0.01	
v/s Ratio Perm	0.09		0.22	0.43					0.07			
v/c Ratio	0.23	0.96	0.53	0.95	0.74		0.84	0.83	0.38	0.10	0.10	
Uniform Delay, d1	21.8	33.8	28.1	42.7	19.1		51.1	51.1	46.5	55.8	55.8	
Progression Factor	0.95	0.81	0.82	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	10.0	2.0	38.3	2.6		24.5	23.7	4.1	1.6	1.7	
Delay (s)	21.1	37.3	24.9	81.0	21.7		75.7	74.8	50.6	57.4	57.5	
Level of Service	C	D	C	F	C		E	E	D	E	E	
Approach Delay (s)		33.9			31.6			64.3			57.5	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay		39.0					HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		130.0					Sum of lost time (s)				16.0	
Intersection Capacity Utilization		120.4%					ICU Level of Service				H	
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	305	985	465	104	798	147	488	205	207	275	241	312
Future Volume (vph)	305	985	465	104	798	147	488	205	207	275	241	312
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0		0.0	15.0		0.0	30.0		0.0	
Storage Lanes	1	0	1		0	1		0	1		0	
Taper Length (m)	7.5		7.5		7.5			7.5			7.5	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.99			0.98		0.99		0.99
Frt		0.952			0.977			0.925		0.915		
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3077	0	1662	3195	0	1630	1589	0	1662	1565	0
Fit Permitted	0.101			0.112			0.118			0.202		
Satd. Flow (perm)	173	3077	0	196	3195	0	202	1589	0	350	1565	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		74			18			43			54	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		616.3			1045.5			348.9			308.0	
Travel Time (s)		44.4			75.3			25.1			22.2	
Confl. Peds. (#/hr)	13		11	11		13	9		21	21		9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%
Adj. Flow (vph)	314	1015	479	107	823	152	503	211	213	284	248	322
Shared Lane Traffic (%)												
Lane Group Flow (vph)	314	1494	0	107	975	0	503	424	0	284	570	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

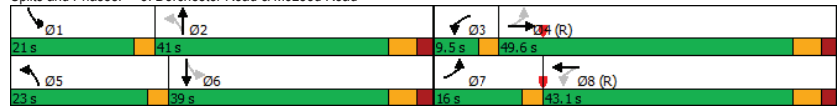
Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.4		9.5	30.4		9.5	37.7		9.5	37.7	
Total Split (s)	16.0	49.6		9.5	43.1		23.0	41.0		21.0	39.0	
Total Split (%)	13.2%	41.0%		7.8%	35.6%		19.0%	33.9%		17.3%	32.2%	
Maximum Green (s)	13.0	43.2		6.5	36.7		20.0	34.3		18.0	32.3	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.3		0.0	2.3		0.0	2.6		0.0	2.6	
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		9.0			9.0			12.0			12.0	
Flash Dont Walk (s)		15.0			15.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	55.1	45.6		44.6	39.1		56.4	37.7		51.3	35.0	
Actuated g/C Ratio	0.45	0.38		0.37	0.32		0.47	0.31		0.42	0.29	
v/c Ratio	1.41	1.24		0.78	0.93		1.58	0.81		0.87	1.16	
Control Delay	235.0	148.0		58.2	55.4		304.4	48.2		50.4	129.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	235.0	148.0		58.2	55.4		304.4	48.2		50.4	129.6	
LOS	F	F		E	E		F	D		D	F	
Approach Delay		163.1			55.7			187.2			103.2	
Approach LOS		F			E			F			F	

Intersection Summary

Area Type: Other
 Cycle Length: 121.1
 Actuated Cycle Length: 121.1
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.58
 Intersection Signal Delay: 132.1 Intersection LOS: F
 Intersection Capacity Utilization 130.1% ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 3: Dorchester Road & McLeod Road



Queues
3: Dorchester Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	314	1494	107	975	503	424	284	570
v/c Ratio	1.41	1.24	0.78	0.93	1.58	0.81	0.87	1.16
Control Delay	235.0	148.0	58.2	55.4	304.4	48.2	50.4	129.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	235.0	148.0	58.2	55.4	304.4	48.2	50.4	129.6
Queue Length 50th (m)	-89.6	-239.1	15.3	122.3	-164.3	89.4	43.5	-159.4
Queue Length 95th (m)	#148.9	#284.5	#40.2	#165.3	#233.6	#143.4	#90.3	#231.4
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	223	1204	138	1043	318	523	334	490
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	1.41	1.24	0.78	0.93	1.58	0.81	0.85	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Future Total
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	305	985	465	104	798	147	488	205	207	275	241	312
Future Volume (vph)	305	985	465	104	798	147	488	205	207	275	241	312
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	3077		1662	3194		1630	1589		1660	1566	
Flt Permitted	0.10	1.00		0.11	1.00		0.12	1.00		0.20	1.00	
Satd. Flow (perm)	173	3077		196	3194		202	1589		354	1566	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	314	1015	479	107	823	152	503	211	213	284	248	322
RTOR Reduction (vph)	0	46	0	0	12	0	0	30	0	0	38	0
Lane Group Flow (vph)	314	1448	0	107	963	0	503	394	0	284	532	0
Confl. Peds. (#/hr)	13		11	11		13	9		21	21		9
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	52.7	43.2		43.2	36.7		55.0	35.0		49.6	32.3	
Effective Green, g (s)	51.7	45.6		41.2	39.1		53.0	37.7		47.6	35.0	
Actuated g/C Ratio	0.43	0.38		0.34	0.32		0.44	0.31		0.39	0.29	
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	218	1158		133	1031		312	494		314	452	
v/s Ratio Prot	c0.14	0.47		0.04	0.30		c0.25	0.25		0.12	0.34	
v/s Ratio Perm	c0.47			0.24			c0.45			0.23		
v/c Ratio	1.44	1.25		0.80	0.93		1.61	0.80		0.90	1.18	
Uniform Delay, d1	34.0	37.8		32.6	39.7		36.6	38.2		29.1	43.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	222.2	119.9		28.6	16.0		289.9	8.8		27.7	100.3	
Delay (s)	256.3	157.7		61.2	55.8		326.5	47.0		56.8	143.3	
Level of Service	F	F		E	E		F	D		E	F	
Approach Delay (s)		174.8			56.3			198.6			114.6	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	141.1	HCM 2000 Level of Service	
HCM 2000 Volume to Capacity ratio	1.50		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	
Intersection Capacity Utilization	130.1%	ICU Level of Service	
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	232	889	248	136	833	202	199	202	117	264	272	212
Future Volume (vph)	232	889	248	136	833	202	199	202	117	264	272	212
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			0.99			0.99			0.99	0.99	0.99
Frt	0.973			0.974			0.969			0.934		
Flt Protected	0.992			0.994			0.981			0.950		
Satd. Flow (prot)	0	3169	0	0	3171	0	0	1629	0	1646	1601	0
Flt Permitted	0.507			0.494			0.383			0.434		
Satd. Flow (perm)	0	1620	0	0	1576	0	0	635	0	746	1601	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			29		18			47		
Link Speed (k/h)		50			50		50			50		
Link Distance (m)		1045.5			1070.0		834.0			207.0		
Travel Time (s)		75.3			77.0		60.0			14.9		
Confl. Peds. (#/hr)	12		2	2		12	8		22	22		8
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	3%	0%	1%	2%	0%
Adj. Flow (vph)	239	916	256	140	859	208	205	208	121	272	280	219
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1411	0	0	1207	0	0	534	0	272	499	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		
Link Offset(m)		0.0			0.0			0.0		0.0		
Crosswalk Width(m)		4.8			4.8			4.8		4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

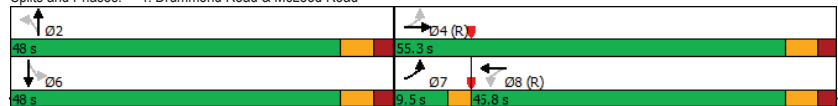
Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	30.5		30.5	30.5		30.8	30.8		30.8	30.8	
Total Split (s)	9.5	55.3		45.8	45.8		48.0	48.0		48.0	48.0	
Total Split (%)	9.2%	53.5%		44.3%	44.3%		46.5%	46.5%		46.5%	46.5%	
Maximum Green (s)	6.5	48.8		39.3	39.3		41.2	41.2		41.2	41.2	
Yellow Time (s)	3.0	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	2.4		2.4	2.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		-2.5			-2.5			-2.8			-2.8	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag	Lead			Lag								
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)		9.0		9.0	9.0		9.0	9.0		9.0	9.0	
Flash Dont Walk (s)		15.0		15.0	15.0		15.0	15.0		15.0	15.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)		51.3			51.3			44.0			44.0	
Actuated g/C Ratio		0.50			0.50			0.43			0.43	
v/c Ratio		1.94dl			1.73dl			1.91			0.86	
Control Delay		350.6			262.3			443.9			53.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		350.6			262.3			443.9			53.9	
LOS		F			F			F			D	
Approach Delay		350.6			262.3			443.9			37.4	
Approach LOS		F			F			F			D	

Intersection Summary

Area Type: Other
 Cycle Length: 103.3
 Actuated Cycle Length: 103.3
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.91
 Intersection Signal Delay: 274.6 Intersection LOS: F
 Intersection Capacity Utilization 154.1% ICU Level of Service H
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 4: Drummond Road & McLeod Road



Queues
4: Drummond Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1411	1207	534	272	499
v/c Ratio	1.94dl	1.73dl	1.91	0.86	0.70
Control Delay	350.6	262.3	443.9	53.9	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	350.6	262.3	443.9	53.9	28.4
Queue Length 50th (m)	-232.8	-188.0	-173.7	50.7	76.9
Queue Length 95th (m)	#277.1	#231.3	#183.8	#101.6	117.3
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	822	797	280	317	708
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.72	1.51	1.91	0.86	0.70

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.
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Future Total
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔		↔		
Traffic Volume (vph)	232	889	248	136	833	202	199	202	117	264	272	212
Future Volume (vph)	232	889	248	136	833	202	199	202	117	264	272	212
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Frbp, ped/bikes		1.00			0.99			0.99		1.00		0.99
Flpb, ped/bikes		1.00			1.00			1.00		0.99		1.00
Frt		0.97			0.97			0.97		1.00		0.93
Flt Protected		0.99			0.99			0.99		0.95		1.00
Satd. Flow (prot)		3167			3173			1628		1632		1601
Flt Permitted		0.51			0.49			0.38		0.43		1.00
Satd. Flow (perm)		1620			1577			636		746		1601
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	239	916	256	140	859	208	205	208	121	272	280	219
RTOR Reduction (vph)	0	18	0	0	15	0	0	10	0	0	27	0
Lane Group Flow (vph)	0	1393	0	0	1192	0	0	524	0	272	472	0
Confl. Peds. (#/hr)	12		2	2		12	8		22	22		8
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	3%	0%	1%	2%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2				6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		48.8			48.8			41.2		41.2		41.2
Effective Green, g (s)		51.3			51.3			44.0		44.0		44.0
Actuated g/C Ratio		0.50			0.50			0.43		0.43		0.43
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5
Lane Grp Cap (vph)		804			783			270		317		681
v/s Ratio Prot												0.29
v/s Ratio Perm		c0.86			0.76			c0.82		0.36		
v/c Ratio		1.94dl			1.73dl			1.94		0.86		0.69
Uniform Delay, d1		26.0			26.0			29.6		26.8		24.2
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		334.8			241.8			436.1		24.7		5.7
Delay (s)		360.8			267.8			465.8		51.6		29.9
Level of Service		F			F			F		D		C
Approach Delay (s)		360.8			267.8			465.8				37.5
Approach LOS		F			F			F				D

Intersection Summary			
HCM 2000 Control Delay	282.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.88		
Actuated Cycle Length (s)	103.3	Sum of lost time (s)	11.0
Intersection Capacity Utilization	154.1%	ICU Level of Service	H
Analysis Period (min)	15		
dl	Defacto Left Lane. Recode with 1 though lane as a left lane.		
c	Critical Lane Group		

Lanes, Volumes, Timings
5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Future Total
Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔		↔		↔	↔	
Traffic Volume (vph)	175	833	25	18	900	331	44	23	11	331	39	182
Future Volume (vph)	175	833	25	18	900	331	44	23	11	331	39	182
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98	1.00		0.98	1.00			0.99		0.99
Frt			0.850			0.850		0.981		0.876		
Flt Protected	0.950			0.950				0.973		0.950		
Satd. Flow (prot)	1662	3325	1488	1662	3292	1430	0	1670	0	1614	1513	0
Flt Permitted	0.117			0.323				0.973		0.950		
Satd. Flow (perm)	205	3325	1455	565	3292	1399	0	1668	0	1614	1513	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			304		5		175		
Link Speed (k/h)		50			50			50		50		50
Link Distance (m)		1070.0			261.8			326.3		294.0		
Travel Time (s)		77.0			18.8			23.5		21.2		
Confl. Peds. (#/hr)	1		1	1		1	3					3
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	180	859	26	19	928	341	45	24	11	341	40	188
Shared Lane Traffic (%)												
Lane Group Flow (vph)	180	859	26	19	928	341	0	80	0	341	228	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		3.6
Link Offset(m)		0.0			0.0			0.0		0.0		0.0
Crosswalk Width(m)		4.8			4.8			4.8		4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4		9.4		9.4
Detector 2 Size(m)		0.6			0.6			0.6		0.6		0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0		0.0		0.0

Lanes, Volumes, Timings

5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Future Total

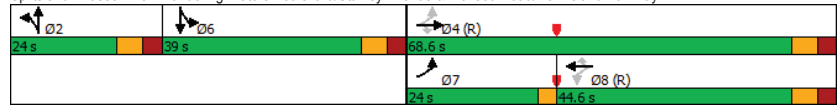
Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	NA	NA
Protected Phases	7	4				8	2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	24.0	68.6	68.6	44.6	44.6	44.6	24.0	24.0		39.0	39.0	
Total Split (%)	18.2%	52.1%	52.1%	33.9%	33.9%	33.9%	18.2%	18.2%		29.6%	29.6%	
Maximum Green (s)	21.0	61.4	61.4	37.4	37.4	37.4	16.8	16.8		31.8	31.8	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	66.4	66.4	66.4	49.5	49.5	49.5	20.0	20.0		33.2	33.2	
Actuated g/C Ratio	0.50	0.50	0.50	0.38	0.38	0.38	0.15	0.15		0.25	0.25	
v/c Ratio	0.73	0.51	0.03	0.09	0.75	0.48	0.31	0.31		0.84	0.45	
Control Delay	39.4	23.5	0.1	31.9	41.6	7.9	50.2	50.2		65.1	13.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	39.4	23.5	0.1	31.9	41.6	7.9	50.2	50.2		65.1	13.4	
LOS	D	C	A	C	D	A	D	D		E	B	
Approach Delay		25.6			32.5		50.2	50.2			44.4	
Approach LOS		C			C		D	D			D	

Intersection Summary

Area Type: Other
 Cycle Length: 131.6
 Actuated Cycle Length: 131.6
 Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 32.8
 Intersection LOS: C
 Intersection Capacity Utilization 77.9%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway



Queues

5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Future Total

Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	180	859	26	19	928	341	80	341	228
v/c Ratio	0.73	0.51	0.03	0.09	0.75	0.48	0.31	0.84	0.45
Control Delay	39.4	23.5	0.1	31.9	41.6	7.9	50.2	65.1	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	23.5	0.1	31.9	41.6	7.9	50.2	65.1	13.4
Queue Length 50th (m)	27.4	82.6	0.0	3.4	116.6	6.5	18.4	87.0	11.1
Queue Length 95th (m)	50.2	102.0	0.0	10.6	#168.1	34.8	34.8	#133.6	34.7
Internal Link Dist (m)		1046.0			237.8		302.3		270.0
Turn Bay Length (m)	60.0		50.0	25.0		80.0			
Base Capacity (vph)	325	1677	781	212	1237	715	258	429	530
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	0.55	0.51	0.03	0.09	0.75	0.48	0.31	0.79	0.43

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Future Total
 Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↗	↖	↕	↗	↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	175	833	25	18	900	331	44	23	11	331	39	182
Future Volume (vph)	175	833	25	18	900	331	44	23	11	331	39	182
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	1.00	0.99	1.00	0.99
Ftpb, 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	0.98	1.00	0.88	1.00	0.88	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.97	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	3325	1455	1661	3292	1399	1671	1614	1513	1614	1513	1614
Fit Permitted	0.12	1.00	1.00	0.32	1.00	1.00	0.97	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	205	3325	1455	565	3292	1399	1671	1614	1513	1614	1513	1614
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	180	859	26	19	928	341	45	24	11	341	40	188
RTOR Reduction (vph)	0	0	13	0	0	190	0	4	0	0	131	0
Lane Group Flow (vph)	180	859	13	19	928	151	0	76	0	341	97	0
Confl. Peds. (#/hr)	1	1	1	1	1	3	3	3	3	3	3	3
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	3%	0%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	NA	NA
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	63.2	63.2	63.2	46.3	46.3	46.3		16.8		30.0	30.0	
Effective Green, g (s)	62.2	66.4	66.4	49.5	49.5	49.5		20.0		33.2	33.2	
Actuated g/C Ratio	0.47	0.50	0.50	0.38	0.38	0.38		0.15		0.25	0.25	
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2		7.2		7.2	7.2	
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5		4.0		4.0	4.0	
Lane Grp Cap (vph)	239	1677	734	212	1238	526		253		407	381	
v/s Ratio Prot	c0.07	0.26			c0.28			c0.05		c0.21	0.06	
v/s Ratio Perm	0.28		0.01	0.03		0.11						
v/c Ratio	0.75	0.51	0.02	0.09	0.75	0.29		0.30		0.84	0.25	
Uniform Delay, d1	25.9	21.8	16.3	26.5	35.7	28.7		49.6		46.6	39.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	11.7	1.1	0.0	0.8	4.2	1.4		3.0		14.5	0.5	
Delay (s)	37.6	22.9	16.3	27.3	39.9	30.1		52.6		61.2	39.8	
Level of Service	D	C	B	C	D	C		D		E	D	
Approach Delay (s)		25.2			37.1			52.6			52.6	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM 2000 Control Delay		36.2										
HCM 2000 Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		131.6						19.2				
Intersection Capacity Utilization		77.9%						ICU Level of Service				
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings
 6: Stanley Avenue & Marineland Parkway

Future Total
 Saturday Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↗	↖	↕	↖	↗
Traffic Volume (vph)	680	488	117	854	395	65
Future Volume (vph)	680	488	117	854	395	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor	0.98	1.00				0.99
Frt	0.850					0.850
Fit Protected			0.950		0.950	
Satd. Flow (prot)	3292	1458	1421	3292	3162	1390
Fit Permitted			0.284		0.950	
Satd. Flow (perm)	3292	1428	424	3292	3162	1372
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		508				68
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Confl. Peds. (#/hr)		1	1			1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	17%	1%	2%	7%
Adj. Flow (vph)	708	508	122	890	411	68
Shared Lane Traffic (%)						
Lane Group Flow (vph)	708	508	122	890	411	68
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4				
Detector 2 Size(m)		0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)		0.0			0.0	

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

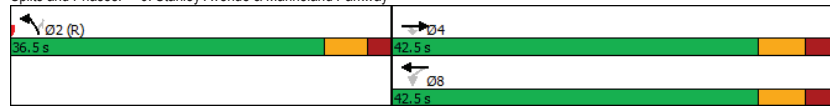
Future Total
Saturday Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	42.5	42.5	42.5	42.5	36.5	36.5
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.2%	46.2%
Maximum Green (s)	35.0	35.0	35.0	35.0	30.0	30.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	32.0	32.0	32.0	32.0	39.0	39.0
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.49	0.49
v/c Ratio	0.53	0.58	0.71	0.67	0.26	0.10
Control Delay	18.7	4.1	42.5	21.2	13.4	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	4.1	42.5	21.2	13.4	4.4
LOS	B	A	D	C	B	A
Approach Delay	12.6			23.8	12.1	
Approach LOS	B			C	B	

Intersection Summary

Area Type: Other
 Cycle Length: 79
 Actuated Cycle Length: 79
 Offset: 0 (0%), Referenced to phase 2:NBL and 6:; Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 16.7
 Intersection Capacity Utilization 65.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 6: Stanley Avenue & Marineland Parkway



Queues
6: Stanley Avenue & Marineland Parkway

Future Total
Saturday Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	708	508	122	890	411	68
v/c Ratio	0.53	0.58	0.71	0.67	0.26	0.10
Control Delay	18.7	4.1	42.5	21.2	13.4	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	4.1	42.5	21.2	13.4	4.4
Queue Length 50th (m)	43.4	0.0	15.7	58.6	18.3	0.0
Queue Length 95th (m)	50.3	15.2	#39.3	66.5	32.4	7.2
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1604	956	206	1604	1559	711
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.53	0.59	0.55	0.26	0.10

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Future Total
Saturday Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔↔	↔↔	↔↔	↔
Traffic Volume (vph)	680	488	117	854	395	65
Future Volume (vph)	680	488	117	854	395	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fr	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3292	1427	1420	3292	3162	1372
Flt Permitted	1.00	1.00	0.28	1.00	0.95	1.00
Satd. Flow (perm)	3292	1427	424	3292	3162	1372
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	708	508	122	890	411	68
RTOR Reduction (vph)	0	302	0	0	0	34
Lane Group Flow (vph)	708	206	122	890	411	34
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	1%	2%	17%	1%	2%	7%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	28.5	28.5	28.5	28.5	36.5	36.5
Effective Green, g (s)	32.0	32.0	32.0	32.0	39.0	39.0
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.49	0.49
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	1333	578	171	1333	1560	677
v/s Ratio Prot	0.22			0.27	c0.13	
v/s Ratio Perm		0.14	c0.29			0.02
v/c Ratio	0.53	0.36	0.71	0.67	0.26	0.05
Uniform Delay, d1	17.8	16.3	19.7	19.2	11.6	10.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.4	13.0	1.3	0.4	0.1
Delay (s)	18.2	16.7	32.7	20.4	12.1	10.5
Level of Service	B	B	C	C	B	B
Approach Delay (s)	17.6			21.9	11.8	
Approach LOS	B			C	B	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	↔	↔	↔↔	↔	↔↔	↔	↔
Traffic Volume (vph)	25	252	3	569	290	80	5	152	574	157	207	58
Future Volume (vph)	25	252	3	569	290	80	5	152	574	157	207	58
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Flt Permitted	0.561			0.950			0.611			0.950		
Satd. Flow (perm)	982	3197	1488	3131	3228	1390	1069	3197	1430	3101	3260	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			95			624			95
Link Speed (k/h)		80			80			60				60
Link Distance (m)		507.4			421.7			216.1				150.6
Travel Time (s)		22.8			19.0			13.0				9.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Adj. Flow (vph)	27	274	3	618	315	87	5	165	624	171	225	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	274	3	618	315	87	5	165	624	171	225	63
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4			3			8				2
												1
												6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4			8	2		2			6
Detector Phase	4	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	31.7	58.0	58.0	22.0	22.0	22.0	10.0	32.0	32.0
Total Split (%)	29.2%	29.2%	29.2%	35.2%	64.4%	64.4%	24.4%	24.4%	24.4%	11.1%	35.6%	35.6%
Maximum Green (s)	20.0	20.0	20.0	27.2	51.7	51.7	15.7	15.7	15.7	5.5	25.7	25.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	15.8	18.1	15.8	22.6	45.2	42.9	20.7	23.0	20.7	9.3	36.8	34.5
Actuated g/C Ratio	0.18	0.20	0.18	0.25	0.50	0.48	0.23	0.26	0.23	0.10	0.41	0.38
v/c Ratio	0.16	0.43	0.01	0.79	0.19	0.12	0.02	0.20	0.77	0.54	0.17	0.10
Control Delay	32.3	33.0	0.0	38.9	11.8	2.2	31.0	29.1	10.8	46.9	19.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	33.0	0.0	38.9	11.8	2.2	31.0	29.1	10.8	46.9	19.1	2.7
LOS	C	C	A	D	B	A	C	C	B	D	B	A
Approach Delay	32.6			27.4			14.7			27.2		
Approach LOS	C			C			B			C		

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.79
Intersection Signal Delay:	24.1
Intersection LOS:	C
Intersection Capacity Utilization:	64.1%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 7: Montrose Road & Biggar Road/Lyons Creek Road



Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	274	3	618	315	87	5	165	624	171	225	63
v/c Ratio	0.16	0.43	0.01	0.79	0.19	0.12	0.02	0.20	0.77	0.54	0.17	0.10
Control Delay	32.3	33.0	0.0	38.9	11.8	2.2	31.0	29.1	10.8	46.9	19.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	33.0	0.0	38.9	11.8	2.2	31.0	29.1	10.8	46.9	19.1	2.7
Queue Length 50th (m)	4.2	23.1	0.0	53.9	15.7	0.0	0.8	12.8	0.0	15.1	13.4	0.0
Queue Length 95th (m)	11.2	33.1	0.0	68.6	18.3	5.4	3.9	22.6	#55.5	#35.7	25.1	4.8
Internal Link Dist (m)	483.4			397.7			192.1			126.6		
Turn Bay Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Base Capacity (vph)	218	792	446	946	1936	838	245	816	809	319	1332	606
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	0.12	0.35	0.01	0.65	0.16	0.10	0.02	0.20	0.77	0.54	0.17	0.10

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↕	↕	↔	↕	↕	↕	↕	↕
Traffic Volume (vph)	25	252	3	569	290	80	5	152	574	157	207	58
Future Volume (vph)	25	252	3	569	290	80	5	152	574	157	207	58
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	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)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Flt Permitted	0.56	1.00	1.00	0.95	1.00	1.00	0.61	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	981	3197	1488	3131	3228	1390	1070	3197	1430	3101	3260	1430
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	274	3	618	315	87	5	165	624	171	225	63
RTOR Reduction (vph)	0	0	2	0	0	46	0	0	480	0	0	39
Lane Group Flow (vph)	27	274	1	618	315	41	5	165	144	171	225	24
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8		2		2	1		6
Permitted Phases	4		4			8	2		2			6
Actuated Green, G (s)	15.8	15.8	15.8	22.6	42.9	42.9	20.7	20.7	9.3	34.5	34.5	34.5
Effective Green, g (s)	15.8	18.1	15.8	22.6	45.2	42.9	20.7	23.0	20.7	9.3	36.8	34.5
Actuated g/C Ratio	0.18	0.20	0.18	0.25	0.50	0.48	0.23	0.26	0.23	0.10	0.41	0.38
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	172	642	261	786	1621	662	246	817	328	320	1332	548
v/s Ratio Prot		c0.09		c0.20	0.10			0.05		c0.06	0.07	
v/s Ratio Perm	0.03		0.00			0.03	0.00		c0.10			0.02
v/c Ratio	0.16	0.43	0.00	0.79	0.19	0.06	0.02	0.20	0.44	0.53	0.17	0.04
Uniform Delay, d1	31.5	31.4	30.6	31.4	12.4	12.7	26.8	26.3	29.7	38.3	16.9	17.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	1.3	0.0	5.2	0.2	0.1	0.2	0.6	4.2	1.7	0.3	0.2
Delay (s)	32.7	32.7	30.6	36.7	12.5	12.8	27.0	26.9	33.9	40.0	17.2	17.6
Level of Service	C	C	C	D	B	B	C	C	C	D	B	B
Approach Delay (s)		32.7			27.2			32.4			25.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	49	3	3	3	10	10	3	664	2	3	707	42
Future Volume (vph)	49	3	3	3	10	10	3	664	2	3	707	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.993			0.941						0.992	
Flt Protected		0.957			0.994							
Satd. Flow (prot)	0	1634	0	0	1637	0	0	1697	0	0	1733	0
Flt Permitted		0.957			0.994							
Satd. Flow (perm)	0	1634	0	0	1637	0	0	1697	0	0	1733	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	2		8	8		2	11		5	5		11
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	33%	3%	0%	0%	0%	3%
Adj. Flow (vph)	53	3	3	3	11	11	3	714	2	3	760	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	0	0	25	0	0	719	0	0	808	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	63.0%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Future Total
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	49	3	3	3	10	10	3	664	2	3	707	42
Future Volume (vph)	49	3	3	3	10	10	3	664	2	3	707	42
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	53	3	3	3	11	11	3	714	2	3	760	45
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	59	25	719	808								
Volume Left (vph)	53	3	3	3								
Volume Right (vph)	3	11	2	45								
Hadj (s)	0.18	-0.24	0.05	-0.03								
Departure Headway (s)	7.3	7.1	5.1	5.0								
Degree Utilization, x	0.12	0.05	1.02	1.13								
Capacity (veh/h)	485	491	706	720								
Control Delay (s)	11.3	10.4	62.5	96.7								
Approach Delay (s)	11.3	10.4	62.5	96.7								
Approach LOS	B	B	F	F								
Intersection Summary												
Delay	77.0											
Level of Service	F											
Intersection Capacity Utilization	63.0%		ICU Level of Service	B								
Analysis Period (min)	15											

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Total
Saturday Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	
Traffic Volume (vph)	117	63	567	86	82	606
Future Volume (vph)	117	63	567	86	82	606
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	15.0	15.0		
Storage Lanes	1	0	1	1		
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.953		0.850			
Fit Protected	0.969			0.950		
Satd. Flow (prot)	1599	0	1750	1488	1646	1750
Fit Permitted	0.969			0.950		
Satd. Flow (perm)	1599	0	1750	1488	1646	1750
Link Speed (k/h)	50		60		60	
Link Distance (m)	1040.1		438.6		461.8	
Travel Time (s)	74.9		26.3		27.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	0%	3%	0%	0%	1%	0%
Adj. Flow (vph)	146	79	709	108	103	758
Shared Lane Traffic (%)						
Lane Group Flow (vph)	225	0	709	108	103	758
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	58.6%		ICU Level of Service	B		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Future Total
Saturday Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑	↔	↔	↑
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	117	63	567	86	82	606
Future Volume (vph)	117	63	567	86	82	606
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	146	79	709	108	102	758
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total (vph)	225	709	108	102	758	
Volume Left (vph)	146	0	0	102	0	
Volume Right (vph)	79	0	108	0	0	
Hadj (s)	-0.06	0.00	-0.70	0.52	0.00	
Departure Headway (s)	6.9	6.3	5.6	6.8	6.2	
Degree Utilization, x	0.43	1.23	0.17	0.19	1.31	
Capacity (veh/h)	519	583	638	523	588	
Control Delay (s)	15.0	139.4	8.5	10.2	172.0	
Approach Delay (s)	15.0	122.1		152.8		
Approach LOS	B	F		F		
Intersection Summary						
Delay			123.3			
Level of Service			F			
Intersection Capacity Utilization			58.6%	ICU Level of Service	B	
Analysis Period (min)			15			

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	2	30	218	13	38	2	304	504	10	2	494	111
Future Volume (vph)	2	30	218	13	38	2	304	504	10	2	494	111
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.882			0.996			0.998			0.975	
Fit Protected					0.988			0.982				
Satd. Flow (prot)	0	1544	0	0	1722	0	0	1705	0	0	1706	0
Fit Permitted					0.988			0.982				
Satd. Flow (perm)	0	1544	0	0	1722	0	0	1705	0	0	1706	0
Link Speed (k/h)		60			60			70			60	
Link Distance (m)		372.3			519.4			156.9			312.6	
Travel Time (s)		22.3			31.2			8.1			18.8	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	2	36	260	15	45	2	362	600	12	2	588	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	298	0	0	62	0	0	974	0	0	722	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	109.9%						ICU Level of Service H					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Future Total
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	2	30	218	13	38	2	304	504	10	2	494	111
Future Volume (Veh/h)	2	30	218	13	38	2	304	504	10	2	494	111
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	2	36	260	15	45	2	362	600	12	2	588	132
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	2012	1994	654	2266	2054	606	720			612		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2012	1994	654	2266	2054	606	720			612		
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 %	0	1	45	0	0	100	59			100		
cM capacity (veh/h)	0	36	470	0	33	501	891			977		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	298	62	974	722								
Volume Left	2	15	362	2								
Volume Right	260	2	12	132								
eSH	0	2	891	977								
Volume to Capacity	Err	32.30	0.41	0.00								
Queue Length 95th (m)	Err	Err	15.9	0.0								
Control Delay (s)	Err	Err	9.1	0.1								
Lane LOS	F	F	A	A								
Approach Delay (s)	Err	Err	9.1	0.1								
Approach LOS	F	F										
Intersection Summary												
Average Delay				Err								
Intersection Capacity Utilization	109.9%			ICU Level of Service	H							
Analysis Period (min)	15											












Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔		↔	↔
Traffic Volume (vph)	570	518	444	124	115	362
Future Volume (vph)	570	518	444	124	115	362
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.971			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1646	1750	1692	0	1662	1488
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1646	1750	1692	0	1662	1488
Link Speed (k/h)	50	50			50	
Link Distance (m)	450.7	605.6			812.1	
Travel Time (s)	32.5	43.6			58.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	613	557	477	133	124	389
Shared Lane Traffic (%)						
Lane Group Flow (vph)	613	557	610	0	124	389
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	3.6	3.6			3.6	
Link Offset(m)	0.0	0.0			0.0	
Crosswalk Width(m)	4.8	4.8			4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	84.8%			ICU Level of Service E		
Analysis Period (min)	15					












HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Future Total
Saturday Peak Hour

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	570	518	444	124	115	362
Future Volume (vph)	570	518	444	124	115	362
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	613	557	477	133	124	389
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	613	557	610	124	389	
Volume Left (vph)	613	0	0	124	0	
Volume Right (vph)	0	0	133	0	389	
Hadj (s)	0.52	0.00	-0.12	0.50	-0.70	
Departure Headway (s)	7.7	7.2	6.9	8.3	7.1	
Degree Utilization, x	1.31	1.11	1.17	0.29	0.77	
Capacity (veh/h)	472	504	529	430	501	
Control Delay (s)	177.2	99.4	117.6	13.4	28.4	
Approach Delay (s)	140.2		117.6	24.8		
Approach LOS	F		F	C		
Intersection Summary						
Delay			108.3			
Level of Service			F			
Intersection Capacity Utilization			84.8%	ICU Level of Service	E	
Analysis Period (min)			15			

Lanes, Volumes, Timings
12: Dorchester Road & Street J

Future Total
Saturday Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	60	348	305	0	405	318
Future Volume (vph)	60	348	305	0	405	318
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.885					
Fit Protected	0.993			0.973		
Satd. Flow (prot)	1508	0	1716	0	0	1669
Fit Permitted	0.993			0.973		
Satd. Flow (perm)	1508	0	1716	0	0	1669
Link Speed (k/h)	50		60		60	
Link Distance (m)	156.0		129.0		684.0	
Travel Time (s)	11.2		7.7		41.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	378	332	0	440	346
Shared Lane Traffic (%)						
Lane Group Flow (vph)	443	0	332	0	0	786
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15		25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	96.9%			ICU Level of Service F		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Dorchester Road & Street J

Future Total
Saturday Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Volume (veh/h)	60	348	305	0	405	318
Future Volume (Veh/h)	60	348	305	0	405	318
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	378	332	0	440	346
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	1558	332			332	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1558	332			332	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	18	47			64	
cM capacity (veh/h)	79	710			1227	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	443	332	786			
Volume Left	65	0	440			
Volume Right	378	0	0			
eSH	328	1700	1227			
Volume to Capacity	1.35	0.20	0.36			
Queue Length 95th (m)	175.6	0.0	13.2			
Control Delay (s)	208.6	0.0	7.2			
Lane LOS	F		A			
Approach Delay (s)	208.6	0.0	7.2			
Approach LOS	F					
Intersection Summary						
Average Delay			62.8			
Intersection Capacity Utilization		96.9%		ICU Level of Service		F
Analysis Period (min)			15			

Lanes, Volumes, Timings
13: Internal Road & Street J

Future Total
Saturday Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	
Traffic Volume (vph)	17	388	0	25	383	0
Future Volume (vph)	17	388	0	25	383	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.871					
Fit Protected					0.950	
Satd. Flow (prot)	1494	0	0	1716	1630	0
Fit Permitted					0.950	
Satd. Flow (perm)	1494	0	0	1716	1630	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	156.0			269.0	59.7	
Travel Time (s)	11.2			19.4	4.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	422	0	27	416	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	440	0	0	27	416	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	56.7%			ICU Level of Service B		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
13: Internal Road & Street J

Future Total
Saturday Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔		↔	↔	
Traffic Volume (veh/h)	17	388	0	25	383	0
Future Volume (Veh/h)	17	388	0	25	383	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	422	0	27	416	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			440		256	229
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			440		256	229
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		43	100
cM capacity (veh/h)			1120		733	810
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	440	27	416			
Volume Left	0	0	416			
Volume Right	422	0	0			
eSH	1700	1120	733			
Volume to Capacity	0.26	0.00	0.57			
Queue Length 95th (m)	0.0	0.0	28.9			
Control Delay (s)	0.0	0.0	16.2			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	16.2			
Approach LOS			C			
Intersection Summary						
Average Delay			7.6			
Intersection Capacity Utilization			56.7%		ICU Level of Service	B
Analysis Period (min)			15			

Lanes, Volumes, Timings
14: Dorchester Road & Internal Road

Future Total
Saturday Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	80	130	175	176	0	378
Future Volume (vph)	80	130	175	176	0	378
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.917		0.932			
Fit Protected	0.981					
Satd. Flow (prot)	1543	0	1599	0	0	1716
Fit Permitted	0.981					
Satd. Flow (perm)	1543	0	1599	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	88.3		186.5			129.0
Travel Time (s)	6.4		11.2			7.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	141	190	191	0	411
Shared Lane Traffic (%)						
Lane Group Flow (vph)	228	0	381	0	0	411
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
14: Dorchester Road & Internal Road

Future Total
Saturday Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R		T
Traffic Volume (veh/h)	80	130	175	176	0	378
Future Volume (Veh/h)	80	130	175	176	0	378
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	141	190	191	0	411
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	696	286			381	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	696	286			381	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	81			100	
cM capacity (veh/h)	407	754			1177	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	228	381	411			
Volume Left	87	0	0			
Volume Right	141	191	0			
eSH	569	1700	1177			
Volume to Capacity	0.40	0.22	0.00			
Queue Length 95th (m)	15.4	0.0	0.0			
Control Delay (s)	15.5	0.0	0.0			
Lane LOS	C					
Approach Delay (s)	15.5	0.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization		41.8%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
15: Dorchester Road & Retail South Access

Future Total
Saturday Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R		T
Traffic Volume (vph)	2	7	344	96	6	452
Future Volume (vph)	2	7	344	96	6	452
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.892		0.971			
Fit Protected	0.990					0.999
Satd. Flow (prot)	1515	0	1666	0	0	1714
Fit Permitted	0.990					0.999
Satd. Flow (perm)	1515	0	1666	0	0	1714
Link Speed (k/h)	50		60			60
Link Distance (m)	131.1		281.9			186.5
Travel Time (s)	9.4		16.9			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	8	374	104	7	491
Shared Lane Traffic (%)						
Lane Group Flow (vph)	10	0	478	0	0	498
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.0%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
15: Dorchester Road & Retail South Access

Future Total
Saturday Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		R			R
Traffic Volume (veh/h)	2	7	344	96	6	452
Future Volume (Veh/h)	2	7	344	96	6	452
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	8	374	104	7	491
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	931	426			478	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	931	426			478	
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	99			99	
cM capacity (veh/h)	294	628			1084	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	10	478	498			
Volume Left	2	0	7			
Volume Right	8	104	0			
eSH	512	1700	1084			
Volume to Capacity	0.02	0.28	0.01			
Queue Length 95th (m)	0.5	0.0	0.2			
Control Delay (s)	12.2	0.0	0.2			
Lane LOS	B		A			
Approach Delay (s)	12.2	0.0	0.2			
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization		41.0%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
16: Dorchester Road & Street K

Future Total
Saturday Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		R			R
Traffic Volume (vph)	8	0	440	15	13	441
Future Volume (vph)	8	0	440	15	13	441
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.996			
Fit Protected	0.950					0.999
Satd. Flow (prot)	1630	0	1709	0	0	1714
Fit Permitted	0.950					0.999
Satd. Flow (perm)	1630	0	1709	0	0	1714
Link Speed (k/h)	50		60			60
Link Distance (m)	454.1		240.5			281.9
Travel Time (s)	32.7		14.4			16.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	0	478	16	14	479
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	494	0	0	493
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	46.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
16: Dorchester Road & Street K

Future Total
Saturday Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Volume (veh/h)	8	0	440	15	13	441
Future Volume (Veh/h)	8	0	440	15	13	441
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	0	478	16	14	479
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	993	486			494	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	993	486			494	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			99	
cM capacity (veh/h)	269	581			1070	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	9	494	493			
Volume Left	9	0	14			
Volume Right	0	16	0			
eSH	269	1700	1070			
Volume to Capacity	0.03	0.29	0.01			
Queue Length 95th (m)	0.8	0.0	0.3			
Control Delay (s)	18.9	0.0	0.4			
Lane LOS	C		A			
Approach Delay (s)	18.9	0.0	0.4			
Approach LOS	C					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		46.6%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
17: Street K & Retirement Home South Access

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (vph)	2	26	7	0	0	1
Future Volume (vph)	2	26	7	0	0	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.865	
Fit Protected		0.997				
Satd. Flow (prot)	0	1711	1716	0	1484	0
Fit Permitted		0.997				
Satd. Flow (perm)	0	1711	1716	0	1484	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		454.1	129.4		65.9	
Travel Time (s)		32.7	9.3		4.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	28	8	0	0	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	30	8	0	1	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		25		15	25	15
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
17: Street K & Retirement Home South Access

Future Total
Saturday Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	2	26	7	0	0	1
Future Volume (Veh/h)	2	26	7	0	0	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	28	8	0	0	1
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	8				40	8
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	8				40	8
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)	1612				970	1074
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	30	8	1			
Volume Left	2	0	0			
Volume Right	0	0	1			
cSH	1612	1700	1074			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.5	0.0	8.4			
Lane LOS	A		A			
Approach Delay (s)	0.5	0.0	8.4			
Approach LOS			A			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
18: Street J & Townhouse Access

Future Total
Saturday Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	↕
Traffic Volume (vph)	3	9	6	20	0	4
Future Volume (vph)	3	9	6	20	0	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.896		0.898			
Fit Protected	0.989					
Satd. Flow (prot)	1520	0	1541	0	0	1716
Fit Permitted	0.989					
Satd. Flow (perm)	1520	0	1541	0	0	1716
Link Speed (k/h)	50		50			50
Link Distance (m)	95.4		27.1			46.1
Travel Time (s)	6.9		2.0			3.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	10	7	22	0	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	29	0	0	4
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
18: Street J & Townhouse Access

Future Total
Saturday Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (veh/h)	3	9	6	20	0	4
Future Volume (Veh/h)	3	9	6	20	0	4
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	10	7	22	0	4
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	22	18			29	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	22	18			29	
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	99			100	
cM capacity (veh/h)	995	1061			1584	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	13	29	4			
Volume Left	3	0	0			
Volume Right	10	22	0			
eSH	1045	1700	1584			
Volume to Capacity	0.01	0.02	0.00			
Queue Length 95th (m)	0.3	0.0	0.0			
Control Delay (s)	8.5	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.5	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
19: Street J & Retirement Home North Access

Future Total
Saturday Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↕	↕	↔
Traffic Volume (vph)	16	4	6	9	0	17
Future Volume (vph)	16	4	6	9	0	17
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.974				0.865	
Fit Protected	0.961			0.980		
Satd. Flow (prot)	1606	0	0	1681	1484	0
Fit Permitted	0.961			0.980		
Satd. Flow (perm)	1606	0	0	1681	1484	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	50.7			46.1	138.5	
Travel Time (s)	3.7			3.3	10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	4	7	10	0	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	0	17	18	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	16.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
19: Street J & Retirement Home North Access

Future Total
Saturday Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↕	↕	
Traffic Volume (veh/h)	16	4	6	9	0	17
Future Volume (Veh/h)	16	4	6	9	0	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	4	7	10	0	18
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	33	9	18			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	33	9	18			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	976	1073	1599			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	21	17	18			
Volume Left	17	7	0			
Volume Right	4	0	18			
cSH	993	1599	1700			
Volume to Capacity	0.02	0.00	0.01			
Queue Length 95th (m)	0.5	0.1	0.0			
Control Delay (s)	8.7	3.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	3.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			4.2			
Intersection Capacity Utilization		16.3%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
20: Retail West Access/Hotel West Access & Internal Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	46	0	130	0	0	0	184	0	0	0	0	26
Future Volume (vph)	46	0	130	0	0	0	184	0	0	0	0	26
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.900									0.865	
Fit Protected		0.987						0.950				
Satd. Flow (prot)	0	1524	0	0	1716	0	0	1630	0	0	1484	0
Fit Permitted		0.987						0.950				
Satd. Flow (perm)	0	1524	0	0	1716	0	0	1630	0	0	1484	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		88.3			73.6			40.4			49.4	
Travel Time (s)		6.4			5.3			2.9			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	141	0	0	0	200	0	0	0	0	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	191	0	0	0	0	200	0	0	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	35.9%						ICU Level of Service A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 20: Retail West Access/Hotel West Access & Internal Road

Future Total
 Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Volume (veh/h)	46	0	130	0	0	0	184	0	0	0	0	26
Future Volume (Veh/h)	46	0	130	0	0	0	184	0	0	0	0	26
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	0	141	0	0	0	200	0	0	0	0	28
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	0			141			198	170	70	170	241	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			141			198	170	70	170	241	0
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			72	100	100	100	100	97
cM capacity (veh/h)	1623			1442			723	700	992	774	640	1085
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	191	0	200	28								
Volume Left	50	0	200	0								
Volume Right	141	0	0	28								
cSH	1623	1700	723	1085								
Volume to Capacity	0.03	0.00	0.28	0.03								
Queue Length 95th (m)	0.8	0.0	9.0	0.6								
Control Delay (s)	2.1	0.0	11.9	8.4								
Lane LOS	A		B	A								
Approach Delay (s)	2.1	0.0	11.9	8.4								
Approach LOS			B	A								
Intersection Summary												
Average Delay				7.2								
Intersection Capacity Utilization				35.9%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings
 21: Internal Road & Hotel East Access/Retail East Access

Future Total
 Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Volume (vph)	76	0	0	0	0	307	0	0	0	307	0	81
Future Volume (vph)	76	0	0	0	0	307	0	0	0	307	0	81
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t				0.865						0.972		
Fit Protected				0.950						0.962		
Satd. Flow (prot)	0	1630	0	0	1484	0	0	1716	0	0	1604	0
Fit Permitted				0.950						0.962		
Satd. Flow (perm)	0	1630	0	0	1484	0	0	1716	0	0	1604	0
Link Speed (k/h)				50						50		
Link Distance (m)				43.1						59.6		
Travel Time (s)				3.1						4.3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	0	0	0	0	334	0	0	0	334	0	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	83	0	0	334	0	0	0	0	0	422	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)				0.0						0.0		
Link Offset(m)				0.0						0.0		
Crosswalk Width(m)				4.8						4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Stop			Stop			Free			Free		
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.0%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 21: Internal Road & Hotel East Access/Retail East Access

Future Total
 Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Volume (veh/h)	76	0	0	0	0	307	0	0	0	307	0	81	
Future Volume (Veh/h)	76	0	0	0	0	307	0	0	0	307	0	81	
Sign Control	Stop			Stop			Free			Free			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	83	0	0	0	0	334	0	0	0	334	0	88	
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	1046	712	44	712	756	0	88						0
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1046	712	44	712	756	0	88						0
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 %	31	100	100	100	100	69	100						79
cM capacity (veh/h)	120	284	1026	292	268	1085	1508						1623
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	83	334	0	422									
Volume Left	83	0	0	334									
Volume Right	0	334	0	88									
sSH	120	1085	1700	1623									
Volume to Capacity	0.69	0.31	0.00	0.21									
Queue Length 95th (m)	29.7	10.5	0.0	6.2									
Control Delay (s)	84.2	9.8	0.0	6.5									
Lane LOS	F	A		A									
Approach Delay (s)	84.2	9.8	0.0	6.5									
Approach LOS	F	A											
Intersection Summary													
Average Delay	15.5												
Intersection Capacity Utilization	59.0%			ICU Level of Service			B						
Analysis Period (min)	15												

Queuing and Blocking Report

Future Total
 Saturday Peak Hour

Intersection: 1: Montrose Road & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	R	L	T	T	R
Maximum Queue (m)	62.4	624.7	629.6	77.5	47.4	85.9	88.9	37.7	27.0	266.0	324.3	424.5
Average Queue (m)	36.3	256.3	257.0	65.3	19.7	39.9	43.3	14.6	9.3	36.3	69.5	133.8
95th Queue (m)	79.1	721.5	721.4	86.9	40.1	73.8	77.2	29.5	21.2	185.8	286.9	446.3
Link Distance (m)	740.7				740.7				665.6			
Upstream Blk Time (%)	20				19							
Queueing Penalty (veh)	0				0							
Storage Bay Dist (m)	55.0				70.0				155.0			
Storage Blk Time (%)	0				43				34			
Queueing Penalty (veh)	1				60				153			

Intersection: 1: Montrose Road & McLeod Road

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	133.3	169.8	164.7
Average Queue (m)	86.0	70.6	34.9
95th Queue (m)	149.0	204.3	105.5
Link Distance (m)	194.3		194.3
Upstream Blk Time (%)	25		0
Queueing Penalty (veh)	0		0
Storage Bay Dist (m)	130.0		
Storage Blk Time (%)	27		0
Queueing Penalty (veh)	26		0

Intersection: 2: Oakwood Drive & McLeod Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	L	TR
Maximum Queue (m)	57.3	631.7	633.0	695.3	87.4	240.0	237.8	102.5	354.7	353.5	15.2	35.4
Average Queue (m)	10.2	371.2	372.8	363.5	41.7	63.6	65.9	79.7	306.1	291.7	3.7	10.5
95th Queue (m)	41.7	795.2	795.9	836.7	86.9	166.9	166.8	139.9	424.2	449.1	11.7	26.5
Link Distance (m)	665.6				665.6				592.5			
Upstream Blk Time (%)	21				21				28			
Queueing Penalty (veh)	133				137				184			
Storage Bay Dist (m)	50.0				80.0				95.0			
Storage Blk Time (%)	0				62				5			
Queueing Penalty (veh)	0				17				33			

Queuing and Blocking Report

Future Total
Saturday Peak Hour

Intersection: 3: Dorchester Road & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	62.5	599.0	599.8	51.3	122.2	126.1	22.4	330.5	37.4	306.4
Average Queue (m)	50.1	517.0	520.9	26.4	66.6	69.7	20.0	326.9	35.5	298.2
95th Queue (m)	85.6	699.3	699.5	59.6	120.0	122.3	31.0	342.4	44.3	310.9
Link Distance (m)		592.5	592.5		1024.4	1024.4		325.7		294.0
Upstream Blk Time (%)		23	24					49		85
Queuing Penalty (veh)		199	213					356		0
Storage Bay Dist (m)	55.0			50.0			15.0		30.0	
Storage Blk Time (%)	15	63		2	17		53	51	35	52
Queuing Penalty (veh)	74	191		7	18		218	248	193	143

Intersection: 4: Drummond Road & McLeod Road

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	LT	TR	LT	TR	LTR	L	TR
Maximum Queue (m)	908.0	907.4	737.7	744.4	442.5	27.3	209.8
Average Queue (m)	666.0	667.0	509.2	511.9	403.2	26.3	196.7
95th Queue (m)	1245.1	1246.4	1034.6	1037.6	479.9	30.7	220.4
Link Distance (m)	1024.4	1024.4	1047.7	1047.7	811.3		193.4
Upstream Blk Time (%)	20	22	8	10			74
Queuing Penalty (veh)	145	165	47	54			0
Storage Bay Dist (m)						20.0	
Storage Blk Time (%)						39	51
Queuing Penalty (veh)						190	134

Intersection: 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	LTR	L	TR
Maximum Queue (m)	46.7	67.5	81.7	39.5	32.2	145.6	140.9	87.5	81.2	166.6	120.2
Average Queue (m)	17.0	28.5	39.5	4.2	4.7	90.1	91.9	22.9	32.3	86.4	53.8
95th Queue (m)	36.4	56.9	73.8	22.3	19.6	189.5	191.1	86.0	117.2	159.1	152.4
Link Distance (m)		1047.7	1047.7			239.8	239.8		307.6	277.4	277.4
Upstream Blk Time (%)						9	10			1	0
Queuing Penalty (veh)						57	60			0	0
Storage Bay Dist (m)	60.0			50.0	25.0			80.0			
Storage Blk Time (%)		1	4			44	17	0			
Queuing Penalty (veh)		1	1			8	55	1			

Queuing and Blocking Report

Future Total
Saturday Peak Hour

Intersection: 6: Stanley Avenue & Marineland Parkway

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	B57
Directions Served	T	T	R	L	T	T	L	L	R	T
Maximum Queue (m)	68.9	75.5	53.4	77.2	112.7	101.9	57.5	133.1	36.3	32.4
Average Queue (m)	30.3	32.3	9.2	27.6	59.9	59.2	28.3	48.6	9.1	1.5
95th Queue (m)	53.7	57.4	33.5	64.4	122.5	118.0	98.1	200.8	35.0	25.0
Link Distance (m)	239.8	239.8			155.4	155.4		485.6		1385.3
Upstream Blk Time (%)					9	7		1		
Queuing Penalty (veh)					0	0		7		
Storage Bay Dist (m)			65.0	105.0			160.0		80.0	
Storage Blk Time (%)		0	0	0	10		1	9	0	
Queuing Penalty (veh)		2	0	0	12		4	25	0	

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	
Directions Served	L	T	T	R	L	L	T	T	R	L	T
Maximum Queue (m)	15.5	59.5	50.8	4.3	76.3	86.9	29.6	31.2	13.8	10.4	77.2
Average Queue (m)	4.6	27.3	13.1	0.4	41.3	54.7	11.3	11.5	4.4	1.0	20.7
95th Queue (m)	12.5	44.9	33.7	2.7	68.6	76.8	24.0	23.5	10.7	5.7	49.2
Link Distance (m)		488.7	488.7				403.0	403.0			196.3
Upstream Blk Time (%)											6
Queuing Penalty (veh)											0
Storage Bay Dist (m)	130.0			120.0	150.0	150.0			225.0	80.0	
Storage Blk Time (%)											1
Queuing Penalty (veh)											4

Intersection: 7: Montrose Road & Biggar Road/Lyons Creek Road

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (m)	67.5	41.0	52.0	36.4	27.5	10.4
Average Queue (m)	55.0	5.7	26.8	15.6	6.9	3.4
95th Queue (m)	83.7	27.4	45.4	29.8	19.2	8.1
Link Distance (m)				130.6	130.6	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	60.0	80.0	80.0		50.0	
Storage Blk Time (%)	34					
Queuing Penalty (veh)	26					

Queuing and Blocking Report

Future Total
Saturday Peak Hour

Intersection: 8: Dorchester Road & Jill Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	39.1	22.5	450.0	41.8
Average Queue (m)	12.3	6.6	378.7	20.2
95th Queue (m)	29.6	18.0	590.3	33.0
Link Distance (m)	110.7	156.1	446.2	325.7
Upstream Blk Time (%)			37	
Queuing Penalty (veh)			232	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Dorchester Road & Oldfield Road

Movement	WB	NB	NB	B29	SB	SB
Directions Served	LR	T	R	T	L	T
Maximum Queue (m)	119.1	445.3	22.5	620.2	19.6	42.4
Average Queue (m)	48.5	255.5	13.8	204.9	8.1	16.5
95th Queue (m)	173.4	563.9	30.1	662.8	16.4	32.8
Link Distance (m)	1018.8	424.6		670.7		446.2
Upstream Blk Time (%)		43		8		
Queuing Penalty (veh)		284		55		
Storage Bay Dist (m)			15.0		15.0	
Storage Blk Time (%)		73	1		0	8
Queuing Penalty (veh)		63	4		2	6

Intersection: 10: Stanley Avenue & Chippawa Parkway

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	56.6	26.8	66.8	9.0
Average Queue (m)	23.4	10.6	25.6	1.0
95th Queue (m)	44.5	21.9	51.9	5.3
Link Distance (m)	355.4	511.0	139.9	295.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report

Future Total
Saturday Peak Hour

Intersection: 11: Lyons Creek Road & Stanley Avenue

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (m)	62.5	456.1	597.3	29.6	46.3
Average Queue (m)	62.4	446.2	512.7	11.5	20.0
95th Queue (m)	62.6	474.4	726.4	27.1	39.2
Link Distance (m)		442.7	589.0		785.7
Upstream Blk Time (%)		93	58		
Queuing Penalty (veh)		0	0		
Storage Bay Dist (m)	55.0			25.0	
Storage Blk Time (%)	97	2		0	6
Queuing Penalty (veh)	503	11		0	7

Intersection: 12: Dorchester Road & Street J

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	129.1	55.8	37.8
Average Queue (m)	57.7	10.8	15.1
95th Queue (m)	127.8	56.8	31.5
Link Distance (m)	137.0	110.9	670.7
Upstream Blk Time (%)	11	2	
Queuing Penalty (veh)	46	7	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: Internal Road & Street J

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	14.9	39.6
Average Queue (m)	3.4	19.3
95th Queue (m)	24.0	36.2
Link Distance (m)	254.0	42.5
Upstream Blk Time (%)		10
Queuing Penalty (veh)		38
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Future Total
Saturday Peak Hour

Intersection: 14: Dorchester Road & Internal Road

Movement	WB	NB
Directions Served	LR	TR
Maximum Queue (m)	34.4	13.4
Average Queue (m)	15.0	1.5
95th Queue (m)	33.2	15.1
Link Distance (m)	68.8	167.8
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	5	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: Dorchester Road & Retail South Access

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.5	11.0
Average Queue (m)	2.3	0.5
95th Queue (m)	8.2	4.9
Link Distance (m)	120.4	167.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 16: Dorchester Road & Street K

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	7.0	15.2
Average Queue (m)	1.1	1.0
95th Queue (m)	5.2	7.0
Link Distance (m)	432.8	259.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Future Total
Saturday Peak Hour

Intersection: 17: Street K & Retirement Home South Access

Movement	SB
Directions Served	LR
Maximum Queue (m)	2.4
Average Queue (m)	0.1
95th Queue (m)	1.0
Link Distance (m)	47.3
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 18: Street J & Townhouse Access

Movement	WB
Directions Served	LR
Maximum Queue (m)	8.8
Average Queue (m)	2.6
95th Queue (m)	9.0
Link Distance (m)	86.3
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 19: Street J & Retirement Home North Access

Movement	EB
Directions Served	LR
Maximum Queue (m)	8.9
Average Queue (m)	3.8
95th Queue (m)	10.9
Link Distance (m)	41.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report

Future Total
Saturday Peak Hour

Intersection: 20: Retail West Access/Hotel West Access & Internal Road

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (m)	30.2	16.9
Average Queue (m)	14.0	6.5
95th Queue (m)	24.4	17.0
Link Distance (m)	30.9	40.9
Upstream Blk Time (%)	2	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 21: Internal Road & Hotel East Access/Retail East Access

Movement	EB	WB
Directions Served	LTR	LTR
Maximum Queue (m)	30.2	49.7
Average Queue (m)	12.8	20.8
95th Queue (m)	25.7	44.1
Link Distance (m)	34.4	59.0
Upstream Blk Time (%)	7	9
Queuing Penalty (veh)	0	0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 5120

Appendix G

McLeod Road at Dorchester Road Widening Preliminary Concept



Appendix H

Signal Warrant



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



Horizon Year: 2031
Region/City/Township: Niagara Falls

Major Street: Dorchester Road North/South?: Y
Minor Street: Oldfield Road

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

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

PM Forecast Only? N

Time Period	Major Street Dorchester Road						Minor Street Oldfield Road						Peds Crossing
	Northbound			Southbound			Eastbound			Westbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM Peak Hour		440	83	29	246					56		78	
PM Peak Hour		510	74	76	521					100		75	
Average Hourly Volume	0	238	39	26	192	0	0	0	0	39	0	38	0

Warrant	AHV
1A - All	572
1B - Minor	77
2A - Major	495
2B - Cross	39

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	All Approaches	480	720	600	900	
		% Fulfilled				119.2%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Minor Street Approaches	180	255	180	255	
		% Fulfilled				42.9%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Major Street Approaches	480	720	600	900	
		% Fulfilled				103.1%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Traffic Crossing Major Street	50	75	50	75	
		% Fulfilled				78.0%

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



Horizon Year: 2031
Region/City/Township: Niagara Falls

Major Street: Dorchester Road North/South?: Y
Minor Street: Jill Drive

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

PM Forecast Only? N

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

Time Period	Major Street Dorchester Road						Minor Street Jill Drive						Peds Crossing
	Northbound			Southbound			Eastbound			Westbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM Peak Hour	3	546	8	0	261	27	55	23	0	1	3	4	
PM Peak Hour	10	613	0	6	608	45	73	8	10	1	5	5	
Average Hourly Volume	3	290	2	2	217	18	32	8	3	1	2	2	0

Warrant	AHV
1A - All	579
1B - Minor	47
2A - Major	532
2B - Cross	40

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	All Approaches	480	720	600	900	
		% Fulfilled				120.6%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Minor Street Approaches	120	170	120	170	
		% Fulfilled				39.2%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Major Street Approaches	480	720	600	900	
		% Fulfilled				110.8%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Traffic Crossing Major Street	50	75	50	75	
		% Fulfilled				80.5%

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



Horizon Year: 2031
Region/City/Township: Niagara Falls

Major Street: Dorchester Road
Minor Street: Street J

North/South?: Y

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

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

PM Forecast Only? N

Time Period	Major Street Dorchester Road						Minor Street Street J						Peds Crossing	
	Northbound			Southbound			Eastbound			Westbound				
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
AM Peak Hour		312	0	174	128					0			211	
PM Peak Hour		288	0	314	307					64			296	
Average Hourly Volume	0	150	0	122	109	0	0	0	0	16	0	127	0	

Warrant	AHV
1A - All	524
1B - Minor	143
2A - Major	381
2B - Cross	16

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	All Approaches	480	720	600	900	
		% Fulfilled				109.1%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Minor Street Approaches	180	255	180	255	
		% Fulfilled				79.3%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Major Street Approaches	480	720	600	900	
		% Fulfilled				79.3%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Traffic Crossing Major Street	50	75	50	75	
		% Fulfilled				32.0%

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



Horizon Year: 2031
Region/City/Township: Niagara Falls

Major Street: Stanley Avenue North/South?: Y
Minor Street: Chippawa Parkway

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

PM Forecast Only? N

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

Time Period	Major Street Stanley Avenue						Minor Street Chippawa Parkway						Peds Crossing
	Northbound			Southbound			Eastbound			Westbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM Peak Hour	144	556	9	13	291	40	4	25	267	8	10	15	
PM Peak Hour	282	499	22	11	736	92	6	28	220	14	27	4	
Average Hourly Volume	107	264	8	6	257	33	3	13	122	6	9	5	0

Warrant	AHV
1A - All	831
1B - Minor	157
2A - Major	674
2B - Cross	21

Warrant 1 - Minimum Vehicular Volume

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

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Minor Street Approaches	120	170	120	170	

Warrant 2 - Delay To Cross Traffic

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

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

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



Horizon Year: 2031
Region/City/Township: Niagara Falls

Major Street: Lyons Creed Road
Minor Street: Stanley Avenue

North/South?: N

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

PM Forecast Only? N

Warrant Results		
150% Satisfied	Yes	Justification for new intersections with forecast traffic
120% Satisfied	Yes	Justification for existing intersections with forecast traffic

Time Period	Major Street Lyons Creed Road						Minor Street Stanley Avenue						Peds Crossing	
	Eastbound			Westbound			Northbound			Southbound				
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
AM Peak Hour	405	201			393	105					67		464	
PM Peak Hour	559	549			373	115					145		578	
Average Hourly Volume	241	188	0	0	192	55	0	0	0	53	0	261	0	

Warrant	AHV
1A - All	989
1B - Minor	314
2A - Major	675
2B - Cross	53

Warrant 1 - Minimum Vehicular Volume

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

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
	Minor Street Approaches	180	255	180	255	

Warrant 2 - Delay To Cross Traffic

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

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

Appendix I

Synchro Reports – Sensitivity



Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	264	658	176	71	744	173	414	239	136	174	152	302
Future Volume (vph)	264	658	176	71	744	173	414	239	136	174	152	302
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		15.0	50.0		0.0	15.0		0.0	40.0		65.0
Storage Lanes	1		0	1		0	2		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98		0.99		0.99	0.98		0.98		0.98	
Frt		0.968				0.972			0.946			0.850
Fit Protected	0.950			0.950			0.950		0.950			
Satd. Flow (prot)	1554	3059	0	1599	3056	0	3101	1549	0	1568	1667	1390
Fit Permitted	0.104			0.261			0.950		0.224			
Satd. Flow (perm)	170	3059	0	434	3056	0	3053	1549	0	362	1667	1358
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			24			25				271
Link Speed (k/h)		50			50			50				50
Link Distance (m)		616.3			1045.5			348.9				308.0
Travel Time (s)		44.4			75.3			25.1				22.2
Confl. Peds. (#/hr)	7		21	21		7	10		44	44		10
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%
Adj. Flow (vph)	290	723	193	78	818	190	455	263	149	191	167	332
Shared Lane Traffic (%)												
Lane Group Flow (vph)	290	916	0	78	1008	0	455	412	0	191	167	332
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8						6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.5	30.4		9.5	30.4		9.5	37.7		9.5	37.7	37.7
Total Split (s)	21.1	52.3		9.6	40.8		21.5	43.6		15.6	37.7	37.7
Total Split (%)	17.4%	43.2%		7.9%	33.7%		17.8%	36.0%		12.9%	31.1%	31.1%
Maximum Green (s)	18.1	45.9		6.6	34.4		18.5	36.9		12.6	31.0	31.0
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	4.1
All-Red Time (s)	0.0	2.3		0.0	2.3		0.0	2.6		0.0	2.6	2.6
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	-2.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		9.0			9.0			12.0			12.0	12.0
Flash Dont Walk (s)		15.0			15.0			19.0			19.0	19.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	61.6	53.6		43.5	37.8		17.5	36.2		41.3	30.0	30.0
Actuated g/C Ratio	0.51	0.44		0.36	0.31		0.14	0.30		0.34	0.25	0.25
v/c Ratio	0.93	0.67		0.37	1.04		1.02	0.86		0.81	0.41	0.61
Control Delay	68.3	30.1		23.6	80.0		97.8	55.2		50.4	40.3	13.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	68.3	30.1		23.6	80.0		97.8	55.2		50.4	40.3	13.3
LOS	E	C		C	E		F	E		D	D	B
Approach Delay		39.3			75.9			77.6			30.1	
Approach LOS		D			E			E			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	140											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.04											
Intersection Signal Delay:	56.6						Intersection LOS: E					
Intersection Capacity Utilization:	93.5%						ICU Level of Service F					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											
<p>The diagram shows the timing for 8 lanes. Lane 1 (EBL) has a split of 15.6s. Lane 2 (EBT) has a split of 43.6s. Lane 3 (EBR) has a split of 9.6s. Lane 4 (WBL) has a split of 52.3s. Lane 5 (WBT) has a split of 21.5s. Lane 6 (WBR) has a split of 37.7s. Lane 7 (NBL) has a split of 21.1s. Lane 8 (NBT) has a split of 40.8s. The diagram also shows the sequence of phases: 1, 2, 3, 4, 5, 6, 7, 8.</p>												

Queues
3: Dorchester Road & McLeod Road

Future Total - Remedial
AM Peak Hour

	↖	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	290	916	78	1008	455	412	191	167	332
v/c Ratio	0.93	0.67	0.37	1.04	1.02	0.86	0.81	0.41	0.61
Control Delay	68.3	30.1	23.6	80.0	97.8	55.2	50.4	40.3	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	30.1	23.6	80.0	97.8	55.2	50.4	40.3	13.3
Queue Length 50th (m)	-59.6	98.1	10.3	-144.6	-60.7	88.8	29.3	33.9	11.7
Queue Length 95th (m)	#121.4	123.8	19.7	#188.1	#95.8	#137.9	#55.3	54.4	41.8
Internal Link Dist (m)		592.3		1021.5		324.9		284.0	
Turn Bay Length (m)	55.0		50.0		15.0		40.0		65.0
Base Capacity (vph)	313	1373	213	969	448	523	239	463	573
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	0.93	0.67	0.37	1.04	1.02	0.79	0.80	0.36	0.58

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Future Total - Remedial
AM Peak Hour

	↖	→	↘	↙	←	↘	↙	↑	↘	↓	↙	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗	↖↗	↖	↖	↖
Traffic Volume (vph)	264	658	176	71	744	173	414	239	136	174	152	302
Future Volume (vph)	264	658	176	71	744	173	414	239	136	174	152	302
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.98		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1554	3060		1594	3055		3101	1549		1562	1667	1358
Flt Permitted	0.10	1.00		0.26	1.00		0.95	1.00		0.22	1.00	1.00
Satd. Flow (perm)	171	3060		437	3055		3101	1549		368	1667	1358
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	290	723	193	78	818	190	455	263	149	191	167	332
RTOR Reduction (vph)	0	19	0	0	17	0	0	18	0	0	0	204
Lane Group Flow (vph)	290	897	0	78	991	0	455	394	0	191	167	128
Conf. Peds. (#/hr)	7		21	21		7	10		44	44		10
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8						6		6
Actuated Green, G (s)	59.2	50.6		40.9	35.3		18.5	33.5		39.6	27.3	27.3
Effective Green, g (s)	58.2	53.0		38.9	37.7		17.5	36.2		37.6	30.0	30.0
Actuated g/C Ratio	0.48	0.44		0.32	0.31		0.14	0.30		0.31	0.25	0.25
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	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
Lane Grp Cap (vph)	309	1339		184	951		448	463		225	412	336
v/s Ratio Prot	c0.15	0.29		0.02	c0.32		c0.15	c0.25		0.08	0.10	
v/s Ratio Perm	0.30			0.12						0.18		0.09
v/c Ratio	0.94	0.67		0.42	1.04		1.02	0.85		0.85	0.41	0.38
Uniform Delay, d1	36.1	27.1		29.5	41.7		51.8	39.9		34.4	38.1	37.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	34.9	2.7		1.6	40.9		46.5	14.0		24.6	0.7	0.7
Delay (s)	71.0	29.8		31.1	82.6		98.3	54.0		58.9	38.7	38.6
Level of Service	E	C		C	F		F	D		E	D	D
Approach Delay (s)		39.7			78.9			77.2			44.2	
Approach LOS		D			E			E			D	

Intersection Summary

HCM 2000 Control Delay	60.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	176	632	122	53	596	192	277	278	134	132	148	178
Future Volume (vph)	176	632	122	53	596	192	277	278	134	132	148	178
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	15.0		15.0	15.0		15.0	15.0		15.0	20.0		15.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	0.99		1.00	0.99		0.99	0.99	
Frt		0.976			0.963			0.951				0.918
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3158	0	1066	3054	0	1599	1575	0	1646	1484	0
Fit Permitted	0.136			0.205			0.199			0.209		
Satd. Flow (perm)	226	3158	0	230	3054	0	334	1575	0	360	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			46			27			64	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1045.5			1070.0			834.0			207.0	
Travel Time (s)		75.3			77.0			60.0			14.9	
Confl. Peds. (#/hr)	7		3	3		7	4		13	13		4
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
Heavy Vehicles (%)	5%	2%	4%	56%	4%	4%	4%	7%	0%	1%	10%	5%
Adj. Flow (vph)	196	702	136	59	662	213	308	309	149	147	164	198
Shared Lane Traffic (%)												
Lane Group Flow (vph)	196	838	0	59	875	0	308	458	0	147	362	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.5		9.5	30.5		9.5	30.8		9.5	30.8	
Total Split (s)	15.0	37.2		10.0	32.2		17.0	34.0		13.8	30.8	
Total Split (%)	15.8%	39.2%		10.5%	33.9%		17.9%	35.8%		14.5%	32.4%	
Maximum Green (s)	12.0	30.7		7.0	25.7		14.0	27.2		10.8	24.0	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.4		0.0	2.4		0.0	2.7		0.0	2.7	
Lost Time Adjust (s)	1.0	-2.5		1.0	-2.5		1.0	-2.8		1.0	-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?		Yes		Yes			Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5		3.0	2.5		3.0	2.5		3.0	2.5	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		9.0			9.0			9.0			9.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	43.2	35.2		34.7	29.0		43.4	31.2		35.4	26.8	
Actuated g/C Ratio	0.45	0.37		0.37	0.31		0.46	0.33		0.37	0.28	
v/c Ratio	0.79	0.71		0.44	0.91		0.95	0.86		0.59	0.78	
Control Delay	42.1	29.3		26.7	44.9		59.5	46.1		25.8	39.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	42.1	29.3		26.7	44.9		59.5	46.1		25.8	39.0	
LOS	D	C		C	D		E	D		C	D	
Approach Delay		31.7			43.7			51.5			35.2	
Approach LOS		C			D			D			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	95											
Actuated Cycle Length:	95											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	85											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.95											
Intersection Signal Delay:	40.4						Intersection LOS: D					
Intersection Capacity Utilization:	85.8%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	4: Drummond Road & McLeod Road											

Queues
4: Drummond Road & McLeod Road

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	838	59	875	308	458	147	362
v/c Ratio	0.79	0.71	0.44	0.91	0.95	0.86	0.59	0.78
Control Delay	42.1	29.3	26.7	44.9	59.5	46.1	25.8	39.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.1	29.3	26.7	44.9	59.5	46.1	25.8	39.0
Queue Length 50th (m)	22.8	71.8	6.4	82.2	38.4	78.8	16.2	53.4
Queue Length 95th (m)	#54.6	95.3	14.2	#122.3	#90.0	#138.6	28.7	#99.0
Internal Link Dist (m)		1021.5		1046.0		810.0		183.0
Turn Bay Length (m)	15.0		15.0		15.0		20.0	
Base Capacity (vph)	259	1186	137	965	325	534	271	464
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	0.76	0.71	0.43	0.91	0.95	0.86	0.54	0.78

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Future Total - Remedial
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	632	122	53	596	192	277	278	134	132	148	178
Future Volume (vph)	176	632	122	53	596	192	277	278	134	132	148	178
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.95		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3157		1065	3055		1598	1576		1644	1484	
Flt Permitted	0.14	1.00		0.20	1.00		0.20	1.00		0.21	1.00	
Satd. Flow (perm)	226	3157		229	3055		334	1576		362	1484	
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)	196	702	136	59	662	213	308	309	149	147	164	198
RTOR Reduction (vph)	0	17	0	0	32	0	0	18	0	0	46	0
Lane Group Flow (vph)	196	821	0	59	843	0	308	440	0	147	316	0
Confl. Peds. (#/hr)	7		3	3		7	4		13	13		4
Heavy Vehicles (%)	5%	2%	4%	56%	4%	4%	4%	7%	0%	1%	10%	5%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	40.7	32.1		32.1	26.5		41.0	28.4		33.6	24.0	
Effective Green, g (s)	39.7	34.6		30.1	29.0		40.0	31.2		31.6	26.8	
Actuated g/C Ratio	0.42	0.36		0.32	0.31		0.42	0.33		0.33	0.28	
Clearance Time (s)	3.0	6.5		3.0	6.5		3.0	6.8		3.0	6.8	
Vehicle Extension (s)	2.5	2.5		3.0	2.5		3.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	240	1149		113	932		313	517		236	418	
v/s Ratio Prot	c0.09	0.26		0.03	c0.28		c0.13	0.28		0.06	0.21	
v/s Ratio Perm	0.25			0.14			c0.28			0.15		
v/c Ratio	0.82	0.71		0.52	0.90		0.98	0.85		0.62	0.76	
Uniform Delay, d1	21.8	26.0		24.1	31.7		22.2	29.7		24.4	31.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.5	3.8		4.3	13.8		46.2	16.0		5.0	12.0	
Delay (s)	40.3	29.8		28.4	45.5		68.4	45.8		29.4	43.1	
Level of Service	D	C		C	D		E	D		C	D	
Approach Delay (s)		31.8			44.4			54.9			39.2	
Approach LOS		C			D			D			D	

Intersection Summary

HCM 2000 Control Delay	42.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c	Critical Lane Group		

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Volume (vph)	55	23	0	1	3	4	3	546	8	0	261	27
Future Volume (vph)	55	23	0	1	3	4	3	546	8	0	261	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.98			1.00			1.00	
Fr't					0.932			0.998			0.987	
Flt Protected		0.966			0.995							
Satd. Flow (prot)	0	1621	0	0	1419	0	0	1604	0	0	1596	0
Flt Permitted		0.784			0.966			0.998				
Satd. Flow (perm)	0	1303	0	0	1374	0	0	1601	0	0	1596	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5			2				13
Link Speed (k/h)		50			50			50				50
Link Distance (m)		121.4			166.8			461.8				348.9
Travel Time (s)		8.7			12.0			33.2				25.1
Confl. Peds. (#/hr)	8		16	16		8	17		8	8		17
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	4%	5%	0%	0%	0%	25%	100%	8%	29%	0%	6%	24%
Adj. Flow (vph)	72	30	0	1	4	5	4	718	11	0	343	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	102	0	0	10	0	0	733	0	0	379	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			2	
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		-3.0			-3.0			-3.0			-3.0	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		12.6			12.6			39.6			39.6	
Actuated g/C Ratio		0.22			0.22			0.70			0.70	
v/c Ratio		0.35			0.03			0.65			0.34	
Control Delay		21.2			12.0			12.1			6.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.2			12.0			12.1			6.2	
LOS		C			B			B			A	
Approach Delay		21.2			12.0			12.1			6.2	
Approach LOS		C			B			B			A	
Intersection Summary												
Area Type:	Other											
Cycle Length:	60											
Actuated Cycle Length:	56.5											
Natural Cycle:	60											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.65											
Intersection Signal Delay:	11.1						Intersection LOS: B					
Intersection Capacity Utilization:	53.8%						ICU Level of Service A					
Analysis Period (min):	15											
Plots and Phases:	8: Dorchester Road & Jill Drive											

Queues
8: Dorchester Road & Jill Drive

Future Total - Remedial
AM Peak Hour

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	102	10	733	379
v/c Ratio	0.35	0.03	0.65	0.34
Control Delay	21.2	12.0	12.1	6.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.2	12.0	12.1	6.2
Queue Length 50th (m)	10.0	0.5	44.1	15.6
Queue Length 95th (m)	15.3	2.6	69.9	27.2
Internal Link Dist (m)	97.4	142.8	437.8	324.9
Turn Bay Length (m)				
Base Capacity (vph)	488	517	1122	1122
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.02	0.65	0.34
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Future Total - Remedial
AM Peak Hour

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	55	23	0	1	3	4	3	546	8	0	261	27
Future Volume (vph)	55	23	0	1	3	4	3	546	8	0	261	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.98			1.00			1.00	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		1.00			0.93			1.00			0.99	
Flt Protected		0.97			1.00			1.00			1.00	
Satd. Flow (prot)		1606			1417			1604			1597	
Flt Permitted		0.78			0.97			1.00			1.00	
Satd. Flow (perm)		1304			1376			1601			1597	
Peak-hour factor, PHF	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Adj. Flow (vph)	72	30	0	1	4	5	4	718	11	0	343	36
RTOR Reduction (vph)	0	0	0	0	4	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	102	0	0	6	0	0	732	0	0	375	0
Confl. Peds. (#/hr)	8		16	16		8	17		8	8		17
Heavy Vehicles (%)	4%	5%	0%	0%	0%	25%	100%	8%	29%	0%	6%	24%
Turn Type	Perm	NA		Perm	NA		Perm	NA		NA		NA
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.3			8.3			35.7			35.7	
Effective Green, g (s)		11.3			11.3			38.7			38.7	
Actuated g/C Ratio		0.19			0.19			0.67			0.67	
Clearance Time (s)		7.0			7.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		254			268			1068			1065	
v/s Ratio Prot											0.23	
v/s Ratio Perm		c0.08			0.00			c0.46				
v/c Ratio		0.40			0.02			0.69			0.35	
Uniform Delay, d1		20.4			18.9			5.9			4.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.0			0.0			3.6			0.9	
Delay (s)		21.4			18.9			9.5			5.1	
Level of Service		C			B			A			A	
Approach Delay (s)		21.4			18.9			9.5			5.1	
Approach LOS		C			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.2						A			
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			58.0					Sum of lost time (s)	8.0			
Intersection Capacity Utilization			53.8%					ICU Level of Service	A			
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Total - Remedial
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↑	↔	↔	↑
Traffic Volume (vph)	56	78	440	83	29	246
Future Volume (vph)	56	78	440	83	29	246
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.921			0.850		
Flt Protected	0.980				0.950	
Satd. Flow (prot)	1359	0	1750	1488	1397	1750
Flt Permitted	0.980				0.436	
Satd. Flow (perm)	1359	0	1750	1488	641	1750
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	90			67		
Link Speed (k/h)	50		60		60	
Link Distance (m)	1040.1		438.6		461.8	
Travel Time (s)	74.9		26.3		27.7	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	25%	10%	0%	0%	19%	0%
Adj. Flow (vph)	64	90	506	95	33	283
Shared Lane Traffic (%)						
Lane Group Flow (vph)	154	0	506	95	33	283
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru Right	Left	Thru	
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4		9.4	
Detector 2 Size(m)			0.6		0.6	
Detector 2 Type			CI+Ex		CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)			0.0		0.0	
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		2			6

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Total - Remedial
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases				2	6	
Detector Phase	8		2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	25.0		25.0	25.0	25.0	25.0
Total Split (s)	25.0		35.0	35.0	35.0	35.0
Total Split (%)	41.7%		58.3%	58.3%	58.3%	58.3%
Maximum Green (s)	18.0		28.0	28.0	28.0	28.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-3.0		-3.0	-3.0	-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	11.5		37.3	37.3	37.3	37.3
Actuated g/C Ratio	0.22		0.70	0.70	0.70	0.70
v/c Ratio	0.42		0.41	0.09	0.07	0.23
Control Delay	12.0		6.7	2.6	5.4	5.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	12.0		6.7	2.6	5.4	5.3
LOS	B		A	A	A	A
Approach Delay	12.0		6.1			5.3
Approach LOS	B		A			A
Intersection Summary						
Area Type:	Other					
Cycle Length:	60					
Actuated Cycle Length:	53.3					
Natural Cycle:	50					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.42					
Intersection Signal Delay:	6.7			Intersection LOS: A		
Intersection Capacity Utilization	41.4%			ICU Level of Service A		
Analysis Period (min)	15					
Split and Phases:	9: Dorchester Road & Oldfield Road					

Queues
9: Dorchester Road & Oldfield Road

Future Total - Remedial
AM Peak Hour

Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	154	506	95	33	283
v/c Ratio	0.42	0.41	0.09	0.07	0.23
Control Delay	12.0	6.7	2.6	5.4	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	6.7	2.6	5.4	5.3
Queue Length 50th (m)	5.2	20.4	0.8	1.0	9.7
Queue Length 95th (m)	16.0	47.1	5.7	4.5	23.8
Internal Link Dist (m)	1016.1	414.6			437.8
Turn Bay Length (m)			15.0	15.0	
Base Capacity (vph)	591	1225	1062	448	1225
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.41	0.09	0.07	0.23
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Future Total - Remedial
AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	56	78	440	83	29	246
Future Volume (vph)	56	78	440	83	29	246
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr	0.92	1.00	0.85	1.00	1.00	1.00
Fit Protected	0.98	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1359	1750	1488	1397	1750	1750
Fit Permitted	0.98	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)	1359	1750	1488	642	1750	1750
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	64	90	506	95	33	283
RTOR Reduction (vph)	73	0	0	22	0	0
Lane Group Flow (vph)	81	0	506	73	33	283
Heavy Vehicles (%)	25%	10%	0%	0%	19%	0%
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	7.3		33.5	33.5	33.5	33.5
Effective Green, g (s)	10.3		36.5	36.5	36.5	36.5
Actuated g/C Ratio	0.19		0.67	0.67	0.67	0.67
Clearance Time (s)	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	255		1165	991	427	1165
v/s Ratio Prot	c0.06		c0.29			0.16
v/s Ratio Perm				0.05	0.05	
v/c Ratio	0.32		0.43	0.07	0.08	0.24
Uniform Delay, d1	19.2		4.3	3.2	3.2	3.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7		1.2	0.1	0.4	0.5
Delay (s)	19.9		5.5	3.4	3.6	4.1
Level of Service	B		A	A	A	A
Approach Delay (s)	19.9		5.1			4.1
Approach LOS	B		A			A
Intersection Summary						
HCM 2000 Control Delay			7.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.41			
Actuated Cycle Length (s)			54.8		Sum of lost time (s)	8.0
Intersection Capacity Utilization			41.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	4	25	267	8	10	15	144	556	9	13	291	40
Future Volume (vph)	4	25	267	8	10	15	144	556	9	13	291	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	160.0	0.0	75.0	0.0	160.0	0.0	75.0	0.0	160.0	0.0	75.0	80.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98				0.98							
Frt		0.863			0.910			0.998				0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1250	1297	0	1421	1558	0	1409	1644	0	1525	1250	1240
Fit Permitted	0.734			0.282			0.426			0.362		
Satd. Flow (perm)	950	1297	0	422	1558	0	632	1644	0	581	1250	1240
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		371			21			2				76
Link Speed (k/h)		60			60			70				60
Link Distance (m)		372.3			519.4			156.9				312.6
Travel Time (s)		22.3			31.2			8.1				18.8
Confl. Peds. (#/hr)	6				6							
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles (%)	33%	0%	18%	17%	0%	0%	18%	6%	20%	9%	40%	20%
Adj. Flow (vph)	6	35	371	11	14	21	200	772	13	18	404	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	406	0	11	35	0	200	785	0	18	404	56
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	6
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	25.0	25.0		25.0	25.0		10.0	25.0		25.0	25.0	25.0
Total Split (s)	31.0	31.0		31.0	31.0		16.0	69.0		53.0	53.0	53.0
Total Split (%)	31.0%	31.0%		31.0%	31.0%		16.0%	69.0%		53.0%	53.0%	53.0%
Maximum Green (s)	24.0	24.0		24.0	24.0		13.0	62.0		46.0	46.0	46.0
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.0	3.0		3.0	3.0		0.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0		1.0	-3.0		-3.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max		Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	14.3	14.3		14.3	14.3		65.4	65.4		53.2	53.2	53.2
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.75	0.75		0.61	0.61	0.61
v/c Ratio	0.04	0.78		0.16	0.13		0.37	0.64		0.05	0.53	0.07
Control Delay	29.2	16.4		35.2	17.9		6.4	10.1		11.2	15.9	2.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	29.2	16.4		35.2	17.9		6.4	10.1		11.2	15.9	2.1
LOS	C	B		D	B		A	B		B	B	A
Approach Delay		16.6			22.0			9.3			14.1	
Approach LOS		B			C			A			B	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	87.7											
Natural Cycle:	60											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.78											
Intersection Signal Delay:	12.4						Intersection LOS: B					
Intersection Capacity Utilization:	65.9%						ICU Level of Service C					
Analysis Period (min):	15											
Splits and Phases:	10: Stanley Avenue & Chippawa Parkway											

Queues
10: Stanley Avenue & Chippawa Parkway

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR			
Lane Group Flow (vph)	6	406	11	35	200	785	18	404	56			
v/c Ratio	0.04	0.78	0.16	0.13	0.37	0.64	0.05	0.53	0.07			
Control Delay	29.2	16.4	35.2	17.9	6.4	10.1	11.2	15.9	2.1			
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Delay	29.2	16.4	35.2	17.9	6.4	10.1	11.2	15.9	2.1			
Queue Length 50th (m)	0.9	5.4	1.7	2.1	7.0	45.4	1.0	33.6	0.0			
Queue Length 95th (m)	3.4	10.2	5.2	7.1	19.1	91.9	4.7	66.3	1.9			
Internal Link Dist (m)	348.3		495.4		132.9		288.6					
Turn Bay Length (m)	160.0	75.0		160.0		75.0		80.0				
Base Capacity (vph)	294	657	130	496	578	1226	352	757	781			
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0			
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0			
Storage Cap Reductn	0	0	0	0	0	0	0	0	0			
Reduced v/c Ratio	0.02	0.62	0.08	0.07	0.35	0.64	0.05	0.53	0.07			
Intersection Summary												

HCM Signalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Future Total - Remedial
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔		↔	↔		↔	↔		↔
Traffic Volume (vph)	4	25	267	8	10	15	144	556	9	13	291	40
Future Volume (vph)	4	25	267	8	10	15	144	556	9	13	291	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.91		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1233	1297		1421	1560		1409	1643		1525	1250	1240
Flt Permitted	0.73	1.00		0.28	1.00		0.43	1.00		0.36	1.00	1.00
Satd. Flow (perm)	953	1297		421	1560		632	1643		581	1250	1240
Peak-hour factor, PHF	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	6	35	371	11	14	21	200	772	12	18	404	56
RTOR Reduction (vph)	0	311	0	0	18	0	0	1	0	0	0	22
Lane Group Flow (vph)	6	95	0	11	17	0	200	784	0	18	404	34
Confl. Peds. (#/hr)	6											
Heavy Vehicles (%)	33%	0%	18%	17%	0%	0%	18%	6%	20%	9%	40%	20%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	11.2	11.2		11.2	11.2		62.4	62.4		50.2	50.2	50.2
Effective Green, g (s)	14.2	14.2		14.2	14.2		61.4	65.4		53.2	53.2	53.2
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.70	0.75		0.61	0.61	0.61
Clearance Time (s)	7.0	7.0		7.0	7.0		3.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	154	210		68	252		515	1226		352	759	753
v/s Ratio Prot	c0.07											
v/s Ratio Perm	0.01			0.03			0.24			0.03		0.03
v/c Ratio	0.04	0.45		0.16	0.07		0.39	0.64		0.05	0.53	0.05
Uniform Delay, d1	30.9	33.2		31.6	31.1		5.3	5.4		7.0	10.0	6.9
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	1.6		1.1	0.1		0.5	2.6		0.3	2.7	0.1
Delay (s)	31.1	34.7		32.7	31.2		5.8	8.0		7.2	12.6	7.1
Level of Service	C	C		C	C		A	A		A	B	A
Approach Delay (s)	34.7			31.6			7.5			11.8		
Approach LOS	C			C			A			B		
Intersection Summary												
HCM 2000 Control Delay	15.0		HCM 2000 Level of Service		B							
HCM 2000 Volume to Capacity ratio	0.64											
Actuated Cycle Length (s)	87.6											
Intersection Capacity Utilization	65.9%		ICU Level of Service		C							
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑	↔		↔	↔
Traffic Volume (vph)	405	201	393	105	67	464
Future Volume (vph)	405	201	393	105	67	464
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	2			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.971			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3014	1683	1662	0	1250	1094
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3014	1683	1662	0	1250	1094
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			20			546
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	7%	4%	1%	7%	33%	36%
Adj. Flow (vph)	476	236	462	124	79	546
Shared Lane Traffic (%)						
Lane Group Flow (vph)	476	236	586	0	79	546
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		7.2	7.2		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

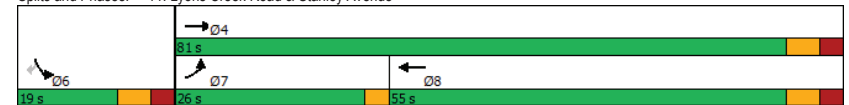
Future Total - Remedial
AM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	25.0	25.0		25.0	25.0
Total Split (s)	26.0	81.0	55.0		19.0	19.0
Total Split (%)	26.0%	81.0%	55.0%		19.0%	19.0%
Maximum Green (s)	23.0	74.0	48.0		12.0	12.0
Yellow Time (s)	3.0	4.0	4.0		4.0	4.0
All-Red Time (s)	0.0	3.0	3.0		3.0	3.0
Lost Time Adjust (s)	1.0	-3.0	-3.0		-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0		4.0	4.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None		Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)	17.3	59.4	38.0		21.6	21.6
Actuated g/C Ratio	0.19	0.67	0.43		0.24	0.24
v/c Ratio	0.82	0.21	0.81		0.26	0.81
Control Delay	47.9	5.8	31.8		35.5	14.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	47.9	5.8	31.8		35.5	14.1
LOS	D	A	C		D	B
Approach Delay		33.9	31.8		16.8	
Approach LOS		C	C		B	

Intersection Summary


Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 89.2
 Natural Cycle: 80
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 27.7
 Intersection Capacity Utilization 67.2%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 11: Lyons Creek Road & Stanley Avenue



Queues
11: Lyons Creek Road & Stanley Avenue

Future Total - Remedial
AM Peak Hour




Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	476	236	586	79	546
v/c Ratio	0.82	0.21	0.81	0.26	0.81
Control Delay	47.9	5.8	31.8	35.5	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	5.8	31.8	35.5	14.1
Queue Length 50th (m)	42.6	14.0	86.9	11.8	0.0
Queue Length 95th (m)	64.4	20.7	125.8	27.5	#30.1
Internal Link Dist (m)		426.7	581.6	788.1	
Turn Bay Length (m)	55.0			25.0	
Base Capacity (vph)	763	1448	984	302	678
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.16	0.60	0.26	0.81

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

HCM Signalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Future Total - Remedial
AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔↔	↑	↔↔		↔↔	↔↔
Traffic Volume (vph)	405	201	393	105	67	464
Future Volume (vph)	405	201	393	105	67	464
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00
Fr _t	1.00	1.00	0.97		1.00	0.85
Fit Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3014	1683	1662		1250	1094
Fit Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3014	1683	1662		1250	1094
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	476	236	462	124	79	546
RTOR Reduction (vph)	0	0	11	0	0	414
Lane Group Flow (vph)	476	236	575	0	79	132
Heavy Vehicles (%)	7%	4%	1%	7%	33%	36%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	18.3	56.3	35.0		18.5	18.5
Effective Green, g (s)	17.3	59.3	38.0		21.5	21.5
Actuated g/C Ratio	0.19	0.67	0.43		0.24	0.24
Clearance Time (s)	3.0	7.0	7.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	587	1123	711		302	264
v/s Ratio Prot	c0.16	0.14	c0.35		0.06	
v/s Ratio Perm						c0.12
v/c Ratio	0.81	0.21	0.81		0.26	0.50
Uniform Delay, d1	34.2	5.7	22.2		27.2	29.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.3	0.1	6.7		2.1	6.6
Delay (s)	42.5	5.8	28.9		29.3	35.7
Level of Service	D	A	C		C	D
Approach Delay (s)		30.3	28.9		34.9	
Approach LOS		C	C		C	

Intersection Summary
 HCM 2000 Control Delay 31.4 HCM 2000 Level of Service C
 HCM 2000 Volume to Capacity ratio 0.72
 Actuated Cycle Length (s) 88.8 Sum of lost time (s) 12.0
 Intersection Capacity Utilization 67.2% ICU Level of Service C
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
12: Dorchester Road & Street J

Future Total - Remedial
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖			↗
Traffic Volume (vph)	51	211	312	0	174	128
Future Volume (vph)	51	211	312	0	174	128
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Friction	0.850					
Fit Protected	0.950					0.972
Satd. Flow (prot)	1630	1458	1716	0	0	1668
Fit Permitted	0.950					0.670
Satd. Flow (perm)	1630	1458	1716	0	0	1150
Right Turn on Red	Yes		Yes			
Satd. Flow (RTOR)	229					
Link Speed (k/h)	50	60		60		
Link Distance (m)	156.0	129.0		684.0		
Travel Time (s)	11.2	7.7		41.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	229	339	0	189	139
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	229	339	0	0	328
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6	0.0		0.0		
Link Offset(m)	0.0	0.0		0.0		
Crosswalk Width(m)	4.8	4.8		4.8		
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	15		25	
Number of Detectors	1	1	2	1		2
Detector Template	Left	Right	Thru	Left	Thru	
Leading Detector (m)	2.0	2.0	10.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	2.0	0.6	2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)			9.4	9.4		
Detector 2 Size(m)			0.6	0.6		
Detector 2 Type			CI+Ex	CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)			0.0	0.0		
Turn Type	Prot	Perm	NA	Perm	NA	
Protected Phases	8	2		6		
Permitted Phases	8		6			
Detector Phase	8	8	2	6	6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	





Lanes, Volumes, Timings
12: Dorchester Road & Street J

Future Total - Remedial
AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)	22.5	22.5	22.5		22.5	22.5
Total Split (s)	22.5	22.5	32.5		32.5	32.5
Total Split (%)	40.9%	40.9%	59.1%		59.1%	59.1%
Maximum Green (s)	18.0	18.0	28.0		28.0	28.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	7.6	7.6	31.1		31.1	
Actuated g/C Ratio	0.16	0.16	0.65		0.65	
v/c Ratio	0.21	0.54	0.30		0.44	
Control Delay	17.8	8.3	5.0		7.0	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	17.8	8.3	5.0		7.0	
LOS	B	A	A		A	
Approach Delay	10.1		5.0		7.0	
Approach LOS	B		A		A	
Intersection Summary						
Area Type: Other						
Cycle Length: 55						
Actuated Cycle Length: 47.8						
Natural Cycle: 55						
Control Type: Semi Act-Uncoord						
Maximum v/c Ratio: 0.54						
Intersection Signal Delay: 7.2						
Intersection Capacity Utilization 51.0%						
Intersection LOS: A						
ICU Level of Service A						
Analysis Period (min) 15						
Splits and Phases: 12: Dorchester Road & Street J						











Queues
12: Dorchester Road & Street J

Future Total - Remedial
AM Peak Hour

				
Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	55	229	339	328
v/c Ratio	0.21	0.54	0.30	0.44
Control Delay	17.8	8.3	5.0	7.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.8	8.3	5.0	7.0
Queue Length 50th (m)	3.9	0.0	9.2	10.0
Queue Length 95th (m)	10.9	13.4	25.1	30.7
Internal Link Dist (m)	132.0		105.0	660.0
Turn Bay Length (m)				
Base Capacity (vph)	620	696	1117	749
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.09	0.33	0.30	0.44
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
12: Dorchester Road & Street J

Future Total - Remedial
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	51	211	312	0	174	128
Future Volume (vph)	51	211	312	0	174	128
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5			4.5
Lane Util. Factor	1.00	1.00	1.00			1.00
Flt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			0.97
Satd. Flow (prot)	1630	1458	1716			1668
Flt Permitted	0.95	1.00	1.00			0.67
Satd. Flow (perm)	1630	1458	1716			1149
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	229	339	0	189	139
RTOR Reduction (vph)	0	193	0	0	0	0
Lane Group Flow (vph)	55	36	339	0	0	328
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	7.6	7.6	31.1			31.1
Effective Green, g (s)	7.6	7.6	31.1			31.1
Actuated g/C Ratio	0.16	0.16	0.65			0.65
Clearance Time (s)	4.5	4.5	4.5			4.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	259	232	1118			749
v/s Ratio Prot	c0.03		0.20			
v/s Ratio Perm		0.03				c0.29
v/c Ratio	0.21	0.16	0.30			0.44
Uniform Delay, d1	17.4	17.3	3.6			4.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.4	0.3	0.7			1.9
Delay (s)	17.9	17.6	4.3			5.9
Level of Service	B	B	A			A
Approach Delay (s)	17.7		4.3			5.9
Approach LOS	B		A			A
Intersection Summary						
HCM 2000 Control Delay			8.8		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.39			
Actuated Cycle Length (s)			47.7		Sum of lost time (s)	9.0
Intersection Capacity Utilization			51.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
14: Dorchester Road & Internal Road

Future Total - Remedial
AM Peak Hour

	←	↖	↑	↗	→	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↗			↘
Traffic Volume (vph)	0	0	312	37	0	128
Future Volume (vph)	0	0	312	37	0	128
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.986			
Fit Protected						
Satd. Flow (prot)	0	1716	1692	0	0	1716
Fit Permitted						
Satd. Flow (perm)	0	1716	1692	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	88.3		186.5			129.0
Travel Time (s)	6.4		11.2			7.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	339	40	0	139
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	379	0	0	139
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	23.6%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
14: Dorchester Road & Internal Road

Future Total - Remedial
AM Peak Hour

	←	↖	↑	↗	→	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↗			↘
Traffic Volume (veh/h)	0	0	312	37	0	128
Future Volume (Veh/h)	0	0	312	37	0	128
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	339	40	0	139
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						129
pX, platoon unblocked						
vC, conflicting volume	498	359			379	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	498	359			379	
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)	532	685			1179	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	379	139			
Volume Left	0	0	0			
Volume Right	0	40	0			
eSH	1700	1700	1700			
Volume to Capacity	0.10	0.22	0.08			
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	23.6%		ICU Level of Service	A		
Analysis Period (min)	15					

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Total - Remedial
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	43	1516	418	263	1460	20	407	5	382	28	15	97
Future Volume (vph)	43	1516	418	263	1460	20	407	5	382	28	15	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0		0.0	60.0		35.0	95.0		0.0	20.0		0.0
Storage Lanes	1		1	2		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			0.98			1.00	1.00				0.99
Frt			0.850			0.850			0.850			0.870
Fit Protected	0.950			0.950			0.950	0.953		0.950		
Satd. Flow (prot)	1583	4730	1444	3131	3260	1403	1533	1530	1458	1662	1484	0
Fit Permitted	0.095			0.096			0.950	0.953		0.950		
Satd. Flow (perm)	158	4730	1411	316	3260	1403	1526	1524	1458	1662	1484	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			420			243			331			99
Link Speed (k/h)		50			50			50				50
Link Distance (m)		692.3			616.3			360.6				181.9
Travel Time (s)		49.8			44.4			26.0				13.1
Conf. Peds. (#/hr)	9		9	9		9	6					6
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Adj. Flow (vph)	44	1547	427	268	1490	20	415	5	390	29	15	99
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	44	1547	427	268	1490	20	212	208	390	29	114	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Total - Remedial
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	NA	Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	16.0	63.0	63.0	27.0	74.0		26.0	26.0	26.0	14.0	14.0	
Total Split (%)	12.3%	48.5%	48.5%	20.8%	56.9%		20.0%	20.0%	20.0%	10.8%	10.8%	
Maximum Green (s)	13.0	55.0	55.0	24.0	66.0		17.0	17.0	17.0	5.0	5.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	-4.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	77.4	71.9	71.9	85.8	78.3	0.0	22.0	22.0	22.0	10.0	10.0	
Actuated g/C Ratio	0.60	0.55	0.55	0.66	0.60	0.00	0.17	0.17	0.17	0.08	0.08	
v/c Ratio	0.29	0.59	0.44	0.63	0.76	0.08	0.82	0.81	0.75	0.23	0.56	
Control Delay	12.3	15.8	1.7	17.3	22.7	0.7	76.8	75.5	19.2	61.1	25.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.3	15.8	1.7	17.3	22.7	0.7	76.8	75.5	19.2	61.1	25.4	
LOS	B	B	A	B	C	A	E	E	B	E	C	
Approach Delay		12.7			21.7			48.8			32.6	
Approach LOS		B			C			D			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.82											
Intersection Signal Delay:	22.8						Intersection LOS: C					
Intersection Capacity Utilization:	104.1%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases: 2: Oakwood Drive & McLeod Road												

Queues
2: Oakwood Drive & McLeod Road

Future Total - Remedial
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	44	1547	427	268	1490	20	212	208	390	29	114
v/c Ratio	0.29	0.59	0.44	0.63	0.76	0.08	0.82	0.81	0.75	0.23	0.56
Control Delay	12.3	15.8	1.7	17.3	22.7	0.7	76.8	75.5	19.2	61.1	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	15.8	1.7	17.3	22.7	0.7	76.8	75.5	19.2	61.1	25.4
Queue Length 50th (m)	2.4	102.8	1.4	12.7	151.5	0.0	58.7	57.4	14.0	7.5	3.9
Queue Length 95th (m)	m3.8	145.7	m5.5	23.1	188.3	0.0	#102.8	#100.6	53.6	18.0	23.4
Internal Link Dist (m)		668.3		592.3			336.6				157.9
Turn Bay Length (m)	50.0			60.0		35.0	95.0		20.0		
Base Capacity (vph)	233	2617	968	707	1963	243	259	258	521	127	205
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	0.19	0.59	0.44	0.38	0.76	0.08	0.82	0.81	0.75	0.23	0.56

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Future Total - Remedial
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	↔	↔↔↔	↔	↔↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	43	1516	418	263	1460	20	407	5	382	28	15	97
Future Volume (vph)	43	1516	418	263	1460	20	407	5	382	28	15	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	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	0.87	0.87
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	4730	1411	3131	3260	1403	1533	1531	1458	1662	1484	1484
Flt Permitted	0.10	1.00	1.00	0.10	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	158	4730	1411	317	3260	1403	1533	1531	1458	1662	1484	1484
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	44	1547	427	268	1490	20	415	5	390	29	15	99
RTOR Reduction (vph)	0	0	188	0	0	20	0	0	275	0	91	0
Lane Group Flow (vph)	44	1547	239	268	1490	0	212	208	115	29	23	0
Confl. Peds. (#/hr)	9		9	9		9	6					6
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	NA	Split	NA	Perm	Split	NA	NA
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	73.2	67.9	67.9	82.0	73.7	0.0	17.0	17.0	17.0	5.0	5.0	
Effective Green, g (s)	71.2	71.9	71.9	81.0	77.7	0.0	22.0	22.0	22.0	10.0	10.0	
Actuated g/C Ratio	0.55	0.55	0.55	0.62	0.60	0.00	0.17	0.17	0.17	0.08	0.08	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	133	2616	780	416	1948	0	259	259	246	127	114	
v/s Ratio Prot	0.01	0.33		c0.05	c0.46		c0.14	0.14		c0.02	0.02	
v/s Ratio Perm	0.17		0.17	0.35					0.08			
v/c Ratio	0.33	0.59	0.31	0.64	0.76	0.00	0.82	0.80	0.47	0.23	0.20	
Uniform Delay, d1	17.9	19.3	15.6	15.9	19.4	65.0	52.1	51.9	48.7	56.4	56.2	
Progression Factor	1.11	0.76	0.49	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.6	0.6	3.0	2.9	0.0	24.2	22.6	6.3	4.1	3.9	
Delay (s)	20.5	15.4	8.4	18.9	22.3	65.0	76.3	74.5	55.0	60.5	60.1	
Level of Service	C	B	A	B	C	E	E	E	D	E	E	
Approach Delay (s)		14.0			22.3			65.6			60.2	
Approach LOS		B			C			E			E	

Intersection Summary

HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total - Remedial
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	327	1025	417	96	859	155	501	208	172	294	213	341
Future Volume (vph)	327	1025	417	96	859	155	501	208	172	294	213	341
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		15.0	50.0		0.0	15.0		0.0	40.0		65.0
Storage Lanes	1		0	1		0	2		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.98			0.99		0.97	0.98		0.99		0.96
Frt		0.957			0.977			0.932				0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3076	0	1630	3193	0	3131	1605	0	1662	1716	1458
Fit Permitted	0.950			0.125			0.950			0.150		
Satd. Flow (perm)	1615	3076	0	214	3193	0	3037	1605	0	260	1716	1406
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		62			17			34				301
Link Speed (k/h)		50			50			50				50
Link Distance (m)		616.3			1045.5			348.9				308.0
Travel Time (s)		44.4			75.3			25.1				22.2
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Adj. Flow (vph)	337	1057	430	99	886	160	516	214	177	303	220	352
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	1487	0	99	1046	0	516	391	0	303	220	352
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total - Remedial
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8						6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.5	30.4		9.5	30.4		9.5	37.7		9.5	37.7	37.7
Total Split (s)	24.0	53.9		9.5	39.4		20.0	38.5		19.2	37.7	37.7
Total Split (%)	19.8%	44.5%		7.8%	32.5%		16.5%	31.8%		15.9%	31.1%	31.1%
Maximum Green (s)	21.0	47.5		6.5	33.0		17.0	31.8		16.2	31.0	31.0
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	4.1
All-Red Time (s)	0.0	2.3		0.0	2.3		0.0	2.6		0.0	2.6	2.6
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	-2.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		9.0			9.0			12.0			12.0	12.0
Flash Dont Walk (s)		15.0			15.0			19.0			19.0	19.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	22.3	51.6		41.5	35.4		16.0	32.2		46.6	31.4	31.4
Actuated g/C Ratio	0.18	0.43		0.34	0.29		0.13	0.27		0.38	0.26	0.26
v/c Ratio	1.12	1.10		0.69	1.11		1.25	0.87		1.10	0.49	0.60
Control Delay	135.4	91.0		46.2	102.7		174.2	58.2		114.3	41.8	11.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	135.4	91.0		46.2	102.7		174.2	58.2		114.3	41.8	11.4
LOS	F	F		D	F		F	E		F	D	B
Approach Delay		99.2			97.8			124.2				54.7
Approach LOS		F			F			F				D
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green												
Natural Cycle:	150											
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 1.25												
Intersection Signal Delay: 95.5	Intersection LOS: F											
Intersection Capacity Utilization 107.6%	ICU Level of Service G											
Analysis Period (min)	15											
Splits and Phases: 3: Dorchester Road & McLeod Road												

Queues
3: Dorchester Road & McLeod Road

Future Total - Remedial
PM Peak Hour

	↖	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	337	1487	99	1046	516	391	303	220	352
v/c Ratio	1.12	1.10	0.69	1.11	1.25	0.87	1.10	0.49	0.60
Control Delay	135.4	91.0	46.2	102.7	174.2	58.2	114.3	41.8	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	135.4	91.0	46.2	102.7	174.2	58.2	114.3	41.8	11.4
Queue Length 50th (m)	~105.4	~224.5	13.1	~155.8	~82.9	84.0	~65.4	45.7	9.6
Queue Length 95th (m)	#165.3	#269.9	#35.2	#199.3	#118.4	#134.4	#123.6	70.6	39.4
Internal Link Dist (m)		592.3		1021.5		324.9		284.0	
Turn Bay Length (m)	55.0		50.0		15.0		40.0		65.0
Base Capacity (vph)	300	1346	144	945	413	481	275	477	608
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	1.10	0.69	1.11	1.25	0.81	1.10	0.46	0.58

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Future Total - Remedial
PM Peak Hour

	↖	→	↘	↙	←	↘	↑	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗	↖↗	↖	↖	↖
Traffic Volume (vph)	327	1025	417	96	859	155	501	208	172	294	213	341
Future Volume (vph)	327	1025	417	96	859	155	501	208	172	294	213	341
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.98		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
Frt	1.00	0.96		1.00	0.98		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1630	3075		1630	3193		3131	1605		1661	1716	1406
Flt Permitted	0.95	1.00		0.12	1.00		0.95	1.00		0.15	1.00	1.00
Satd. Flow (perm)	1630	3075		214	3193		3131	1605		262	1716	1406
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	337	1057	430	99	886	160	516	214	177	303	220	352
RTOR Reduction (vph)	0	36	0	0	12	0	0	25	0	0	0	223
Lane Group Flow (vph)	337	1451	0	99	1034	0	516	366	0	303	220	129
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Turn Type	Prot	NA		pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8						6		6
Actuated Green, G (s)	23.3	49.2		40.1	33.0		17.0	29.5		44.9	28.7	28.7
Effective Green, g (s)	22.3	51.6		38.1	35.4		16.0	32.2		42.9	31.4	31.4
Actuated g/C Ratio	0.18	0.43		0.31	0.29		0.13	0.27		0.35	0.26	0.26
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	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
Lane Grp Cap (vph)	300	1310		138	933		413	426		268	444	364
v/s Ratio Prot	c0.21	c0.47		0.04	0.32		c0.16	0.23		0.14	0.13	
v/s Ratio Perm				0.19						c0.26		0.09
v/c Ratio	1.12	1.11		0.72	1.11		1.25	0.86		1.13	0.50	0.35
Uniform Delay, d1	49.4	34.8		33.7	42.8		52.5	42.3		32.8	38.1	36.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	89.4	60.0		16.3	63.8		130.9	15.7		94.8	0.9	0.6
Delay (s)	138.8	94.7		50.0	106.6		183.5	58.0		127.7	39.0	37.2
Level of Service	F	F		D	F		F	E		F	D	D
Approach Delay (s)		102.9			101.7			129.4			69.0	
Approach LOS		F			F			F			E	

Intersection Summary

HCM 2000 Control Delay	101.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	107.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings

4: Drummond Road & McLeod Road

Future Total - Remedial

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	259	847	291	145	829	222	206	208	106	267	271	223
Future Volume (vph)	259	847	291	145	829	222	206	208	106	267	271	223
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	15.0		15.0	15.0		15.0	15.0		15.0	20.0		15.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.99		1.00	0.99		1.00	0.99	
Frt		0.962			0.968			0.949				0.932
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3109	0	1662	3137	0	1662	1600	0	1662	1583	0
Fit Permitted	0.101			0.113			0.172			0.147		
Satd. Flow (perm)	177	3109	0	198	3137	0	286	1600	0	256	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		52			34			22			38	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1045.5			1070.0			834.0			207.0	
Travel Time (s)		75.3			77.0			60.0			14.9	
Confl. Peds. (#/hr)	8		6	6		8	8		8	8		8
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
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	5%	2%	5%	0%	2%	2%
Adj. Flow (vph)	288	941	323	161	921	247	229	231	118	297	301	248
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	1264	0	161	1168	0	229	349	0	297	549	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings

4: Drummond Road & McLeod Road

Future Total - Remedial

PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.5		9.5	30.5		9.5	30.8		9.5	30.8	
Total Split (s)	17.0	48.8		11.2	43.0		14.0	31.0		19.0	36.0	
Total Split (%)	15.5%	44.4%		10.2%	39.1%		12.7%	28.2%		17.3%	32.7%	
Maximum Green (s)	14.0	42.3		8.2	36.5		11.0	24.2		16.0	29.2	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.4		0.0	2.4		0.0	2.7		0.0	2.7	
Lost Time Adjust (s)	1.0	-2.5		1.0	-2.5		1.0	-2.8		1.0	-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		3.0	2.5		3.0	2.5		3.0	2.5	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		9.0			9.0			9.0			9.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	56.0	44.8		46.2	39.0		37.0	27.0		46.0	32.0	
Actuated g/C Ratio	0.51	0.41		0.42	0.35		0.34	0.25		0.42	0.29	
v/c Ratio	1.09	0.97		0.90	1.03		1.07	0.85		1.00	1.13	
Control Delay	108.6	50.9		69.7	69.3		108.5	57.8		80.3	115.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	108.6	50.9		69.7	69.3		108.5	57.8		80.3	115.2	
LOS	F	D		E	E		F	E		F	F	
Approach Delay		61.7			69.3			77.9			102.9	
Approach LOS		E			E			E			F	
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	105											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.13											
Intersection Signal Delay:	74.3						Intersection LOS: E					
Intersection Capacity Utilization:	104.7%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	4: Drummond Road & McLeod Road											

Queues
4: Drummond Road & McLeod Road

Future Total - Remedial
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	288	1264	161	1168	229	349	297	549
v/c Ratio	1.09	0.97	0.90	1.03	1.07	0.85	1.00	1.13
Control Delay	108.6	50.9	69.7	69.3	108.5	57.8	80.3	115.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.6	50.9	69.7	69.3	108.5	57.8	80.3	115.2
Queue Length 50th (m)	-56.4	140.8	19.3	-146.4	-40.2	71.2	50.1	-137.9
Queue Length 95th (m)	#111.6	#192.7	#60.1	#190.1	#90.9	#123.0	#107.6	#206.5
Internal Link Dist (m)		1021.5		1046.0		810.0		183.0
Turn Bay Length (m)	15.0		15.0		15.0		20.0	
Base Capacity (vph)	265	1297	178	1134	214	409	298	487
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	1.09	0.97	0.90	1.03	1.07	0.85	1.00	1.13

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.

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Future Total - Remedial
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↕	↕	↕
Traffic Volume (vph)	259	847	291	145	829	222	206	208	106	267	271	223
Future Volume (vph)	259	847	291	145	829	222	206	208	106	267	271	223
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.95		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3108		1662	3138		1583	1600		1662	1583	
Flt Permitted	0.10	1.00		0.11	1.00		0.17	1.00		0.15	1.00	
Satd. Flow (perm)	177	3108		197	3138		287	1600		257	1583	
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)	288	941	323	161	921	247	229	231	118	297	301	248
RTOR Reduction (vph)	0	31	0	0	22	0	0	17	0	0	27	0
Lane Group Flow (vph)	288	1233	0	161	1146	0	229	332	0	297	522	0
Confl. Peds. (#/hr)	8		6	6		8	8		8	8		8
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	5%	2%	5%	0%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	53.5	42.3		44.7	36.5		35.2	24.2		43.2	29.2	
Effective Green, g (s)	52.5	44.8		42.7	39.0		33.2	27.0		42.2	32.0	
Actuated g/C Ratio	0.48	0.41		0.39	0.35		0.30	0.25		0.38	0.29	
Clearance Time (s)	3.0	6.5		3.0	6.5		3.0	6.8		3.0	6.8	
Vehicle Extension (s)	2.5	2.5		3.0	2.5		3.0	2.5		3.0	2.5	
Lane Grp Cap (vph)	259	1265		172	1112		204	392		290	460	
v/s Ratio Prot	c0.13	0.40		0.06	0.37		0.10	0.21		c0.14	c0.33	
v/s Ratio Perm	c0.40			0.30			0.24			0.25		
v/c Ratio	1.11	0.97		0.94	1.03		1.12	0.85		1.02	1.13	
Uniform Delay, d1	32.3	32.0		27.2	35.5		34.5	39.5		30.2	39.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	89.3	20.0		49.8	35.1		99.8	19.9		59.2	84.4	
Delay (s)	121.6	52.0		77.0	70.6		134.3	59.4		89.4	123.4	
Level of Service	F	D		E	E		F	E		F	F	
Approach Delay (s)		64.9			71.4			89.1			111.4	
Approach LOS		E			E			F			F	

Intersection Summary

- HCM 2000 Control Delay: 79.3, HCM 2000 Level of Service: E
- HCM 2000 Volume to Capacity ratio: 1.12
- Actuated Cycle Length (s): 110.0, Sum of lost time (s): 16.0
- Intersection Capacity Utilization: 104.7%, ICU Level of Service: G
- Analysis Period (min): 15
- c Critical Lane Group

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Total - Remedial
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Volume (vph)	73	8	10	1	5	5	10	613	0	6	608	45
Future Volume (vph)	73	8	10	1	5	5	10	613	0	6	608	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			0.99			1.00			1.00		
Frt	0.986			0.938						0.991		
Flt Protected	0.961			0.996			0.999					
Satd. Flow (prot)	0	1641	0	0	1616	0	0	1706	0	0	1723	0
Flt Permitted	0.758			0.973			0.988			0.994		
Satd. Flow (perm)	0	1289	0	0	1578	0	0	1687	0	0	1713	0
Right Turn on Red		Yes		Yes			Yes			Yes		Yes
Satd. Flow (RTOR)	11			6			9					
Link Speed (k/h)	50			50			50			50		
Link Distance (m)	121.4			166.8			461.8			348.9		
Travel Time (s)	8.7			12.0			33.2			25.1		
Confl. Peds. (#/hr)	3		2	2		3	1		5	5		1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	33%	2%	0%	0%	0%	7%
Adj. Flow (vph)	84	9	11	1	6	6	11	705	0	7	699	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	13	0	0	716	0	0	758	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0			0.0			7.2			7.2		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	4.8			4.8			4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	4	4		8	8		2	2		6	6	
Permitted Phases	4			8			2			6		

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Total - Remedial
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		-3.0			-3.0			-3.0			-3.0	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		12.3			12.3			39.4			39.4	
Actuated g/C Ratio		0.22			0.22			0.70			0.70	
v/c Ratio		0.36			0.04			0.60			0.63	
Control Delay		19.5			12.0			10.2			10.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		19.5			12.0			10.2			10.8	
LOS		B			B			B			B	
Approach Delay		19.5			12.0			10.2			10.8	
Approach LOS		B			B			B			B	
Intersection Summary												
Area Type:	Other											
Cycle Length:	60											
Actuated Cycle Length:	56.1											
Natural Cycle:	60											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.63											
Intersection Signal Delay:	11.1						Intersection LOS: B					
Intersection Capacity Utilization:	60.9%						ICU Level of Service B					
Analysis Period (min):	15											
Plots and Phases:	8: Dorchester Road & Jill Drive											

Queues
8: Dorchester Road & Jill Drive

Future Total - Remedial
PM Peak Hour

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	104	13	716	758
v/c Ratio	0.36	0.04	0.60	0.63
Control Delay	19.5	12.0	10.2	10.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.5	12.0	10.2	10.8
Queue Length 50th (m)	8.8	0.6	39.5	42.6
Queue Length 95th (m)	17.2	3.6	84.3	#93.9
Internal Link Dist (m)	97.4	142.8	437.8	324.9
Turn Bay Length (m)				
Base Capacity (vph)	493	599	1184	1205
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.02	0.60	0.63

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Future Total - Remedial
PM Peak Hour

	↖	→	↘	↙	←	↖	↘	↑	↙	↘	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	73	8	10	1	5	5	10	613	0	6	608	45
Future Volume (vph)	73	8	10	1	5	5	10	613	0	6	608	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.94			1.00			0.99	
Flt Protected		0.96			1.00			1.00			1.00	
Satd. Flow (prot)		1635			1616			1706			1722	
Flt Permitted		0.76			0.97			0.99			0.99	
Satd. Flow (perm)		1290			1579			1687			1712	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	84	9	11	1	6	6	11	705	0	7	699	52
RTOR Reduction (vph)	0	9	0	0	5	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	95	0	0	8	0	0	716	0	0	755	0
Conf. Peds. (#/hr)	3	2	2	2	3	1	5	5	5	5	1	1
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	33%	2%	0%	0%	0%	7%
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)		8.1			8.1			35.4			35.4	
Effective Green, g (s)		11.1			11.1			38.4			38.4	
Actuated g/C Ratio		0.19			0.19			0.67			0.67	
Clearance Time (s)		7.0			7.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		249			304			1126			1143	
v/s Ratio Prot												
v/s Ratio Perm		c0.07			0.01			0.42			c0.44	
v/c Ratio		0.38			0.03			0.64			0.66	
Uniform Delay, d1		20.2			18.8			5.5			5.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.0			0.0			2.7			3.0	
Delay (s)		21.2			18.9			8.3			8.7	
Level of Service		C			B			A			A	
Approach Delay (s)		21.2			18.9			8.3			8.7	
Approach LOS		C			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.4								A	
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			57.5					Sum of lost time (s)			8.0	
Intersection Capacity Utilization			60.9%					ICU Level of Service			B	
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Total - Remedial
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑	↔	↔	↑
Traffic Volume (vph)	100	75	510	74	76	521
Future Volume (vph)	100	75	510	74	76	521
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					
Frt	0.942		0.850			
Flt Protected	0.972			0.950		
Satd. Flow (prot)	1575	0	1750	1488	1614	1750
Flt Permitted	0.972			0.358		
Satd. Flow (perm)	1574	0	1750	1488	608	1750
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	69			52		
Link Speed (k/h)	50		60		60	
Link Distance (m)	1040.1		438.6		461.8	
Travel Time (s)	74.9		26.3		27.7	
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%
Adj. Flow (vph)	116	87	593	86	88	606
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	0	593	86	88	606
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4		9.4	
Detector 2 Size(m)			0.6		0.6	
Detector 2 Type			Cl+Ex		Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)			0.0		0.0	

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Total - Remedial
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases				2	6	
Detector Phase	8		2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	25.0		25.0	25.0	25.0	25.0
Total Split (s)	25.0		35.0	35.0	35.0	35.0
Total Split (%)	41.7%		58.3%	58.3%	58.3%	58.3%
Maximum Green (s)	18.0		28.0	28.0	28.0	28.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		3.0	3.0	3.0	3.0
Lost Time Adjust (s)	-3.0		-3.0	-3.0	-3.0	-3.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	13.2		34.4	34.4	34.4	34.4
Actuated g/C Ratio	0.24		0.62	0.62	0.62	0.62
v/c Ratio	0.48		0.55	0.09	0.23	0.56
Control Delay	14.7		9.6	3.3	8.1	9.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	14.7		9.6	3.3	8.1	9.8
LOS	B		A	A	A	A
Approach Delay	14.7		8.8			9.6
Approach LOS	B		A			A
Intersection Summary						
Area Type:	Other					
Cycle Length:	60					
Actuated Cycle Length:	55.7					
Natural Cycle:	55					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.56					
Intersection Signal Delay:	9.9			Intersection LOS: A		
Intersection Capacity Utilization	54.7%			ICU Level of Service A		
Analysis Period (min)	15					
Splits and Phases:	9: Dorchester Road & Oldfield Road					

Queues
9: Dorchester Road & Oldfield Road

Future Total - Remedial
PM Peak Hour

Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	203	593	86	88	606
v/c Ratio	0.48	0.55	0.09	0.23	0.56
Control Delay	14.7	9.6	3.3	8.1	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	9.6	3.3	8.1	9.8
Queue Length 50th (m)	10.8	29.6	1.2	3.4	30.6
Queue Length 95th (m)	23.6	64.3	6.3	11.7	66.5
Internal Link Dist (m)	1016.1	414.6			437.8
Turn Bay Length (m)			15.0	15.0	
Base Capacity (vph)	638	1081	939	375	1081
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.55	0.09	0.23	0.56
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Future Total - Remedial
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	100	75	510	74	76	521
Future Volume (vph)	100	75	510	74	76	521
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.94		1.00	0.85	1.00	1.00
Flt Protected	0.97		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1576		1750	1488	1614	1750
Flt Permitted	0.97		1.00	1.00	0.36	1.00
Satd. Flow (perm)	1576		1750	1488	609	1750
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	116	87	593	86	88	606
RTOR Reduction (vph)	53	0	0	20	0	0
Lane Group Flow (vph)	150	0	593	66	88	606
Confl. Peds. (#/hr)	1					
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	10.2		31.4	31.4	31.4	31.4
Effective Green, g (s)	13.2		34.4	34.4	34.4	34.4
Actuated g/C Ratio	0.24		0.62	0.62	0.62	0.62
Clearance Time (s)	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	374		1082	920	376	1082
v/s Ratio Prot	c0.10		0.34			c0.35
v/s Ratio Perm				0.04	0.14	
v/c Ratio	0.40		0.55	0.07	0.23	0.56
Uniform Delay, d1	17.9		6.1	4.2	4.7	6.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7		2.0	0.2	1.5	2.1
Delay (s)	18.6		8.1	4.4	6.2	8.3
Level of Service	B		A	A	A	A
Approach Delay (s)	18.6		7.6			8.0
Approach LOS	B		A			A
Intersection Summary						
HCM 2000 Control Delay			9.2		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.52			
Actuated Cycle Length (s)			55.6		Sum of lost time (s)	8.0
Intersection Capacity Utilization			54.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway
Future Total - Remedial
PM Peak Hour


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	6	28	220	14	27	4	282	499	22	11	736	92
Future Volume (vph)	6	28	220	14	27	4	282	499	22	11	736	92
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	160.0	0.0	75.0	0.0	160.0	0.0	160.0	0.0	75.0	0.0	75.0	80.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00	1.00				
Frt	0.867			0.979			0.994				0.850	
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	1517	0	1662	1638	0	1662	1572	0	1662	1651	1316
Fit Permitted	0.734			0.367			0.162			0.435		
Satd. Flow (perm)	1284	1517	0	642	1638	0	284	1572	0	759	1651	1316
Right Turn on Red		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		256			5			8				107
Link Speed (k/h)		60			60			70				60
Link Distance (m)		372.3			519.4			156.9				312.6
Travel Time (s)		22.3			31.2			8.1				18.8
Confl. Peds. (#/hr)								2		2		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	33%	0%	11%	0%	0%	6%	13%
Adj. Flow (vph)	7	33	256	16	31	5	328	580	26	13	856	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	289	0	16	36	0	328	606	0	13	856	107
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway
Future Total - Remedial
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	6
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	25.0	25.0		25.0	25.0		9.5	25.0		25.0	25.0	25.0
Total Split (s)	17.0	17.0		17.0	17.0		20.0	83.0		63.0	63.0	63.0
Total Split (%)	17.0%	17.0%		17.0%	17.0%		20.0%	83.0%		63.0%	63.0%	63.0%
Maximum Green (s)	10.0	10.0		10.0	10.0		17.0	76.0		56.0	56.0	56.0
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.0	3.0		3.0	3.0		0.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0		1.0	-3.0		-3.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max		Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	10.9	10.9		10.9	10.9		79.0	79.0		61.9	61.9	61.9
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.81	0.81		0.63	0.63	0.63
v/c Ratio	0.05	0.73		0.23	0.19		0.79	0.48		0.03	0.82	0.12
Control Delay	39.2	19.5		47.4	37.5		25.0	4.6		8.7	23.8	2.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	39.2	19.5		47.4	37.5		25.0	4.6		8.7	23.8	2.2
LOS	D	B		D	D		C	A		A	C	A
Approach Delay		20.0			40.6			11.7			21.2	
Approach LOS		B			D			B			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	98											
Natural Cycle:	100											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.82											
Intersection Signal Delay:	17.6						Intersection LOS: B					
Intersection Capacity Utilization	85.4%						ICU Level of Service E					
Analysis Period (min)	15											
Splits and Phases:	10: Stanley Avenue & Chippawa Parkway											

Queues
10: Stanley Avenue & Chippawa Parkway

Future Total - Remedial
PM Peak Hour




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	7	289	16	36	328	606	13	856	107
v/c Ratio	0.05	0.73	0.23	0.19	0.79	0.48	0.03	0.82	0.12
Control Delay	39.2	19.5	47.4	37.5	25.0	4.6	8.7	23.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	19.5	47.4	37.5	25.0	4.6	8.7	23.8	2.2
Queue Length 50th (m)	1.3	6.1	3.0	5.7	19.9	28.7	1.0	129.3	0.0
Queue Length 95th (m)	5.2	28.7	9.1	14.6	48.6	44.8	3.5	#195.5	6.0
Internal Link Dist (m)		348.3		495.4		132.9		288.6	
Turn Bay Length (m)	160.0		75.0		160.0		75.0		80.0
Base Capacity (vph)	170	423	85	221	453	1269	478	1042	870
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	0.68	0.19	0.16	0.72	0.48	0.03	0.82	0.12

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Future Total - Remedial
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	6	28	220	14	27	4	282	499	22	11	736	92
Future Volume (vph)	6	28	220	14	27	4	282	499	22	11	736	92
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1662	1517		1662	1638		1662	1571		1659	1651	1316
Flt Permitted	0.73	1.00		0.37	1.00		0.16	1.00		0.44	1.00	1.00
Satd. Flow (perm)	1284	1517		642	1638		284	1571		760	1651	1316
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	7	33	256	16	31	5	328	580	26	13	856	107
RTOR Reduction (vph)	0	227	0	0	4	0	0	2	0	0	0	39
Lane Group Flow (vph)	7	62	0	16	32	0	328	604	0	13	856	68
Confl. Peds. (#/hr)									2		2	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	33%	0%	11%	0%	0%	6%	13%
Turn Type	Perm	NA		Perm	NA	pm+pt	NA		Perm	NA	Perm	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	7.9	7.9		7.9	7.9		76.0	76.0		58.8	58.8	58.8
Effective Green, g (s)	10.9	10.9		10.9	10.9		75.0	79.0		61.8	61.8	61.8
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.77	0.81		0.63	0.63	0.63
Clearance Time (s)	7.0	7.0		7.0	7.0		3.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	142	168		71	182		403	1267		479	1042	830
v/s Ratio Prot		c0.04			0.02		c0.11	0.38			c0.52	
v/s Ratio Perm	0.01			0.02			0.51			0.02		0.05
v/c Ratio	0.05	0.37		0.23	0.17		0.81	0.48		0.03	0.82	0.08
Uniform Delay, d1	38.9	40.3		39.7	39.4		17.4	3.0		6.8	13.8	7.0
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	1.4		1.6	0.5		11.9	1.3		0.1	7.3	0.2
Delay (s)	39.0	41.7		41.3	39.9		29.3	4.3		6.9	21.1	7.2
Level of Service	D	D		D	D		C	A		A	C	A
Approach Delay (s)		41.6			40.3			13.1			19.4	
Approach LOS		D			D			B			B	

Intersection Summary

HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	97.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Total - Remedial
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑	↔		↔	↔
Traffic Volume (vph)	559	549	373	115	145	578
Future Volume (vph)	559	549	373	115	145	578
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	2			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.968			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	2932	1733	1662	0	1662	1390
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	2932	1733	1662	0	1662	1390
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			23			608
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	1%	5%	0%	7%
Adj. Flow (vph)	588	578	393	121	153	608
Shared Lane Traffic (%)						
Lane Group Flow (vph)	588	578	514	0	153	608
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		7.2	7.2		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

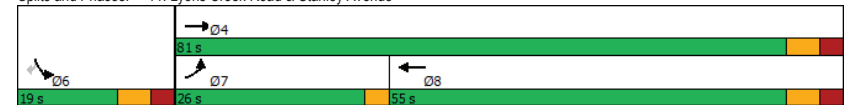
Future Total - Remedial
PM Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	25.0	25.0		25.0	25.0
Total Split (s)	26.0	81.0	55.0		19.0	19.0
Total Split (%)	26.0%	81.0%	55.0%		19.0%	19.0%
Maximum Green (s)	23.0	74.0	48.0		12.0	12.0
Yellow Time (s)	3.0	4.0	4.0		4.0	4.0
All-Red Time (s)	0.0	3.0	3.0		3.0	3.0
Lost Time Adjust (s)	1.0	-3.0	-3.0		-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0		4.0	4.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None		Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)	20.2	58.9	34.7		21.4	21.4
Actuated g/C Ratio	0.23	0.67	0.39		0.24	0.24
v/c Ratio	0.88	0.50	0.77		0.38	0.76
Control Delay	50.3	8.7	30.8		34.9	10.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	50.3	8.7	30.8		34.9	10.5
LOS	D	A	C		C	B
Approach Delay		29.7	30.8		15.4	
Approach LOS		C	C		B	

Intersection Summary


Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 88.5
 Natural Cycle: 80
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 25.5
 Intersection Capacity Utilization 74.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 11: Lyons Creek Road & Stanley Avenue



Queues
11: Lyons Creek Road & Stanley Avenue

Future Total - Remedial
PM Peak Hour




Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	588	578	514	153	608
v/c Ratio	0.88	0.50	0.77	0.38	0.76
Control Delay	50.3	8.7	30.8	34.9	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	8.7	30.8	34.9	10.5
Queue Length 50th (m)	51.6	44.4	77.1	23.3	0.0
Queue Length 95th (m)	#101.3	64.3	114.3	50.3	41.4
Internal Link Dist (m)		426.7	581.6	788.1	
Turn Bay Length (m)	55.0			25.0	
Base Capacity (vph)	742	1504	985	401	796
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.79	0.38	0.52	0.38	0.76

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Future Total - Remedial
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔↔	↑	↔↔		↔↔	↔↔
Traffic Volume (vph)	559	549	373	115	145	578
Future Volume (vph)	559	549	373	115	145	578
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00
Fr	1.00	1.00	0.97		1.00	0.85
Fit Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	2932	1733	1662		1662	1390
Fit Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	2932	1733	1662		1662	1390
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	588	578	393	121	153	608
RTOR Reduction (vph)	0	0	14	0	0	461
Lane Group Flow (vph)	588	578	500	0	153	147
Heavy Vehicles (%)	10%	1%	1%	5%	0%	7%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	21.2	55.9	31.7		18.3	18.3
Effective Green, g (s)	20.2	58.9	34.7		21.3	21.3
Actuated g/C Ratio	0.23	0.67	0.39		0.24	0.24
Clearance Time (s)	3.0	7.0	7.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	671	1157	653		401	335
v/s Ratio Prot	c0.20	0.33	c0.30			0.09
v/s Ratio Perm						c0.11
v/c Ratio	0.88	0.50	0.77		0.38	0.44
Uniform Delay, d1	32.8	7.3	23.2		27.9	28.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	12.3	0.3	5.4		2.7	4.1
Delay (s)	45.1	7.6	28.6		30.7	32.5
Level of Service	D	A	C		C	C
Approach Delay (s)		26.5	28.6		32.1	
Approach LOS		C	C		C	

Intersection Summary

HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	88.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total - Remedial
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	305	985	465	104	798	147	488	205	207	275	241	312
Future Volume (vph)	305	985	465	104	798	147	488	205	207	275	241	312
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		15.0	50.0		0.0	15.0		0.0	40.0		65.0
Storage Lanes	1		0	1		0	2		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.98			0.99		0.99	0.98		0.99		0.98
Frt		0.952			0.977			0.925				0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3077	0	1662	3195	0	3162	1589	0	1662	1733	1473
Fit Permitted	0.950			0.125			0.950			0.138		
Satd. Flow (perm)	1616	3077	0	219	3195	0	3123	1589	0	239	1733	1440
Right Turn on Red			Yes			Yes			Yes			
Satd. Flow (RTOR)		79			18			42				303
Link Speed (k/h)		50			50			50				50
Link Distance (m)		616.3			1045.5			348.9				308.0
Travel Time (s)		44.4			75.3			25.1				22.2
Confl. Peds. (#/hr)	13		11	11		13	9		21	21		9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%
Adj. Flow (vph)	314	1015	479	107	823	152	503	211	213	284	248	322
Shared Lane Traffic (%)												
Lane Group Flow (vph)	314	1494	0	107	975	0	503	424	0	284	248	322
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total - Remedial
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8						6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	8.0
Minimum Split (s)	9.5	30.4		9.5	30.4		9.5	37.7		9.5	37.7	37.7
Total Split (s)	24.0	53.9		9.5	39.4		20.0	38.3		19.4	37.7	37.7
Total Split (%)	19.8%	44.5%		7.8%	32.5%		16.5%	31.6%		16.0%	31.1%	31.1%
Maximum Green (s)	21.0	47.5		6.5	33.0		17.0	31.6		16.4	31.0	31.0
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	4.1
All-Red Time (s)	0.0	2.3		0.0	2.3		0.0	2.6		0.0	2.6	2.6
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	-2.7
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		9.0			9.0			12.0			12.0	12.0
Flash Dont Walk (s)		15.0			15.0			19.0			19.0	19.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	21.1	50.8		41.1	35.4		16.0	33.2		48.0	32.6	32.6
Actuated g/C Ratio	0.17	0.42		0.34	0.29		0.13	0.27		0.40	0.27	0.27
v/c Ratio	1.11	1.12		0.75	1.03		1.21	0.91		1.03	0.53	0.53
Control Delay	132.0	96.3		53.6	78.8		158.1	62.9		95.0	42.2	8.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	132.0	96.3		53.6	78.8		158.1	62.9		95.0	42.2	8.3
LOS	F	F		D	E		F	E		F	D	A
Approach Delay		102.5			76.3			114.5				47.0
Approach LOS		F			E			F				D
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green											
Natural Cycle:	150											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.21											
Intersection Signal Delay:	88.7						Intersection LOS: F					
Intersection Capacity Utilization:	108.7%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											

Queues
3: Dorchester Road & McLeod Road

Future Total - Remedial
Saturday Peak Hour

	↖	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	314	1494	107	975	503	424	284	248	322
v/c Ratio	1.11	1.12	0.75	1.03	1.21	0.91	1.03	0.53	0.53
Control Delay	132.0	96.3	53.6	78.8	158.1	62.9	95.0	42.2	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	132.0	96.3	53.6	78.8	158.1	62.9	95.0	42.2	8.3
Queue Length 50th (m)	-93.4	-223.5	14.2	-135.7	-78.9	92.8	-57.7	52.3	3.5
Queue Length 95th (m)	#151.7	#269.0	#39.6	#179.0	#114.1	#152.8	#114.9	79.4	28.4
Internal Link Dist (m)		592.3		1021.5		324.9		284.0	
Turn Bay Length (m)	55.0		50.0		15.0		40.0		65.0
Base Capacity (vph)	283	1335	142	946	417	480	275	482	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	1.12	0.75	1.03	1.21	0.88	1.03	0.51	0.52

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Future Total - Remedial
Saturday Peak Hour

	↖	→	↘	↙	←	↘	↙	↑	↘	↓	↙	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖	↖↗	↖	↖	↖
Traffic Volume (vph)	305	985	465	104	798	147	488	205	207	275	241	312
Future Volume (vph)	305	985	465	104	798	147	488	205	207	275	241	312
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.98		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.98		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1630	3077		1662	3194		3162	1589		1661	1733	1440
Flt Permitted	0.95	1.00		0.12	1.00		0.95	1.00		0.14	1.00	1.00
Satd. Flow (perm)	1630	3077		219	3194		3162	1589		242	1733	1440
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	314	1015	479	107	823	152	503	211	213	284	248	322
RTOR Reduction (vph)	0	46	0	0	13	0	0	30	0	0	0	221
Lane Group Flow (vph)	314	1448	0	107	962	0	503	394	0	284	248	101
Conf. Peds. (#/hr)	13		11	11		13	9		21	21		9
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%
Turn Type	Prot	NA		pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases				8						6		6
Actuated Green, G (s)	22.1	48.4		39.7	33.0		17.0	30.5		46.3	29.9	29.9
Effective Green, g (s)	21.1	50.8		37.7	35.4		16.0	33.2		44.3	32.6	32.6
Actuated g/C Ratio	0.17	0.42		0.31	0.29		0.13	0.27		0.37	0.27	0.27
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	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
Lane Grp Cap (vph)	284	1290		136	933		417	435		268	466	387
v/s Ratio Prot	c0.19	c0.47		0.04	0.30		c0.16	0.25		0.13	0.14	
v/s Ratio Perm				0.21						c0.25		0.07
v/c Ratio	1.11	1.12		0.79	1.03		1.21	0.90		1.06	0.53	0.26
Uniform Delay, d1	50.0	35.1		34.3	42.8		52.5	42.4		33.9	37.7	34.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	84.7	65.9		25.2	37.8		113.5	21.8		71.6	1.2	0.4
Delay (s)	134.7	101.0		59.5	80.7		166.0	64.3		105.5	38.9	35.1
Level of Service	F	F		E	F		F	E		F	D	D
Approach Delay (s)		106.9			78.6			119.5			59.6	
Approach LOS		F			E			F			E	

Intersection Summary

- HCM 2000 Control Delay: 94.2, HCM 2000 Level of Service: F
- HCM 2000 Volume to Capacity ratio: 1.10
- Actuated Cycle Length (s): 121.1, Sum of lost time (s): 16.0
- Intersection Capacity Utilization: 108.7%, ICU Level of Service: G
- Analysis Period (min): 15
- c Critical Lane Group

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Total - Remedial
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	232	889	248	136	833	202	199	202	117	264	272	212
Future Volume (vph)	232	889	248	136	833	202	199	202	117	264	272	212
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	15.0		15.0	15.0		15.0	15.0		15.0	20.0		15.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.99		1.00	0.98		0.99	0.99	
Frt		0.967			0.971			0.945				0.934
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3166	0	1662	3173	0	1662	1598	0	1646	1600	0
Fit Permitted	0.105			0.118			0.162			0.205		
Satd. Flow (perm)	184	3166	0	206	3173	0	283	1598	0	351	1600	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			29			25			37	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1045.5			1070.0			834.0			207.0	
Travel Time (s)		75.3			77.0			60.0			14.9	
Confl. Peds. (#/hr)	12		2	2		12	8		22	22		8
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	3%	0%	1%	2%	0%
Adj. Flow (vph)	239	916	256	140	859	208	205	208	121	272	280	219
Shared Lane Traffic (%)												
Lane Group Flow (vph)	239	1172	0	140	1067	0	205	329	0	272	499	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Total - Remedial
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.5		9.5	30.5		9.5	30.8		9.5	30.8	
Total Split (s)	17.0	47.2		11.0	41.2		14.6	31.4		20.4	37.2	
Total Split (%)	15.5%	42.9%		10.0%	37.5%		13.3%	28.5%		18.5%	33.8%	
Maximum Green (s)	14.0	40.7		8.0	34.7		11.6	24.6		17.4	30.4	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.4		0.0	2.4		0.0	2.7		0.0	2.7	
Lost Time Adjust (s)	1.0	-2.5		1.0	-2.5		1.0	-2.8		1.0	-2.8	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5		3.0	2.5		3.0	2.5		3.0	2.5	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		9.0			9.0			9.0			9.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.2	43.2		44.5	37.5		39.1	28.5		47.2	33.2	
Actuated g/C Ratio	0.49	0.39		0.40	0.34		0.36	0.26		0.43	0.30	
v/c Ratio	0.92	0.93		0.80	0.97		0.88	0.76		0.82	0.98	
Control Delay	64.6	44.2		51.9	55.9		60.8	47.9		43.0	72.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	64.6	44.2		51.9	55.9		60.8	47.9		43.0	72.1	
LOS	E	D		D	E		E	D		D	E	
Approach Delay		47.7			55.5			52.8			61.8	
Approach LOS		D			E			D			E	
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	95											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.98											
Intersection Signal Delay:	53.6						Intersection LOS: D					
Intersection Capacity Utilization:	101.5%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	4: Drummond Road & McLeod Road											
<p>The diagram shows the timing for 8 lanes. Lane 1 (EBL) has a split of 20.4s. Lane 2 (EBT) has a split of 31.4s. Lane 3 (EBR) has a split of 11s. Lane 4 (WBL) has a split of 47.2s. Lane 5 (WBT) has a split of 19.6s. Lane 6 (WBR) has a split of 37.2s. Lane 7 (NBL) has a split of 17s. Lane 8 (NBT) has a split of 41.2s. Phases are indicated by arrows: (R) for right-turn, (L) for left-turn, and (T) for thru.</p>												

Queues
4: Drummond Road & McLeod Road

Future Total - Remedial
Saturday Peak Hour

	↖	→	↘	←	↙	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	239	1172	140	1067	205	329	272	499
v/c Ratio	0.92	0.93	0.80	0.97	0.88	0.76	0.82	0.98
Control Delay	64.6	44.2	51.9	55.9	60.8	47.9	43.0	72.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.6	44.2	51.9	55.9	60.8	47.9	43.0	72.1
Queue Length 50th (m)	36.8	127.5	16.9	121.8	29.2	64.8	40.7	105.0
Queue Length 95th (m)	#84.4	#173.9	#48.6	#169.5	#73.3	#109.6	#75.4	#175.6
Internal Link Dist (m)		1021.5		1046.0		810.0		183.0
Turn Bay Length (m)	15.0		15.0		15.0		20.0	
Base Capacity (vph)	265	1266	176	1102	233	432	345	508
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	0.90	0.93	0.80	0.97	0.88	0.76	0.79	0.98

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Future Total - Remedial
Saturday Peak Hour

	↖	→	↘	↙	←	↗	↖	↗	↑	↘	↙	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖	↖	↖	↖	↖	
Traffic Volume (vph)	232	889	248	136	833	202	199	202	117	264	272	212	
Future Volume (vph)	232	889	248	136	833	202	199	202	117	264	272	212	
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00		
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.97		1.00	0.97		1.00	0.94		1.00	0.93		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1662	3167		1662	3173		1662	1598		1643	1600		
Flt Permitted	0.11	1.00		0.12	1.00		0.16	1.00		0.21	1.00		
Satd. Flow (perm)	184	3167		206	3173		283	1598		355	1600		
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	239	916	256	140	859	208	205	208	121	272	280	219	
RTOR Reduction (vph)	0	23	0	0	19	0	0	19	0	0	26	0	
Lane Group Flow (vph)	239	1149	0	140	1048	0	205	310	0	272	473	0	
Conf. Peds. (#/hr)	12		2	2		12	8		22	22		8	
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	3%	0%	1%	2%	0%	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA		
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4			8			2			6			
Actuated Green, G (s)	51.7	40.7		43.0	35.0		37.3	25.7		45.0	30.4		
Effective Green, g (s)	50.7	43.2		41.0	37.5		35.3	28.5		44.0	33.2		
Actuated g/C Ratio	0.46	0.39		0.37	0.34		0.32	0.26		0.40	0.30		
Clearance Time (s)	3.0	6.5		3.0	6.5		3.0	6.8		3.0	6.8		
Vehicle Extension (s)	2.5	2.5		3.0	2.5		3.0	2.5		3.0	2.5		
Lane Grp Cap (vph)	255	1243		169	1081		223	414		321	482		
v/s Ratio Prot	c0.11	c0.36		0.05	0.33		0.09	0.19		c0.12	c0.30		
v/s Ratio Perm	0.32			0.26			0.21			0.22			
v/c Ratio	0.94	0.92		0.83	0.97		0.92	0.75		0.85	0.98		
Uniform Delay, d1	30.1	31.8		27.1	35.7		31.1	37.5		25.8	38.1		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	39.2	12.8		27.1	20.9		38.3	11.8		18.3	36.7		
Delay (s)	69.3	44.7		54.2	56.6		69.4	49.3		44.1	74.8		
Level of Service	E	D		D	E		E	D		D	E		
Approach Delay (s)		48.9			56.3			57.0			64.0		
Approach LOS		D			E			E			E		

Intersection Summary

HCM 2000 Control Delay	55.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Total - Remedial
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	49	3	3	3	10	10	3	664	2	3	707	42
Future Volume (vph)	49	3	3	3	10	10	3	664	2	3	707	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			1.00			1.00	
Frt		0.993			0.941						0.992	
Flt Protected		0.957			0.994							
Satd. Flow (prot)	0	1631	0	0	1620	0	0	1697	0	0	1729	0
Flt Permitted		0.730			0.947			0.997			0.998	
Satd. Flow (perm)	0	1240	0	0	1541	0	0	1692	0	0	1726	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			11						7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	2		8	8		2	11		5	5		11
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	33%	3%	0%	0%	0%	3%
Adj. Flow (vph)	53	3	3	3	11	11	3	714	2	3	760	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	0	0	25	0	0	719	0	0	808	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Total - Remedial
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		7.0			7.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		8.0			7.8			41.1			41.1	
Actuated g/C Ratio		0.15			0.14			0.75			0.75	
v/c Ratio		0.32			0.11			0.56			0.62	
Control Delay		24.5			15.5			10.2			11.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.5			15.5			10.2			11.6	
LOS		C			B			B			B	
Approach Delay		24.5			15.5			10.2			11.6	
Approach LOS		C			B			B			B	
Intersection Summary												
Area Type:	Other											
Cycle Length:	60											
Actuated Cycle Length:	54.5											
Natural Cycle:	65											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.62											
Intersection Signal Delay:	11.5						Intersection LOS: B					
Intersection Capacity Utilization:	68.4%						ICU Level of Service C					
Analysis Period (min):	15											
Split and Phases:	8: Dorchester Road & Jill Drive											

Queues
8: Dorchester Road & Jill Drive

Future Total - Remedial
Saturday Peak Hour

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	59	25	719	808
v/c Ratio	0.32	0.11	0.56	0.62
Control Delay	24.5	15.5	10.2	11.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.5	15.5	10.2	11.6
Queue Length 50th (m)	6.6	1.6	45.1	54.2
Queue Length 95th (m)	13.1	6.2	#113.7	#133.9
Internal Link Dist (m)	97.4	142.8	437.8	324.9
Turn Bay Length (m)				
Base Capacity (vph)	415	521	1276	1303
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.14	0.05	0.56	0.62

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Future Total - Remedial
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↘	↑	↙	↘	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	49	3	3	3	10	10	3	664	2	3	707	42
Future Volume (vph)	49	3	3	3	10	10	3	664	2	3	707	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.94			1.00			0.99	
Flt Protected		0.96			0.99			1.00			1.00	
Satd. Flow (prot)		1627			1617			1696			1730	
Flt Permitted		0.73			0.95			1.00			1.00	
Satd. Flow (perm)		1240			1541			1692			1727	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	53	3	3	3	11	11	3	714	2	3	760	45
RTOR Reduction (vph)	0	3	0	0	10	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	56	0	0	15	0	0	719	0	0	806	0
Conf. Peds. (#/hr)		2		8	8		2	11		5	5	11
Heavy Vehicles (%)		2%		0%	0%		0%	33%		3%	0%	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)		5.4			5.4			38.0			38.0	
Effective Green, g (s)		5.4			5.4			38.0			38.0	
Actuated g/C Ratio		0.09			0.09			0.66			0.66	
Clearance Time (s)		7.0			7.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		116			144			1120			1143	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.01			0.42			c0.47	
v/c Ratio		0.49			0.10			0.64			0.70	
Uniform Delay, d1		24.7			23.8			5.7			6.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.2			0.3			2.8			3.7	
Delay (s)		27.9			24.1			8.5			9.8	
Level of Service		C			C			A			A	
Approach Delay (s)		27.9			24.1			8.5			9.8	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay				10.1				HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio				0.68								
Actuated Cycle Length (s)				57.4				Sum of lost time (s)			14.0	
Intersection Capacity Utilization				68.4%				ICU Level of Service			C	
Analysis Period (min)				15								

c Critical Lane Group

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Total - Remedial
Saturday Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑	↔	↔	↑
Traffic Volume (vph)	117	63	567	86	82	606
Future Volume (vph)	117	63	567	86	82	606
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.953			0.850		
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1599	0	1750	1488	1646	1750
Flt Permitted	0.969				0.272	
Satd. Flow (perm)	1599	0	1750	1488	471	1750
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	46			49		
Link Speed (k/h)	50		60		60	
Link Distance (m)	1040.1		438.6		461.8	
Travel Time (s)	74.9		26.3		27.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	0%	3%	0%	0%	1%	0%
Adj. Flow (vph)	146	79	709	108	103	758
Shared Lane Traffic (%)						
Lane Group Flow (vph)	225	0	709	108	103	758
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru Right	Left	Thru	
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4		9.4	
Detector 2 Size(m)			0.6		0.6	
Detector 2 Type			CI+Ex		CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)			0.0		0.0	
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		2		6	

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Total - Remedial
Saturday Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases				2	6	
Detector Phase	8		2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	25.0		25.0	25.0	25.0	25.0
Total Split (s)	25.0		35.0	35.0	35.0	35.0
Total Split (%)	41.7%		58.3%	58.3%	58.3%	58.3%
Maximum Green (s)	18.0		28.0	28.0	28.0	28.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.0	7.0	7.0	7.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Max	Max	Max	Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	11.7		31.0	31.0	31.0	31.0
Actuated g/C Ratio	0.21		0.55	0.55	0.55	0.55
v/c Ratio	0.62		0.74	0.13	0.40	0.79
Control Delay	22.8		18.2	5.3	15.4	20.6
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	22.8		18.2	5.3	15.4	20.6
LOS	C		B	A	B	C
Approach Delay	22.8		16.5		20.0	
Approach LOS	C		B		C	
Intersection Summary						
Area Type:	Other					
Cycle Length:	60					
Actuated Cycle Length:	56.8					
Natural Cycle:	60					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.79					
Intersection Signal Delay:	18.8			Intersection LOS: B		
Intersection Capacity Utilization:	66.1%			ICU Level of Service C		
Analysis Period (min):	15					
Splits and Phases:	9: Dorchester Road & Oldfield Road					

Queues
9: Dorchester Road & Oldfield Road

Future Total - Remedial
Saturday Peak Hour

	↙	↑	↘	↙	↓
Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	225	709	108	103	758
v/c Ratio	0.62	0.74	0.13	0.40	0.79
Control Delay	22.8	18.2	5.3	15.4	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	18.2	5.3	15.4	20.6
Queue Length 50th (m)	16.1	51.0	2.6	5.7	57.2
Queue Length 95th (m)	28.3	#94.5	9.0	17.3	#117.5
Internal Link Dist (m)	1016.1	414.6			437.8
Turn Bay Length (m)			15.0	15.0	
Base Capacity (vph)	540	956	835	257	956
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.42	0.74	0.13	0.40	0.79

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Future Total - Remedial
Saturday Peak Hour

	↙	↘	↑	↘	↙	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↘	↘	↑
Traffic Volume (vph)	117	63	567	86	82	606
Future Volume (vph)	117	63	567	86	82	606
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	7.0		7.0	7.0	7.0	7.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Fr	0.95		1.00	0.85	1.00	1.00
Fit Protected	0.97		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1598		1750	1488	1646	1750
Fit Permitted	0.97		1.00	1.00	0.27	1.00
Satd. Flow (perm)	1598		1750	1488	471	1750
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	146	79	709	108	102	758
RTOR Reduction (vph)	37	0	0	22	0	0
Lane Group Flow (vph)	188	0	709	86	103	758
Heavy Vehicles (%)	0%	3%	0%	0%	1%	0%
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases				2	6	
Actuated Green, G (s)	11.7		31.0	31.0	31.0	31.0
Effective Green, g (s)	11.7		31.0	31.0	31.0	31.0
Actuated g/C Ratio	0.21		0.55	0.55	0.55	0.55
Clearance Time (s)	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	329		956	813	257	956
v/s Ratio Prot	c0.12		0.41			c0.43
v/s Ratio Perm				0.06	0.22	
v/c Ratio	0.57		0.74	0.11	0.40	0.79
Uniform Delay, d1	20.3		9.8	6.2	7.5	10.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4		5.2	0.3	4.6	6.7
Delay (s)	22.7		15.0	6.4	12.1	17.0
Level of Service	C		B	A	B	B
Approach Delay (s)	22.7		13.8			16.4
Approach LOS	C		B			B

Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	14.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Total - Remedial
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	2	30	218	13	38	2	304	504	10	2	494	111
Future Volume (vph)	2	30	218	13	38	2	304	504	10	2	494	111
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	160.0	0.0	75.0	0.0	160.0	0.0	75.0	0.0	160.0	0.0	75.0	80.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.868			0.994			0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	1519	0	1662	1740	0	1662	1728	0	1662	1750	1488
Flt Permitted	0.726			0.310			0.289			0.433		
Satd. Flow (perm)	1270	1519	0	542	1740	0	506	1728	0	758	1750	1488
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		260			2			2				132
Link Speed (k/h)	60			60			70			60		
Link Distance (m)	372.3			519.4			156.9			312.6		
Travel Time (s)	22.3			31.2			8.1			18.8		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	2	36	260	15	45	2	362	600	12	2	588	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	296	0	15	47	0	362	612	0	2	588	132
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)	3.6			3.6			3.6			3.6		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	4.8			4.8			4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8			5		2		6

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Total - Remedial
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	25.0	25.0		25.0	25.0		9.5	25.0		25.0	25.0	25.0
Total Split (s)	25.0	25.0		25.0	25.0		27.0	75.0		48.0	48.0	48.0
Total Split (%)	25.0%	25.0%		25.0%	25.0%		27.0%	75.0%		48.0%	48.0%	48.0%
Maximum Green (s)	18.0	18.0		18.0	18.0		24.0	68.0		41.0	41.0	41.0
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.0	3.0		3.0	3.0		0.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	-3.0	-3.0		-3.0	-3.0		1.0	-3.0		-3.0	-3.0	-3.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max		Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	12.9	12.9		12.9	12.9		71.2	71.2		53.6	53.6	53.6
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.77	0.77		0.58	0.58	0.58
v/c Ratio	0.01	0.68		0.20	0.19		0.65	0.46		0.00	0.58	0.14
Control Delay	32.5	15.5		40.5	34.8		9.4	5.6		13.5	17.9	3.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	32.5	15.5		40.5	34.8		9.4	5.6		13.5	17.9	3.2
LOS	C	B		D	C		A	A		B	B	A
Approach Delay		15.6			36.1			7.0			15.2	
Approach LOS		B			D			A			B	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	92.1											
Natural Cycle:	80											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.68											
Intersection Signal Delay:	12.0						Intersection LOS: B					
Intersection Capacity Utilization:	72.8%						ICU Level of Service C					
Analysis Period (min):	15											
Splits and Phases:	10: Stanley Avenue & Chippawa Parkway											

Queues
10: Stanley Avenue & Chippawa Parkway

Future Total - Remedial
Saturday Peak Hour

	↖	→	↘	←	↙	↑	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	2	296	15	47	362	612	2	588	132
v/c Ratio	0.01	0.68	0.20	0.19	0.65	0.46	0.00	0.58	0.14
Control Delay	32.5	15.5	40.5	34.8	9.4	5.6	13.5	17.9	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	15.5	40.5	34.8	9.4	5.6	13.5	17.9	3.2
Queue Length 50th (m)	0.3	6.0	2.5	7.5	13.7	28.0	0.2	59.1	0.0
Queue Length 95th (m)	2.1	24.0	8.0	16.3	32.7	62.9	1.5	128.1	8.7
Internal Link Dist (m)		348.3		495.4		132.9		288.6	
Turn Bay Length (m)	160.0		75.0		160.0		75.0		80.0
Base Capacity (vph)	290	547	124	399	680	1336	441	1019	921
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	0.01	0.54	0.12	0.12	0.53	0.46	0.00	0.58	0.14

Intersection Summary

HCM Signalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Future Total - Remedial
Saturday Peak Hour

	↖	→	↘	↙	←	↘	↑	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖		↖	↖		↖	↖	↖
Traffic Volume (vph)	2	30	218	13	38	2	304	504	10	2	494	111
Future Volume (vph)	2	30	218	13	38	2	304	504	10	2	494	111
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Fr	1.00	0.87		1.00	0.99		1.00	1.00		1.00	1.00	0.85
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1662	1519		1662	1739		1662	1728		1662	1750	1488
Fit Permitted	0.73	1.00		0.31	1.00		0.29	1.00		0.43	1.00	1.00
Satd. Flow (perm)	1271	1519		543	1739		506	1728		758	1750	1488
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	2	36	260	15	45	2	362	600	12	2	588	132
RTOR Reduction (vph)	0	224	0	0	2	0	0	0	0	0	0	55
Lane Group Flow (vph)	2	72	0	15	45	0	362	612	0	2	588	77
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	9.9	9.9		9.9	9.9		68.2	68.2		50.7	50.7	50.7
Effective Green, g (s)	12.9	12.9		12.9	12.9		67.2	71.2		53.7	53.7	53.7
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.73	0.77		0.58	0.58	0.58
Clearance Time (s)	7.0	7.0		7.0	7.0		3.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	178	212		76	243		538	1335		441	1020	867
v/s Ratio Prot		c0.05			0.03		c0.10	0.35			0.34	
v/s Ratio Perm	0.00			0.03			c0.39			0.00		0.05
v/c Ratio	0.01	0.34		0.20	0.19		0.67	0.46		0.00	0.58	0.09
Uniform Delay, d1	34.1	35.8		35.0	35.0		7.8	3.7		8.0	12.1	8.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	1.0		1.3	0.4		3.3	1.1		0.0	2.4	0.2
Delay (s)	34.1	36.7		36.3	35.3		11.2	4.8		8.0	14.4	8.6
Level of Service	C	D		D	D		B	A		A	B	A
Approach Delay (s)		36.7			35.6			7.2			13.4	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	92.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Total - Remedial
Saturday Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑	↔		↔	↔
Traffic Volume (vph)	570	518	444	124	115	362
Future Volume (vph)	570	518	444	124	115	362
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	2			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.971			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3193	1750	1692	0	1662	1488
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3193	1750	1692	0	1662	1488
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			21			389
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	613	557	477	133	124	389
Shared Lane Traffic (%)						
Lane Group Flow (vph)	613	557	610	0	124	389
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		7.2	7.2		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	


Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Total - Remedial
Saturday Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases						6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0
Minimum Split (s)	9.5	25.0	25.0		25.0	25.0
Total Split (s)	25.0	81.0	56.0		19.0	19.0
Total Split (%)	25.0%	81.0%	56.0%		19.0%	19.0%
Maximum Green (s)	22.0	74.0	49.0		12.0	12.0
Yellow Time (s)	3.0	4.0	4.0		4.0	4.0
All-Red Time (s)	0.0	3.0	3.0		3.0	3.0
Lost Time Adjust (s)	1.0	-3.0	-3.0		-3.0	-3.0
Total Lost Time (s)	4.0	4.0	4.0		4.0	4.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	None		Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)	19.7	63.7	40.0		21.3	21.3
Actuated g/C Ratio	0.21	0.68	0.43		0.23	0.23
v/c Ratio	0.91	0.47	0.83		0.33	0.61
Control Delay	56.5	7.9	33.0		36.2	8.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	56.5	7.9	33.0		36.2	8.4
LOS	E	A	C		D	A
Approach Delay		33.4	33.0		15.1	
Approach LOS		C	C		B	
Intersection Summary						
Area Type:	Other					
Cycle Length:	100					
Actuated Cycle Length:	93.2					
Natural Cycle:	80					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.91					
Intersection Signal Delay:	29.2			Intersection LOS: C		
Intersection Capacity Utilization:	68.1%			ICU Level of Service C		
Analysis Period (min):	15					
Spplits and Phases:	11: Lyons Creek Road & Stanley Avenue					

Queues
11: Lyons Creek Road & Stanley Avenue

Future Total - Remedial
Saturday Peak Hour




Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	613	557	610	124	389
v/c Ratio	0.91	0.47	0.83	0.33	0.61
Control Delay	56.5	7.9	33.0	36.2	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	7.9	33.0	36.2	8.4
Queue Length 50th (m)	58.9	41.8	97.9	20.2	0.0
Queue Length 95th (m)	#104.8	60.4	143.5	41.8	27.5
Internal Link Dist (m)		426.7	581.6	788.1	
Turn Bay Length (m)	55.0			25.0	
Base Capacity (vph)	730	1458	967	380	640
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.38	0.63	0.33	0.61

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Future Total - Remedial
Saturday Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔↔	↑	↔		↔↔	↔↔
Traffic Volume (vph)	570	518	444	124	115	362
Future Volume (vph)	570	518	444	124	115	362
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	1.00	1.00		1.00	1.00
Fr	1.00	1.00	0.97		1.00	0.85
Fit Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3193	1750	1691		1662	1488
Fit Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3193	1750	1691		1662	1488
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	613	557	477	133	124	389
RTOR Reduction (vph)	0	0	12	0	0	300
Lane Group Flow (vph)	613	557	598	0	124	89
Heavy Vehicles (%)	1%	0%	0%	2%	0%	0%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	20.7	60.7	37.0		18.3	18.3
Effective Green, g (s)	19.7	63.7	40.0		21.3	21.3
Actuated g/C Ratio	0.21	0.68	0.43		0.23	0.23
Clearance Time (s)	3.0	7.0	7.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	676	1198	727		380	340
v/s Ratio Prot	c0.19	0.32	c0.35		c0.07	
v/s Ratio Perm						0.06
v/c Ratio	0.91	0.46	0.82		0.33	0.26
Uniform Delay, d1	35.8	6.8	23.4		29.9	29.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	15.8	0.3	7.5		2.3	1.9
Delay (s)	51.6	7.1	30.8		32.1	31.3
Level of Service	D	A	C		C	C
Approach Delay (s)		30.4	30.8		31.5	
Approach LOS		C	C		C	

Intersection Summary

HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	93.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
12: Dorchester Road & Street J

Future Total - Remedial
Saturday Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔			↔
Traffic Volume (vph)	140	348	305	0	405	318
Future Volume (vph)	140	348	305	0	405	318
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.850					
Fit Protected	0.950		0.973			
Satd. Flow (prot)	1630	1458	1716	0	0	1669
Fit Permitted	0.950		0.649			
Satd. Flow (perm)	1630	1458	1716	0	0	1113
Right Turn on Red	Yes		Yes			
Satd. Flow (RTOR)	378					
Link Speed (k/h)	50		60		60	
Link Distance (m)	156.0	129.0		684.0		
Travel Time (s)	11.2	7.7		41.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	378	332	0	440	346
Shared Lane Traffic (%)						
Lane Group Flow (vph)	152	378	332	0	0	786
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6	0.0		0.0		
Link Offset(m)	0.0		0.0			
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	15		25	
Number of Detectors	1	1	2	1		2
Detector Template	Left	Right	Thru	Left	Thru	
Leading Detector (m)	2.0	2.0	10.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0		
Detector 1 Position(m)	0.0	0.0	0.0	0.0		
Detector 1 Size(m)	2.0	2.0	0.6	2.0		
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0		
Detector 1 Queue (s)	0.0	0.0	0.0	0.0		
Detector 1 Delay (s)	0.0	0.0	0.0	0.0		
Detector 2 Position(m)			9.4	9.4		
Detector 2 Size(m)			0.6	0.6		
Detector 2 Type			CI+Ex	CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)			0.0	0.0		
Turn Type	Prot	Perm	NA	Perm	NA	
Protected Phases	8	2		6		
Permitted Phases	8		6			
Detector Phase	8	8	2	6	6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	





Lanes, Volumes, Timings
12: Dorchester Road & Street J

Future Total - Remedial
Saturday Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Split (s)	22.5	22.5	22.5		22.5	22.5
Total Split (s)	22.5	22.5	67.5		67.5	67.5
Total Split (%)	25.0%	25.0%	75.0%		75.0%	75.0%
Maximum Green (s)	18.0	18.0	63.0		63.0	63.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5		4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		Max	Max
Walk Time (s)	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	13.0	13.0	63.1		63.1	63.1
Actuated g/C Ratio	0.15	0.15	0.74		0.74	0.74
v/c Ratio	0.61	0.70	0.26		0.95	0.95
Control Delay	44.6	11.2	4.6		35.3	35.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	44.6	11.2	4.6		35.3	35.3
LOS	D	B	A		D	D
Approach Delay	20.8		4.6		35.3	
Approach LOS	C		A		D	
Intersection Summary						
Area Type: Other						
Cycle Length: 90						
Actuated Cycle Length: 85.1						
Natural Cycle: 90						
Control Type: Semi Act-Uncooord						
Maximum v/c Ratio: 0.95						
Intersection Signal Delay: 24.4						
Intersection LOS: C						
Intersection Capacity Utilization 79.6%						
ICU Level of Service D						
Analysis Period (min) 15						
Splits and Phases: 12: Dorchester Road & Street J						
<p>The diagram shows three phases: Phase 02 (upward arrow) with a duration of 67.5s, Phase 06 (downward arrow) with a duration of 67.5s, and Phase 08 (rightward arrow) with a duration of 22.5s. Each phase bar is divided into green, yellow, and red segments.</p>						

Queues
12: Dorchester Road & Street J

Future Total - Remedial
Saturday Peak Hour











				
Lane Group	WBL	WBR	NBT	SBT
Lane Group Flow (vph)	152	378	332	786
v/c Ratio	0.61	0.70	0.26	0.95
Control Delay	44.6	11.2	4.6	35.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	44.6	11.2	4.6	35.3
Queue Length 50th (m)	24.6	0.0	14.8	96.2
Queue Length 95th (m)	43.7	25.1	30.2	#222.0
Internal Link Dist (m)	132.0		105.0	660.0
Turn Bay Length (m)				
Base Capacity (vph)	345	607	1273	825
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.62	0.26	0.95

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
12: Dorchester Road & Street J

Future Total - Remedial
Saturday Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	140	348	305	0	405	318
Future Volume (vph)	140	348	305	0	405	318
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5			4.5
Lane Util. Factor	1.00	1.00	1.00			1.00
Fr't	1.00	0.85	1.00			1.00
Fit Protected	0.95	1.00	1.00			0.97
Sat'd. Flow (prot)	1630	1458	1716			1669
Fit Permitted	0.95	1.00	1.00			0.65
Sat'd. Flow (perm)	1630	1458	1716			1114
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	378	332	0	440	346
RTOR Reduction (vph)	0	320	0	0	0	0
Lane Group Flow (vph)	152	58	332	0	0	786
Turn Type	Prot	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	13.0	13.0	63.1			63.1
Effective Green, g (s)	13.0	13.0	63.1			63.1
Actuated g/C Ratio	0.15	0.15	0.74			0.74
Clearance Time (s)	4.5	4.5	4.5			4.5
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	249	222	1272			826
v/s Ratio Prot	c0.09		0.19			
v/s Ratio Perm		0.04				c0.71
v/c Ratio	0.61	0.26	0.26			0.95
Uniform Delay, d1	33.7	31.8	3.5			9.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	4.4	0.6	0.5			21.5
Delay (s)	38.1	32.4	4.0			31.2
Level of Service	D	C	A			C
Approach Delay (s)	34.0		4.0			31.2
Approach LOS	C		A			C

Intersection Summary

HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	85.1	Sum of lost time (s)	9.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
14: Dorchester Road & Internal Road

Future Total - Remedial
Saturday Peak Hour

	←	↖	↑	↗	→	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↗			↘
Traffic Volume (vph)	0	130	175	176	0	378
Future Volume (vph)	0	130	175	176	0	378
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr		0.865	0.932			
Fit Protected						
Satd. Flow (prot)	0	1484	1599	0	0	1716
Fit Permitted						
Satd. Flow (perm)	0	1484	1599	0	0	1716
Link Speed (k/h)	50		60			60
Link Distance (m)	88.3		186.5			129.0
Travel Time (s)	6.4		11.2			7.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	141	190	191	0	411
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	141	381	0	0	411
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	37.1%		ICU Level of Service		A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
14: Dorchester Road & Internal Road

Future Total - Remedial
Saturday Peak Hour

	←	↖	↑	↗	→	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↗			↘
Traffic Volume (veh/h)	0	130	175	176	0	378
Future Volume (Veh/h)	0	130	175	176	0	378
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	141	190	191	0	411
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						129
pX, platoon unblocked						
vC, conflicting volume	696	286			381	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	696	286			381	
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	81			100	
cM capacity (veh/h)	407	754			1177	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	141	381	411			
Volume Left	0	0	0			
Volume Right	141	191	0			
eSH	754	1700	1700			
Volume to Capacity	0.19	0.22	0.24			
Queue Length 95th (m)	5.5	0.0	0.0			
Control Delay (s)	10.9	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	10.9	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization	37.1%		ICU Level of Service	A		
Analysis Period (min)	15					

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	43	882	377	186	1211	22	314	18	178	13	5	19
Future Volume (vph)	43	882	377	186	1211	22	314	18	178	13	5	19
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0		0.0	80.0		0.0	95.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		1.00		1.00			0.99
Frt			0.850		0.997				0.850			0.881
Flt Protected	0.950			0.950			0.950	0.957		0.950		
Satd. Flow (prot)	1583	3167	1365	1511	3216	0	1462	1485	1403	1662	1388	0
Flt Permitted	0.097			0.139			0.950	0.957		0.950		
Satd. Flow (perm)	162	3167	1365	221	3216	0	1461	1484	1403	1662	1388	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			357		1				182			19
Link Speed (k/h)		50			50			50				50
Link Distance (m)		692.3			616.3			360.6				181.9
Travel Time (s)		49.8			44.4			26.0				13.1
Confl. Peds. (#/hr)	2				2		1					1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	5%	9%	10%	3%	5%	8%	0%	6%	0%	25%	6%
Adj. Flow (vph)	44	900	385	190	1236	22	320	18	182	13	5	19
Shared Lane Traffic (%)					47%							
Lane Group Flow (vph)	44	900	385	190	1258	0	170	168	182	13	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	25.0	49.0	49.0	25.0	49.0		28.0	28.0	28.0	28.0	28.0	
Total Split (%)	19.2%	37.7%	37.7%	19.2%	37.7%		21.5%	21.5%	21.5%	21.5%	21.5%	
Maximum Green (s)	22.0	41.0	41.0	22.0	41.0		19.0	19.0	19.0	19.0	19.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	57.1	51.2	46.2	70.0	61.9		24.0	24.0	24.0	24.0	24.0	
Actuated g/C Ratio	0.44	0.39	0.36	0.54	0.48		0.18	0.18	0.18	0.18	0.18	
v/c Ratio	0.33	0.72	0.54	0.71	0.82		0.63	0.61	0.45	0.04	0.09	
Control Delay	28.3	24.9	8.8	34.1	35.6		60.6	59.4	10.0	44.2	21.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	28.3	24.9	8.8	34.1	35.6		60.6	59.4	10.0	44.2	21.9	
LOS	C	C	A	C	D		E	E	B	D	C	
Approach Delay		20.4			35.4			42.5			29.7	
Approach LOS		C			D			D			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.82											
Intersection Signal Delay:	30.4						Intersection LOS: C					
Intersection Capacity Utilization:	88.8%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	2: Oakwood Drive & McLeod Road											

Queues
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
AM Peak Hour

	↖	→	↘	↙	←	↖	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	44	900	385	190	1258	170	168	182	13	24
v/c Ratio	0.33	0.72	0.54	0.71	0.82	0.63	0.61	0.45	0.04	0.09
Control Delay	28.3	24.9	8.8	34.1	35.6	60.6	59.4	10.0	44.2	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.3	24.9	8.8	34.1	35.6	60.6	59.4	10.0	44.2	21.9
Queue Length 50th (m)	2.5	112.3	56.1	26.1	153.8	45.0	44.3	0.0	2.9	1.1
Queue Length 95th (m)	m8.8	148.3	88.3	48.5	192.0	72.3	71.0	21.0	9.1	9.2
Internal Link Dist (m)	668.3		592.3			336.6		157.9		
Turn Bay Length (m)	50.0	80.0			95.0		20.0			
Base Capacity (vph)	315	1246	715	327	1531	269	274	407	306	271
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.72	0.54	0.58	0.82	0.63	0.61	0.45	0.04	0.09
Intersection Summary										
m	Volume for 95th percentile queue is metered by upstream signal.									

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
AM Peak Hour

	↖	→	↘	↙	←	↖	↑	↘	↙	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	43	882	377	186	1211	22	314	18	178	13	5	19
Future Volume (vph)	43	882	377	186	1211	22	314	18	178	13	5	19
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3167	1365	1511	3217		1462	1485	1403	1662	1388	
Flt Permitted	0.10	1.00	1.00	0.14	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	162	3167	1365	221	3217		1462	1485	1403	1662	1388	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	44	900	385	190	1236	22	320	18	182	13	5	19
RTOR Reduction (vph)	0	0	230	0	1	0	0	0	148	0	15	0
Lane Group Flow (vph)	44	900	155	190	1257	0	170	168	34	13	9	0
Confl. Peds. (#/hr)	2		2			1		1			1	
Heavy Vehicles (%)	5%	5%	9%	10%	3%	5%	8%	0%	6%	0%	25%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	52.9	47.2	47.2	66.0	57.3		19.0	19.0	19.0	19.0	19.0	
Effective Green, g (s)	50.9	51.2	46.2	65.0	61.3		24.0	24.0	24.0	24.0	24.0	
Actuated g/C Ratio	0.39	0.39	0.36	0.50	0.47		0.18	0.18	0.18	0.18	0.18	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	114	1247	485	257	1516		269	274	259	306	256	
v/s Ratio Prot	0.01	0.28		c0.08	c0.39		c0.12	0.11		c0.01	0.01	
v/s Ratio Perm	0.14		0.11	0.28					0.02			
v/c Ratio	0.39	0.72	0.32	0.74	0.83		0.63	0.61	0.13	0.04	0.03	
Uniform Delay, d1	27.7	33.4	30.5	23.5	29.8		48.9	48.7	44.3	43.6	43.5	
Progression Factor	1.42	0.63	1.32	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	3.1	1.5	10.0	5.4		10.8	9.9	1.0	0.3	0.2	
Delay (s)	40.7	24.0	41.6	33.5	35.2		59.7	58.6	45.3	43.8	43.7	
Level of Service	D	C	D	C	D		E	E	D	D	D	
Approach Delay (s)	29.7		35.0			54.3		43.8				
Approach LOS	C		C			D		D				
Intersection Summary												
HCM 2000 Control Delay	36.0		HCM 2000 Level of Service			D						
HCM 2000 Volume to Capacity ratio	0.63											
Actuated Cycle Length (s)	130.0			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	88.8%		ICU Level of Service			E						
Analysis Period (min)	15											
c	Critical Lane Group											

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	264	658	107	71	744	173	293	239	136	174	152	302
Future Volume (vph)	264	658	107	71	744	173	293	239	136	174	152	302
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0	0.0	15.0	0.0	15.0	0.0	30.0	0.0	30.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	1	0
Taper Length (m)	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Frt	0.979	0.979	0.979	0.979	0.979	0.979	0.979	0.979	0.979	0.979	0.979	0.979
Fit Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1554	3116	0	1599	3056	0	1599	1549	0	1568	1458	0
Fit Permitted	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107
Satd. Flow (perm)	175	3116	0	409	3056	0	199	1549	0	465	1458	0
Right Turn on Red		Yes		Yes		Yes		Yes		Yes		Yes
Satd. Flow (RTOR)	17	17	17	17	17	17	17	17	17	17	17	17
Link Speed (k/h)	50	50	50	50	50	50	50	50	50	50	50	50
Link Distance (m)	616.3	616.3	616.3	616.3	616.3	616.3	616.3	616.3	616.3	616.3	616.3	616.3
Travel Time (s)	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4
Confl. Peds. (#/hr)	7	21	21	7	10	10	44	44	10	10	10	10
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%
Adj. Flow (vph)	290	723	118	78	818	190	322	263	149	191	167	332
Shared Lane Traffic (%)												
Lane Group Flow (vph)	290	841	0	78	1008	0	322	412	0	191	499	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	25	15	25	15	25	15	25	15	25	15
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Detector 2 Size(m)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases	4		8		2		6					
Detector Phase	7	4	3	8	5	2	1	6				
Switch Phase												
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	8.0	5.0	8.0	5.0	8.0	5.0	8.0
Minimum Split (s)	9.5	30.4	9.5	30.4	9.5	37.7	9.5	37.7	9.5	37.7	9.5	37.7
Total Split (s)	20.4	50.1	11.1	40.8	22.2	43.3	16.6	37.7	16.6	37.7	16.6	37.7
Total Split (%)	16.8%	41.4%	9.2%	33.7%	18.3%	35.8%	13.7%	31.1%	13.7%	31.1%	13.7%	31.1%
Maximum Green (s)	17.4	43.7	8.1	34.4	19.2	36.6	13.6	31.0	13.6	31.0	13.6	31.0
Yellow Time (s)	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1
All-Red Time (s)	0.0	2.3	0.0	2.3	0.0	2.6	0.0	2.6	0.0	2.6	0.0	2.6
Lost Time Adjust (s)	1.0	-2.4	1.0	-2.4	1.0	-2.7	1.0	-2.7	1.0	-2.7	1.0	-2.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None	None	None
Walk Time (s)	9.0	9.0	9.0	9.0	9.0	12.0	9.0	12.0	9.0	12.0	9.0	12.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	19.0	15.0	19.0	15.0	19.0	15.0	19.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	57.2	48.4	43.4	36.8	55.9	40.3	45.3	33.7	45.3	33.7	45.3	33.7
Actuated g/C Ratio	0.47	0.40	0.36	0.30	0.46	0.33	0.37	0.28	0.37	0.28	0.37	0.28
v/c Ratio	1.08	0.67	0.37	1.07	1.07	0.77	0.68	1.08	0.68	1.08	0.68	1.08
Control Delay	109.1	33.0	23.9	88.5	102.6	45.8	34.7	98.8	34.7	98.8	34.7	98.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.1	33.0	23.9	88.5	102.6	45.8	34.7	98.8	34.7	98.8	34.7	98.8
LOS	F	C	C	F	F	D	C	F	C	F	C	F
Approach Delay	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5
Approach LOS	D	D	D	D	F	F	E	F	E	F	E	F
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	120											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.08											
Intersection Signal Delay:	70.9						Intersection LOS: E					
Intersection Capacity Utilization:	104.8%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											

Queues
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
AM Peak Hour

	↖	→	↘	←	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	290	841	78	1008	322	412	191	499
v/c Ratio	1.08	0.67	0.37	1.07	1.07	0.77	0.68	1.08
Control Delay	109.1	33.0	23.9	88.5	102.6	45.8	34.7	98.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.1	33.0	23.9	88.5	102.6	45.8	34.7	98.8
Queue Length 50th (m)	-65.2	90.9	10.6	-144.6	-72.5	88.4	28.6	-123.2
Queue Length 95th (m)	#122.9	115.0	19.9	#188.1	#132.3	#138.9	45.7	#192.0
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	269	1255	218	945	302	532	292	464
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	1.08	0.67	0.36	1.07	1.07	0.77	0.65	1.08

Intersection Summary
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
AM Peak Hour

	↖	→	↘	↙	←	↘	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	↖
Traffic Volume (vph)	264	658	107	71	744	173	293	239	136	174	152	302
Future Volume (vph)	264	658	107	71	744	173	293	239	136	174	152	302
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.95		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)	1554	3116		1594	3055		1599	1549		1559	1458	
Flt Permitted	0.11	1.00		0.25	1.00		0.12	1.00		0.29	1.00	
Satd. Flow (perm)	175	3116		413	3055		198	1549		473	1458	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	290	723	118	78	818	190	322	263	149	191	167	332
RTOR Reduction (vph)	0	10	0	0	17	0	0	17	0	0	59	0
Lane Group Flow (vph)	290	831	0	78	991	0	322	395	0	191	440	0
Conf. Peds. (#/hr)	7		21	21		7	10		44	44		10
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	54.8	45.4		40.8	34.4		53.2	37.6		43.6	31.0	
Effective Green, g (s)	53.8	47.8		38.8	36.8		52.2	40.3		41.6	33.7	
Actuated g/C Ratio	0.44	0.39		0.32	0.30		0.43	0.33		0.34	0.28	
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	264	1229		184	928		295	515		266	405	
v/s Ratio Prot	c0.15	0.27		0.02	0.32		c0.16	0.26		0.07	c0.30	
v/s Ratio Perm	c0.34			0.12			0.31			0.18		
v/c Ratio	1.10	0.68		0.42	1.07		1.09	0.77		0.72	1.09	
Uniform Delay, d1	36.5	30.3		29.8	42.1		36.4	36.2		30.7	43.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	84.3	3.0		1.6	49.5		79.1	6.8		8.9	69.8	
Delay (s)	120.8	33.2		31.4	91.7		115.4	43.0		39.6	113.5	
Level of Service	F	C		C	F		F	D		D	F	
Approach Delay (s)		55.7			87.3			74.8			93.0	
Approach LOS		E			F			E			F	

Intersection Summary
 HCM 2000 Control Delay 76.1 HCM 2000 Level of Service E
 HCM 2000 Volume to Capacity ratio 1.09
 Actuated Cycle Length (s) 121.1 Sum of lost time (s) 16.0
 Intersection Capacity Utilization 104.8% ICU Level of Service G
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Sensitivity - OPG Crossing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	50	195	1	356	190	109	4	192	501	67	101	19
Future Volume (vph)	50	195	1	356	190	109	4	192	501	67	101	19
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0			225.0		80.0	60.0	80.0	50.0
Storage Lanes	1		1	2			1		1	2		1
Taper Length (m)	7.5			7.5					7.5		7.5	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1614	3197	744	2959	3107	1377	1662	3137	1458	2757	2891	1365
Fit Permitted	0.622			0.950			0.682			0.950		
Satd. Flow (perm)	1057	3197	744	2959	3107	1377	1194	3137	1458	2757	2891	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168			118			545			106
Link Speed (k/h)		80			80			60				60
Link Distance (m)		507.4			421.7			216.1				150.6
Travel Time (s)		22.8			19.0			13.0				9.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	100%	9%	7%	8%	0%	6%	2%	17%	15%	9%
Adj. Flow (vph)	54	212	1	387	207	118	4	209	545	73	110	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	212	1	387	207	118	4	209	545	73	110	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					9.4				9.4			9.4
Detector 2 Size(m)					0.6				0.6			0.6
Detector 2 Type					CI+Ex				CI+Ex			CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0				0.0			0.0
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3		8		2		1		6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

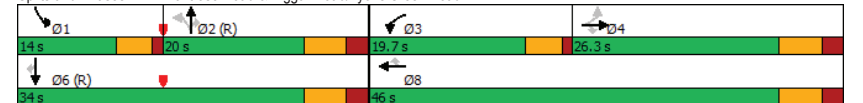
Sensitivity - OPG Crossing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4		3	8		8	2	2	2	6
Detector Phase	4	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	19.7	46.0	46.0	20.0	20.0	20.0	14.0	34.0	34.0
Total Split (%)	32.9%	32.9%	32.9%	24.6%	57.5%	57.5%	25.0%	25.0%	25.0%	17.5%	42.5%	42.5%
Maximum Green (s)	20.0	20.0	20.0	15.2	39.7	39.7	13.7	13.7	13.7	9.5	27.7	27.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	10.0	8.0	10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effect Green (s)	13.7	16.0	13.7	14.1	34.6	32.3	25.1	27.4	25.1	7.5	37.4	35.1
Actuated g/C Ratio	0.17	0.20	0.17	0.18	0.43	0.40	0.31	0.34	0.31	0.09	0.47	0.44
v/c Ratio	0.30	0.33	0.00	0.74	0.15	0.19	0.01	0.19	0.66	0.28	0.08	0.03
Control Delay	32.6	28.3	0.0	40.5	13.3	3.5	24.2	21.9	7.3	36.0	13.3	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	0.0
Total Delay	32.6	28.3	0.0	40.5	13.3	3.5	24.2	21.9	7.3	36.0	13.3	0.1
LOS	C	C	A	D	B	A	C	C	A	D	B	A
Approach Delay		29.1			26.5			11.4				20.1
Approach LOS		C			C			B				C

Intersection Summary

Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBL and 6:SBT, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	20.3
Intersection Capacity Utilization:	58.5%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 7: Montrose Road & Biggar Road/Lyons Creek Road



Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Sensitivity - OPG Crossing
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	54	212	1	387	207	118	4	209	545	73	110	21
v/c Ratio	0.30	0.33	0.00	0.74	0.15	0.19	0.01	0.19	0.66	0.28	0.08	0.03
Control Delay	32.6	28.3	0.0	40.5	13.3	3.5	24.2	21.9	7.3	36.0	13.3	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	0.0
Total Delay	32.6	28.3	0.0	40.5	13.3	3.5	24.2	21.9	7.3	36.0	13.3	0.1
Queue Length 50th (m)	7.7	15.4	0.0	30.0	10.0	0.0	0.5	12.9	0.0	5.7	5.0	0.0
Queue Length 95th (m)	17.3	23.7	0.0	44.8	14.7	8.4	3.0	24.1	31.2	11.7	10.6	0.0
Internal Link Dist (m)	483.4		397.7					192.1		126.6		
Turn Bay Length (m)	130.0	120.0		150.0	225.0			80.0	60.0	80.0	50.0	
Base Capacity (vph)	264	891	312	562	1631	742	375	1075	831	327	1352	658
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	0.20	0.24	0.00	0.69	0.13	0.16	0.01	0.19	0.66	0.22	0.08	0.03

Intersection Summary

Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	4		3		8		2		1		6	
Permitted Phases	4		4		8		2		2		6	
Actuated Green, G (s)	13.7	13.7	13.7	14.1	32.3	32.3	24.2	24.2	6.4	35.1	35.1	35.1
Effective Green, g (s)	13.7	16.0	13.7	14.1	34.6	32.3	24.2	26.5	24.2	6.4	37.4	35.1
Actuated g/C Ratio	0.17	0.20	0.17	0.18	0.43	0.40	0.30	0.33	0.30	0.08	0.47	0.44
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	181	639	127	521	1343	555	361	1039	441	220	1351	598
v/s Ratio Prot	c0.07		c0.13		0.07		0.07		c0.03		0.04	
v/s Ratio Perm	0.05		0.00		0.03		0.00		c0.11		0.01	
v/c Ratio	0.30	0.33	0.00	0.74	0.15	0.09	0.01	0.20	0.37	0.33	0.08	0.02
Uniform Delay, d1	29.0	27.4	27.5	31.2	13.8	14.7	19.5	19.2	21.9	34.8	11.8	12.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.9	0.0	5.7	0.2	0.2	0.1	0.4	2.4	0.9	0.1	0.0
Delay (s)	31.6	28.3	27.5	36.9	14.0	14.9	19.6	19.6	24.4	35.7	11.9	12.7
Level of Service	C	C	C	D	B	B	B	B	C	D	B	B
Approach Delay (s)	28.9		26.6		23.0		20.5					
Approach LOS	C		C		C		C					
Intersection Summary												
HCM 2000 Control Delay	24.9		HCM 2000 Level of Service		C							
HCM 2000 Volume to Capacity ratio	0.43											
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		17.0							
Intersection Capacity Utilization	58.5%		ICU Level of Service		B							
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Sensitivity - OPG Crossing
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↖↖	↘	↖↖	↖↖	↖↖	↘	↖↖	↖↖	↖↖	↖↖	↖↖
Traffic Volume (vph)	50	195	1	356	190	109	4	192	501	67	101	19
Future Volume (vph)	50	195	1	356	190	109	4	192	501	67	101	19
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit 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)	1614	3197	744	2959	3107	1377	1662	3137	1458	2757	2891	1365
Fit Permitted	0.62	1.00	1.00	0.95	1.00	1.00	0.68	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1057	3197	744	2959	3107	1377	1194	3137	1458	2757	2891	1365
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	212	1	387	207	118	4	209	545	73	110	21
RTOR Reduction (vph)	0	0	1	0	0	70	0	0	380	0	0	12
Lane Group Flow (vph)	54	212	0	387	207	48	4	209	165	73	110	9
Heavy Vehicles (%)	3%	4%	100%	9%	7%	8%	0%	6%	2%	17%	15%	9%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	4		3		8		2		1		6	
Permitted Phases	4		4		8		2		2		6	
Actuated Green, G (s)	13.7	13.7	13.7	14.1	32.3	32.3	24.2	24.2	6.4	35.1	35.1	35.1
Effective Green, g (s)	13.7	16.0	13.7	14.1	34.6	32.3	24.2	26.5	24.2	6.4	37.4	35.1
Actuated g/C Ratio	0.17	0.20	0.17	0.18	0.43	0.40	0.30	0.33	0.30	0.08	0.47	0.44
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	181	639	127	521	1343	555	361	1039	441	220	1351	598
v/s Ratio Prot	c0.07		c0.13		0.07		0.07		c0.03		0.04	
v/s Ratio Perm	0.05		0.00		0.03		0.00		c0.11		0.01	
v/c Ratio	0.30	0.33	0.00	0.74	0.15	0.09	0.01	0.20	0.37	0.33	0.08	0.02
Uniform Delay, d1	29.0	27.4	27.5	31.2	13.8	14.7	19.5	19.2	21.9	34.8	11.8	12.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.9	0.0	5.7	0.2	0.2	0.1	0.4	2.4	0.9	0.1	0.0
Delay (s)	31.6	28.3	27.5	36.9	14.0	14.9	19.6	19.6	24.4	35.7	11.9	12.7
Level of Service	C	C	C	D	B	B	B	B	C	D	B	B
Approach Delay (s)	28.9		26.6		23.0		20.5					
Approach LOS	C		C		C		C					

Intersection Summary												
HCM 2000 Control Delay	24.9		HCM 2000 Level of Service		C							
HCM 2000 Volume to Capacity ratio	0.43											
Actuated Cycle Length (s)	80.0		Sum of lost time (s)		17.0							
Intersection Capacity Utilization	58.5%		ICU Level of Service		B							
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Sensitivity - OPG Crossing
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	55	23	0	1	3	4	3	425	8	0	192	27
Future Volume (vph)	55	23	0	1	3	4	3	425	8	0	192	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.997			0.983	
Flt Protected		0.966			0.995							
Satd. Flow (prot)	0	1621	0	0	1443	0	0	1600	0	0	1589	0
Flt Permitted		0.966			0.995							
Satd. Flow (perm)	0	1621	0	0	1443	0	0	1600	0	0	1589	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	8		16	16		8	17		8	8		17
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	4%	5%	0%	0%	0%	25%	100%	8%	29%	0%	6%	24%
Adj. Flow (vph)	72	30	0	1	4	5	4	559	11	0	253	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	102	0	0	10	0	0	574	0	0	289	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	15	25	15	25	15	25	15	25	15	25
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	46.2%					ICU Level of Service A						
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Sensitivity - OPG Crossing
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	55	23	0	1	3	4	3	425	8	0	192	27
Future Volume (vph)	55	23	0	1	3	4	3	425	8	0	192	27
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	72	30	0	1	4	5	4	559	11	0	253	36
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	102	10	574	289								
Volume Left (vph)	72	1	4	0								
Volume Right (vph)	0	5	11	36								
Hadj (s)	0.21	-0.07	0.14	0.07								
Departure Headway (s)	6.2	6.2	4.8	5.0								
Degree Utilization, x	0.18	0.02	0.76	0.40								
Capacity (veh/h)	528	509	737	689								
Control Delay (s)	10.5	9.3	21.4	11.4								
Approach Delay (s)	10.5	9.3	21.4	11.4								
Approach LOS	B	A	C	B								
Intersection Summary												
Delay	17.2											
Level of Service	C											
Intersection Capacity Utilization	46.2%					ICU Level of Service A						
Analysis Period (min)	15											

Lanes, Volumes, Timings
9: Dorchester Road & OPG Crossing/Oldfield Road

Sensitivity - OPG Crossing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	0	0	87	56	78	0	156	302	83	29	177	0
Future Volume (vph)	0	0	87	56	78	0	156	302	83	29	177	0
Ideal Flow (vphpl)	1900	1900	1900	1750	1900	1750	1900	1750	1750	1750	1750	1900
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	1	0	1	0	0	0
Taper Length (m)	7.5			7.5			7.5		7.5			7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865						0.968				
Flt Protected					0.979		0.950			0.950		
Satd. Flow (prot)	0	1611	0	0	1663	0	1770	1694	0	1397	1750	0
Flt Permitted					0.817		0.630			0.468		
Satd. Flow (perm)	0	1611	0	0	1387	0	1174	1694	0	688	1750	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		660					34					
Link Speed (k/h)	50			50			60			60		
Link Distance (m)	863.7			1040.1			438.6			461.8		
Travel Time (s)	62.2			74.9			26.3			27.7		
Peak Hour Factor	0.92	0.92	0.92	0.87	0.92	0.87	0.92	0.87	0.87	0.87	0.87	0.92
Heavy Vehicles (%)	2%	2%	2%	25%	2%	10%	2%	0%	19%	0%	2%	2%
Adj. Flow (vph)	0	0	95	64	85	0	170	347	95	33	203	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	0	0	149	0	170	442	0	33	203	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	3.6	0.0	0.0
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.11	1.00	1.11	1.00	1.11	1.11	1.11	1.11	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	NA		Perm	NA		Perm	NA		Perm	NA		NA
Protected Phases	4			8			2			6		

Lanes, Volumes, Timings
9: Dorchester Road & OPG Crossing/Oldfield Road

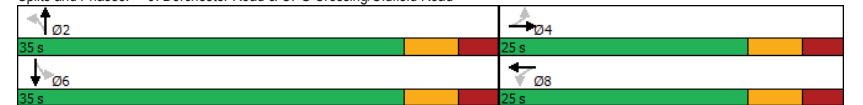
Sensitivity - OPG Crossing
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		-3.0			-3.0		-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		13.5			13.7		35.4	35.4		35.4	35.4	
Actuated g/C Ratio		0.25			0.26		0.66	0.66		0.66	0.66	
v/c Ratio		0.11			0.42		0.22	0.39		0.07	0.17	
Control Delay		0.2			20.0		6.9	7.2		6.4	6.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		0.2			20.0		6.9	7.2		6.4	6.2	
LOS		A			B		A	A		A	A	
Approach Delay		0.2			20.0		7.1			6.2		
Approach LOS		A			B		A			A		

Intersection Summary

Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	53.4
Natural Cycle:	50
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.42
Intersection Signal Delay:	8.1
Intersection Capacity Utilization:	50.8%
Intersection LOS:	A
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 9: Dorchester Road & OPG Crossing/Oldfield Road



Queues
9: Dorchester Road & OPG Crossing/Oldfield Road

Sensitivity - OPG Crossing
AM Peak Hour

	→	←	↖	↗	↘	↙
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	95	149	170	442	33	203
v/c Ratio	0.11	0.42	0.22	0.39	0.07	0.17
Control Delay	0.2	20.0	6.9	7.2	6.4	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.2	20.0	6.9	7.2	6.4	6.2
Queue Length 50th (m)	0.0	12.2	6.9	18.6	1.2	8.0
Queue Length 95th (m)	0.0	25.4	19.0	42.2	5.0	19.3
Internal Link Dist (m)	839.7	1016.1		414.6		437.8
Turn Bay Length (m)				15.0		
Base Capacity (vph)	1034	546	778	1134	456	1160
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.27	0.22	0.39	0.07	0.17

Intersection Summary

Turn Type	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4		8		2		6
Permitted Phases	4		8		2		6
Actuated Green, G (s)	9.3		9.3		31.6		31.6
Effective Green, g (s)	12.3		12.3		34.6		34.6
Actuated g/C Ratio	0.22		0.22		0.63		0.63
Clearance Time (s)	7.0		7.0		7.0		7.0
Vehicle Extension (s)	3.0		3.0		3.0		3.0
Lane Grp Cap (vph)	360		310		739		1067
v/s Ratio Prot	0.01				c0.25		0.12
v/s Ratio Perm			c0.11		0.14		0.05
v/c Ratio	0.06		0.48		0.23		0.40
Uniform Delay, d1	16.7		18.5		4.4		5.0
Progression Factor	1.00		1.00		1.00		1.00
Incremental Delay, d2	0.1		1.2		0.7		1.1
Delay (s)	16.8		19.7		5.1		6.2
Level of Service	B		B		A		A
Approach Delay (s)	16.8		19.7		5.9		4.6
Approach LOS	B		B		A		A

HCM Signalized Intersection Capacity Analysis
9: Dorchester Road & OPG Crossing/Oldfield Road

Sensitivity - OPG Crossing
AM Peak Hour

	↖	→	↘	↙	←	↖	↗	↘	↙	↘	↙	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	↔	↔
Traffic Volume (vph)	0	0	87	56	78	0	156	302	83	29	177	0	0
Future Volume (vph)	0	0	87	56	78	0	156	302	83	29	177	0	0
Ideal Flow (vphpl)	1900	1900	1900	1750	1900	1750	1900	1750	1750	1750	1750	1750	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0		4.0
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00		1.00
Fr		0.86			1.00		1.00	0.97		1.00	1.00		1.00
Fit Protected		1.00			0.98		0.95	1.00		0.95	1.00		1.00
Satd. Flow (prot)		1611			1663		1770	1694		1397	1750		1750
Fit Permitted		1.00			0.82		0.63	1.00		0.47	1.00		1.00
Satd. Flow (perm)		1611			1387		1174	1694		689	1750		1750
Peak-hour factor, PHF	0.92	0.92	0.92	0.87	0.92	0.87	0.92	0.87	0.87	0.87	0.87	0.87	0.92
Adj. Flow (vph)	0	0	95	64	85	0	170	347	95	33	203	0	0
RTOR Reduction (vph)	0	74	0	0	0	0	0	13	0	0	0	0	0
Lane Group Flow (vph)	0	21	0	0	149	0	170	429	0	33	203	0	0
Heavy Vehicles (%)	2%	2%	2%	25%	2%	10%	2%	0%	0%	19%	0%	2%	2%
Turn Type	NA		Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases	4			8			2			6			6
Permitted Phases	4			8			2			6			6
Actuated Green, G (s)	9.3			9.3			31.6	31.6		31.6			31.6
Effective Green, g (s)	12.3			12.3			34.6	34.6		34.6			34.6
Actuated g/C Ratio	0.22			0.22			0.63	0.63		0.63			0.63
Clearance Time (s)	7.0			7.0			7.0	7.0		7.0			7.0
Vehicle Extension (s)	3.0			3.0			3.0	3.0		3.0			3.0
Lane Grp Cap (vph)	360			310			739	1067		434			1102
v/s Ratio Prot	0.01						c0.25			0.12			0.12
v/s Ratio Perm				c0.11			0.14			0.05			0.05
v/c Ratio	0.06			0.48			0.23	0.40		0.08			0.18
Uniform Delay, d1	16.7			18.5			4.4	5.0		3.9			4.2
Progression Factor	1.00			1.00			1.00	1.00		1.00			1.00
Incremental Delay, d2	0.1			1.2			0.7	1.1		0.3			0.4
Delay (s)	16.8			19.7			5.1	6.2		4.3			4.6
Level of Service	B			B			A	A		A			A
Approach Delay (s)	16.8			19.7			5.9			4.6			4.6
Approach LOS	B			B			A			A			A

Intersection Summary

HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	54.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Sensitivity - OPG Crossing
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	4	25	249	8	10	15	126	556	9	13	291	40
Future Volume (vph)	4	25	249	8	10	15	126	556	9	13	291	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.879			0.938			0.998			0.984	
Flt Protected		0.999			0.988			0.991			0.998	
Satd. Flow (prot)	0	1318	0	0	1558	0	0	1597	0	0	1259	0
Flt Permitted		0.999			0.988			0.991			0.998	
Satd. Flow (perm)	0	1318	0	0	1558	0	0	1597	0	0	1259	0
Link Speed (k/h)		60			60			70			60	
Link Distance (m)		372.3			519.4			156.9			312.6	
Travel Time (s)		22.3			31.2			8.1			18.8	
Confl. Peds. (#/hr)	6					6						
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles (%)	33%	0%	18%	17%	0%	0%	18%	6%	20%	9%	40%	20%
Adj. Flow (vph)	6	35	346	11	14	21	175	772	13	18	404	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	387	0	0	46	0	0	960	0	0	478	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	15	25	25	15	25	15	25	15	25	15
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	88.6%					ICU Level of Service E						
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Sensitivity - OPG Crossing
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Volume (veh/h)	4	25	249	8	10	15	126	556	9	13	291	40	
Future Volume (Veh/h)	4	25	249	8	10	15	126	556	9	13	291	40	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	
Hourly flow rate (vph)	6	35	346	11	14	21	175	772	12	18	404	56	
Pedestrians												6	
Lane Width (m)												3.6	
Walking Speed (m/s)												1.2	
Percent Blockage												1	
Right turn flare (veh)													
Median type								None				None	
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	1630	1602	432	1960	1624	784	460				784		
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1630	1602	432	1960	1624	784	460				784		
tC, single (s)	7.4	6.5	6.4	7.3	6.5	6.2	4.3				4.2		
tC, 2 stage (s)													
tF (s)	3.8	4.0	3.5	3.7	4.0	3.3	2.4				2.3		
p0 queue free %	88	60	41	0	83	95	83				98		
cM capacity (veh/h)	48	87	591	11	84	394	1022				804		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	387	46	959	478									
Volume Left	6	11	175	18									
Volume Right	346	21	12	56									
eSH	347	37	1022	804									
Volume to Capacity	1.11	1.25	0.17	0.02									
Queue Length 95th (m)	118.2	38.2	4.9	0.5									
Control Delay (s)	117.4	401.9	4.1	0.6									
Lane LOS	F	F	A	A									
Approach Delay (s)	117.4	401.9	4.1	0.6									
Approach LOS	F	F											
Intersection Summary													
Average Delay				36.5									
Intersection Capacity Utilization			88.6%		ICU Level of Service					E			
Analysis Period (min)			15										

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Sensitivity - OPG Crossing
AM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↔	↕
Traffic Volume (vph)	387	201	393	105	67	446
Future Volume (vph)	387	201	393	105	67	446
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr			0.971			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1554	1683	1662	0	1250	1094
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1554	1683	1662	0	1250	1094
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	7%	4%	1%	7%	33%	36%
Adj. Flow (vph)	455	236	462	124	79	525
Shared Lane Traffic (%)						
Lane Group Flow (vph)	455	236	586	0	79	525
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		25		15	25	15
Sign Control		Stop	Stop		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	66.7%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Sensitivity - OPG Crossing
AM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↔	↕
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	387	201	393	105	67	446
Future Volume (vph)	387	201	393	105	67	446
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	455	236	462	124	79	525
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	455	236	586	79	525	
Volume Left (vph)	455	0	0	79	0	
Volume Right (vph)	0	0	124	0	525	
Hadj (s)	0.62	0.07	-0.09	1.06	-0.09	
Departure Headway (s)	8.2	7.7	7.2	8.7	7.6	
Degree Utilization, x	1.04	0.50	1.18	0.19	1.11	
Capacity (veh/h)	442	466	502	407	487	
Control Delay (s)	81.4	17.0	124.7	12.6	98.9	
Approach Delay (s)	59.4		124.7		87.6	
Approach LOS	F		F		F	
Intersection Summary						
Delay			88.8			
Level of Service			F			
Intersection Capacity Utilization			66.7%		ICU Level of Service	C
Analysis Period (min)			15			

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	43	1516	577	263	1328	20	521	5	382	28	15	97
Future Volume (vph)	43	1516	577	263	1328	20	521	5	382	28	15	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0	0.0	80.0	0.0	95.0	0.0	95.0	0.0	20.0	0.0	0.0	0.0
Storage Lanes	1	1	1	0	1	1	1	1	1	1	0	0
Taper Length (m)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99
Frt		0.850	0.998	0.998	0.998	0.998	0.998	0.998	0.850	0.870	0.870	0.870
Fit Protected	0.950		0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1583	3292	1444	1614	3250	0	1533	1532	1458	1662	1484	0
Fit Permitted	0.122		0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067
Satd. Flow (perm)	203	3292	1389	114	3250	0	1526	1525	1458	1662	1484	0
Right Turn on Red		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)		387	1	1	295	99	50	50	50	50	50	50
Link Speed (k/h)		50	50	50	50	50	50	50	50	50	50	50
Link Distance (m)	692.3		616.3	360.6	181.9							
Travel Time (s)	49.8		44.4	26.0	13.1							
Confl. Peds. (#/hr)	9	9	9	9	6	6	6	6	6	6	6	6
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Adj. Flow (vph)	44	1547	589	268	1355	20	532	5	390	29	15	99
Shared Lane Traffic (%)					50%							
Lane Group Flow (vph)	44	1547	589	268	1375	0	266	271	390	29	114	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	25	15	25	15	25	15	25	15	25	15
Number of Detectors	1	2	1	1	2	1	2	1	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Left	Thru	Right	Left	Thru	Right	Left
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	10.0	2.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	0.6	2.0	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Detector 2 Size(m)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Detector 2 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Split	NA	Perm	Split	NA	Split	NA
Protected Phases	7	4		3	8	2	2	2	6	6		
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8	2	2	2	6	6		
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0	48.0	48.0	48.0	53.0	53.0	53.0	53.0
Total Split (s)	21.0	65.0	65.0	21.0	65.0	30.0	30.0	30.0	14.0	14.0	14.0	14.0
Total Split (%)	16.2%	50.0%	50.0%	16.2%	50.0%	23.1%	23.1%	23.1%	10.8%	10.8%	10.8%	10.8%
Maximum Green (s)	18.0	57.0	57.0	18.0	57.0	21.0	21.0	21.0	5.0	5.0	5.0	5.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Recall Mode	None	C-Max	C-Max	None	C-Max	Max	Max	Max	Max	Max	Max	Max
Walk Time (s)		12.0	12.0		12.0	14.0	14.0	14.0	16.0	16.0	16.0	16.0
Flash Dont Walk (s)		20.0	20.0		20.0	25.0	25.0	25.0	28.0	28.0	28.0	28.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Act Effct Green (s)	66.6	61.0	56.0	82.0	74.2	26.0	26.0	26.0	10.0	10.0	10.0	10.0
Actuated g/C Ratio	0.51	0.47	0.43	0.63	0.57	0.20	0.20	0.20	0.08	0.08	0.08	0.08
v/c Ratio	0.27	1.00	0.72	1.00	0.74	0.87	0.89	0.74	0.23	0.56	0.56	0.56
Control Delay	14.3	49.8	12.6	92.4	24.4	77.7	80.1	21.8	61.1	25.4	25.4	25.4
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	14.3	49.8	12.6	92.4	24.4	77.7	80.1	21.8	61.1	25.4	25.4	25.4
LOS	B	D	B	F	C	E	F	C	E	C	C	C
Approach Delay		39.0			35.5		54.9				32.6	
Approach LOS		D			D		D				C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.00											
Intersection Signal Delay:	40.7						Intersection LOS: D					
Intersection Capacity Utilization:	117.8%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	2: Oakwood Drive & McLeod Road											

Queues
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
PM Peak Hour

	↖	→	↘	↙	←	↖	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	44	1547	589	268	1375	266	271	390	29	114
v/c Ratio	0.27	1.00	0.72	1.00	0.74	0.87	0.89	0.74	0.23	0.56
Control Delay	14.3	49.8	12.6	92.4	24.4	77.7	80.1	21.8	61.1	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	49.8	12.6	92.4	24.4	77.7	80.1	21.8	61.1	25.4
Queue Length 50th (m)	2.3	-219.7	82.5	56.7	142.8	73.7	75.4	22.9	7.5	3.9
Queue Length 95th (m)	m3.6	#274.4	m117.7	#116.1	177.7	#125.4	#129.6	64.0	18.0	23.4
Internal Link Dist (m)		668.3			592.3		336.6			157.9
Turn Bay Length (m)	50.0			80.0		95.0			20.0	
Base Capacity (vph)	302	1544	818	268	1855	306	306	527	127	205
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	1.00	0.72	1.00	0.74	0.87	0.89	0.74	0.23	0.56

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
PM Peak Hour

	↖	→	↘	↙	←	↖	↑	↘	↙	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗		↖	↖↗	↖	↖	↖	↖
Traffic Volume (vph)	43	1516	577	263	1328	20	521	5	382	28	15	97
Future Volume (vph)	43	1516	577	263	1328	20	521	5	382	28	15	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00	1.00	1.00	0.99	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		1.00	1.00	0.85	1.00	0.87	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3292	1389	1614	3249		1533	1533	1458	1662	1484	1484
Flt Permitted	0.12	1.00	1.00	0.07	1.00		0.95	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	203	3292	1389	113	3249		1533	1533	1458	1662	1484	1484
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	44	1547	589	268	1355	20	532	5	390	29	15	99
RTOR Reduction (vph)	0	0	220	0	0	0	0	0	236	0	91	0
Lane Group Flow (vph)	44	1547	369	268	1375	0	266	271	154	29	23	0
Conf. Peds. (#/hr)	9		9	9			9	6				6
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	62.4	57.0	57.0	78.0	69.6		21.0	21.0	21.0	5.0	5.0	
Effective Green, g (s)	60.4	61.0	56.0	77.0	73.6		26.0	26.0	26.0	10.0	10.0	
Actuated g/C Ratio	0.46	0.47	0.43	0.59	0.57		0.20	0.20	0.20	0.08	0.08	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	141	1544	598	263	1839		306	306	291	127	114	
v/s Ratio Prot	0.01	c0.47		c0.13	0.42		0.17	c0.18		c0.02	0.02	
v/s Ratio Perm	0.13		0.27	0.47					0.11			
v/c Ratio	0.31	1.00	0.62	1.02	0.75		0.87	0.89	0.53	0.23	0.20	
Uniform Delay, d1	21.2	34.5	28.7	43.9	21.2		50.4	50.6	46.5	56.4	56.2	
Progression Factor	1.11	0.89	0.91	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	18.7	3.0	60.5	2.8		26.9	29.1	6.7	4.1	3.9	
Delay (s)	24.1	49.4	29.1	104.3	24.0		77.2	79.7	53.3	60.5	60.1	
Level of Service	C	D	C	F	C		E	E	D	E	E	
Approach Delay (s)		43.4			37.1			67.8			60.2	
Approach LOS		D			D			E			E	

Intersection Summary

HCM 2000 Control Delay: 46.4
HCM 2000 Level of Service: D

HCM 2000 Volume to Capacity ratio: 0.91

Actuated Cycle Length (s): 130.0
Sum of lost time (s): 16.0

Intersection Capacity Utilization: 117.8%
ICU Level of Service: H

Analysis Period (min): 15

c Critical Lane Group

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	327	1025	258	96	859	155	387	208	172	294	213	341
Future Volume (vph)	327	1025	258	96	859	155	387	208	172	294	213	341
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		0.0	50.0		0.0	15.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.99			0.98		0.99		0.98
Frt		0.970			0.977			0.932				0.908
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3141	0	1630	3193	0	1614	1605	0	1662	1523	0
Fit Permitted	0.106			0.119			0.115			0.259		
Satd. Flow (perm)	182	3141	0	204	3193	0	195	1605	0	449	1523	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			18			36			68	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		616.3			1045.5			348.9			308.0	
Travel Time (s)		44.4			75.3			25.1			22.2	
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Adj. Flow (vph)	337	1057	266	99	886	160	399	214	177	303	220	352
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	1323	0	99	1046	0	399	391	0	303	572	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.4		9.5	30.4		9.5	37.7		9.5	37.7	
Total Split (s)	17.0	48.6		9.5	41.1		23.0	41.6		21.4	40.0	
Total Split (%)	14.0%	40.1%		7.8%	33.9%		19.0%	34.4%		17.7%	33.0%	
Maximum Green (s)	14.0	42.2		6.5	34.7		20.0	34.9		18.4	33.3	
Yellow Time (s)	3.0	4.1		3.0	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.3		0.0	2.3		0.0	2.6		0.0	2.6	
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		9.0			9.0			12.0			12.0	
Flash Dont Walk (s)		15.0			15.0			19.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	54.1	44.6		42.6	37.1		57.1	38.4		52.6	36.0	
Actuated g/C Ratio	0.45	0.37		0.35	0.31		0.47	0.32		0.43	0.30	
v/c Ratio	1.43	1.13		0.73	1.06		1.27	0.73		0.84	1.14	
Control Delay	242.4	103.5		53.2	84.8		175.2	42.9		42.2	121.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	242.4	103.5		53.2	84.8		175.2	42.9		42.2	121.1	
LOS	F	F		D	F		F	D		D	F	
Approach Delay		131.7			82.1			109.7			93.8	
Approach LOS		F			F			F			F	
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	130											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.43											
Intersection Signal Delay:	107.7						Intersection LOS: F					
Intersection Capacity Utilization:	123.8%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											

Queues
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
PM Peak Hour

	↖	→	↘	←	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	337	1323	99	1046	399	391	303	572
v/c Ratio	1.43	1.13	0.73	1.06	1.27	0.73	0.84	1.14
Control Delay	242.4	103.5	53.2	84.8	175.2	42.9	42.2	121.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	242.4	103.5	53.2	84.8	175.2	42.9	42.2	121.1
Queue Length 50th (m)	-98.1	-199.6	14.3	-149.3	-110.5	80.3	46.2	-155.3
Queue Length 95th (m)	#159.0	#244.4	#35.4	#192.8	#174.6	119.3	#81.9	#227.3
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	236	1175	136	990	314	534	372	500
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	1.43	1.13	0.73	1.06	1.27	0.73	0.81	1.14

Intersection Summary
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
PM Peak Hour

	↖	→	↘	↙	←	↘	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↖	↘	↘	↖	↘	↘	↖	↘	↘	↖	↘
Traffic Volume (vph)	327	1025	258	96	859	155	387	208	172	294	213	341
Future Volume (vph)	327	1025	258	96	859	155	387	208	172	294	213	341
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.93		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	3140		1630	3193		1614	1605		1659	1523	
Flt Permitted	0.11	1.00		0.12	1.00		0.12	1.00		0.26	1.00	
Satd. Flow (perm)	182	3140		204	3193		196	1605		452	1523	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	337	1057	266	99	886	160	399	214	177	303	220	352
RTOR Reduction (vph)	0	18	0	0	12	0	0	25	0	0	48	0
Lane Group Flow (vph)	337	1305	0	99	1034	0	399	366	0	303	524	0
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	51.7	42.2		41.2	34.7		55.7	35.7		50.9	33.3	
Effective Green, g (s)	50.7	44.6		39.2	37.1		53.7	38.4		48.9	36.0	
Actuated g/C Ratio	0.42	0.37		0.32	0.31		0.44	0.32		0.40	0.30	
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	231	1156		130	978		309	508		347	452	
v/s Ratio Prot	c0.16	0.42		0.03	0.32		c0.20	0.23		0.12	0.34	
v/s Ratio Perm	c0.45			0.21			c0.37			0.23		
v/c Ratio	1.46	1.13		0.76	1.06		1.29	0.72		0.87	1.16	
Uniform Delay, d1	34.7	38.2		33.4	42.0		36.7	36.6		28.0	42.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	228.8	69.3		22.8	45.0		153.2	5.0		20.7	94.0	
Delay (s)	263.5	107.5		56.1	87.0		189.9	41.6		48.8	136.6	
Level of Service	F	F		E	F		F	D		D	F	
Approach Delay (s)		139.2			84.3			116.5			106.2	
Approach LOS		F			F			F			F	

Intersection Summary
 HCM 2000 Control Delay 114.7 HCM 2000 Level of Service F
 HCM 2000 Volume to Capacity ratio 1.34
 Actuated Cycle Length (s) 121.1 Sum of lost time (s) 16.0
 Intersection Capacity Utilization 123.8% ICU Level of Service H
 Analysis Period (min) 15
 c Critical Lane Group

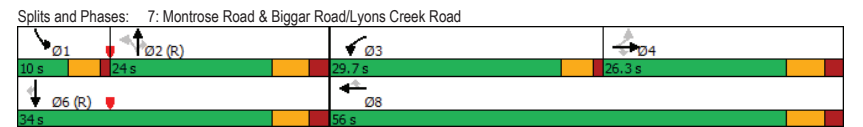
Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road
Sensitivity - OPG Crossing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	32	241	3	557	282	80	5	166	551	157	219	64
Future Volume (vph)	32	241	3	557	282	80	5	166	551	157	219	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5		7.5			7.5			7.5			7.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Fit Permitted	0.565			0.950			0.604			0.950		
Satd. Flow (perm)	989	3197	1488	3131	3228	1390	1057	3197	1430	3101	3260	1430
Right Turn on Red			Yes			Yes			Yes		Yes	
Satd. Flow (RTOR)			149			95			599		95	
Link Speed (k/h)		80			80			60				60
Link Distance (m)		507.4			421.7			216.1				150.6
Travel Time (s)		22.8			19.0			13.0				9.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Adj. Flow (vph)	35	262	3	605	307	87	5	180	599	171	238	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	262	3	605	307	87	5	180	599	171	238	70
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3		8		2		1		6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road
Sensitivity - OPG Crossing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4		3	8		8	2		2	6
Detector Phase	4	4	4	4	3	8	8	2	2	2	1	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	29.7	56.0	56.0	24.0	24.0	24.0	10.0	34.0	34.0
Total Split (%)	29.2%	29.2%	29.2%	33.0%	62.2%	62.2%	26.7%	26.7%	26.7%	11.1%	37.8%	37.8%
Maximum Green (s)	20.0	20.0	20.0	25.2	49.7	49.7	17.7	17.7	17.7	5.5	27.7	27.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	15.5	17.8	15.5	21.9	44.2	41.9	21.9	24.2	21.9	9.1	37.8	35.5
Actuated g/C Ratio	0.17	0.20	0.17	0.24	0.49	0.47	0.24	0.27	0.24	0.10	0.42	0.39
v/c Ratio	0.21	0.41	0.01	0.80	0.19	0.12	0.02	0.21	0.75	0.55	0.17	0.11
Control Delay	33.7	33.0	0.0	40.2	12.4	2.5	29.4	28.0	9.9	47.3	18.3	3.2
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	33.7	33.0	0.0	40.2	12.4	2.5	29.4	28.0	9.9	47.3	18.3	3.2
LOS	C	C	A	D	B	A	C	C	A	D	B	A
Approach Delay		32.8			28.4			14.1				26.5
Approach LOS		C			C			B				C

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBL and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.80
Intersection Signal Delay:	24.2
Intersection Capacity Utilization:	62.6%
ICU Level of Service:	B
Analysis Period:	(min) 15



Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Sensitivity - OPG Crossing
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	35	262	3	605	307	87	5	180	599	171	238	70
v/c Ratio	0.21	0.41	0.01	0.80	0.19	0.12	0.02	0.21	0.75	0.55	0.17	0.11
Control Delay	33.7	33.0	0.0	40.2	12.4	2.5	29.4	28.0	9.9	47.3	18.3	3.2
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	33.7	33.0	0.0	40.2	12.4	2.5	29.4	28.0	9.9	47.3	18.3	3.2
Queue Length 50th (m)	5.5	22.1	0.0	52.9	15.6	0.0	0.7	13.9	0.0	15.1	14.0	0.0
Queue Length 95th (m)	13.6	31.9	0.0	69.4	19.2	5.8	3.8	23.6	#40.0	#34.6	25.3	5.9
Internal Link Dist (m)		483.4		397.7				192.1			126.6	
Turn Bay Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Base Capacity (vph)	219	792	446	876	1865	810	256	859	801	313	1369	621
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	0.16	0.33	0.01	0.69	0.16	0.11	0.02	0.21	0.75	0.55	0.17	0.11

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

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Sensitivity - OPG Crossing
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↘↘	↘	↘↘	↘↘	↘	↘	↘↘	↘	↘↘	↘↘	↘
Traffic Volume (vph)	32	241	3	557	282	80	5	166	551	157	219	64
Future Volume (vph)	32	241	3	557	282	80	5	166	551	157	219	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit 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)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Fit Permitted	0.56	1.00	1.00	0.95	1.00	1.00	0.60	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	989	3197	1488	3131	3228	1390	1057	3197	1430	3101	3260	1430
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	262	3	605	307	87	5	180	599	171	238	70
RTOR Reduction (vph)	0	0	2	0	0	46	0	0	453	0	0	42
Lane Group Flow (vph)	35	262	1	605	307	41	5	180	146	171	238	28
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8			2		1		6
Permitted Phases	4		4			8	2		2			6
Actuated Green, G (s)	15.5	15.5	15.5	21.9	41.9	41.9	21.9	21.9	21.9	9.1	35.5	35.5
Effective Green, g (s)	15.5	17.8	15.5	21.9	44.2	41.9	21.9	24.2	21.9	9.1	37.8	35.5
Actuated g/C Ratio	0.17	0.20	0.17	0.24	0.49	0.47	0.24	0.27	0.24	0.10	0.42	0.39
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	170	632	256	761	1585	647	257	859	347	313	1369	564
v/s Ratio Prot		c0.08		c0.19	0.10			0.06		c0.06	0.07	
v/s Ratio Perm	0.04		0.00			0.03	0.00		c0.10			0.02
v/c Ratio	0.21	0.41	0.00	0.80	0.19	0.06	0.02	0.21	0.42	0.55	0.17	0.05
Uniform Delay, d1	32.0	31.5	30.8	31.9	12.9	13.2	25.9	25.5	28.7	38.5	16.3	16.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	1.2	0.0	5.8	0.2	0.1	0.1	0.6	3.7	1.9	0.3	0.2
Delay (s)	33.7	32.8	30.9	37.7	13.0	13.4	26.0	26.0	32.4	40.4	16.6	17.0
Level of Service	C	C	C	D	B	B	C	C	C	D	B	B
Approach Delay (s)		32.9			28.0			30.9			25.2	
Approach LOS		C			C			C			C	

Intersection Summary
HCM 2000 Control Delay 28.9 HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio 0.53
Actuated Cycle Length (s) 90.0 Sum of lost time (s) 17.0
Intersection Capacity Utilization 62.6% ICU Level of Service B
Analysis Period (min) 15
c Critical Lane Group

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Sensitivity - OPG Crossing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	73	8	10	1	5	5	10	499	0	6	449	45
Future Volume (vph)	73	8	10	1	5	5	10	499	0	6	449	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.986			0.938						0.988	
Flt Protected		0.961			0.996			0.999			0.999	
Satd. Flow (prot)	0	1645	0	0	1635	0	0	1704	0	0	1716	0
Flt Permitted		0.961			0.996			0.999			0.999	
Satd. Flow (perm)	0	1645	0	0	1635	0	0	1704	0	0	1716	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	3		2	2		3	1		5	5		1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	33%	2%	0%	0%	0%	7%
Adj. Flow (vph)	84	9	11	1	6	6	11	574	0	7	516	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	104	0	0	13	0	0	585	0	0	575	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	53.9%					ICU Level of Service A						
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Sensitivity - OPG Crossing
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Sign Control		Stop			Stop			Stop			Stop		
Traffic Volume (vph)	73	8	10	1	5	5	10	499	0	6	449	45	
Future Volume (vph)	73	8	10	1	5	5	10	499	0	6	449	45	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	
Hourly flow rate (vph)	84	9	11	1	6	6	11	574	0	7	516	52	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total (vph)	104	13	585	575									
Volume Left (vph)	84	1	11	7									
Volume Right (vph)	11	6	0	52									
Hadj (s)	0.11	-0.26	0.05	-0.04									
Departure Headway (s)	6.8	6.8	5.1	5.0									
Degree Utilization, x	0.20	0.02	0.83	0.81									
Capacity (veh/h)	495	474	693	697									
Control Delay (s)	11.4	9.9	28.0	25.5									
Approach Delay (s)	11.4	9.9	28.0	25.5									
Approach LOS	B	A	D	D									
Intersection Summary													
Delay				25.4									
Level of Service	D												
Intersection Capacity Utilization	53.9%				ICU Level of Service				A				
Analysis Period (min)	15												

Lanes, Volumes, Timings
9: Dorchester Road & OPG Crossing/Oldfield Road

Sensitivity - OPG Crossing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	0	0	180	100	75	0	209	328	65	76	362	0
Future Volume (vph)	0	0	180	100	75	0	209	328	65	76	362	0
Ideal Flow (vphpl)	1900	1900	1900	1750	1900	1750	1900	1750	1750	1750	1750	1900
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	1	0	1	0	0	0
Taper Length (m)	7.5			7.5			7.5		7.5		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00				0.975			
Fit Protected					0.972		0.950		0.950			
Satd. Flow (prot)	0	1611	0	0	1832	0	1770	1706	0	1614	1750	0
Fit Permitted					0.670		0.464		0.436			
Satd. Flow (perm)	0	1611	0	0	1262	0	864	1706	0	741	1750	0
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		381						25				
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		863.7			1040.1			438.6			461.8	
Travel Time (s)		62.2			74.9			26.3			27.7	
Confl. Peds. (#/hr)				1								
Peak Hour Factor	0.92	0.92	0.92	0.86	0.92	0.86	0.92	0.86	0.86	0.86	0.86	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	0%	0%	3%	0%	2%
Adj. Flow (vph)	0	0	196	116	82	0	227	381	76	88	421	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	196	0	0	198	0	227	457	0	88	421	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.11	1.00	1.11	1.00	1.11	1.11	1.11	1.11	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
9: Dorchester Road & OPG Crossing/Oldfield Road

Sensitivity - OPG Crossing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA			Perm		NA		Perm	NA		NA
Protected Phases		4					8			2		6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		-3.0			-3.0			-3.0			-3.0	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		15.9			15.9		32.4	32.4		32.4	32.4	
Actuated g/C Ratio		0.28			0.28		0.58	0.58		0.58	0.58	
v/c Ratio		0.27			0.56		0.46	0.46		0.21	0.42	
Control Delay		0.9			23.1		12.0	9.3		8.7	9.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		0.9			23.1		12.0	9.3		8.7	9.2	
LOS		A			C		B	A		A	A	
Approach Delay		0.9			23.1		10.2	9.1				
Approach LOS		A			C		B	A				
Intersection Summary												
Area Type:	Other											
Cycle Length:	60											
Actuated Cycle Length:	56.3											
Natural Cycle:	55											
Control Type:	Semi Act-Uncoord											
Maximum v/c Ratio:	0.56											
Intersection Signal Delay:	10.3						Intersection LOS: B					
Intersection Capacity Utilization:	66.2%						ICU Level of Service C					
Analysis Period (min):	15											
Splits and Phases:	9: Dorchester Road & OPG Crossing/Oldfield Road											

Queues
9: Dorchester Road & OPG Crossing/Oldfield Road

Sensitivity - OPG Crossing
PM Peak Hour

	→	←	↖	↗	↘	↙
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	198	227	457	88	421
v/c Ratio	0.27	0.56	0.46	0.46	0.21	0.42
Control Delay	0.9	23.1	12.0	9.3	8.7	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.9	23.1	12.0	9.3	8.7	9.2
Queue Length 50th (m)	0.0	17.2	12.3	23.2	4.0	22.2
Queue Length 95th (m)	0.0	34.0	34.2	48.2	12.1	45.2
Internal Link Dist (m)	839.7	1016.1		414.6		437.8
Turn Bay Length (m)				15.0		
Base Capacity (vph)	840	471	497	993	426	1008
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.42	0.46	0.46	0.21	0.42

Intersection Summary

HCM Signalized Intersection Capacity Analysis
9: Dorchester Road & OPG Crossing/Oldfield Road

Sensitivity - OPG Crossing
PM Peak Hour

	↖	→	↘	↗	←	↖	↗	↘	↙	↘	↙	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	0	0	180	100	75	0	209	328	65	76	362	0
Future Volume (vph)	0	0	180	100	75	0	209	328	65	76	362	0
Ideal Flow (vphpl)	1900	1900	1900	1750	1900	1750	1900	1750	1750	1750	1750	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.86			1.00		1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1611			1830		1770	1706		1614	1750	
Flt Permitted		1.00			0.67		0.46	1.00		0.44	1.00	
Satd. Flow (perm)		1611			1261		864	1706		741	1750	
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.92	0.86	0.92	0.86	0.86	0.86	0.86	0.92
Adj. Flow (vph)	0	0	196	116	82	0	227	381	76	88	421	0
RTOR Reduction (vph)	0	141	0	0	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	55	0	0	198	0	227	446	0	88	421	0
Confl. Peds. (#/hr)				1								
Heavy Vehicles (%)	2%	2%	2%	0%	2%	4%	2%	0%	0%	3%	0%	2%
Turn Type	NA	NA	Perm	NA	Perm	NA	NA	Perm	NA	Perm	NA	NA
Protected Phases	4			8			2			6		6
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	12.9			12.9			29.4	29.4		29.4		29.4
Effective Green, g (s)	15.9			15.9			32.4	32.4		32.4		32.4
Actuated g/C Ratio	0.28			0.28			0.58	0.58		0.58		0.58
Clearance Time (s)	7.0			7.0			7.0	7.0		7.0		7.0
Vehicle Extension (s)	3.0			3.0			3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	454			356			497	981		426		1007
v/s Ratio Prot	0.03							0.26				0.24
v/s Ratio Perm				c0.16			c0.26			0.12		
v/c Ratio	0.12			0.56			0.46	0.46		0.21		0.42
Uniform Delay, d1	15.0			17.2			6.9	6.9		5.8		6.7
Progression Factor	1.00			1.00			1.00	1.00		1.00		1.00
Incremental Delay, d2	0.1			1.9			3.0	1.5		1.1		1.3
Delay (s)	15.1			19.1			9.9	8.4		6.9		8.0
Level of Service	B			B			A	A		A		A
Approach Delay (s)	15.1			19.1			8.9			7.8		
Approach LOS	B			B			A			A		

Intersection Summary

HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	56.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Sensitivity - OPG Crossing
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	6	28	202	14	27	4	261	499	22	11	736	92
Future Volume (vph)	6	28	202	14	27	4	261	499	22	11	736	92
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.885			0.987			0.996			0.985	
Flt Protected		0.999			0.985			0.984			0.999	
Satd. Flow (prot)	0	1547	0	0	1649	0	0	1603	0	0	1614	0
Flt Permitted		0.999			0.985			0.984			0.999	
Satd. Flow (perm)	0	1547	0	0	1649	0	0	1603	0	0	1614	0
Link Speed (k/h)		60			60			70			60	
Link Distance (m)		372.3			519.4			156.9			312.6	
Travel Time (s)		22.3			31.2			8.1			18.8	
Confl. Peds. (#/hr)								2		2		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	0%	0%	0%	0%	33%	0%	11%	0%	0%	6%	13%
Adj. Flow (vph)	7	33	235	16	31	5	303	580	26	13	856	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	275	0	0	52	0	0	909	0	0	976	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	25	25	15	25	25	15	25	25	15	25
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	120.1% ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Sensitivity - OPG Crossing
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	6	28	202	14	27	4	261	499	22	11	736	92
Future Volume (Veh/h)	6	28	202	14	27	4	261	499	22	11	736	92
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	33	235	16	31	5	303	580	26	13	856	107
Pedestrians					2							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	2155	2150	910	2388	2190	595	963			608		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2155	2150	910	2388	2190	595	963			608		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.5	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.6	2.2			2.2		
p0 queue free %	0	0	30	0	0	99	58			99		
cM capacity (veh/h)	0	28	336	0	26	450	723			979		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	275	52	909	976								
Volume Left	7	16	303	13								
Volume Right	235	5	26	107								
eSH	0	0	723	979								
Volume to Capacity	Err	Err	0.42	0.01								
Queue Length 95th (m)	Err	Err	16.7	0.3								
Control Delay (s)	Err	Err	10.4	0.4								
Lane LOS	F	F	B	A								
Approach Delay (s)	Err	Err	10.4	0.4								
Approach LOS	F	F										

Intersection Summary	
Average Delay	Err
Intersection Capacity Utilization	120.1% ICU Level of Service H
Analysis Period (min)	15

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Sensitivity - OPG Crossing
PM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↔	↕
Traffic Volume (vph)	538	549	373	115	145	560
Future Volume (vph)	538	549	373	115	145	560
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.968			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1511	1733	1662	0	1662	1390
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1511	1733	1662	0	1662	1390
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	1%	5%	0%	7%
Adj. Flow (vph)	566	578	393	121	153	589
Shared Lane Traffic (%)						
Lane Group Flow (vph)	566	578	514	0	153	589
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		25		15	25	15
Sign Control		Stop	Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	80.0%		ICU Level of Service D			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Sensitivity - OPG Crossing
PM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↔	↕
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	538	549	373	115	145	560
Future Volume (vph)	538	549	373	115	145	560
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	566	578	393	121	153	589
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	566	578	514	153	589	
Volume Left (vph)	566	0	0	153	0	
Volume Right (vph)	0	0	121	0	589	
Hadj (s)	0.67	0.02	-0.11	0.50	-0.58	
Departure Headway (s)	8.3	7.7	7.3	8.3	7.2	
Degree Utilization, x	1.31	1.23	1.04	0.35	1.18	
Capacity (veh/h)	442	477	500	430	505	
Control Delay (s)	176.8	143.9	77.2	14.5	122.9	
Approach Delay (s)	160.2		77.2		100.5	
Approach LOS	F		F		F	
Intersection Summary						
Delay			124.0			
Level of Service			F			
Intersection Capacity Utilization	80.0%		ICU Level of Service	D		
Analysis Period (min)	15					

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	28	1375	677	276	1202	16	566	18	361	12	9	34
Future Volume (vph)	28	1375	677	276	1202	16	566	18	361	12	9	34
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0		0.0	80.0		0.0	95.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.95		1.00		1.00		0.99	1.00		0.99
Frt			0.850		0.998				0.850			0.880
Flt Protected	0.950			0.950			0.950	0.955		0.950		
Satd. Flow (prot)	1662	3292	1473	1630	3284	0	1548	1558	1473	1662	1522	0
Flt Permitted	0.149			0.077			0.950	0.955		0.950		
Satd. Flow (perm)	260	3292	1396	132	3284	0	1545	1555	1452	1660	1522	0
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)			446		1				379			36
Link Speed (k/h)		50			50			50				50
Link Distance (m)		692.3			616.3			360.6				181.9
Travel Time (s)		49.8			44.4			26.0				13.1
Confl. Peds. (#/hr)	10		16	16		10	3		2	2		3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	2%	0%	1%	0%	0%	0%
Adj. Flow (vph)	29	1447	713	291	1265	17	596	19	380	13	9	36
Shared Lane Traffic (%)							48%					
Lane Group Flow (vph)	29	1447	713	291	1282	0	310	305	380	13	45	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left		Thru
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0		10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0		0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	10.0	56.0	56.0	25.0	71.0		32.0	32.0	32.0	17.0	17.0	
Total Split (%)	7.7%	43.1%	43.1%	19.2%	54.6%		24.6%	24.6%	24.6%	13.1%	13.1%	
Maximum Green (s)	7.0	48.0	48.0	22.0	63.0		23.0	23.0	23.0	8.0	8.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	58.4	53.1	48.1	77.0	71.3		28.0	28.0	28.0	13.0	13.0	
Actuated g/C Ratio	0.45	0.41	0.37	0.59	0.55		0.22	0.22	0.22	0.10	0.10	
v/c Ratio	0.17	1.08	0.89	0.95	0.71		0.93	0.91	0.62	0.08	0.24	
Control Delay	12.9	74.5	23.1	75.8	25.3		84.9	81.1	9.2	54.4	25.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	12.9	74.5	23.1	75.8	25.3		84.9	81.1	9.2	54.4	25.0	
LOS	B	E	C	E	C		F	F	A	D	C	
Approach Delay		56.9			34.6			54.8			31.6	
Approach LOS		E			C			D			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.08											
Intersection Signal Delay:	48.9						Intersection LOS: D					
Intersection Capacity Utilization:	120.4%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	2: Oakwood Drive & McLeod Road											

Queues
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
Saturday Peak Hour

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	1447	713	291	1282	310	305	380	13	45
v/c Ratio	0.17	1.08	0.89	0.95	0.71	0.93	0.91	0.62	0.08	0.24
Control Delay	12.9	74.5	23.1	75.8	25.3	84.9	81.1	9.2	54.4	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	74.5	23.1	75.8	25.3	84.9	81.1	9.2	54.4	25.0
Queue Length 50th (m)	2.0	~234.4	120.2	61.1	137.6	87.0	85.2	0.2	3.2	2.3
Queue Length 95th (m)	m2.1	#280.7 m	#173.6	#115.8	169.4	#147.0	#142.8	29.5	10.1	14.6
Internal Link Dist (m)		668.3		592.3		336.6				157.9
Turn Bay Length (m)	50.0			80.0		95.0			20.0	
Base Capacity (vph)	182	1344	797	320	1802	333	335	610	166	184
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	1.08	0.89	0.91	0.71	0.93	0.91	0.62	0.08	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.

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Sensitivity - OPG Crossing
Saturday Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	28	1375	677	276	1202	16	566	18	361	12	9	34
Future Volume (vph)	28	1375	677	276	1202	16	566	18	361	12	9	34
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.99	1.00	0.99	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		1.00	1.00	0.85	1.00	0.88	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	3292	1396	1630	3284		1548	1559	1452	1662	1522	1522
Flt Permitted	0.15	1.00	1.00	0.08	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	261	3292	1396	132	3284		1548	1559	1452	1662	1522	1522
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	1447	713	291	1265	17	596	19	380	13	9	36
RTOR Reduction (vph)	0	0	281	0	0	0	0	0	297	0	32	0
Lane Group Flow (vph)	29	1447	432	291	1282	0	310	305	83	13	13	0
Confl. Peds. (#/hr)	10		16	16		10	3		2	2		3
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	53.0	49.1	49.1	73.0	66.1		23.0	23.0	23.0	8.0	8.0	
Effective Green, g (s)	51.0	53.1	48.1	72.0	70.1		28.0	28.0	28.0	13.0	13.0	
Actuated g/C Ratio	0.39	0.41	0.37	0.55	0.54		0.22	0.22	0.22	0.10	0.10	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	133	1344	516	302	1770		333	335	312	166	152	
v/s Ratio Prot	0.00	c0.44		c0.15	0.39		c0.20	0.20		0.01	c0.01	
v/s Ratio Perm	0.08		0.31	0.39					0.06			
v/c Ratio	0.22	1.08	0.84	0.96	0.72		0.93	0.91	0.26	0.08	0.08	
Uniform Delay, d1	25.4	38.5	37.4	42.0	22.6		50.1	49.8	42.4	53.1	53.1	
Progression Factor	0.90	0.81	0.91	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	43.3	9.3	41.7	2.6		34.5	30.9	2.1	0.9	1.1	
Delay (s)	23.3	74.5	43.3	83.7	25.3		84.6	80.7	44.5	54.0	54.2	
Level of Service	C	E	D	F	C		F	F	D	D	D	
Approach Delay (s)		63.6			36.1			68.1			54.1	
Approach LOS		E			D			E			D	

Intersection Summary

HCM 2000 Control Delay 55.4 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) 16.0

Intersection Capacity Utilization 120.4% ICU Level of Service H

Analysis Period (min) 15

c Critical Lane Group

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	305	985	277	104	798	147	359	205	207	275	241	312
Future Volume (vph)	305	985	277	104	798	147	359	205	207	275	241	312
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0	0.0	15.0	0.0	15.0	0.0	30.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	1	0	1	0	1	0	0	0
Taper Length (m)	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	0.0	0.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.967	0.967	0.967	0.967	0.967	0.967	0.967	0.967	0.967	0.967	0.967	0.967
Fit Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1630	3144	0	1662	3195	0	1630	1589	0	1662	1565	0
Fit Permitted	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101	0.101
Satd. Flow (perm)	173	3144	0	196	3195	0	202	1589	0	350	1565	0
Right Turn on Red		Yes		Yes		Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		34		18		43		54		54		54
Link Speed (k/h)		50		50		50		50		50		50
Link Distance (m)		616.3		1045.5		348.9		308.0		308.0		308.0
Travel Time (s)		44.4		75.3		25.1		22.2		22.2		22.2
Confl. Peds. (#/hr)	13	11	11	13	9	21	21	9	21	21	9	9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	1%	1%	1%
Adj. Flow (vph)	314	1015	286	107	823	152	370	211	213	284	248	322
Shared Lane Traffic (%)												
Lane Group Flow (vph)	314	1301	0	107	975	0	370	424	0	284	570	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6		3.6		3.6		3.6		3.6		3.6
Link Offset(m)		0.0		0.0		0.0		0.0		0.0		0.0
Crosswalk Width(m)		4.8		4.8		4.8		4.8		4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	25	15	25	15	25	15	25	15	25	15
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4		9.4		9.4		9.4		9.4		9.4
Detector 2 Size(m)		0.6		0.6		0.6		0.6		0.6		0.6
Detector 2 Type		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0		0.0		0.0		0.0		0.0		0.0

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6	6	6	6	6
Permitted Phases	4	8	2	6	6	6	6	6	6	6	6	6
Detector Phase	7	4	3	8	5	2	1	6	6	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	8.0	5.0	8.0	5.0	8.0	5.0	8.0
Minimum Split (s)	9.5	30.4	9.5	30.4	9.5	37.7	9.5	37.7	9.5	37.7	9.5	37.7
Total Split (s)	16.0	49.6	9.5	43.1	23.0	41.0	21.0	39.0	21.0	39.0	21.0	39.0
Total Split (%)	13.2%	41.0%	7.8%	35.6%	19.0%	33.9%	17.3%	32.2%	17.3%	32.2%	17.3%	32.2%
Maximum Green (s)	13.0	43.2	6.5	36.7	20.0	34.3	18.0	32.3	18.0	32.3	18.0	32.3
Yellow Time (s)	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1	3.0	4.1
All-Red Time (s)	0.0	2.3	0.0	2.3	0.0	2.6	0.0	2.6	0.0	2.6	0.0	2.6
Lost Time Adjust (s)	1.0	-2.4	1.0	-2.4	1.0	-2.7	1.0	-2.7	1.0	-2.7	1.0	-2.7
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None	None	None	None
Walk Time (s)		9.0		9.0		12.0		12.0		12.0		12.0
Flash Dont Walk (s)		15.0		15.0		19.0		19.0		19.0		19.0
Pedestrian Calls (#/hr)		0		0		0		0		0		0
Act Effct Green (s)	55.1	45.6	44.6	39.1	56.4	37.7	51.3	35.0	51.3	35.0	51.3	35.0
Actuated g/C Ratio	0.45	0.38	0.37	0.32	0.47	0.31	0.42	0.29	0.42	0.29	0.42	0.29
v/c Ratio	1.41	1.08	0.78	0.93	1.16	0.81	0.87	1.16	0.87	1.16	0.87	1.16
Control Delay	235.0	85.9	58.2	55.4	134.9	48.2	50.4	129.6	50.4	129.6	50.4	129.6
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	235.0	85.9	58.2	55.4	134.9	48.2	50.4	129.6	50.4	129.6	50.4	129.6
LOS	F	F	E	E	F	D	D	F	D	F	D	F
Approach Delay		114.9		55.7		88.6		103.2		103.2		103.2
Approach LOS		F		E		F		F		F		F
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	120											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.41											
Intersection Signal Delay:	93.1						Intersection LOS: F					
Intersection Capacity Utilization:	117.6%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											

Queues
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
Saturday Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	314	1301	107	975	370	424	284	570
v/c Ratio	1.41	1.08	0.78	0.93	1.16	0.81	0.87	1.16
Control Delay	235.0	85.9	58.2	55.4	134.9	48.2	50.4	129.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	235.0	85.9	58.2	55.4	134.9	48.2	50.4	129.6
Queue Length 50th (m)	-89.6	-188.8	15.3	122.3	-93.9	89.4	43.5	-159.4
Queue Length 95th (m)	#148.9	#234.0	#40.2	#165.3	#156.9	#143.4	#90.3	#231.4
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	223	1205	138	1043	318	523	334	490
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	1.41	1.08	0.78	0.93	1.16	0.81	0.85	1.16

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Sensitivity - OPG Crossing
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	305	985	277	104	798	147	359	205	207	275	241	312
Future Volume (vph)	305	985	277	104	798	147	359	205	207	275	241	312
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	3144		1662	3194		1630	1589		1660	1566	
Flt Permitted	0.10	1.00		0.11	1.00		0.12	1.00		0.20	1.00	
Satd. Flow (perm)	173	3144		196	3194		202	1589		354	1566	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	314	1015	286	107	823	152	370	211	213	284	248	322
RTOR Reduction (vph)	0	21	0	0	12	0	0	30	0	0	38	0
Lane Group Flow (vph)	314	1280	0	107	963	0	370	394	0	284	532	0
Conf. Peds. (#/hr)	13		11	11		13	9		21	21		9
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	52.7	43.2		43.2	36.7		55.0	35.0		49.6	32.3	
Effective Green, g (s)	51.7	45.6		41.2	39.1		53.0	37.7		47.6	35.0	
Actuated g/C Ratio	0.43	0.38		0.34	0.32		0.44	0.31		0.39	0.29	
Clearance Time (s)	3.0	6.4		3.0	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	218	1183		133	1031		312	494		314	452	
v/s Ratio Prot	c0.14	0.41		0.04	0.30		c0.19	0.25		0.12	c0.34	
v/s Ratio Perm	c0.47			0.24			0.33			0.23		
v/c Ratio	1.44	1.08		0.80	0.93		1.19	0.80		0.90	1.18	
Uniform Delay, d1	34.0	37.8		32.6	39.7		36.6	38.2		29.1	43.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	222.2	51.3		28.6	16.0		111.3	8.8		27.7	100.3	
Delay (s)	256.3	89.0		61.2	55.8		147.9	47.0		56.8	143.3	
Level of Service	F	F		E	E		F	D		E	F	
Approach Delay (s)		121.5			56.3			94.0			114.6	
Approach LOS		F			E			F			F	

Intersection Summary

- HCM 2000 Control Delay: 98.9, HCM 2000 Level of Service: F
- HCM 2000 Volume to Capacity ratio: 1.29
- Actuated Cycle Length (s): 121.1, Sum of lost time (s): 16.0
- Intersection Capacity Utilization: 117.6%, ICU Level of Service: H
- Analysis Period (min): 15
- c Critical Lane Group

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Sensitivity - OPG Crossing
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	↔	↔	↔↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	34	243	3	554	282	80	5	170	556	157	222	66
Future Volume (vph)	34	243	3	554	282	80	5	170	556	157	222	66
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0			225.0	80.0		60.0	80.0	50.0
Storage Lanes	1		1	2			1	1		1	2	1
Taper Length (m)	7.5			7.5				7.5			7.5	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Fit Permitted	0.565			0.950			0.602			0.950		
Satd. Flow (perm)	989	3197	1488	3131	3228	1390	1054	3197	1430	3101	3260	1430
Right Turn on Red			Yes			Yes			Yes		Yes	
Satd. Flow (RTOR)			149			95			604			95
Link Speed (k/h)		80			80			60				60
Link Distance (m)		507.4			421.7			216.1				150.6
Travel Time (s)		22.8			19.0			13.0				9.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Adj. Flow (vph)	37	264	3	602	307	87	5	185	604	171	241	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	264	3	602	307	87	5	185	604	171	241	72
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8			2		1		6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

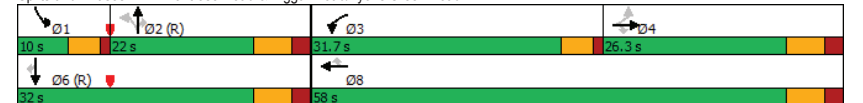
Sensitivity - OPG Crossing
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4		3	8	8	2		2		6
Detector Phase	4	4	4	4	3	8	8	2	2	2	1	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	31.7	58.0	58.0	22.0	22.0	22.0	10.0	32.0	32.0
Total Split (%)	29.2%	29.2%	29.2%	35.2%	64.4%	64.4%	24.4%	24.4%	24.4%	11.1%	35.6%	35.6%
Maximum Green (s)	20.0	20.0	20.0	27.2	51.7	51.7	15.7	15.7	15.7	5.5	25.7	25.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	15.7	18.0	15.7	22.3	44.8	42.5	21.1	23.4	21.1	9.3	37.2	34.9
Actuated g/C Ratio	0.17	0.20	0.17	0.25	0.50	0.47	0.23	0.26	0.23	0.10	0.41	0.39
v/c Ratio	0.22	0.41	0.01	0.78	0.19	0.12	0.02	0.22	0.76	0.53	0.18	0.12
Control Delay	33.7	32.8	0.0	38.7	12.0	2.3	31.0	29.1	10.4	46.6	19.0	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	32.8	0.0	38.7	12.0	2.3	31.0	29.1	10.4	46.6	19.0	3.7
LOS	C	C	A	D	B	A	C	C	B	D	B	A
Approach Delay		32.6			27.3			14.9				26.5
Approach LOS		C			C			B				C

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBL and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	23.9
Intersection Capacity Utilization:	62.9%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 7: Montrose Road & Biggar Road/Lyons Creek Road



Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Sensitivity - OPG Crossing
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	37	264	3	602	307	87	5	185	604	171	241	72
v/c Ratio	0.22	0.41	0.01	0.78	0.19	0.12	0.02	0.22	0.76	0.53	0.18	0.12
Control Delay	33.7	32.8	0.0	38.7	12.0	2.3	31.0	29.1	10.4	46.6	19.0	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	32.8	0.0	38.7	12.0	2.3	31.0	29.1	10.4	46.6	19.0	3.7
Queue Length 50th (m)	5.9	22.3	0.0	52.5	15.5	0.0	0.7	14.3	0.0	15.1	14.2	0.0
Queue Length 95th (m)	14.2	32.2	0.0	66.6	18.1	5.4	3.9	25.0	#53.5	#34.6	26.6	6.6
Internal Link Dist (m)		483.4		397.7				192.1			126.6	
Turn Bay Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Base Capacity (vph)	219	792	446	946	1936	838	246	829	797	321	1346	612
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	0.17	0.33	0.01	0.64	0.16	0.10	0.02	0.22	0.76	0.53	0.18	0.12

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

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Sensitivity - OPG Crossing
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖↖	↖↖	↖	↖	↖↖	↖	↖↖	↖↖	↖
Traffic Volume (vph)	34	243	3	554	282	80	5	170	556	157	222	66
Future Volume (vph)	34	243	3	554	282	80	5	170	556	157	222	66
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit 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)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Fit Permitted	0.56	1.00	1.00	0.95	1.00	1.00	0.60	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	989	3197	1488	3131	3228	1390	1053	3197	1430	3101	3260	1430
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	264	3	602	307	87	5	185	604	171	241	72
RTOR Reduction (vph)	0	0	2	0	0	46	0	0	462	0	0	44
Lane Group Flow (vph)	37	264	1	602	307	41	5	185	142	171	241	28
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4		4			8	2		2			6
Actuated Green, G (s)	15.7	15.7	15.7	22.3	42.5	42.5	21.1	21.1	21.1	9.3	34.9	34.9
Effective Green, g (s)	15.7	18.0	15.7	22.3	44.8	42.5	21.1	23.4	21.1	9.3	37.2	34.9
Actuated g/C Ratio	0.17	0.20	0.17	0.25	0.50	0.47	0.23	0.26	0.23	0.10	0.41	0.39
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	172	639	259	775	1606	656	246	831	335	320	1347	554
v/s Ratio Prot		c0.08		c0.19	0.10			0.06		c0.06	0.07	
v/s Ratio Perm	0.04		0.00			0.03	0.00		c0.10			0.02
v/c Ratio	0.22	0.41	0.00	0.78	0.19	0.06	0.02	0.22	0.42	0.53	0.18	0.05
Uniform Delay, d1	31.9	31.4	30.7	31.5	12.5	12.9	26.5	26.2	29.3	38.3	16.7	17.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.2	0.0	4.9	0.2	0.1	0.2	0.6	3.9	1.7	0.3	0.2
Delay (s)	33.6	32.6	30.7	36.4	12.7	13.0	26.7	26.8	33.2	40.0	17.0	17.4
Level of Service	C	C	C	D	B	B	C	C	C	D	B	B
Approach Delay (s)		32.7			27.1			31.6			25.2	
Approach LOS		C			C			C			C	

Intersection Summary
HCM 2000 Control Delay 28.8 HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio 0.53
Actuated Cycle Length (s) 90.0 Sum of lost time (s) 17.0
Intersection Capacity Utilization 62.9% ICU Level of Service B
Analysis Period (min) 15
c Critical Lane Group

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Sensitivity - OPG Crossing
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	49	3	3	3	10	10	3	535	2	3	519	42
Future Volume (vph)	49	3	3	3	10	10	3	535	2	3	519	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.993			0.941						0.990	
Flt Protected		0.957			0.994							
Satd. Flow (prot)	0	1634	0	0	1637	0	0	1697	0	0	1729	0
Flt Permitted		0.957			0.994							
Satd. Flow (perm)	0	1634	0	0	1637	0	0	1697	0	0	1729	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	2		8	8		2	11		5	5		11
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	33%	3%	0%	0%	0%	3%
Adj. Flow (vph)	53	3	3	3	11	11	3	575	2	3	558	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	0	0	25	0	0	580	0	0	606	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	52.2%					ICU Level of Service A						
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Sensitivity - OPG Crossing
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	49	3	3	3	10	10	3	535	2	3	519	42
Future Volume (vph)	49	3	3	3	10	10	3	535	2	3	519	42
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	53	3	3	3	11	11	3	575	2	3	558	45
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	59	25	580	606								
Volume Left (vph)	53	3	3	3								
Volume Right (vph)	3	11	2	45								
Hadj (s)	0.18	-0.24	0.05	-0.04								
Departure Headway (s)	6.9	6.6	5.0	4.9								
Degree Utilization, x	0.11	0.05	0.80	0.82								
Capacity (veh/h)	485	491	708	721								
Control Delay (s)	10.8	9.9	25.2	26.2								
Approach Delay (s)	10.8	9.9	25.2	26.2								
Approach LOS	B	A	D	D								
Intersection Summary												
Delay				24.7								
Level of Service	C											
Intersection Capacity Utilization	52.2%				ICU Level of Service				A			
Analysis Period (min)	15											

Lanes, Volumes, Timings
9: Dorchester Road & OPG Crossing/Oldfield Road

Sensitivity - OPG Crossing
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	0	0	215	117	63	0	228	377	71	82	418	0
Future Volume (vph)	0	0	215	117	63	0	228	377	71	82	418	0
Ideal Flow (vphpl)	1900	1900	1900	1750	1900	1750	1900	1750	1750	1750	1750	1900
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	1	0	1	0	0	0
Taper Length (m)	7.5			7.5			7.5		7.5			7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865						0.976				
Flt Protected					0.967		0.950			0.950		
Satd. Flow (prot)	0	1611	0	0	1826	0	1770	1708	0	1646	1750	0
Flt Permitted					0.587		0.375			0.347		
Satd. Flow (perm)	0	1611	0	0	1108	0	699	1708	0	601	1750	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		293					23					
Link Speed (k/h)	50			50			60			60		
Link Distance (m)	863.7			1040.1			438.6			461.8		
Travel Time (s)	62.2			74.9			26.3			27.7		
Peak Hour Factor	0.92	0.92	0.92	0.80	0.92	0.80	0.92	0.80	0.80	0.80	0.80	0.92
Heavy Vehicles (%)	2%	2%	2%	0%	2%	3%	2%	0%	0%	1%	0%	2%
Adj. Flow (vph)	0	0	234	146	68	0	248	471	89	103	523	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	234	0	0	214	0	248	560	0	103	523	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	3.6	0.0	3.6	0.0
Link Offset(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crosswalk Width(m)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.11	1.00	1.11	1.00	1.11	1.11	1.11	1.11	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	NA		Perm	NA		Perm	NA		Perm	NA		NA
Protected Phases	4			8			2			6		

Lanes, Volumes, Timings
9: Dorchester Road & OPG Crossing/Oldfield Road

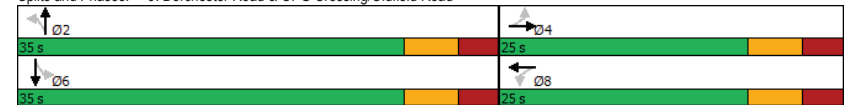
Sensitivity - OPG Crossing
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4						8					6
Detector Phase	4	4					8	8			2	2
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	
Maximum Green (s)	18.0	18.0		18.0	18.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		-3.0			-3.0		-3.0	-3.0		-3.0	-3.0	
Total Lost Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		17.4			17.4		31.5	31.5		31.5	31.5	
Actuated g/C Ratio		0.31			0.31		0.55	0.55		0.55	0.55	
v/c Ratio		0.34			0.63		0.64	0.59		0.31	0.54	
Control Delay		2.4			26.0		20.8	12.1		11.4	11.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		2.4			26.0		20.8	12.1		11.4	11.6	
LOS		A			C		C	B		B	B	
Approach Delay		2.4			26.0		14.7			11.6		
Approach LOS		A			C		B			B		

Intersection Summary


Area Type:	Other
Cycle Length:	60
Actuated Cycle Length:	56.9
Natural Cycle:	60
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	13.4
Intersection Capacity Utilization:	73.0%
ICU Level of Service:	C
Intersection LOS:	B
Analysis Period (min):	15

Splits and Phases: 9: Dorchester Road & OPG Crossing/Oldfield Road



Queues
9: Dorchester Road & OPG Crossing/Oldfield Road

Sensitivity - OPG Crossing
Saturday Peak Hour




Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	234	214	248	560	103	523
v/c Ratio	0.34	0.63	0.64	0.59	0.31	0.54
Control Delay	2.4	26.0	20.8	12.1	11.4	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.4	26.0	20.8	12.1	11.4	11.6
Queue Length 50th (m)	0.0	19.5	17.8	36.5	5.8	34.6
Queue Length 95th (m)	7.3	39.2	#55.7	56.9	13.8	53.0
Internal Link Dist (m)	839.7	1016.1		414.6		437.8
Turn Bay Length (m)				15.0		
Base Capacity (vph)	781	410	386	955	332	968
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.52	0.64	0.59	0.31	0.54

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
9: Dorchester Road & OPG Crossing/Oldfield Road

Sensitivity - OPG Crossing
Saturday Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	0	0	215	117	63	0	228	377	71	82	418	0
Future Volume (vph)	0	0	215	117	63	0	228	377	71	82	418	0
Ideal Flow (vphpl)	1900	1900	1900	1750	1900	1750	1900	1750	1750	1750	1750	1900
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Fr		0.86			1.00		1.00	0.98		1.00	1.00	
Fit Protected		1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1611			1826		1770	1708		1646	1750	
Fit Permitted		1.00			0.59		0.37	1.00		0.35	1.00	
Satd. Flow (perm)		1611			1108		698	1708		600	1750	
Peak-hour factor, PHF	0.92	0.92	0.92	0.80	0.92	0.80	0.92	0.80	0.80	0.80	0.80	0.92
Adj. Flow (vph)	0	0	234	146	68	0	248	471	89	102	522	0
RTOR Reduction (vph)	0	162	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	72	0	0	214	0	248	550	0	103	523	0
Heavy Vehicles (%)	2%	2%	2%	0%	2%	3%	2%	0%	0%	1%	0%	2%
Turn Type	NA		Perm	NA		Perm	NA		Perm	NA		NA
Protected Phases	4			8			2			6		6
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	14.4			14.4			28.5			28.5		28.5
Effective Green, g (s)	17.4			17.4			31.5			31.5		31.5
Actuated g/C Ratio	0.31			0.31			0.55			0.55		0.55
Clearance Time (s)	7.0			7.0			7.0			7.0		7.0
Vehicle Extension (s)	3.0			3.0			3.0			3.0		3.0
Lane Grp Cap (vph)	492			338			386			945		332
v/s Ratio Prot	0.04						0.32					0.30
v/s Ratio Perm				c0.19			c0.36			0.17		
v/c Ratio	0.15			0.63			0.64			0.58		0.54
Uniform Delay, d1	14.3			17.0			8.8			8.4		6.8
Progression Factor	1.00			1.00			1.00			1.00		1.00
Incremental Delay, d2	0.1			3.8			8.0			2.6		2.4
Delay (s)	14.5			20.8			16.8			11.0		9.3
Level of Service	B			C			B			B		A
Approach Delay (s)	14.5			20.8			12.8			10.1		10.1
Approach LOS	B			C			B			B		B

Intersection Summary

HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Sensitivity - OPG Crossing
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	2	30	195	13	38	2	277	504	10	2	494	111
Future Volume (vph)	2	30	195	13	38	2	277	504	10	2	494	111
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.884			0.996			0.998			0.975	
Fit Protected					0.988			0.983				
Satd. Flow (prot)	0	1547	0	0	1722	0	0	1706	0	0	1706	0
Fit Permitted					0.988			0.983				
Satd. Flow (perm)	0	1547	0	0	1722	0	0	1706	0	0	1706	0
Link Speed (k/h)		60			60			70			60	
Link Distance (m)		372.3			519.4			156.9			312.6	
Travel Time (s)		22.3			31.2			8.1			18.8	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	2	36	232	15	45	2	330	600	12	2	588	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	0	0	62	0	0	942	0	0	722	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	106.8%
Analysis Period (min)	15
	ICU Level of Service G

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Sensitivity - OPG Crossing
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	2	30	195	13	38	2	277	504	10	2	494	111
Future Volume (Veh/h)	2	30	195	13	38	2	277	504	10	2	494	111
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	2	36	232	15	45	2	330	600	12	2	588	132
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	1948	1930	654	2174	1990	606	720				612	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1948	1930	654	2174	1990	606	720				612	
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 %	0	15	51	0	0	100	63				100	
cM capacity (veh/h)	0	42	470	4	39	501	891				977	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	270	62	942	722								
Volume Left	2	15	330	2								
Volume Right	232	2	12	132								
eSH	0	12	891	977								
Volume to Capacity	Err	5.30	0.37	0.00								
Queue Length 95th (m)	Err	Err	13.8	0.0								
Control Delay (s)	Err	Err	8.3	0.1								
Lane LOS	F	F	A	A								
Approach Delay (s)	Err	Err	8.3	0.1								
Approach LOS	F	F										

Intersection Summary	
Average Delay	Err
Intersection Capacity Utilization	106.8%
Analysis Period (min)	15
	ICU Level of Service G

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Sensitivity - OPG Crossing
Saturday Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↔	↕
Traffic Volume (vph)	543	518	444	124	115	339
Future Volume (vph)	543	518	444	124	115	339
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.971			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1646	1750	1692	0	1662	1488
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1646	1750	1692	0	1662	1488
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	584	557	477	133	124	365
Shared Lane Traffic (%)						
Lane Group Flow (vph)	584	557	610	0	124	365
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control		Stop	Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	83.1%		ICU Level of Service E			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

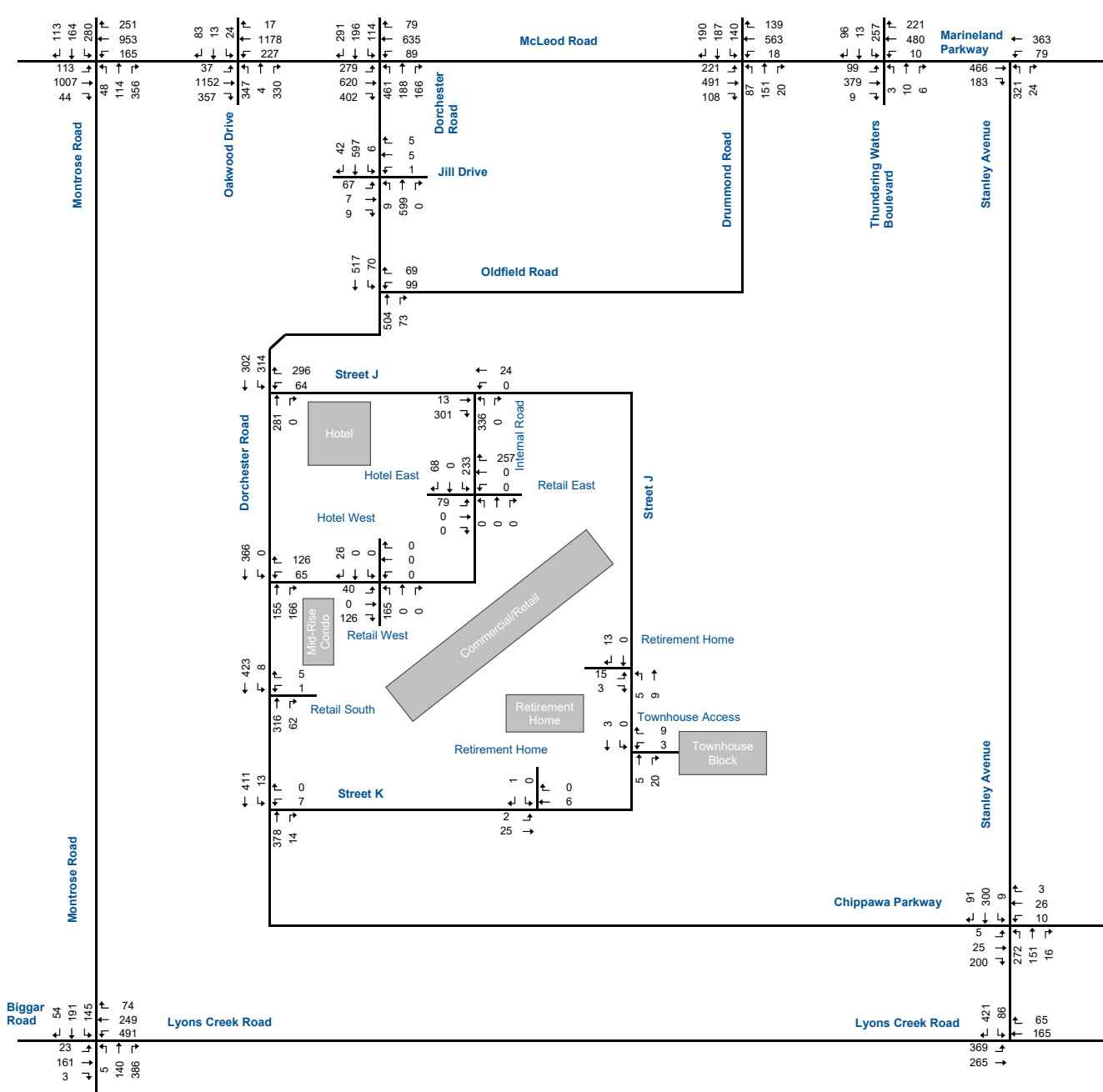
Sensitivity - OPG Crossing
Saturday Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↔		↔	↕
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	543	518	444	124	115	339
Future Volume (vph)	543	518	444	124	115	339
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	584	557	477	133	124	365
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	584	557	610	124	365	
Volume Left (vph)	584	0	0	124	0	
Volume Right (vph)	0	0	133	0	365	
Hadj (s)	0.52	0.00	-0.12	0.50	-0.70	
Departure Headway (s)	7.6	7.1	6.8	8.3	7.1	
Degree Utilization, x	1.24	1.10	1.15	0.29	0.72	
Capacity (veh/h)	478	520	535	430	499	
Control Delay (s)	146.3	94.3	112.5	13.4	24.9	
Approach Delay (s)	120.9		112.5	22.0		
Approach LOS	F		F	C		
Intersection Summary						
Delay	97.0					
Level of Service	F					
Intersection Capacity Utilization	83.1%		ICU Level of Service E			
Analysis Period (min)	15					

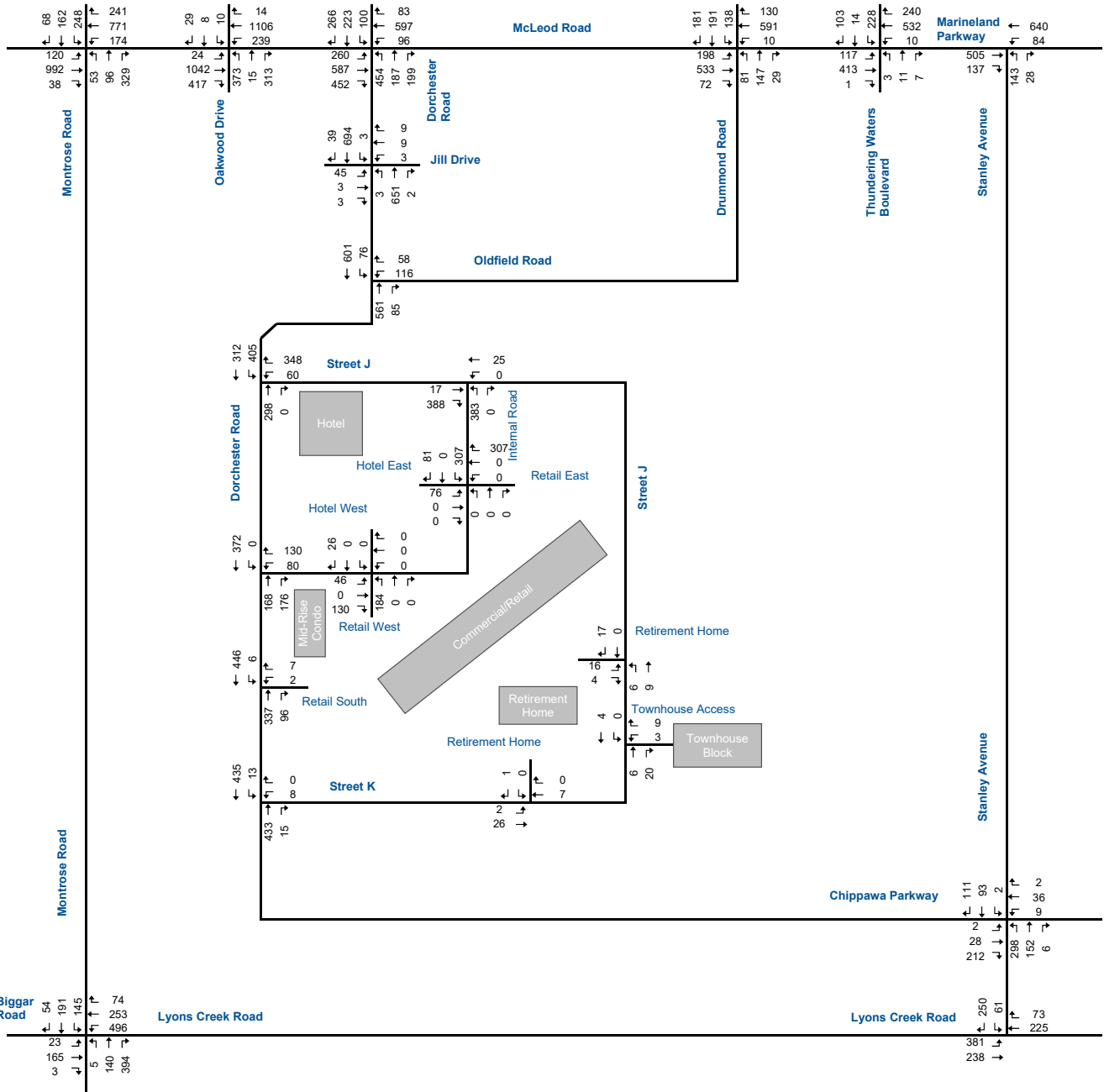
Appendix J

Isolated Traffic Projections





Future Isolated Traffic Volumes Weekday PM Peak Hour



Future Isolated Traffic Volumes Saturday Peak Hour

Appendix K

Synchro Reports – Isolated Traffic



Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	99	836	20	94	721	205	21	61	140	156	70	75
Future Volume (vph)	99	836	20	94	721	205	21	61	140	156	70	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0		0.0	115.0		0.0	130.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00					0.99
Frt		0.996					0.850			0.850		0.922
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1498	4480	0	1484	3228	1430	1662	3023	1340	1583	2890	0
Fit Permitted	0.212			0.210			0.653			0.645		
Satd. Flow (perm)	334	4480	0	328	3228	1430	1141	3023	1340	1075	2890	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				220			151			81
Link Speed (k/h)		50			50			50				50
Link Distance (m)		759.2			692.3			721.0				213.3
Travel Time (s)		54.7			49.8			51.9				15.4
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	11%	6%	15%	12%	3%	4%	0%	10%	11%	5%	11%	0%
Adj. Flow (vph)	106	899	22	101	775	220	23	66	151	168	75	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	921	0	101	775	220	23	66	151	168	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1		2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0		10.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0		0.6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		2	6	
Permitted Phases	4			8		8	2			2	6	
Detector Phase	7	4		3	8	8	5	2		2	1	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0		8.0	6.0	8.0
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0		46.0	9.5	46.0
Total Split (s)	17.8	51.9		17.9	52.0	52.0	9.5	46.0		46.0	14.2	50.7
Total Split (%)	13.7%	39.9%		13.8%	40.0%	40.0%	7.3%	35.4%		35.4%	10.9%	39.0%
Maximum Green (s)	14.8	43.9		14.9	44.0	44.0	6.5	38.0		38.0	11.2	42.7
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0		4.0	0.0	4.0
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0		-4.0	1.0	-4.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	None	Max
Walk Time (s)		12.0			12.0	12.0		14.0		14.0		14.0
Flash Dont Walk (s)		20.0			20.0	20.0		24.0		24.0		24.0
Pedestrian Calls (#/hr)		0			0	0		0		0		0
Act Effct Green (s)	62.0	53.1		61.6	52.9	52.9	47.7	42.5		42.5	56.2	50.6
Actuated g/C Ratio	0.48	0.41		0.47	0.41	0.41	0.37	0.33		0.33	0.43	0.39
v/c Ratio	0.44	0.50		0.44	0.59	0.31	0.05	0.07		0.28	0.33	0.13
Control Delay	23.3	30.1		8.3	15.9	5.5	22.0	30.7		6.2	25.7	13.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	23.3	30.1		8.3	15.9	5.5	22.0	30.7		6.2	25.7	13.6
LOS	C	C		A	B	A	C	C		A	C	B
Approach Delay		29.4			13.1			14.5				19.9
Approach LOS		C			B			B				B
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	105											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.59											
Intersection Signal Delay:	20.2						Intersection LOS: C					
Intersection Capacity Utilization:	69.3%						ICU Level of Service C					
Analysis Period (min):	15											
Splits and Phases:	1: Montrose Road & McLeod Road											

Queues
1: Montrose Road & McLeod Road

Isolated
AM Peak Hour

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	106	921	101	775	220	23	66	151	168	156
v/c Ratio	0.44	0.50	0.44	0.59	0.31	0.05	0.07	0.28	0.33	0.13
Control Delay	23.3	30.1	8.3	15.9	5.5	22.0	30.7	6.2	25.7	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	30.1	8.3	15.9	5.5	22.0	30.7	6.2	25.7	13.6
Queue Length 50th (m)	14.8	66.6	3.9	88.5	16.5	3.5	6.4	0.0	28.3	6.9
Queue Length 95th (m)	25.8	84.4	m4.0	111.3	m25.8	9.2	12.2	15.5	45.2	15.0
Internal Link Dist (m)		735.2		668.3			697.0			189.3
Turn Bay Length (m)	55.0		155.0			115.0			130.0	
Base Capacity (vph)	291	1831	288	1313	712	442	987	539	504	1174
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.50	0.35	0.59	0.31	0.05	0.07	0.28	0.33	0.13
Intersection Summary										
m Volume for 95th percentile queue is metered by upstream signal.										

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Isolated
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔		↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	99	836	20	94	721	205	21	61	140	156	70	75
Future Volume (vph)	99	836	20	94	721	205	21	61	140	156	70	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1498	4482		1484	3228	1430	1661	3023	1340	1583	2891	
Flt Permitted	0.21	1.00		0.21	1.00	1.00	0.65	1.00	1.00	0.65	1.00	
Satd. Flow (perm)	334	4482		328	3228	1430	1142	3023	1340	1075	2891	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	106	899	22	101	775	220	23	66	151	168	75	81
RTOR Reduction (vph)	0	2	0	0	0	133	0	0	100	0	49	0
Lane Group Flow (vph)	106	919	0	101	775	87	23	66	51	168	107	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	11%	6%	15%	12%	3%	4%	0%	10%	11%	5%	11%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	57.8	47.9		57.4	47.7	47.7	43.5	39.7	39.7	53.4	46.6	
Effective Green, g (s)	55.8	51.9		55.4	51.7	51.7	41.5	43.7	43.7	52.4	50.6	
Actuated g/C Ratio	0.43	0.40		0.43	0.40	0.40	0.32	0.34	0.34	0.40	0.39	
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	223	1789		217	1283	568	375	1016	450	471	1125	
v/s Ratio Prot	c0.03	0.21		0.03	c0.24		0.00	0.02		c0.03	0.04	
v/s Ratio Perm	0.17			0.17		0.06	0.02		0.04	c0.12		
v/c Ratio	0.48	0.51		0.47	0.60	0.15	0.06	0.06	0.11	0.36	0.09	
Uniform Delay, d1	24.5	29.5		23.9	31.0	25.1	30.5	29.3	29.8	26.0	25.2	
Progression Factor	1.00	1.00		0.23	0.47	1.37	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	1.1		0.8	1.6	0.4	0.1	0.1	0.5	0.3	0.2	
Delay (s)	25.7	30.6		6.3	16.1	34.7	30.6	29.4	30.3	26.3	25.3	
Level of Service	C	C		A	B	C	C	C	C	C	C	
Approach Delay (s)		30.1			18.9			30.1			25.8	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			25.0			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			69.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	37	699	263	163	1080	19	165	15	154	11	4	16
Future Volume (vph)	37	699	263	163	1080	19	165	15	154	11	4	16
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0		0.0	80.0		0.0	95.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		1.00	1.00				0.99
Frt			0.850		0.997				0.850			0.880
Flt Protected	0.950			0.950			0.950	0.960		0.950		
Satd. Flow (prot)	1583	3167	1365	1511	3216	0	1462	1496	1403	1662	1388	0
Flt Permitted	0.139			0.239			0.950	0.960		0.950		
Satd. Flow (perm)	232	3167	1365	380	3216	0	1461	1495	1403	1662	1388	0
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)			268		1				157			16
Link Speed (k/h)		50			50			50				50
Link Distance (m)		692.3			616.3			360.6				181.9
Travel Time (s)		49.8			44.4			26.0				13.1
Confl. Peds. (#/hr)	2					2	1					1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	5%	9%	10%	3%	5%	8%	0%	6%	0%	25%	6%
Adj. Flow (vph)	38	713	268	166	1102	19	168	15	157	11	4	16
Shared Lane Traffic (%)							46%					
Lane Group Flow (vph)	38	713	268	166	1121	0	91	92	157	11	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0		10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0		0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	25.0	49.0	49.0	25.0	49.0		28.0	28.0	28.0	28.0	28.0	
Total Split (%)	19.2%	37.7%	37.7%	19.2%	37.7%		21.5%	21.5%	21.5%	21.5%	21.5%	
Maximum Green (s)	22.0	41.0	41.0	22.0	41.0		19.0	19.0	19.0	19.0	19.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	60.2	54.5	49.5	70.0	62.1		24.0	24.0	24.0	24.0	24.0	
Actuated g/C Ratio	0.46	0.42	0.38	0.54	0.48		0.18	0.18	0.18	0.18	0.18	
v/c Ratio	0.23	0.54	0.39	0.55	0.73		0.34	0.33	0.41	0.04	0.07	
Control Delay	13.9	17.7	5.8	22.7	31.4		50.2	50.0	10.1	44.1	22.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	13.9	17.7	5.8	22.7	31.4		50.2	50.0	10.1	44.1	22.1	
LOS	B	B	A	C	C		D	D	B	D	C	
Approach Delay		14.4			30.2			31.6			29.9	
Approach LOS		B			C			C			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.73											
Intersection Signal Delay:	24.4						Intersection LOS: C					
Intersection Capacity Utilization:	84.7%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	2: Oakwood Drive & McLeod Road											

Queues
2: Oakwood Drive & McLeod Road

Isolated
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	713	268	166	1121	91	92	157	11	20
v/c Ratio	0.23	0.54	0.39	0.55	0.73	0.34	0.33	0.41	0.04	0.07
Control Delay	13.9	17.7	5.8	22.7	31.4	50.2	50.0	10.1	44.1	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	17.7	5.8	22.7	31.4	50.2	50.0	10.1	44.1	22.1
Queue Length 50th (m)	1.4	79.4	28.1	22.4	127.5	22.7	22.9	0.0	2.5	0.9
Queue Length 95th (m)	m6.7	109.4	58.6	35.9	159.6	41.1	41.3	19.5	8.2	8.5
Internal Link Dist (m)		668.3			592.3			336.6		157.9
Turn Bay Length (m)	50.0			80.0		95.0			20.0	
Base Capacity (vph)	343	1327	685	387	1536	269	276	387	306	269
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.54	0.39	0.43	0.73	0.34	0.33	0.41	0.04	0.07

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Isolated
AM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations												
Traffic Volume (vph)	37	699	263	163	1080	19	165	15	154	11	4	16
Future Volume (vph)	37	699	263	163	1080	19	165	15	154	11	4	16
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3167	1365	1511	3218		1462	1496	1403	1662	1388	
Flt Permitted	0.14	1.00	1.00	0.24	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	232	3167	1365	380	3218		1462	1496	1403	1662	1388	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	38	713	268	166	1102	19	168	15	157	11	4	16
RTOR Reduction (vph)	0	0	166	0	1	0	0	0	128	0	13	0
Lane Group Flow (vph)	38	713	102	166	1120	0	91	92	29	11	7	0
Confl. Peds. (#/hr)		2				2	1					1
Heavy Vehicles (%)	5%	5%	9%	10%	3%	5%	8%	0%	6%	0%	25%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	56.0	50.5	50.5	66.0	57.5		19.0	19.0	19.0	19.0	19.0	
Effective Green, g (s)	54.0	54.5	49.5	65.0	61.5		24.0	24.0	24.0	24.0	24.0	
Actuated g/C Ratio	0.42	0.42	0.38	0.50	0.47		0.18	0.18	0.18	0.18	0.18	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	143	1327	519	290	1522		269	276	259	306	256	
v/s Ratio Prot	0.01	0.23		c0.05	c0.35		c0.06	0.06		c0.01	0.01	
v/s Ratio Perm	0.10		0.07	0.24					0.02			
v/c Ratio	0.27	0.54	0.20	0.57	0.74		0.34	0.33	0.11	0.04	0.03	
Uniform Delay, d1	24.9	28.3	26.9	20.4	27.7		46.1	46.0	44.1	43.5	43.4	
Progression Factor	0.74	0.56	1.25	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	1.4	0.8	2.2	3.2		3.4	3.2	0.9	0.2	0.2	
Delay (s)	19.0	17.2	34.4	22.6	30.9		49.5	49.3	45.0	43.7	43.6	
Level of Service	B	B	C	C	C		D	D	D	D	D	
Approach Delay (s)		21.8			29.8			47.4			43.7	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay		29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.51		
Actuated Cycle Length (s)		130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization		84.7%	ICU Level of Service	E
Analysis Period (min)		15		

c Critical Lane Group

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	225	466	170	62	546	97	389	218	128	95	138	258
Future Volume (vph)	225	466	170	62	546	97	389	218	128	95	138	258
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0	0.0	15.0	0.0	30.0	0.0	30.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	2	0	1	0	1	0	0	0
Taper Length (m)	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	0.0	0.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.98	0.98	0.98	0.99	0.99	0.98	0.98	0.97	0.98	0.98	0.98
Frt	0.960			0.977			0.944			0.902		
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1554	3016	0	1599	3076	0	3101	1545	0	1568	1462	0
Flt Permitted	0.152			0.386			0.950			0.950		
Satd. Flow (perm)	248	3016	0	636	3076	0	3068	1545	0	1521	1462	0
Right Turn on Red		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		56			17			27			78	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		616.3			1045.5			348.9			308.0	
Travel Time (s)		44.4			75.3			25.1			22.2	
Confl. Peds. (#/hr)	7		21	21		7	10		44	44		10
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%
Adj. Flow (vph)	247	512	187	68	600	107	427	240	141	104	152	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	247	699	0	68	707	0	427	381	0	104	436	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		8	8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	7	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.4		30.4	30.4		9.5	37.7		9.5	37.7	
Total Split (s)	22.0	59.1		37.1	37.1		23.0	46.4		15.6	39.0	
Total Split (%)	18.2%	48.8%		30.6%	30.6%		19.0%	38.3%		12.9%	32.2%	
Maximum Green (s)	19.0	52.7		30.7	30.7		20.0	39.7		12.6	32.3	
Yellow Time (s)	3.0	4.1		4.1	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.3		2.3	2.3		0.0	2.6		0.0	2.6	
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	
Total Lost Time (s)	4.0	4.0		7.4	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		9.0		9.0	9.0			12.0			12.0	
Flash Dont Walk (s)		15.0		15.0	15.0			19.0			19.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	56.6	56.6		32.7	36.1		18.5	41.9		10.6	34.0	
Actuated g/C Ratio	0.47	0.47		0.27	0.30		0.15	0.35		0.09	0.28	
v/c Ratio	0.84	0.49		0.40	0.76		0.90	0.69		0.76	0.94	
Control Delay	49.8	22.0		46.7	44.8		73.8	38.9		86.7	63.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	49.8	22.0		46.7	44.8		73.8	38.9		86.7	63.4	
LOS	D	C		D	D		E	D		F	E	
Approach Delay		29.2			45.0			57.4			67.9	
Approach LOS		C			D			E			E	
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	100											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.94											
Intersection Signal Delay:	47.4						Intersection LOS: D					
Intersection Capacity Utilization:	84.7%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											

Queues
3: Dorchester Road & McLeod Road

Isolated
AM Peak Hour

	↖	→	↘	←	↙	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	247	699	68	707	427	381	104	436
v/c Ratio	0.84	0.49	0.40	0.76	0.90	0.69	0.76	0.94
Control Delay	49.8	22.0	46.7	44.8	73.8	38.9	86.7	63.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	22.0	46.7	44.8	73.8	38.9	86.7	63.4
Queue Length 50th (m)	39.2	58.2	14.5	85.7	54.5	75.5	25.6	89.4
Queue Length 95th (m)	#81.7	76.0	30.4	110.3	#82.5	112.6	#52.5	#153.5
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	309	1439	171	930	486	561	150	478
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	0.80	0.49	0.40	0.76	0.88	0.68	0.69	0.91

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Isolated
AM Peak Hour

	↖	→	↘	↙	←	↗	↖	↗	↑	↘	↙	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗	↖↗	↖	↖	↖	↖	↖
Traffic Volume (vph)	225	466	170	62	546	97	389	218	128	95	138	258		
Future Volume (vph)	225	466	170	62	546	97	389	218	128	95	138	258		
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		7.4	4.0		4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.98		1.00	0.98		1.00	0.98
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.96		1.00	0.98		1.00	0.94		1.00	0.90		1.00	0.90
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1553	3015		1566	3077		3101	1545		1568	1463		1568	1463
Flt Permitted	0.15	1.00		0.39	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	248	3015		636	3077		3101	1545		1568	1463		1568	1463
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	247	512	187	68	600	107	427	240	141	104	152	284		
RTOR Reduction (vph)	0	30	0	0	12	0	0	18	0	0	56	0		
Lane Group Flow (vph)	247	669	0	68	695	0	427	363	0	104	380	0		
Confl. Peds. (#/hr)	7		21	21		7	10		44	44		10		
Heavy Vehicles (%)	7%	3%	6%	4%	5%	5%	4%	3%	7%	6%	5%	7%		
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA			
Protected Phases	7	4			8		5	2		1	6			
Permitted Phases	4			8										
Actuated Green, G (s)	54.2	54.2		33.7	33.7		19.5	39.2		11.6	31.3			
Effective Green, g (s)	53.2	56.6		32.7	36.1		18.5	41.9		10.6	34.0			
Actuated g/C Ratio	0.44	0.47		0.27	0.30		0.15	0.35		0.09	0.28			
Clearance Time (s)	3.0	6.4		6.4	6.4		3.0	6.7		3.0	6.7			
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	286	1409		171	917		473	534		137	410			
v/s Ratio Prot	c0.12	0.22			0.23		c0.14	0.24		0.07	c0.26			
v/s Ratio Perm	c0.26			0.11										
v/c Ratio	0.86	0.47		0.40	0.76		0.90	0.68		0.76	0.93			
Uniform Delay, d1	26.0	22.1		36.1	38.5		50.4	33.9		54.0	42.3			
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00			
Incremental Delay, d2	22.6	1.1		6.8	5.8		20.3	3.6		21.1	26.7			
Delay (s)	48.6	23.2		42.9	44.4		70.7	37.4		75.1	69.1			
Level of Service	D	C		D	D		E	D		E	E			
Approach Delay (s)		29.8			44.2			55.0			70.2			
Approach LOS		C			D			E			E			

Intersection Summary

HCM 2000 Control Delay	47.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔		↔		
Traffic Volume (vph)	150	450	56	9	371	114	104	199	17	78	114	152
Future Volume (vph)	150	450	56	9	371	114	104	199	17	78	114	152
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			0.99			1.00			0.99		0.99
Frt	0.987			0.965			0.993			0.914		
Flt Protected	0.989			0.999			0.984			0.950		
Satd. Flow (prot)	0	3148	0	0	3030	0	0	1616	0	1646	1478	0
Flt Permitted	0.663			0.939			0.710			0.499		
Satd. Flow (perm)	0	2108	0	0	2848	0	0	1165	0	858	1478	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			45			3			82	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1045.5			1070.0			834.0			207.0	
Travel Time (s)		75.3			77.0			60.0			14.9	
Confl. Peds. (#/hr)	7		3	3		7	4		13	13		4
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
Heavy Vehicles (%)	5%	2%	4%	56%	4%	4%	4%	7%	0%	1%	10%	5%
Adj. Flow (vph)	167	500	62	10	412	127	116	221	19	87	127	169
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	729	0	0	549	0	0	356	0	87	296	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	30.5		30.5	30.5		30.8	30.8		30.8	30.8	
Total Split (s)	9.5	54.3		44.8	44.8		49.0	49.0		49.0	49.0	
Total Split (%)	9.2%	52.6%		43.4%	43.4%		47.4%	47.4%		47.4%	47.4%	
Maximum Green (s)	6.5	47.8		38.3	38.3		42.2	42.2		42.2	42.2	
Yellow Time (s)	3.0	4.1		4.1	4.1		4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	2.4		2.4	2.4		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		-2.5			-2.5			-2.8			-2.8	
Total Lost Time (s)		4.0			4.0			4.0			4.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Walk Time (s)		9.0			9.0			9.0			9.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)		50.3			50.3			45.0			45.0	
Actuated g/C Ratio		0.49			0.49			0.44			0.44	
v/c Ratio		0.71			0.39			0.70			0.23	0.43
Control Delay		24.9			16.3			32.4			20.5	16.5
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		24.9			16.3			32.4			20.5	16.5
LOS		C			B			C			C	B
Approach Delay		24.9			16.3			32.4			17.4	
Approach LOS		C			B			C			B	
Intersection Summary												
Area Type:	Other											
Cycle Length:	103.3											
Actuated Cycle Length:	103.3											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	75											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.71											
Intersection Signal Delay:	22.5						Intersection LOS: C					
Intersection Capacity Utilization:	93.5%						ICU Level of Service F					
Analysis Period (min):	15											
Splits and Phases:	4: Drummond Road & McLeod Road											

Queues
4: Drummond Road & McLeod Road

Isolated
AM Peak Hour

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	729	549	356	87	296
v/c Ratio	0.71	0.39	0.70	0.23	0.43
Control Delay	24.9	16.3	32.4	20.5	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	16.3	32.4	20.5	16.5
Queue Length 50th (m)	60.1	34.0	59.1	11.3	29.7
Queue Length 95th (m)	83.6	47.3	96.0	22.9	52.8
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	1033	1409	509	373	690
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.71	0.39	0.70	0.23	0.43
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Isolated
AM Peak Hour

	↘	→	↙	↘	←	↙	↑	↘	↙	↓	↘	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↔	↔	
Traffic Volume (vph)	150	450	56	9	371	114	104	199	17	78	114	152
Future Volume (vph)	150	450	56	9	371	114	104	199	17	78	114	152
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Frbp, ped/bikes		1.00			0.99			1.00		1.00		0.99
Flpb, ped/bikes		1.00			1.00			1.00		0.99		1.00
Frt		0.99			0.97			0.99		1.00		0.91
Flt Protected		0.99			1.00			0.98		0.95		1.00
Satd. Flow (prot)		3144			3031			1614		1633		1479
Flt Permitted		0.66			0.94			0.71		0.50		1.00
Satd. Flow (perm)		2107			2850			1165		858		1479
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)	167	500	62	10	412	127	116	221	19	87	127	169
RTOR Reduction (vph)	0	7	0	0	23	0	0	2	0	0	46	0
Lane Group Flow (vph)	0	722	0	0	526	0	0	354	0	87	250	0
Confl. Peds. (#/hr)	7		3	3		7	4		13	13		4
Heavy Vehicles (%)	5%	2%	4%	56%	4%	4%	4%	7%	0%	1%	10%	5%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2				6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		47.8			47.8			42.2		42.2		42.2
Effective Green, g (s)		50.3			50.3			45.0		45.0		45.0
Actuated g/C Ratio		0.49			0.49			0.44		0.44		0.44
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5
Lane Grp Cap (vph)		1025			1387			507		373		644
v/s Ratio Prot												0.17
v/s Ratio Perm		c0.34			0.18			c0.30		0.10		
v/c Ratio		0.70			0.38			0.70		0.23		0.39
Uniform Delay, d1		20.7			16.7			23.7		18.3		19.8
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		2.1			0.8			7.8		1.5		1.8
Delay (s)		22.8			17.5			31.4		19.8		21.6
Level of Service		C			B			C		B		C
Approach Delay (s)		22.8			17.5			31.4				21.1
Approach LOS		C			B			C				C
Intersection Summary												
HCM 2000 Control Delay					22.5							C
HCM 2000 Volume to Capacity ratio					0.72							
Actuated Cycle Length (s)					103.3					Sum of lost time (s)		11.0
Intersection Capacity Utilization					93.5%					ICU Level of Service		F
Analysis Period (min)					15							
c Critical Lane Group												

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	94	294	5	2	362	176	3	11	6	161	4	39
Future Volume (vph)	94	294	5	2	362	176	3	11	6	161	4	39
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.98						
Frt			0.850			0.850			0.957			0.863
Flt Protected	0.950			0.950			0.993		0.950			
Satd. Flow (prot)	1599	3228	1488	1662	3137	1417	0	1663	0	1539	1339	0
Flt Permitted	0.399			0.554			0.993		0.950			
Satd. Flow (perm)	671	3228	1488	970	3137	1385	0	1663	0	1539	1339	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			196			7			43
Link Speed (k/h)		50			50				50			50
Link Distance (m)		1070.0			261.8				326.3			294.0
Travel Time (s)		77.0			18.8				23.5			21.2
Confl. Peds. (#/hr)	1					1						
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
Heavy Vehicles (%)	4%	3%	0%	0%	6%	5%	0%	0%	0%	8%	0%	14%
Adj. Flow (vph)	104	327	6	2	402	196	3	12	7	179	4	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	327	6	2	402	196	0	22	0	179	47	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				3.6			3.6
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	Split	NA			
Protected Phases	7	4			8		2	2		6	6				
Permitted Phases	4		4	8		8									
Detector Phase	7	4	4	8	8	8	2	2		6	6				
Switch Phase															
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0				
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2				
Total Split (s)	16.0	57.2	57.2	41.2	41.2	41.2	37.2	37.2		37.2	37.2				
Total Split (%)	12.2%	43.5%	43.5%	31.3%	31.3%	31.3%	28.3%	28.3%		28.3%	28.3%				
Maximum Green (s)	13.0	50.0	50.0	34.0	34.0	34.0	30.0	30.0		30.0	30.0				
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1				
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1				
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2	-3.2				
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
Lead/Lag	Lead			Lag	Lag	Lag									
Lead-Lag Optimize?															
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None				
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0				
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0				
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0				
Act Effct Green (s)	61.8	61.8	61.8	48.9	48.9	48.9		33.2		24.6	24.6				
Actuated g/C Ratio	0.47	0.47	0.47	0.37	0.37	0.37		0.25		0.19	0.19				
v/c Ratio	0.28	0.22	0.01	0.01	0.34	0.31		0.05		0.62	0.16				
Control Delay	23.4	22.0	0.0	31.5	32.6	5.9		28.9		58.2	14.4				
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0				
Total Delay	23.4	22.0	0.0	31.5	32.6	5.9		28.9		58.2	14.4				
LOS	C	C	A	C	C	A		C		E	B				
Approach Delay		22.1			23.9			28.9			49.1				
Approach LOS		C			C			C			D				
Intersection Summary															
Area Type:	Other														
Cycle Length:	131.6														
Actuated Cycle Length:	131.6														
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green														
Natural Cycle:	125														
Control Type:	Actuated-Coordinated														
Maximum v/c Ratio:	0.62														
Intersection Signal Delay:	27.8						Intersection LOS: C								
Intersection Capacity Utilization:	58.7%						ICU Level of Service B								
Analysis Period (min):	15														
Splits and Phases:	5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway														

Queues
5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Isolated

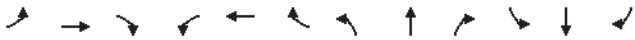


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	104	327	6	2	402	196	22	179	47
v/c Ratio	0.28	0.22	0.01	0.01	0.34	0.31	0.05	0.62	0.16
Control Delay	23.4	22.0	0.0	31.5	32.6	5.9	28.9	58.2	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	22.0	0.0	31.5	32.6	5.9	28.9	58.2	14.4
Queue Length 50th (m)	15.8	27.1	0.0	0.3	41.2	0.0	3.1	45.5	0.9
Queue Length 95th (m)	30.7	41.8	0.0	2.6	64.0	18.5	10.4	66.6	11.3
Internal Link Dist (m)	1046.0			237.8			302.3		
Turn Bay Length (m)	60.0	50.0	25.0	80.0					
Base Capacity (vph)	401	1515	749	360	1166	638	424	388	369
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	0.26	0.22	0.01	0.01	0.34	0.31	0.05	0.46	0.13

Intersection Summary

HCM Signalized Intersection Capacity Analysis
5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Isolated



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔		↔↔		↔	↔	
Traffic Volume (vph)	94	294	5	2	362	176	3	11	6	161	4	39
Future Volume (vph)	94	294	5	2	362	176	3	11	6	161	4	39
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	0.96	1.00	0.86	1.00	0.86	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.99	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1598	3228	1488	1662	3137	1385	1663	1539	1338	1539	1338	1338
Flt Permitted	0.40	1.00	1.00	0.55	1.00	1.00	0.99	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	671	3228	1488	970	3137	1385	1663	1539	1338	1539	1338	1338
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)	104	327	6	2	402	196	3	12	7	179	4	43
RTOR Reduction (vph)	0	0	3	0	0	123	0	5	0	0	35	0
Lane Group Flow (vph)	104	327	3	2	402	73	0	17	0	179	12	0
Confl. Peds. (#/hr)	1											
Heavy Vehicles (%)	4%	3%	0%	0%	6%	5%	0%	0%	0%	8%	0%	14%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	Split	NA
Protected Phases	7	4			8	2		2	6		6	
Permitted Phases	4	4		8	8							
Actuated Green, G (s)	58.6	58.6	58.6	45.7	45.7	45.7	30.0		21.4		21.4	
Effective Green, g (s)	57.6	61.8	61.8	48.9	48.9	48.9	33.2		24.6		24.6	
Actuated g/C Ratio	0.44	0.47	0.47	0.37	0.37	0.37	0.25		0.19		0.19	
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2	7.2		7.2		7.2	
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0		4.0		4.0	
Lane Grp Cap (vph)	356	1515	698	360	1165	514	419		287		250	
v/s Ratio Prot	c0.02	0.10				c0.13	c0.01		c0.12		0.01	
v/s Ratio Perm	0.11	0.00		0.00		0.05						
v/c Ratio	0.29	0.22	0.00	0.01	0.35	0.14	0.04		0.62		0.05	
Uniform Delay, d1	22.8	20.6	18.5	26.0	29.8	27.4	37.2		49.2		43.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	
Incremental Delay, d2	0.3	0.3	0.0	0.0	0.8	0.6	0.2		4.7		0.1	
Delay (s)	23.0	20.9	18.6	26.1	30.6	28.0	37.3		54.0		44.0	
Level of Service	C	C	B	C	C	C	D		D		D	
Approach Delay (s)	21.4				29.8		37.3				51.9	
Approach LOS	C				C		D				D	

Intersection Summary

HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	131.6	Sum of lost time (s)	19.2
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Isolated
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	250	210	20	388	148	23
Future Volume (vph)	250	210	20	388	148	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor						0.99
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3228	1390	1385	3228	2880	1316
Flt Permitted			0.545		0.950	
Satd. Flow (perm)	3228	1390	795	3228	2880	1300
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		231				25
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Confl. Peds. (#/hr)						1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	7%	20%	3%	12%	13%
Adj. Flow (vph)	275	231	22	426	163	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	275	231	22	426	163	25
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4		9.4		
Detector 2 Size(m)		0.6		0.6		
Detector 2 Type		CI+Ex		CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)		0.0		0.0		

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Isolated
AM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	36.0	36.0	36.0	36.0	43.0	43.0
Total Split (%)	45.6%	45.6%	45.6%	45.6%	54.4%	54.4%
Maximum Green (s)	28.5	28.5	28.5	28.5	36.5	36.5
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	19.2	19.2	19.2	19.2	51.8	51.8
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.66	0.66
v/c Ratio	0.35	0.45	0.11	0.54	0.09	0.03
Control Delay	25.4	6.4	23.1	28.3	5.7	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	6.4	23.1	28.3	5.7	2.7
LOS	C	A	C	C	A	A
Approach Delay	16.7			28.1	5.3	
Approach LOS	B			C	A	
Intersection Summary						
Area Type:	Other					
Cycle Length:	79					
Actuated Cycle Length:	79					
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green					
Natural Cycle:	65					
Control Type:	Actuated-Coordinated					
Maximum v/c Ratio:	0.54					
Intersection Signal Delay:	19.3			Intersection LOS: B		
Intersection Capacity Utilization:	51.4%			ICU Level of Service A		
Analysis Period (min)	15					
Splits and Phases:	6: Stanley Avenue & Marineland Parkway					

Queues
6: Stanley Avenue & Marineland Parkway

Isolated
AM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	275	231	22	426	163	25
v/c Ratio	0.35	0.45	0.11	0.54	0.09	0.03
Control Delay	25.4	6.4	23.1	28.3	5.7	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	6.4	23.1	28.3	5.7	2.7
Queue Length 50th (m)	18.8	0.0	2.7	30.8	4.2	0.0
Queue Length 95th (m)	27.3	15.6	8.0	41.7	8.9	2.9
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1307	700	322	1307	1888	861
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.33	0.07	0.33	0.09	0.03
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Isolated
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	250	210	20	388	148	23
Future Volume (vph)	250	210	20	388	148	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3228	1390	1385	3228	2880	1300
Flt Permitted	1.00	1.00	0.55	1.00	0.95	1.00
Satd. Flow (perm)	3228	1390	795	3228	2880	1300
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	275	231	22	426	163	25
RTOR Reduction (vph)	0	175	0	0	0	9
Lane Group Flow (vph)	275	56	22	426	163	16
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	3%	7%	20%	3%	12%	13%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	15.7	15.7	15.7	15.7	49.3	49.3
Effective Green, g (s)	19.2	19.2	19.2	19.2	51.8	51.8
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.66	0.66
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	784	337	193	784	1888	852
v/s Ratio Prot	0.09			c0.13	c0.06	
v/s Ratio Perm		0.04	0.03			0.01
v/c Ratio	0.35	0.17	0.11	0.54	0.09	0.02
Uniform Delay, d1	24.7	23.6	23.3	26.1	5.0	4.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2	0.7	0.1	0.0
Delay (s)	25.0	23.8	23.5	26.8	5.1	4.8
Level of Service	C	C	C	C	A	A
Approach Delay (s)	24.5			26.7	5.0	
Approach LOS	C			C	A	
Intersection Summary						
HCM 2000 Control Delay			22.1		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.21			
Actuated Cycle Length (s)			79.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			51.4%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	41	161	1	307	164	101	4	166	425	62	82	12
Future Volume (vph)	41	161	1	307	164	101	4	166	425	62	82	12
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0			225.0	80.0		60.0	80.0	50.0
Storage Lanes	1		1	2			1	1		1	2	1
Taper Length (m)	7.5			7.5				7.5			7.5	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1614	3197	744	2959	3107	1377	1662	3137	1458	2757	2891	1365
Fit Permitted	0.640			0.950			0.696			0.950		
Satd. Flow (perm)	1087	3197	744	2959	3107	1377	1218	3137	1458	2757	2891	1365
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168			110			462			106
Link Speed (k/h)		80			80			60				60
Link Distance (m)		507.4			421.7			216.1				150.6
Travel Time (s)		22.8			19.0			13.0				9.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	4%	100%	9%	7%	8%	0%	6%	2%	17%	15%	9%
Adj. Flow (vph)	45	175	1	334	178	110	4	180	462	67	89	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	175	1	334	178	110	4	180	462	67	89	13
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					9.4				9.4			9.4
Detector 2 Size(m)					0.6				0.6			0.6
Detector 2 Type					CI+Ex				CI+Ex			CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0				0.0			0.0
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8			2		1		6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

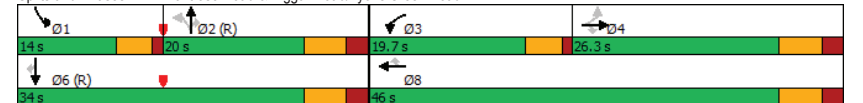
Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4		3	8		8	2	2	2	6
Detector Phase	4	4	4	3	8	8	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	19.7	46.0	46.0	20.0	20.0	20.0	14.0	34.0	34.0
Total Split (%)	32.9%	32.9%	32.9%	24.6%	57.5%	57.5%	25.0%	25.0%	25.0%	17.5%	42.5%	42.5%
Maximum Green (s)	20.0	20.0	20.0	15.2	39.7	39.7	13.7	13.7	13.7	9.5	27.7	27.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	12.8	15.1	12.8	13.4	33.0	30.7	26.8	29.1	26.8	7.3	39.0	36.7
Actuated g/C Ratio	0.16	0.19	0.16	0.17	0.41	0.38	0.34	0.36	0.34	0.09	0.49	0.46
v/c Ratio	0.26	0.29	0.00	0.67	0.14	0.18	0.01	0.16	0.58	0.26	0.06	0.02
Control Delay	32.5	28.6	0.0	38.1	14.0	3.7	23.2	20.6	6.2	35.9	12.5	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	0.0
Total Delay	32.5	28.6	0.0	38.1	14.0	3.7	23.2	20.6	6.2	35.9	12.5	0.1
LOS	C	C	A	D	B	A	C	C	A	D	B	A
Approach Delay		29.2			25.1			10.3				20.8
Approach LOS		C			C			B				C

Intersection Summary

Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	80
Offset:	0 (0%), Referenced to phase 2:NBL and 6:SBT, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	19.5
Intersection Capacity Utilization:	53.4%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 7: Montrose Road & Biggar Road/Lyons Creek Road



Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Isolated
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	45	175	1	334	178	110	4	180	462	67	89	13
v/c Ratio	0.26	0.29	0.00	0.67	0.14	0.18	0.01	0.16	0.58	0.26	0.06	0.02
Control Delay	32.5	28.6	0.0	38.1	14.0	3.7	23.2	20.6	6.2	35.9	12.5	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	0.0
Total Delay	32.5	28.6	0.0	38.1	14.0	3.7	23.2	20.6	6.2	35.9	12.5	0.1
Queue Length 50th (m)	6.4	12.8	0.0	25.7	8.9	0.0	0.4	10.5	0.0	5.2	3.8	0.0
Queue Length 95th (m)	15.2	20.5	0.0	38.8	13.4	8.4	3.0	20.6	26.1	11.0	8.7	0.0
Internal Link Dist (m)	483.4			397.7				192.1			126.6	
Turn Bay Length (m)	130.0	120.0		150.0	225.0			80.0	60.0	80.0	50.0	
Base Capacity (vph)	271	891	312	562	1631	738	408	1142	795	327	1408	683
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	0.17	0.20	0.00	0.59	0.11	0.15	0.01	0.16	0.58	0.20	0.06	0.02

Intersection Summary												
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	4				3				8			
Permitted Phases	4				8				2			
Actuated Green, G (s)	12.8	12.8	12.8	13.4	30.7	30.7	26.0	26.0	26.0	6.2	36.7	36.7
Effective Green, g (s)	12.8	15.1	12.8	13.4	33.0	30.7	26.0	28.3	26.0	6.2	39.0	36.7
Actuated g/C Ratio	0.16	0.19	0.16	0.17	0.41	0.38	0.32	0.35	0.32	0.08	0.49	0.46
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	173	603	119	495	1281	528	396	1109	473	213	1409	626
v/s Ratio Prot	c0.05		c0.11		0.06		0.06		c0.02		0.03	
v/s Ratio Perm	0.04		0.00		0.03		0.00		c0.10		0.00	
v/c Ratio	0.26	0.29	0.00	0.67	0.14	0.08	0.01	0.16	0.32	0.31	0.06	0.01
Uniform Delay, d1	29.4	27.9	28.2	31.3	14.6	15.7	18.3	17.7	20.3	34.9	10.8	11.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.8	0.0	3.6	0.1	0.2	0.0	0.3	1.8	0.9	0.1	0.0
Delay (s)	31.7	28.6	28.2	34.9	14.8	15.9	18.3	18.0	22.1	35.7	10.9	11.8
Level of Service	C	C	C	C	B	B	B	B	C	D	B	B
Approach Delay (s)	29.2			25.8				20.9		20.8		
Approach LOS	C			C				C		C		

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Isolated
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖↗	↖↗	↖	↖	↖↗	↖	↖↗	↖↗	↖
Traffic Volume (vph)	41	161	1	307	164	101	4	166	425	62	82	12
Future Volume (vph)	41	161	1	307	164	101	4	166	425	62	82	12
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit 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)	1614	3197	744	2959	3107	1377	1662	3137	1458	2757	2891	1365
Fit Permitted	0.64	1.00	1.00	0.95	1.00	1.00	0.70	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1087	3197	744	2959	3107	1377	1219	3137	1458	2757	2891	1365
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	175	1	334	178	110	4	180	462	67	89	13
RTOR Reduction (vph)	0	0	1	0	0	68	0	0	312	0	0	7
Lane Group Flow (vph)	45	175	0	334	178	42	4	180	150	67	89	6
Heavy Vehicles (%)	3%	4%	100%	9%	7%	8%	0%	6%	2%	17%	15%	9%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	4				3				8			
Permitted Phases	4				8				2			
Actuated Green, G (s)	12.8	12.8	12.8	13.4	30.7	30.7	26.0	26.0	26.0	6.2	36.7	36.7
Effective Green, g (s)	12.8	15.1	12.8	13.4	33.0	30.7	26.0	28.3	26.0	6.2	39.0	36.7
Actuated g/C Ratio	0.16	0.19	0.16	0.17	0.41	0.38	0.32	0.35	0.32	0.08	0.49	0.46
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	173	603	119	495	1281	528	396	1109	473	213	1409	626
v/s Ratio Prot	c0.05		c0.11		0.06		0.06		c0.02		0.03	
v/s Ratio Perm	0.04		0.00		0.03		0.00		c0.10		0.00	
v/c Ratio	0.26	0.29	0.00	0.67	0.14	0.08	0.01	0.16	0.32	0.31	0.06	0.01
Uniform Delay, d1	29.4	27.9	28.2	31.3	14.6	15.7	18.3	17.7	20.3	34.9	10.8	11.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.8	0.0	3.6	0.1	0.2	0.0	0.3	1.8	0.9	0.1	0.0
Delay (s)	31.7	28.6	28.2	34.9	14.8	15.9	18.3	18.0	22.1	35.7	10.9	11.8
Level of Service	C	C	C	C	B	B	B	B	C	D	B	B
Approach Delay (s)	29.2			25.8				20.9		20.8		
Approach LOS	C			C				C		C		

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		
c	Critical Lane Group		

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Isolated
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Volume (vph)	51	21	0	1	3	4	3	537	7	0	257	25
Future Volume (vph)	51	21	0	1	3	4	3	537	7	0	257	25
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.932			0.998			0.988	
Flt Protected		0.966			0.995							
Satd. Flow (prot)	0	1621	0	0	1443	0	0	1606	0	0	1607	0
Flt Permitted		0.966			0.995							
Satd. Flow (perm)	0	1621	0	0	1443	0	0	1606	0	0	1607	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	8		16	16		8	17		8	8		17
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Heavy Vehicles (%)	4%	5%	0%	0%	0%	25%	100%	8%	29%	0%	6%	24%
Adj. Flow (vph)	67	28	0	1	4	5	4	707	9	0	338	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	0	0	10	0	0	720	0	0	371	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.3% ICU Level of Service A
Analysis Period (min)	15


HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Isolated
AM Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	51	21	0	1	3	4	3	537	7	0	257	25
Future Volume (vph)	51	21	0	1	3	4	3	537	7	0	257	25
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	67	28	0	1	4	5	4	707	9	0	338	33
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	95	10	720	371								
Volume Left (vph)	67	1	4	0								
Volume Right (vph)	0	5	9	33								
Hadj (s)	0.21	-0.07	0.14	0.08								
Departure Headway (s)	6.8	6.8	4.9	5.3								
Degree Utilization, x	0.18	0.02	0.98	0.54								
Capacity (veh/h)	514	492	720	681								
Control Delay (s)	11.2	9.9	50.8	14.3								
Approach Delay (s)	11.2	9.9	50.8	14.3								
Approach LOS	B	A	F	B								
Intersection Summary												
Delay			36.0									
Level of Service			E									
Intersection Capacity Utilization			52.3%					ICU Level of Service			A	
Analysis Period (min)			15									


Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Isolated
AM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	R
Traffic Volume (vph)	56	72	439	83	27	243
Future Volume (vph)	56	72	439	83	27	243
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.924			0.850		
Fit Protected	0.979				0.950	
Satd. Flow (prot)	1358	0	1750	1488	1397	1750
Fit Permitted	0.979				0.950	
Satd. Flow (perm)	1358	0	1750	1488	1397	1750
Link Speed (k/h)	50		60		60	
Link Distance (m)	1040.1		438.6		461.8	
Travel Time (s)	74.9		26.3		27.7	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	25%	10%	0%	0%	19%	0%
Adj. Flow (vph)	64	83	505	95	31	279
Shared Lane Traffic (%)						
Lane Group Flow (vph)	147	0	505	95	31	279
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	39.9%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Isolated
AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	R
Sign Control	Stop		Stop		Stop	Stop
Traffic Volume (vph)	56	72	439	83	27	243
Future Volume (vph)	56	72	439	83	27	243
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	64	83	505	95	31	279
Direction, Lane #						
	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total (vph)	147	505	95	31	279	
Volume Left (vph)	64	0	0	31	0	
Volume Right (vph)	83	0	95	0	0	
Hadj (s)	0.03	0.00	-0.70	0.82	0.00	
Departure Headway (s)	6.0	5.3	4.6	6.4	5.6	
Degree Utilization, x	0.24	0.75	0.12	0.06	0.43	
Capacity (veh/h)	547	661	754	534	622	
Control Delay (s)	10.9	21.2	7.1	8.6	11.7	
Approach Delay (s)	10.9	19.0		11.4		
Approach LOS	B	C		B		
Intersection Summary						
Delay	15.6					
Level of Service	C					
Intersection Capacity Utilization	39.9%		ICU Level of Service		A	
Analysis Period (min)	15					

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Isolated
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Volume (vph)	3	25	261	6	9	13	124	223	5	11	105	39
Future Volume (vph)	3	25	261	6	9	13	124	223	5	11	105	39
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.878			0.938			0.998			0.966	
Flt Protected					0.990			0.983			0.997	
Satd. Flow (prot)	0	1318	0	0	1570	0	0	1555	0	0	1269	0
Flt Permitted					0.990			0.983			0.997	
Satd. Flow (perm)	0	1318	0	0	1570	0	0	1555	0	0	1269	0
Link Speed (k/h)		60			60			70			60	
Link Distance (m)		372.3			519.4			156.9			312.6	
Travel Time (s)		22.3			31.2			8.1			18.8	
Confl. Peds. (#/hr)	6					6						
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles (%)	33%	0%	18%	17%	0%	0%	18%	6%	20%	9%	40%	20%
Adj. Flow (vph)	4	35	363	8	13	18	172	310	7	15	146	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	402	0	0	39	0	0	489	0	0	215	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	59.1%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Isolated
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Volume (veh/h)	3	25	261	6	9	13	124	223	5	11	105	39
Future Volume (Veh/h)	3	25	261	6	9	13	124	223	5	11	105	39
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	4	35	362	8	12	18	172	310	7	15	146	54
Pedestrians												6
Lane Width (m)												3.6
Walking Speed (m/s)												1.2
Percent Blockage												1
Right turn flare (veh)												
Median type								None				None
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	890	864	173	1240	888	320	200				317	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	890	864	173	1240	888	320	200				317	
tC, single (s)	7.4	6.5	6.4	7.3	6.5	6.2	4.3				4.2	
tC, 2 stage (s)												
tF (s)	3.8	4.0	3.5	3.7	4.0	3.3	2.4				2.3	
p0 queue free %	98	86	56	87	95	98	87				99	
cM capacity (veh/h)	193	252	831	64	244	722	1282				1205	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	401	38	489	215								
Volume Left	4	8	172	15								
Volume Right	362	18	7	54								
eSH	673	190	1282	1205								
Volume to Capacity	0.60	0.20	0.13	0.01								
Queue Length 95th (m)	31.7	5.8	3.7	0.3								
Control Delay (s)	17.9	28.6	3.8	0.7								
Lane LOS	C	D	A	A								
Approach Delay (s)	17.9	28.6	3.8	0.7								
Approach LOS	C	D										

Intersection Summary	
Average Delay	9.0
Intersection Capacity Utilization	59.1%
Analysis Period (min)	15
	ICU Level of Service B

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Isolated
AM Peak Hour

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	↗
Traffic Volume (vph)	300	105	193	52	35	331
Future Volume (vph)	300	105	193	52	35	331
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.971			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1554	1683	1662	0	1250	1094
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1554	1683	1662	0	1250	1094
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	7%	4%	1%	7%	33%	36%
Adj. Flow (vph)	353	124	227	61	41	389
Shared Lane Traffic (%)						
Lane Group Flow (vph)	353	124	288	0	41	389
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control		Stop	Stop		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	45.8%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Isolated
AM Peak Hour

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	↗
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	300	105	193	52	35	331
Future Volume (vph)	300	105	193	52	35	331
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	353	124	227	61	41	389
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	353	124	288	41	389	
Volume Left (vph)	353	0	0	41	0	
Volume Right (vph)	0	0	61	0	389	
Hadj (s)	0.62	0.07	-0.09	1.06	-0.09	
Departure Headway (s)	7.1	6.6	6.5	7.8	6.7	
Degree Utilization, x	0.70	0.23	0.52	0.09	0.72	
Capacity (veh/h)	482	525	529	442	518	
Control Delay (s)	24.0	10.3	16.4	10.4	23.8	
Approach Delay (s)	20.5		16.4	22.5		
Approach LOS	C		C	C		
Intersection Summary						
Delay			20.2			
Level of Service			C			
Intersection Capacity Utilization			45.8%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Isolated
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	113	1007	44	165	953	251	48	114	356	280	164	113
Future Volume (vph)	113	1007	44	165	953	251	48	114	356	280	164	113
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	70.0	155.0	0.0	115.0	0.0	130.0	0.0	130.0	0.0	0.0	0.0
Storage Lanes	1	1	1	1	1	1	1	1	1	1	0	0
Taper Length (m)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	1.00	0.99	0.99
Frt	0.994				0.850		0.850		0.850		0.939	
Fit Protected	0.950			0.950			0.950		0.950		0.950	
Satd. Flow (prot)	1599	4647	0	1599	3292	1430	1630	3167	1444	1630	2995	0
Fit Permitted	0.145			0.147			0.573		0.594		0.594	
Satd. Flow (perm)	244	4647	0	247	3292	1410	974	3167	1425	1018	2995	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		6				257		278		119		
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		759.2			692.3			721.0		213.3		
Travel Time (s)		54.7			49.8			51.9		15.4		
Confl. Peds. (#/hr)	2		1	1	2	13		1	1		13	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	2%	5%	4%	1%	4%	2%	5%	3%	2%	4%	2%
Adj. Flow (vph)	119	1060	46	174	1003	264	51	120	375	295	173	119
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	1106	0	174	1003	264	51	120	375	295	292	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		3.6
Link Offset(m)		0.0			0.0			0.0		0.0		0.0
Crosswalk Width(m)		4.8			4.8			4.8		4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4		9.4		
Detector 2 Size(m)		0.6			0.6			0.6		0.6		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0		0.0		

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Isolated
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		2	6	
Permitted Phases	4			8		8	2			2	6	
Detector Phase	7	4		3	8	8	5	2		2	1	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0		46.0	9.5	46.0
Total Split (s)	17.0	54.0		20.0	57.0	57.0	11.0	37.0		37.0	19.0	45.0
Total Split (%)	13.1%	41.5%		15.4%	43.8%	43.8%	8.5%	28.5%		28.5%	14.6%	34.6%
Maximum Green (s)	14.0	46.0		17.0	49.0	49.0	8.0	29.0		29.0	16.0	37.0
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0		4.0	0.0	4.0
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0		-4.0	1.0	-4.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	None	Max
Walk Time (s)		12.0			12.0	12.0		14.0		14.0		14.0
Flash Dont Walk (s)		20.0			20.0	20.0		24.0		24.0		24.0
Pedestrian Calls (#/hr)		0			0	0		0		0		0
Act Effct Green (s)	63.4	54.5		68.6	57.0	57.0	39.5	33.3		33.3	52.0	43.6
Actuated g/C Ratio	0.49	0.42		0.53	0.44	0.44	0.30	0.26		0.26	0.40	0.34
v/c Ratio	0.56	0.57		0.70	0.69	0.35	0.16	0.15		0.66	0.62	0.27
Control Delay	26.1	30.5		28.9	31.4	5.1	26.1	38.2		17.5	35.6	19.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	26.1	30.5		28.9	31.4	5.1	26.1	38.2		17.5	35.6	19.7
LOS	C	C		C	C	A	C	D		B	D	B
Approach Delay		30.0			26.3			22.9				27.7
Approach LOS		C			C			C				C
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	105											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.70											
Intersection Signal Delay:	27.2						Intersection LOS: C					
Intersection Capacity Utilization:	89.9%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	1: Montrose Road & McLeod Road											

Queues
1: Montrose Road & McLeod Road

Isolated
PM Peak Hour

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	119	1106	174	1003	264	51	120	375	295	292
v/c Ratio	0.56	0.57	0.70	0.69	0.35	0.16	0.15	0.66	0.62	0.27
Control Delay	26.1	30.5	28.9	31.4	5.1	26.1	38.2	17.5	35.6	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	30.5	28.9	31.4	5.1	26.1	38.2	17.5	35.6	19.7
Queue Length 50th (m)	15.4	81.4	16.7	124.7	10.5	8.4	13.3	21.6	57.7	17.7
Queue Length 95th (m)	26.2	103.0	m32.4	156.2	m17.2	17.4	22.0	59.3	84.8	30.0
Internal Link Dist (m)		735.2		668.3			697.0			189.3
Turn Bay Length (m)	55.0		155.0			115.0			130.0	
Base Capacity (vph)	261	1950	299	1444	762	337	810	571	477	1083
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.57	0.58	0.69	0.35	0.15	0.15	0.66	0.62	0.27

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Isolated
PM Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	113	1007	44	165	953	251	48	114	356	280	164	113
Future Volume (vph)	113	1007	44	165	953	251	48	114	356	280	164	113
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1598	4646		1599	3292	1410	1622	3167	1425	1629	2994	
Flt Permitted	0.15	1.00		0.15	1.00	1.00	0.57	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	244	4646		248	3292	1410	979	3167	1425	1018	2994	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	1060	46	174	1003	264	51	120	375	295	173	119
RTOR Reduction (vph)	0	4	0	0	0	146	0	0	206	0	79	0
Lane Group Flow (vph)	119	1102	0	174	1003	118	51	120	169	295	213	0
Confl. Peds. (#/hr)	2		1	1		2	13		1	1		13
Heavy Vehicles (%)	4%	2%	5%	4%	1%	4%	2%	5%	3%	2%	4%	2%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	59.9	49.9		64.9	52.4	52.4	35.9	29.9	29.9	48.6	39.6	
Effective Green, g (s)	57.9	53.9		62.9	56.4	56.4	33.9	33.9	33.9	47.6	43.6	
Actuated g/C Ratio	0.45	0.41		0.48	0.43	0.43	0.26	0.26	0.26	0.37	0.34	
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	202	1926		239	1428	611	280	825	371	441	1004	
v/s Ratio Prot	0.04	0.24		c0.06	c0.30		0.01	0.04		c0.08	0.07	
v/s Ratio Perm	0.22			0.29		0.08	0.04		0.12	c0.17		
v/c Ratio	0.59	0.57		0.73	0.70	0.19	0.18	0.15	0.46	0.67	0.21	
Uniform Delay, d1	24.6	29.2		22.3	30.0	22.7	36.7	36.9	40.3	32.7	30.9	
Progression Factor	1.00	1.00		1.03	0.97	1.29	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.6	1.2		7.8	2.2	0.5	0.2	0.4	4.0	3.4	0.5	
Delay (s)	28.2	30.4		30.6	31.3	29.9	36.9	37.3	44.3	36.2	31.4	
Level of Service	C	C		C	C	C	D	D	D	D	C	
Approach Delay (s)		30.2			30.9			42.1			33.8	
Approach LOS		C			C			D			C	

Intersection Summary

HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Isolated
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	37	1152	357	227	1178	17	347	4	330	24	13	83
Future Volume (vph)	37	1152	357	227	1178	17	347	4	330	24	13	83
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0	0.0	80.0			0.0	95.0			0.0	20.0	0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor			0.96	1.00	1.00		1.00	1.00				0.99
Frt			0.850		0.998				0.850			0.870
Fit Protected	0.950			0.950			0.950	0.953		0.950		
Satd. Flow (prot)	1583	3292	1444	1614	3250	0	1533	1531	1458	1662	1484	0
Fit Permitted	0.176			0.122			0.950	0.953		0.950		
Satd. Flow (perm)	293	3292	1389	207	3250	0	1526	1524	1458	1662	1484	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			323		1				337			85
Link Speed (k/h)		50			50			50				50
Link Distance (m)		692.3			616.3			360.6				181.9
Travel Time (s)		49.8			44.4			26.0				13.1
Confl. Peds. (#/hr)	9		9	9		9	6					6
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Adj. Flow (vph)	38	1176	364	232	1202	17	354	4	337	24	13	85
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	38	1176	364	232	1219	0	181	177	337	24	98	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Isolated
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	23.0	67.0	67.0	23.0	67.0		25.0	25.0	25.0	15.0	15.0	
Total Split (%)	17.7%	51.5%	51.5%	17.7%	51.5%		19.2%	19.2%	19.2%	11.5%	11.5%	
Maximum Green (s)	20.0	59.0	59.0	20.0	59.0		16.0	16.0	16.0	6.0	6.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	72.9	67.5	62.5	86.0	78.4		21.0	21.0	21.0	11.0	11.0	
Actuated g/C Ratio	0.56	0.52	0.48	0.66	0.60		0.16	0.16	0.16	0.08	0.08	
v/c Ratio	0.18	0.69	0.44	0.79	0.62		0.73	0.72	0.65	0.17	0.48	
Control Delay	10.3	22.2	6.3	37.0	18.6		70.0	68.8	11.5	58.5	23.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	10.3	22.2	6.3	37.0	18.6		70.0	68.8	11.5	58.5	23.5	
LOS	B	C	A	D	B		E	E	B	E	C	
Approach Delay		18.2			21.5			41.3			30.4	
Approach LOS		B			C			D			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.79											
Intersection Signal Delay:	24.0						Intersection LOS: C					
Intersection Capacity Utilization:	103.4%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	2: Oakwood Drive & McLeod Road											

Queues
2: Oakwood Drive & McLeod Road

Isolated
PM Peak Hour

	↖	→	↘	↙	←	↖	↑	↘	↙	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	1176	364	232	1219	181	177	337	24	98
v/c Ratio	0.18	0.69	0.44	0.79	0.62	0.73	0.72	0.65	0.17	0.48
Control Delay	10.3	22.2	6.3	37.0	18.6	70.0	68.8	11.5	58.5	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	22.2	6.3	37.0	18.6	70.0	68.8	11.5	58.5	23.5
Queue Length 50th (m)	2.0	132.3	39.8	27.5	107.1	49.4	48.2	0.0	6.1	3.3
Queue Length 95th (m)	m3.8	169.5	64.0	57.4	133.5	#84.4	#82.2	29.5	15.4	21.7
Internal Link Dist (m)		668.3		592.3		336.6			157.9	
Turn Bay Length (m)	50.0			80.0		95.0			20.0	
Base Capacity (vph)	378	1709	835	342	1961	247	247	518	140	203
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.69	0.44	0.68	0.62	0.73	0.72	0.65	0.17	0.48

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Isolated
PM Peak Hour

	↖	→	↘	↙	←	↖	↑	↘	↙	↓	↖	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	37	1152	357	227	1178	17	347	4	330	24	13	83
Future Volume (vph)	37	1152	357	227	1178	17	347	4	330	24	13	83
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3292	1389	1614	3249		1533	1531	1458	1662	1484	
Flt Permitted	0.18	1.00	1.00	0.12	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	294	3292	1389	207	3249		1533	1531	1458	1662	1484	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	38	1176	364	232	1202	17	354	4	337	24	13	85
RTOR Reduction (vph)	0	0	168	0	0	0	0	0	283	0	78	0
Lane Group Flow (vph)	38	1176	196	232	1219	0	181	177	54	24	20	0
Confl. Peds. (#/hr)	9		9	9			9	6				6
Heavy Vehicles (%)	5%	1%	3%	3%	2%	6%	3%	25%	2%	0%	8%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	68.7	63.5	63.5	82.0	73.8		16.0	16.0	16.0	6.0	6.0	
Effective Green, g (s)	66.7	67.5	62.5	81.0	77.8		21.0	21.0	21.0	11.0	11.0	
Actuated g/C Ratio	0.51	0.52	0.48	0.62	0.60		0.16	0.16	0.16	0.08	0.08	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	192	1709	667	285	1944		247	247	235	140	125	
v/s Ratio Prot	0.01	0.36		c0.09	0.38		c0.12	0.12		c0.01	0.01	
v/s Ratio Perm	0.09		0.14	c0.41					0.04			
v/c Ratio	0.20	0.69	0.29	0.81	0.63		0.73	0.72	0.23	0.17	0.16	
Uniform Delay, d1	16.7	23.4	20.4	23.2	16.8		51.8	51.7	47.5	55.3	55.2	
Progression Factor	1.00	0.83	1.32	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.9	0.9	15.8	1.5		17.5	16.3	2.3	2.6	2.8	
Delay (s)	16.9	21.3	27.8	39.0	18.3		69.3	68.0	49.8	57.9	58.0	
Level of Service	B	C	C	D	B		E	E	D	E	E	
Approach Delay (s)		22.7			21.6			59.5			58.0	
Approach LOS		C			C			E			E	

Intersection Summary
 HCM 2000 Control Delay 30.0 HCM 2000 Level of Service C
 HCM 2000 Volume to Capacity ratio 0.72
 Actuated Cycle Length (s) 130.0 Sum of lost time (s) 16.0
 Intersection Capacity Utilization 103.4% ICU Level of Service G
 Analysis Period (min) 15
 c Critical Lane Group

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Isolated
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	279	620	402	89	635	79	461	188	166	114	196	291
Future Volume (vph)	279	620	402	89	635	79	461	188	166	114	196	291
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		0.0	50.0		0.0	15.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	2		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.97		0.99	0.99		0.98	0.98		0.99	0.98	
Frt		0.941			0.983			0.930				0.910
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	2999	0	1630	3219	0	3131	1601	0	1662	1528	0
Fit Permitted	0.127			0.223			0.950			0.950		
Satd. Flow (perm)	216	2999	0	378	3219	0	3067	1601	0	1639	1528	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		161			11			40			62	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		616.3			1045.5			348.9			308.0	
Travel Time (s)		44.4			75.3			25.1			22.2	
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Adj. Flow (vph)	288	639	414	92	655	81	475	194	171	118	202	300
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	1053	0	92	736	0	475	365	0	118	502	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	


Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Isolated
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	7	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.4		30.4	30.4		9.5	37.7		9.5	37.7	
Total Split (s)	19.7	58.9		39.2	39.2		23.0	45.7		16.5	39.2	
Total Split (%)	16.3%	48.6%		32.4%	32.4%		19.0%	37.7%		13.6%	32.4%	
Maximum Green (s)	16.7	52.5		32.8	32.8		20.0	39.0		13.5	32.5	
Yellow Time (s)	3.0	4.1		4.1	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.3		2.3	2.3		0.0	2.6		0.0	2.6	
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	
Total Lost Time (s)	4.0	4.0		7.4	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		9.0		9.0	9.0			12.0			12.0	
Flash Dont Walk (s)		15.0		15.0	15.0			19.0			19.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	54.9	54.9		31.8	35.2		19.0	42.9		11.3	35.2	
Actuated g/C Ratio	0.45	0.45		0.26	0.29		0.16	0.35		0.09	0.29	
v/c Ratio	1.02	0.73		0.93	0.78		0.97	0.62		0.76	1.03	
Control Delay	90.9	26.0		118.6	45.6		84.3	34.3		83.1	85.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	90.9	26.0		118.6	45.6		84.3	34.3		83.1	85.7	
LOS	F	C		F	D		F	C		F	F	
Approach Delay		40.0			53.7			62.5			85.2	
Approach LOS		D			D			E			F	
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	120											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.03											
Intersection Signal Delay:	56.1						Intersection LOS: E					
Intersection Capacity Utilization:	103.9%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											

Queues
3: Dorchester Road & McLeod Road

Isolated
PM Peak Hour




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	288	1053	92	736	475	365	118	502
v/c Ratio	1.02	0.73	0.93	0.78	0.97	0.62	0.76	1.03
Control Delay	90.9	26.0	118.6	45.6	84.3	34.3	83.1	85.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.9	26.0	118.6	45.6	84.3	34.3	83.1	85.7
Queue Length 50th (m)	-58.0	95.1	22.5	87.6	61.6	68.0	29.0	-122.6
Queue Length 95th (m)	#115.2	122.0	#57.5	111.8	#95.9	102.4	#56.4	#191.9
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	281	1447	99	943	491	592	171	488
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	1.02	0.73	0.93	0.78	0.97	0.62	0.69	1.03

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Isolated
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	279	620	402	89	635	79	461	188	166	114	196	291
Future Volume (vph)	279	620	402	89	635	79	461	188	166	114	196	291
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		7.4	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.97		1.00	0.99		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	0.93		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1629	2999		1612	3221		3131	1600		1662	1528	
Flt Permitted	0.13	1.00		0.22	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	218	2999		378	3221		3131	1600		1662	1528	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	288	639	414	92	655	81	475	194	171	118	202	300
RTOR Reduction (vph)	0	88	0	0	8	0	0	26	0	0	44	0
Lane Group Flow (vph)	288	965	0	92	728	0	475	339	0	118	458	0
Confl. Peds. (#/hr)	15		21	21		15	21		20	20		21
Heavy Vehicles (%)	2%	1%	2%	2%	1%	0%	3%	0%	0%	0%	2%	2%
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	52.5	52.5		32.8	32.8		20.0	40.2		12.3	32.5	
Effective Green, g (s)	51.5	54.9		31.8	35.2		19.0	42.9		11.3	35.2	
Actuated g/C Ratio	0.43	0.45		0.26	0.29		0.16	0.35		0.09	0.29	
Clearance Time (s)	3.0	6.4		6.4	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	275	1359		99	936		491	566		155	444	
v/s Ratio Prot	c0.14	0.32			0.23		c0.15	0.21		0.07	c0.30	
v/s Ratio Perm	c0.31			0.24								
v/c Ratio	1.05	0.71		0.93	0.78		0.97	0.60		0.76	1.03	
Uniform Delay, d1	33.1	26.7		43.6	39.4		50.7	32.1		53.6	42.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	67.2	3.2		72.7	6.3		32.0	1.7		19.6	51.1	
Delay (s)	100.3	29.9		116.3	45.7		82.7	33.8		73.1	94.0	
Level of Service	F	C		F	D		F	C		E	F	
Approach Delay (s)		45.0			53.5			61.5			90.0	
Approach LOS		D			D			E			F	

Intersection Summary

- HCM 2000 Control Delay: 58.4
- HCM 2000 Volume to Capacity ratio: 1.02
- Actuated Cycle Length (s): 121.1
- Intersection Capacity Utilization: 103.9%
- Analysis Period (min): 15
- HCM 2000 Level of Service: E
- Sum of lost time (s): 16.0
- ICU Level of Service: G
- c Critical Lane Group

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Isolated
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔		↔		
Traffic Volume (vph)	221	491	108	18	563	139	87	151	20	140	187	190
Future Volume (vph)	221	491	108	18	563	139	87	151	20	140	187	190
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	1	0	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			0.99			1.00			0.99	0.99	
Frt	0.980			0.971			0.990			0.924		
Flt Protected	0.987			0.999			0.983			0.950		
Satd. Flow (prot)	0	3156	0	0	3147	0	0	1647	0	1662	1568	0
Flt Permitted	0.575			0.918			0.515			0.526		
Satd. Flow (perm)	0	1837	0	0	2892	0	0	862	0	916	1568	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			37			5			57	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1045.5			1070.0			834.0			207.0	
Travel Time (s)		75.3			77.0			60.0			14.9	
Confl. Peds. (#/hr)	8		6	6		8	8		8	8		8
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
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	5%	2%	5%	0%	2%	2%
Adj. Flow (vph)	246	546	120	20	626	154	97	168	22	156	208	211
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	912	0	0	800	0	0	287	0	156	419	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Isolated
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8				2			6	
Detector Phase	7	4		8	8			2	2		6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0			8.0	8.0		8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5			30.8	30.8		30.8	30.8
Total Split (s)	9.5	60.3		50.8	50.8			43.0	43.0		43.0	43.0
Total Split (%)	9.2%	58.4%		49.2%	49.2%			41.6%	41.6%		41.6%	41.6%
Maximum Green (s)	6.5	53.8		44.3	44.3			36.2	36.2		36.2	36.2
Yellow Time (s)	3.0	4.1		4.1	4.1			4.1	4.1		4.1	4.1
All-Red Time (s)	0.0	2.4		2.4	2.4			2.7	2.7		2.7	2.7
Lost Time Adjust (s)		-2.5			-2.5			-2.8	-2.8		-2.8	-2.8
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Recall Mode	None	C-Max		C-Max	C-Max			Max	Max		Max	Max
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)		56.3			56.3			39.0	39.0		39.0	39.0
Actuated g/C Ratio		0.55			0.55			0.38	0.38		0.38	0.38
v/c Ratio		0.90			0.50			0.88	0.88		0.45	0.67
Control Delay		34.1			15.3			57.6	57.6		29.4	29.1
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		34.1			15.3			57.6	57.6		29.4	29.1
LOS		C			B			E	E		C	C
Approach Delay		34.1			15.3			57.6	57.6		29.2	29.2
Approach LOS		C			B			E	E		C	C
Intersection Summary												
Area Type:	Other											
Cycle Length:	103.3											
Actuated Cycle Length:	103.3											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	75											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.90											
Intersection Signal Delay:	29.8						Intersection LOS: C					
Intersection Capacity Utilization:	105.0%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	4: Drummond Road & McLeod Road											

Queues
4: Drummond Road & McLeod Road

Isolated
PM Peak Hour

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	912	800	287	156	419
v/c Ratio	0.90	0.50	0.88	0.45	0.67
Control Delay	34.1	15.3	57.6	29.4	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	15.3	57.6	29.4	29.1
Queue Length 50th (m)	84.0	50.2	54.7	24.4	63.0
Queue Length 95th (m)	#133.3	66.7	#107.2	44.4	99.0
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	1013	1593	328	345	627
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.90	0.50	0.88	0.45	0.67

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

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Isolated
PM Peak Hour

	↘	→	↙	↗	←	↖	↑	↘	↓	↙		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↔	↔	
Traffic Volume (vph)	221	491	108	18	563	139	87	151	20	140	187	190
Future Volume (vph)	221	491	108	18	563	139	87	151	20	140	187	190
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Frbp, ped/bikes		1.00			0.99			1.00		1.00		0.99
Flpb, ped/bikes		1.00			1.00			1.00		0.99		1.00
Frt		0.98			0.97			0.99		1.00		0.92
Flt Protected		0.99			1.00			0.98		0.95		1.00
Satd. Flow (prot)		3152			3147			1645		1654		1568
Flt Permitted		0.57			0.92			0.51		0.53		1.00
Satd. Flow (perm)		1837			2891			861		916		1568
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)	246	546	120	20	626	154	97	168	22	156	208	211
RTOR Reduction (vph)	0	12	0	0	17	0	0	3	0	0	35	0
Lane Group Flow (vph)	0	900	0	0	783	0	0	284	0	156	384	0
Confl. Peds. (#/hr)	8		6	6		8	8		8	8		8
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	5%	2%	5%	0%	2%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2				6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		53.8			53.8			36.2		36.2		36.2
Effective Green, g (s)		56.3			56.3			39.0		39.0		39.0
Actuated g/C Ratio		0.55			0.55			0.38		0.38		0.38
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5
Lane Grp Cap (vph)		1001			1575			325		345		591
v/s Ratio Prot												0.24
v/s Ratio Perm		c0.49			0.27			c0.33		0.17		
v/c Ratio		0.90			0.50			0.87		0.45		0.65
Uniform Delay, d1		21.0			14.7			29.9		24.1		26.5
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		10.7			1.1			26.2		4.2		5.4
Delay (s)		31.6			15.8			56.1		28.4		31.9
Level of Service		C			B			E		C		C
Approach Delay (s)		31.6			15.8			56.1				31.0
Approach LOS		C			B			E				C

Intersection Summary
HCM 2000 Control Delay 29.3 HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio 0.92
Actuated Cycle Length (s) 103.3 Sum of lost time (s) 11.0
Intersection Capacity Utilization 105.0% ICU Level of Service G
Analysis Period (min) 15
c Critical Lane Group

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	99	379	9	10	480	221	3	10	6	257	13	96
Future Volume (vph)	99	379	9	10	480	221	3	10	6	257	13	96
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			7.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.850			0.850			0.959			0.868
Flt Protected	0.950			0.950					0.993			0.950
Satd. Flow (prot)	1599	3260	1488	1662	3260	1417	0	1667	0	1554	1501	0
Flt Permitted	0.367			0.517					0.993			0.950
Satd. Flow (perm)	618	3260	1488	905	3260	1417	0	1666	0	1554	1501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			233			6			101
Link Speed (k/h)		50			50				50			50
Link Distance (m)		1070.0			261.8				326.3			294.0
Travel Time (s)		77.0			18.8				23.5			21.2
Conf. Peds. (#/hr)							1					1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	2%	0%	0%	2%	5%	0%	0%	0%	7%	0%	0%
Adj. Flow (vph)	104	399	9	11	505	233	3	11	6	271	14	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	104	399	9	11	505	233	0	20	0	271	115	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				3.6			3.6
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		4.8			4.8				4.8			4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	Split	NA
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	24.4	66.6	66.6	42.2	42.2	42.2	20.0	20.0		45.0	45.0	
Total Split (%)	18.5%	50.6%	50.6%	32.1%	32.1%	32.1%	15.2%	15.2%		34.2%	34.2%	
Maximum Green (s)	21.4	59.4	59.4	35.0	35.0	35.0	12.8	12.8		37.8	37.8	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	71.4	71.4	71.4	59.2	59.2	59.2	16.0			32.2	32.2	
Actuated g/C Ratio	0.54	0.54	0.54	0.45	0.45	0.45	0.12			0.24	0.24	
v/c Ratio	0.26	0.23	0.01	0.03	0.34	0.30	0.10			0.71	0.26	
Control Delay	18.1	17.1	0.0	25.3	26.1	4.5	41.4			55.5	10.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	
Total Delay	18.1	17.1	0.0	25.3	26.1	4.5	41.4			55.5	10.0	
LOS	B	B	A	C	C	A	D			E	A	
Approach Delay		17.0			19.4		41.4				42.0	
Approach LOS		B			B		D				D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	131.6											
Actuated Cycle Length:	131.6											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	125											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.71											
Intersection Signal Delay:	24.1						Intersection LOS: C					
Intersection Capacity Utilization:	52.6%						ICU Level of Service A					
Analysis Period (min):	15											
Splits and Phases:	5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway											

Queues
5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Isolated
Peak Hour




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	104	399	9	11	505	233	20	271	115
v/c Ratio	0.26	0.23	0.01	0.03	0.34	0.30	0.10	0.71	0.26
Control Delay	18.1	17.1	0.0	25.3	26.1	4.5	41.4	55.5	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	17.1	0.0	25.3	26.1	4.5	41.4	55.5	10.0
Queue Length 50th (m)	13.4	28.8	0.0	1.6	46.2	0.0	3.5	68.0	2.9
Queue Length 95th (m)	27.2	45.0	0.0	6.6	72.0	17.9	11.5	92.0	17.0
Internal Link Dist (m)	1046.0			237.8			302.3		
Turn Bay Length (m)	60.0	50.0		25.0	80.0				
Base Capacity (vph)	487	1768	850	406	1466	765	207	484	537
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	0.21	0.23	0.01	0.03	0.34	0.30	0.10	0.56	0.21

Intersection Summary

Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA
Protected Phases	7	4			8		2	2	6	6
Permitted Phases	4		4	8		8				
Actuated Green, G (s)	68.2	68.2	68.2	56.0	56.0	56.0		12.8	29.0	29.0
Effective Green, g (s)	67.2	71.4	71.4	59.2	59.2	59.2		16.0	32.2	32.2
Actuated g/C Ratio	0.51	0.54	0.54	0.45	0.45	0.45		0.12	0.24	0.24
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2		7.2	7.2	7.2
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5		4.0	4.0	4.0
Lane Grp Cap (vph)	376	1768	807	407	1466	637		202	380	367
v/s Ratio Prot	c0.02	0.12			c0.15			c0.01	c0.17	0.03
v/s Ratio Perm	0.12		0.00	0.01		0.07				
v/c Ratio	0.28	0.23	0.01	0.03	0.34	0.16		0.07	0.71	0.11
Uniform Delay, d1	17.5	15.7	13.8	20.2	23.6	21.5		51.2	45.5	38.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.0	0.1	0.6	0.6		0.7	6.7	0.2
Delay (s)	17.8	16.0	13.8	20.3	24.2	22.1		51.9	52.1	38.7
Level of Service	B	B	B	C	C	C		D	D	D
Approach Delay (s)	16.3				23.5			51.9	48.1	
Approach LOS	B				C			D	D	

HCM Signalized Intersection Capacity Analysis
5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

Isolated
Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔		↔↔		↔	↔	
Traffic Volume (vph)	99	379	9	10	480	221	3	10	6	257	13	96
Future Volume (vph)	99	379	9	10	480	221	3	10	6	257	13	96
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0		4.0		4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00		1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00		0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00		1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.96		1.00		0.87
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95		1.00
Satd. Flow (prot)	1599	3260	1488	1662	3260	1417		1667		1554		1502
Flt Permitted	0.37	1.00	1.00	0.52	1.00	1.00		0.99		0.95		1.00
Satd. Flow (perm)	618	3260	1488	905	3260	1417		1667		1554		1502
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	104	399	9	11	505	233	3	11	6	271	14	101
RTOR Reduction (vph)	0	0	4	0	0	128	0	5	0	0	76	0
Lane Group Flow (vph)	104	399	5	11	505	105	0	15	0	271	39	0
Confl. Peds. (#/hr)	1											
Heavy Vehicles (%)	4%	2%	0%	0%	2%	5%	0%	0%	0%	7%	0%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA		
Protected Phases	7	4			8		2	2	6	6		
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	68.2	68.2	68.2	56.0	56.0	56.0		12.8	29.0	29.0		
Effective Green, g (s)	67.2	71.4	71.4	59.2	59.2	59.2		16.0	32.2	32.2		
Actuated g/C Ratio	0.51	0.54	0.54	0.45	0.45	0.45		0.12	0.24	0.24		
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2		7.2	7.2	7.2		
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5		4.0	4.0	4.0		
Lane Grp Cap (vph)	376	1768	807	407	1466	637		202	380	367		
v/s Ratio Prot	c0.02	0.12			c0.15			c0.01	c0.17	0.03		
v/s Ratio Perm	0.12		0.00	0.01		0.07						
v/c Ratio	0.28	0.23	0.01	0.03	0.34	0.16		0.07	0.71	0.11		
Uniform Delay, d1	17.5	15.7	13.8	20.2	23.6	21.5		51.2	45.5	38.5		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		
Incremental Delay, d2	0.2	0.3	0.0	0.1	0.6	0.6		0.7	6.7	0.2		
Delay (s)	17.8	16.0	13.8	20.3	24.2	22.1		51.9	52.1	38.7		
Level of Service	B	B	B	C	C	C		D	D	D		
Approach Delay (s)	16.3				23.5			51.9	48.1			
Approach LOS	B				C			D	D			

Intersection Summary

HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	131.6	Sum of lost time (s)	19.2
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Isolated
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	466	183	79	363	321	24
Future Volume (vph)	466	183	79	363	321	24
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3228	1390	1554	3228	3162	1316
Flt Permitted			0.353		0.950	
Satd. Flow (perm)	3228	1390	577	3228	3162	1316
Right Turn on Red		Yes			Yes	
Satd. Flow (RTOR)		191			25	
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	7%	7%	3%	2%	13%
Adj. Flow (vph)	485	191	82	378	334	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	485	191	82	378	334	25
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4	
Detector 2 Size(m)		0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)		0.0			0.0	
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Isolated
PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	42.5	42.5	42.5	42.5	36.5	36.5
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.2%	46.2%
Maximum Green (s)	35.0	35.0	35.0	35.0	30.0	30.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	21.4	21.4	21.4	21.4	49.6	49.6
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.63	0.63
v/c Ratio	0.56	0.37	0.53	0.43	0.17	0.03
Control Delay	26.7	5.4	36.3	24.7	7.1	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	5.4	36.3	24.7	7.1	3.3
LOS	C	A	D	C	A	A
Approach Delay	20.7			26.8	6.8	
Approach LOS	C			C	A	
Intersection Summary						
Area Type:	Other					
Cycle Length:	79					
Actuated Cycle Length:	79					
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green					
Natural Cycle:	65					
Control Type:	Actuated-Coordinated					
Maximum v/c Ratio:	0.56					
Intersection Signal Delay:	19.2			Intersection LOS: B		
Intersection Capacity Utilization:	42.3%			ICU Level of Service A		
Analysis Period (min)	15					
Plots and Phases:	6: Stanley Avenue & Marineland Parkway					
	↔ O2 (R)		↔ O4		↔ O8	
	36.5 s		42.5 s		42.5 s	

Queues
6: Stanley Avenue & Marineland Parkway

Isolated
PM Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	485	191	82	378	334	25
v/c Ratio	0.56	0.37	0.53	0.43	0.17	0.03
Control Delay	26.7	5.4	36.3	24.7	7.1	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	5.4	36.3	24.7	7.1	3.3
Queue Length 50th (m)	34.7	0.0	11.1	26.1	9.7	0.0
Queue Length 95th (m)	44.0	13.2	23.4	34.2	19.1	3.3
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1573	775	281	1573	1987	836
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.25	0.29	0.24	0.17	0.03

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Isolated
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕	↕	↕	↕↕	↕↕	↕
Traffic Volume (vph)	466	183	79	363	321	24
Future Volume (vph)	466	183	79	363	321	24
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Fr	1.00	0.85	1.00	1.00	1.00	0.85
Fit Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3228	1390	1554	3228	3162	1316
Fit Permitted	1.00	1.00	0.35	1.00	0.95	1.00
Satd. Flow (perm)	3228	1390	577	3228	3162	1316
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	485	191	82	378	334	25
RTOR Reduction (vph)	0	139	0	0	0	9
Lane Group Flow (vph)	485	52	82	378	334	16
Heavy Vehicles (%)	3%	7%	7%	3%	2%	13%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	17.9	17.9	17.9	17.9	47.1	47.1
Effective Green, g (s)	21.4	21.4	21.4	21.4	49.6	49.6
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.63	0.63
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	874	376	156	874	1985	826
v/s Ratio Prot	c0.15			0.12	c0.11	
v/s Ratio Perm		0.04	0.14			0.01
v/c Ratio	0.55	0.14	0.53	0.43	0.17	0.02
Uniform Delay, d1	24.7	21.8	24.5	23.8	6.1	5.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	3.0	0.3	0.2	0.0
Delay (s)	25.5	22.0	27.5	24.1	6.3	5.6
Level of Service	C	C	C	C	A	A
Approach Delay (s)	24.5			24.7	6.2	
Approach LOS	C			C	A	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Isolated
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	23	161	3	491	249	74	5	140	386	145	191	54
Future Volume (vph)	23	161	3	491	249	74	5	140	386	145	191	54
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Fit Permitted	0.585			0.950			0.621			0.950		
Satd. Flow (perm)	1024	3197	1488	3131	3228	1390	1087	3197	1430	3101	3260	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			95			420			95
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		507.4			421.7			216.1			150.6	
Travel Time (s)		22.8			19.0			13.0			9.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Adj. Flow (vph)	25	175	3	534	271	80	5	152	420	158	208	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	175	3	534	271	80	5	152	420	158	208	59
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8			2		1		6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

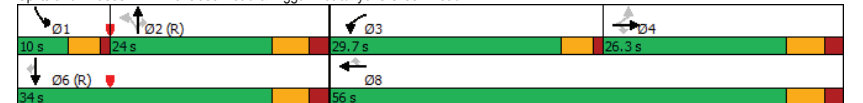
Isolated
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4		3	8		2		2		6
Detector Phase	4	4	4	4	3	8	8	2	2	2	1	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	29.7	56.0	56.0	24.0	24.0	24.0	10.0	34.0	34.0
Total Split (%)	29.2%	29.2%	29.2%	33.0%	62.2%	62.2%	26.7%	26.7%	26.7%	11.1%	37.8%	37.8%
Maximum Green (s)	20.0	20.0	20.0	25.2	49.7	49.7	17.7	17.7	17.7	5.5	27.7	27.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	13.1	15.4	13.1	20.4	40.3	38.0	25.1	27.4	25.1	9.8	41.7	39.4
Actuated g/C Ratio	0.15	0.17	0.15	0.23	0.45	0.42	0.28	0.30	0.28	0.11	0.46	0.44
v/c Ratio	0.17	0.32	0.01	0.75	0.19	0.12	0.02	0.16	0.60	0.47	0.14	0.09
Control Delay	35.5	33.9	0.0	39.3	14.4	2.6	28.4	25.7	7.5	42.3	15.6	1.9
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	35.5	33.9	0.0	39.3	14.4	2.6	28.4	25.7	7.5	42.3	15.6	1.9
LOS	D	C	A	D	B	A	C	C	A	D	B	A
Approach Delay		33.6			28.4		12.4				23.6	
Approach LOS		C			C		B				C	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBL and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	23.5
Intersection Capacity Utilization:	53.5%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 7: Montrose Road & Biggar Road/Lyons Creek Road



Queues
7: Montrose Road & Biggar Road/Lyons Creek Road

Isolated
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	25	175	3	534	271	80	5	152	420	158	208	59
v/c Ratio	0.17	0.32	0.01	0.75	0.19	0.12	0.02	0.16	0.60	0.47	0.14	0.09
Control Delay	35.5	33.9	0.0	39.3	14.4	2.6	28.4	25.7	7.5	42.3	15.6	1.9
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	35.5	33.9	0.0	39.3	14.4	2.6	28.4	25.7	7.5	42.3	15.6	1.9
Queue Length 50th (m)	4.0	14.8	0.0	46.8	15.1	0.0	0.7	10.7	0.0	13.9	11.0	0.0
Queue Length 95th (m)	11.2	23.7	0.0	60.4	19.2	5.5	3.8	20.4	27.6	24.2	20.8	3.6
Internal Link Dist (m)	483.4			397.7				192.1		126.6		
Turn Bay Length (m)	130.0	120.0		150.0	225.0			80.0	60.0	80.0	50.0	
Base Capacity (vph)	227	792	446	876	1865	810	303	973	701	338	1511	679
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	0.11	0.22	0.01	0.61	0.15	0.10	0.02	0.16	0.60	0.47	0.14	0.09

Intersection Summary

Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	4				3				8			
Permitted Phases	4				8				2			
Actuated Green, G (s)	13.1	13.1	13.1	20.4	38.0	38.0	25.1	25.1	25.1	9.8	39.4	39.4
Effective Green, g (s)	13.1	15.4	13.1	20.4	40.3	38.0	25.1	27.4	25.1	9.8	41.7	39.4
Actuated g/C Ratio	0.15	0.17	0.15	0.23	0.45	0.42	0.28	0.30	0.28	0.11	0.46	0.44
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	149	547	216	709	1445	586	303	973	398	337	1510	626
v/s Ratio Prot	c0.05				c0.17				0.08			
v/s Ratio Perm	0.02				0.00				0.02			
v/c Ratio	0.17	0.32	0.00	0.75	0.19	0.06	0.02	0.16	0.29	0.47	0.14	0.04
Uniform Delay, d1	33.7	32.7	32.9	32.5	15.0	15.4	23.5	22.9	25.5	37.7	13.8	14.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.0	0.0	4.5	0.2	0.1	0.1	0.3	1.9	1.0	0.2	0.1
Delay (s)	35.2	33.7	32.9	37.0	15.2	15.5	23.6	23.2	27.4	38.7	14.0	14.6
Level of Service	D	C	C	D	B	B	C	C	C	D	B	B
Approach Delay (s)	33.8				28.4				26.2			
Approach LOS	C				C				C			
Intersection Summary												
HCM 2000 Control Delay	27.3				HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	90.0				Sum of lost time (s)				17.0			
Intersection Capacity Utilization	53.5%				ICU Level of Service				A			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
7: Montrose Road & Biggar Road/Lyons Creek Road

Isolated
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↖↗	↘	↖↗	↖↗	↘	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	23	161	3	491	249	74	5	140	386	145	191	54
Future Volume (vph)	23	161	3	491	249	74	5	140	386	145	191	54
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit 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)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Fit Permitted	0.58	1.00	1.00	0.95	1.00	1.00	0.62	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1024	3197	1488	3131	3228	1390	1087	3197	1430	3101	3260	1430
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	175	3	534	271	80	5	152	420	158	208	59
RTOR Reduction (vph)	0	0	3	0	0	46	0	0	303	0	0	33
Lane Group Flow (vph)	25	175	0	534	271	34	5	152	117	158	208	26
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	4				3				8			
Permitted Phases	4				8				2			
Actuated Green, G (s)	13.1	13.1	13.1	20.4	38.0	38.0	25.1	25.1	25.1	9.8	39.4	39.4
Effective Green, g (s)	13.1	15.4	13.1	20.4	40.3	38.0	25.1	27.4	25.1	9.8	41.7	39.4
Actuated g/C Ratio	0.15	0.17	0.15	0.23	0.45	0.42	0.28	0.30	0.28	0.11	0.46	0.44
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	149	547	216	709	1445	586	303	973	398	337	1510	626
v/s Ratio Prot	c0.05				c0.17				0.08			
v/s Ratio Perm	0.02				0.00				0.02			
v/c Ratio	0.17	0.32	0.00	0.75	0.19	0.06	0.02	0.16	0.29	0.47	0.14	0.04
Uniform Delay, d1	33.7	32.7	32.9	32.5	15.0	15.4	23.5	22.9	25.5	37.7	13.8	14.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.0	0.0	4.5	0.2	0.1	0.1	0.3	1.9	1.0	0.2	0.1
Delay (s)	35.2	33.7	32.9	37.0	15.2	15.5	23.6	23.2	27.4	38.7	14.0	14.6
Level of Service	D	C	C	D	B	B	C	C	C	D	B	B
Approach Delay (s)	33.8				28.4				26.2			
Approach LOS	C				C				C			

Intersection Summary												
HCM 2000 Control Delay	27.3				HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	90.0				Sum of lost time (s)				17.0			
Intersection Capacity Utilization	53.5%				ICU Level of Service				A			
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Isolated
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	67	7	9	1	5	5	9	599	0	6	597	42
Future Volume (vph)	67	7	9	1	5	5	9	599	0	6	597	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.986			0.938						0.991	
Flt Protected		0.961			0.996			0.999				
Satd. Flow (prot)	0	1645	0	0	1635	0	0	1707	0	0	1726	0
Flt Permitted		0.961			0.996			0.999				
Satd. Flow (perm)	0	1645	0	0	1635	0	0	1707	0	0	1726	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	3		2	2		3	1		5	5		1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	33%	2%	0%	0%	0%	7%
Adj. Flow (vph)	77	8	10	1	6	6	10	689	0	7	686	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	95	0	0	13	0	0	699	0	0	741	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.0%					ICU Level of Service B						
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive

Isolated
PM Peak Hour

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Sign Control		Stop			Stop			Stop			Stop		
Traffic Volume (vph)	67	7	9	1	5	5	9	599	0	6	597	42	
Future Volume (vph)	67	7	9	1	5	5	9	599	0	6	597	42	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	
Hourly flow rate (vph)	77	8	10	1	6	6	10	689	0	7	686	48	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total (vph)	95	13	699	741									
Volume Left (vph)	77	1	10	7									
Volume Right (vph)	10	6	0	48									
Hadj (s)	0.11	-0.26	0.04	-0.03									
Departure Headway (s)	7.2	7.2	5.2	5.2									
Degree Utilization, x	0.19	0.03	1.02	1.06									
Capacity (veh/h)	495	477	699	709									
Control Delay (s)	11.8	10.4	60.6	73.4									
Approach Delay (s)	11.8	10.4	60.6	73.4									
Approach LOS	B	B	F	F									
Intersection Summary													
Delay	63.3												
Level of Service	F												
Intersection Capacity Utilization	59.0%				ICU Level of Service				B				
Analysis Period (min)	15												

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Isolated
PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	T	T	T
Traffic Volume (vph)	99	69	504	73	70	517
Future Volume (vph)	99	69	504	73	70	517
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945			0.850		
Flt Protected	0.971			0.950		
Satd. Flow (prot)	1580	0	1750	1488	1614	1750
Flt Permitted	0.971			0.950		
Satd. Flow (perm)	1580	0	1750	1488	1614	1750
Link Speed (k/h)	50		60		60	
Link Distance (m)	1040.1		438.6		461.8	
Travel Time (s)	74.9		26.3		27.7	
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	0%	4%	0%	0%	3%	0%
Adj. Flow (vph)	115	80	586	85	81	601
Shared Lane Traffic (%)						
Lane Group Flow (vph)	195	0	586	85	81	601
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	53.6% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Isolated
PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	T	T	T
Sign Control	Stop		Stop		Stop	
Traffic Volume (vph)	99	69	504	73	70	517
Future Volume (vph)	99	69	504	73	70	517
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	115	80	586	85	81	601
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total (vph)	195	586	85	81	601	
Volume Left (vph)	115	0	0	81	0	
Volume Right (vph)	80	0	85	0	0	
Hadj (s)	-0.10	0.00	-0.70	0.55	0.00	
Departure Headway (s)	6.8	6.1	5.4	6.7	6.1	
Degree Utilization, x	0.37	0.99	0.13	0.15	1.02	
Capacity (veh/h)	521	586	659	534	601	
Control Delay (s)	13.8	57.7	8.0	9.7	66.8	
Approach Delay (s)	13.8	51.4		60.0		
Approach LOS	B	F		F		

Intersection Summary	
Delay	50.4
Level of Service	F
Intersection Capacity Utilization	53.6% ICU Level of Service A
Analysis Period (min)	15

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Isolated
PM Peak Hour

	↖	→	↘	↙	←	↖	↘	↙	↖	↘	↙	↖	↘	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations		↕			↕			↕			↕				
Traffic Volume (vph)	5	25	200	10	26	3	272	151	16	9	300	91			
Future Volume (vph)	5	25	200	10	26	3	272	151	16	9	300	91			
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Ped Bike Factor															
Frt		0.883			0.991			0.995			0.969				
Flt Protected		0.999			0.987			0.970			0.999				
Satd. Flow (prot)	0	1544	0	0	1675	0	0	1627	0	0	1576	0			
Flt Permitted		0.999			0.987			0.970			0.999				
Satd. Flow (perm)	0	1544	0	0	1675	0	0	1627	0	0	1576	0			
Link Speed (k/h)		60			60			70			60				
Link Distance (m)		372.3			519.4			156.9			312.6				
Travel Time (s)		22.3			31.2			8.1			18.8				
Confl. Peds. (#/hr)								2	2						
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	33%	0%	11%	0%	0%	6%	13%			
Adj. Flow (vph)	6	29	233	12	30	3	316	176	19	10	349	106			
Shared Lane Traffic (%)															
Lane Group Flow (vph)	0	268	0	0	45	0	0	511	0	0	465	0			
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No			
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right			
Median Width(m)		0.0			0.0			0.0			0.0				
Link Offset(m)		0.0			0.0			0.0			0.0				
Crosswalk Width(m)		4.8			4.8			4.8			4.8				
Two way Left Turn Lane															
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11			
Turning Speed (k/h)	25	15	25	15	25	15	25	15	25	15	25	15			
Sign Control		Stop			Stop			Free			Free				
Intersection Summary															
Area Type:	Other														
Control Type:	Unsignalized														
Intersection Capacity Utilization	75.1%						ICU Level of Service D								
Analysis Period (min)	15														

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Isolated
PM Peak Hour

	↖	→	↘	↙	←	↖	↘	↙	↖	↘	↙	↖	↘	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↕			↕			↕			↕			
Traffic Volume (veh/h)	5	25	200	10	26	3	272	151	16	9	300	91		
Future Volume (Veh/h)	5	25	200	10	26	3	272	151	16	9	300	91		
Sign Control		Stop			Stop			Free			Free			
Grade		0%			0%			0%			0%			
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86		
Hourly flow rate (vph)	6	29	233	12	30	3	316	176	19	10	349	106		
Pedestrians					2									
Lane Width (m)					3.6									
Walking Speed (m/s)					1.2									
Percent Blockage					0									
Right turn flare (veh)														
Median type								None						None
Median storage (veh)														
Upstream signal (m)														
pX, platoon unblocked														
vC, conflicting volume	1258	1251	402	1489	1294	188	455				197			
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	1258	1251	402	1489	1294	188	455				197			
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.5	4.1				4.1			
tC, 2 stage (s)														
tF (s)	3.5	4.0	3.3	3.5	4.0	3.6	2.2				2.2			
p0 queue free %	94	77	64	72	74	100	72				99			
cM capacity (veh/h)	94	124	653	43	116	780	1116				1385			
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	268	45	511	465										
Volume Left	6	12	316	10										
Volume Right	233	3	19	106										
eSH	409	83	1116	1385										
Volume to Capacity	0.66	0.54	0.28	0.01										
Queue Length 95th (m)	36.3	19.0	9.4	0.2										
Control Delay (s)	29.1	91.2	7.0	0.2										
Lane LOS	D	F	A	A										
Approach Delay (s)	29.1	91.2	7.0	0.2										
Approach LOS	D	F												
Intersection Summary														
Average Delay				12.1										
Intersection Capacity Utilization	75.1%			ICU Level of Service	D									
Analysis Period (min)	15													

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Isolated
PM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑	↔		↔	↑
Traffic Volume (vph)	369	265	165	65	86	421
Future Volume (vph)	369	265	165	65	86	421
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1511	1733	1648	0	1662	1390
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1511	1733	1648	0	1662	1390
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	10%	1%	1%	5%	0%	7%
Adj. Flow (vph)	388	279	174	68	91	443
Shared Lane Traffic (%)						
Lane Group Flow (vph)	388	279	242	0	91	443
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		25		15	25	15
Sign Control		Stop	Stop		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.1% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Isolated
PM Peak Hour

	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑	↔		↔	↑
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	369	265	165	65	86	421
Future Volume (vph)	369	265	165	65	86	421
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	388	279	174	68	91	443
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	388	279	242	91	443	
Volume Left (vph)	388	0	0	91	0	
Volume Right (vph)	0	0	68	0	443	
Hadj (s)	0.67	0.02	-0.13	0.50	-0.58	
Departure Headway (s)	7.4	6.7	6.8	7.5	6.4	
Degree Utilization, x	0.79	0.52	0.46	0.19	0.79	
Capacity (veh/h)	475	524	506	463	544	
Control Delay (s)	32.0	15.5	15.5	11.1	28.4	
Approach Delay (s)	25.1		15.5	25.4		
Approach LOS	D		C	D		
Intersection Summary						
Delay			23.6			
Level of Service			C			
Intersection Capacity Utilization			51.1%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	120	992	38	174	771	241	53	96	329	248	162	68
Future Volume (vph)	120	992	38	174	771	241	53	96	329	248	162	68
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0		70.0	155.0		0.0	115.0		0.0	130.0		0.0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00					1.00
Frt		0.994					0.850			0.850		0.956
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1539	4518	0	1599	3228	1444	1662	3107	1403	1599	3058	0
Fit Permitted	0.218			0.120			0.592			0.600		
Satd. Flow (perm)	353	4518	0	202	3228	1444	1035	3107	1403	1010	3058	0
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		5				271			366		52	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		759.2			692.3			721.0			213.3	
Travel Time (s)		54.7			49.8			51.9			15.4	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	8%	5%	8%	4%	3%	3%	0%	7%	6%	4%	5%	0%
Adj. Flow (vph)	135	1115	43	196	866	271	60	108	370	279	182	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	135	1158	0	196	866	271	60	108	370	279	258	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Montrose Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		2	6	
Permitted Phases	4			8		8	2			2	6	
Detector Phase	7	4		3	8	8	5	2		2	1	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0	10.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	9.5	40.0		9.5	40.0	40.0	9.5	46.0		46.0	9.5	46.0
Total Split (s)	15.0	48.0		26.4	59.4	59.4	9.6	36.6		36.6	19.0	46.0
Total Split (%)	11.5%	36.9%		20.3%	45.7%	45.7%	7.4%	28.2%		28.2%	14.6%	35.4%
Maximum Green (s)	12.0	40.0		23.4	51.4	51.4	6.6	28.6		28.6	16.0	38.0
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0		4.0	3.0	4.0
All-Red Time (s)	0.0	4.0		0.0	4.0	4.0	0.0	4.0		4.0	0.0	4.0
Lost Time Adjust (s)	1.0	-4.0		1.0	-4.0	-4.0	1.0	-4.0		-4.0	1.0	-4.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lag	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5
Recall Mode	None	C-Max		None	C-Max	C-Max	None	Max		Max	None	Max
Walk Time (s)		12.0			12.0	12.0		14.0		14.0		14.0
Flash Dont Walk (s)		20.0			20.0	20.0		24.0		24.0		24.0
Pedestrian Calls (#/hr)		0			0	0		0		0		0
Act Effct Green (s)	61.0	51.8		69.7	57.2	57.2	38.5	33.0		33.0	51.6	43.9
Actuated g/C Ratio	0.47	0.40		0.54	0.44	0.44	0.30	0.25		0.25	0.40	0.34
v/c Ratio	0.54	0.64		0.74	0.61	0.34	0.18	0.14		0.59	0.60	0.24
Control Delay	24.4	34.3		35.2	29.8	5.1	26.8	38.3		8.3	35.2	25.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	24.4	34.3		35.2	29.8	5.1	26.8	38.3		8.3	35.2	25.8
LOS	C	C		D	C	A	C	D		A	D	C
Approach Delay		33.3			25.6			16.4				30.7
Approach LOS		C			C			B				C
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	95 (73%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	105											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.74											
Intersection Signal Delay:	27.7						Intersection LOS: C					
Intersection Capacity Utilization:	82.2%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	1: Montrose Road & McLeod Road											

Queues
1: Montrose Road & McLeod Road

Future Total
Saturday Peak Hour

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	135	1158	196	866	271	60	108	370	279	258
v/c Ratio	0.54	0.64	0.74	0.61	0.34	0.18	0.14	0.59	0.60	0.24
Control Delay	24.4	34.3	35.2	29.8	5.1	26.8	38.3	8.3	35.2	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	34.3	35.2	29.8	5.1	26.8	38.3	8.3	35.2	25.8
Queue Length 50th (m)	17.6	90.5	17.8	105.4	9.2	10.0	11.9	0.8	54.4	21.2
Queue Length 95th (m)	29.0	117.1	41.5	128.2	13.0	19.5	19.9	27.2	79.4	32.2
Internal Link Dist (m)		735.2		668.3			697.0			189.3
Turn Bay Length (m)	55.0		155.0			115.0			130.0	
Base Capacity (vph)	270	1804	350	1419	786	334	788	629	468	1067
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.64	0.56	0.61	0.34	0.18	0.14	0.59	0.60	0.24

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Montrose Road & McLeod Road

Future Total
Saturday Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	120	992	38	174	771	241	53	96	329	248	162	68
Future Volume (vph)	120	992	38	174	771	241	53	96	329	248	162	68
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1539	4520		1599	3228	1444	1661	3107	1403	1599	3057	
Flt Permitted	0.22	1.00		0.12	1.00	1.00	0.59	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	353	4520		202	3228	1444	1036	3107	1403	1009	3057	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	135	1115	43	196	866	271	60	108	370	279	182	76
RTOR Reduction (vph)	0	3	0	0	0	153	0	0	271	0	34	0
Lane Group Flow (vph)	135	1155	0	196	866	118	60	108	99	279	224	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	8%	5%	8%	4%	3%	3%	0%	7%	6%	4%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	57.4	47.2		65.8	52.6	52.6	34.9	29.6	29.6	48.2	39.9	
Effective Green, g (s)	55.4	51.2		64.8	56.6	56.6	32.9	33.6	33.6	47.2	43.9	
Actuated g/C Ratio	0.43	0.39		0.50	0.44	0.44	0.25	0.26	0.26	0.36	0.34	
Clearance Time (s)	3.0	8.0		3.0	8.0	8.0	3.0	8.0	8.0	3.0	8.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	234	1780		257	1405	628	282	803	362	432	1032	
v/s Ratio Prot	0.04	0.26		c0.09	0.27		0.01	0.03		c0.07	0.07	
v/s Ratio Perm	0.20			c0.29		0.08	0.05		0.07	c0.16		
v/c Ratio	0.58	0.65		0.76	0.62	0.19	0.21	0.13	0.27	0.65	0.22	
Uniform Delay, d1	24.7	32.1		23.2	28.3	22.6	37.6	37.0	38.4	32.7	30.8	
Progression Factor	1.00	1.00		1.05	0.99	1.54	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.8	1.8		9.7	1.6	0.5	0.3	0.3	1.9	2.9	0.5	
Delay (s)	27.5	33.9		33.9	29.7	35.3	37.9	37.4	40.3	35.6	31.2	
Level of Service	C	C		C	C	D	D	D	D	D	C	
Approach Delay (s)		33.3			31.4			39.4			33.5	
Approach LOS		C			C			D			C	

Intersection Summary

HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	24	1042	417	239	1106	14	373	15	313	10	8	29
Future Volume (vph)	24	1042	417	239	1106	14	373	15	313	10	8	29
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	50.0		0.0	80.0		0.0	95.0		0.0	20.0		0.0
Storage Lanes	1		1	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.95		1.00		1.00		0.99	1.00		0.99
Frt			0.850		0.998				0.850			0.881
Flt Protected	0.950			0.950			0.950	0.956		0.950		
Satd. Flow (prot)	1662	3292	1473	1630	3284	0	1548	1561	1473	1662	1524	0
Flt Permitted	0.196			0.133			0.950	0.956		0.950		
Satd. Flow (perm)	342	3292	1396	228	3284	0	1545	1557	1452	1660	1524	0
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)			391		2				329			31
Link Speed (k/h)		50			50			50				50
Link Distance (m)		692.3			616.3			360.6				181.9
Travel Time (s)		49.8			44.4			26.0				13.1
Confl. Peds. (#/hr)	10		16	16		10	3		2	2		3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	2%	0%	1%	0%	0%	0%
Adj. Flow (vph)	25	1097	439	252	1164	15	393	16	329	11	8	31
Shared Lane Traffic (%)							48%					
Lane Group Flow (vph)	25	1097	439	252	1179	0	204	205	329	11	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2		1	2	1	1		2
Detector Template	Left	Thru	Right	Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0	2.0		10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0	2.0		0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
2: Oakwood Drive & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Detector Phase	7	4	4	3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.5	40.0	40.0	9.5	40.0		48.0	48.0	48.0	53.0	53.0	
Total Split (s)	12.0	62.0	62.0	26.0	76.0		28.0	28.0	28.0	14.0	14.0	
Total Split (%)	9.2%	47.7%	47.7%	20.0%	58.5%		21.5%	21.5%	21.5%	10.8%	10.8%	
Maximum Green (s)	9.0	54.0	54.0	23.0	68.0		19.0	19.0	19.0	5.0	5.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	4.0	4.0	0.0	4.0		5.0	5.0	5.0	5.0	5.0	
Lost Time Adjust (s)	1.0	-4.0	1.0	1.0	-4.0		-5.0	-5.0	-5.0	-5.0	-5.0	
Total Lost Time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max		Max	Max	Max	Max	Max	
Walk Time (s)		12.0	12.0		12.0		14.0	14.0	14.0	16.0	16.0	
Flash Dont Walk (s)		20.0	20.0		20.0		25.0	25.0	25.0	28.0	28.0	
Pedestrian Calls (#/hr)		0	0		0		0	0	0	0	0	
Act Effct Green (s)	69.4	64.3	59.3	84.0	78.5		24.0	24.0	24.0	10.0	10.0	
Actuated g/C Ratio	0.53	0.49	0.46	0.65	0.60		0.18	0.18	0.18	0.08	0.08	
v/c Ratio	0.11	0.67	0.52	0.80	0.59		0.72	0.71	0.61	0.09	0.27	
Control Delay	8.0	21.6	7.8	36.3	18.1		64.9	64.5	10.2	57.5	28.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	8.0	21.6	7.8	36.3	18.1		64.9	64.5	10.2	57.5	28.3	
LOS	A	C	A	D	B		E	E	B	E	C	
Approach Delay		17.5			21.3			40.4			34.7	
Approach LOS		B			C			D			C	
Intersection Summary												
Area Type:	Other											
Cycle Length:	130											
Actuated Cycle Length:	130											
Offset:	32 (25%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	155											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.80											
Intersection Signal Delay:	23.6						Intersection LOS: C					
Intersection Capacity Utilization:	110.4%						ICU Level of Service H					
Analysis Period (min):	15											
Splits and Phases:	2: Oakwood Drive & McLeod Road											

Queues
2: Oakwood Drive & McLeod Road

Future Total
Saturday Peak Hour

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	1097	439	252	1179	204	205	329	11	39
v/c Ratio	0.11	0.67	0.52	0.80	0.59	0.72	0.71	0.61	0.09	0.27
Control Delay	8.0	21.6	7.8	36.3	18.1	64.9	64.5	10.2	57.5	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	21.6	7.8	36.3	18.1	64.9	64.5	10.2	57.5	28.3
Queue Length 50th (m)	1.4	131.8	56.9	30.8	105.3	54.9	55.2	0.0	2.8	2.1
Queue Length 95th (m)	m2.5	163.5	92.0	61.0	129.1	#89.6	#89.5	28.1	9.3	13.9
Internal Link Dist (m)		668.3			592.3		336.6			157.9
Turn Bay Length (m)	50.0			80.0		95.0			20.0	
Base Capacity (vph)	271	1627	849	384	1982	285	288	536	127	145
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.67	0.52	0.66	0.59	0.72	0.71	0.61	0.09	0.27

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Oakwood Drive & McLeod Road

Future Total
Saturday Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations												
Traffic Volume (vph)	24	1042	417	239	1106	14	373	15	313	10	8	29
Future Volume (vph)	24	1042	417	239	1106	14	373	15	313	10	8	29
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	9.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1662	3292	1396	1629	3285		1548	1560	1452	1662	1523	
Flt Permitted	0.20	1.00	1.00	0.13	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	343	3292	1396	228	3285		1548	1560	1452	1662	1523	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	1097	439	252	1164	15	393	16	329	11	8	31
RTOR Reduction (vph)	0	0	213	0	1	0	0	0	268	0	29	0
Lane Group Flow (vph)	25	1097	226	252	1178	0	204	205	61	11	10	0
Confl. Peds. (#/hr)	10		16	16		10	3		2	2		3
Heavy Vehicles (%)	0%	1%	1%	2%	1%	0%	2%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Split	NA	Perm	Split	NA	
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)	64.0	60.3	60.3	80.0	73.3		19.0	19.0	19.0	5.0	5.0	
Effective Green, g (s)	62.0	64.3	59.3	79.0	77.3		24.0	24.0	24.0	10.0	10.0	
Actuated g/C Ratio	0.48	0.49	0.46	0.61	0.59		0.18	0.18	0.18	0.08	0.08	
Clearance Time (s)	3.0	8.0	8.0	3.0	8.0		9.0	9.0	9.0	9.0	9.0	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	190	1628	636	307	1953		285	288	268	127	117	
v/s Ratio Prot	0.00	0.33		c0.10	0.36		c0.13	0.13		0.01	c0.01	
v/s Ratio Perm	0.06		0.16	c0.40					0.04			
v/c Ratio	0.13	0.67	0.36	0.82	0.60		0.72	0.71	0.23	0.09	0.09	
Uniform Delay, d1	18.5	24.9	23.0	23.0	16.7		49.8	49.8	45.1	55.8	55.8	
Progression Factor	0.74	0.76	1.51	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.8	1.2	15.7	1.4		14.3	13.9	2.0	1.3	1.5	
Delay (s)	14.0	20.6	35.8	38.7	18.0		64.1	63.7	47.1	57.1	57.3	
Level of Service	B	C	D	D	B		E	E	D	E	E	
Approach Delay (s)		24.8			21.7			56.4			57.2	
Approach LOS		C			C			E			E	

Intersection Summary

- HCM 2000 Control Delay 30.2 HCM 2000 Level of Service C
- HCM 2000 Volume to Capacity ratio 0.72
- Actuated Cycle Length (s) 130.0 Sum of lost time (s) 16.0
- Intersection Capacity Utilization 110.4% ICU Level of Service H
- Analysis Period (min) 15
- c Critical Lane Group

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	260	587	452	96	597	83	454	187	199	100	223	266
Future Volume (vph)	260	587	452	96	597	83	454	187	199	100	223	266
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0	0.0	50.0	0.0	15.0	0.0	30.0	0.0	30.0	0.0	0.0	0.0
Storage Lanes	1	0	1	0	2	0	1	0	1	0	0	0
Taper Length (m)	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	7.5	0.0	0.0	0.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.98	0.99	0.99	0.99	0.99	0.98	0.99	0.99	0.99	0.99	0.99
Frt	0.935			0.982			0.923			0.918		
Fit Protected	0.950		0.950		0.950		0.950		0.950		0.950	
Satd. Flow (prot)	1630	3002	0	1662	3216	0	3162	1585	0	1662	1571	0
Fit Permitted	0.178		0.201		0.950		0.950		0.950		0.950	
Satd. Flow (perm)	303	3002	0	350	3216	0	3134	1585	0	1639	1571	0
Right Turn on Red		Yes		Yes		Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		212		13		49		50		50		50
Link Speed (k/h)		50		50		50		50		50		50
Link Distance (m)		616.3		1045.5		348.9		308.0		308.0		308.0
Travel Time (s)		44.4		75.3		25.1		22.2		22.2		22.2
Confl. Peds. (#/hr)	13		11	11		13	9		21	21		9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%
Adj. Flow (vph)	268	605	466	99	615	86	468	193	205	103	230	274
Shared Lane Traffic (%)												
Lane Group Flow (vph)	268	1071	0	99	701	0	468	398	0	103	504	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6		3.6		7.2		7.2		7.2		7.2
Link Offset(m)		0.0		0.0		0.0		0.0		0.0		0.0
Crosswalk Width(m)		4.8		4.8		4.8		4.8		4.8		4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
3: Dorchester Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		8	8		5	2		1	6	
Permitted Phases	4			8								
Detector Phase	7	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		5.0	8.0		5.0	8.0	
Minimum Split (s)	9.5	30.4		30.4	30.4		9.5	37.7		9.5	37.7	
Total Split (s)	17.0	59.8		42.8	42.8		22.2	46.3		15.0	39.1	
Total Split (%)	14.0%	49.4%		35.3%	35.3%		18.3%	38.2%		12.4%	32.3%	
Maximum Green (s)	14.0	53.4		36.4	36.4		19.2	39.6		12.0	32.4	
Yellow Time (s)	3.0	4.1		4.1	4.1		3.0	4.1		3.0	4.1	
All-Red Time (s)	0.0	2.3		2.3	2.3		0.0	2.6		0.0	2.6	
Lost Time Adjust (s)	1.0	-2.4		1.0	-2.4		1.0	-2.7		1.0	-2.7	
Total Lost Time (s)	4.0	4.0		7.4	4.0		4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		9.0		9.0	9.0			12.0			12.0	
Flash Dont Walk (s)		15.0		15.0	15.0			19.0			19.0	
Pedestrian Calls (#/hr)		0		0	0			0			0	
Act Effct Green (s)	55.8	55.8		35.4	38.8		18.2	43.2		10.1	35.1	
Actuated g/C Ratio	0.46	0.46		0.29	0.32		0.15	0.36		0.08	0.29	
v/c Ratio	0.95	0.72		0.97	0.67		0.99	0.67		0.75	1.03	
Control Delay	67.2	23.8		126.1	38.9		89.3	35.3		85.2	86.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	67.2	23.8		126.1	38.9		89.3	35.3		85.2	86.7	
LOS	E	C		F	D		F	D		F	F	
Approach Delay		32.5			49.7			64.5			86.4	
Approach LOS		C			D			E			F	
Intersection Summary												
Area Type:	Other											
Cycle Length:	121.1											
Actuated Cycle Length:	121.1											
Offset:	106.7 (88%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	120											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	1.03											
Intersection Signal Delay:	53.0						Intersection LOS: D					
Intersection Capacity Utilization:	103.3%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	3: Dorchester Road & McLeod Road											

Queues
3: Dorchester Road & McLeod Road

Future Total
Saturday Peak Hour

	↖	→	↘	←	↙	↑	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	268	1071	99	701	468	398	103	504
v/c Ratio	0.95	0.72	0.97	0.67	0.99	0.67	0.75	1.03
Control Delay	67.2	23.8	126.1	38.9	89.3	35.3	85.2	86.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	23.8	126.1	38.9	89.3	35.3	85.2	86.7
Queue Length 50th (m)	42.3	90.3	24.5	78.4	60.9	74.5	25.4	~125.2
Queue Length 95th (m)	#93.3	117.0	#61.4	100.4	#96.1	112.1	#51.8	#194.6
Internal Link Dist (m)		592.3		1021.5		324.9		284.0
Turn Bay Length (m)	55.0		50.0		15.0		30.0	
Base Capacity (vph)	282	1497	102	1039	475	597	150	490
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	0.95	0.72	0.97	0.67	0.99	0.67	0.69	1.03

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Dorchester Road & McLeod Road

Future Total
Saturday Peak Hour

	↖	→	↘	↙	←	↘	↙	↑	↘	↙	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖↗	↖↗		↖	↖	↖
Traffic Volume (vph)	260	587	452	96	597	83	454	187	199	100	223	266
Future Volume (vph)	260	587	452	96	597	83	454	187	199	100	223	266
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		7.4	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.97	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1628	3001		1654	3215		3162	1585		1662	1572	
Flt Permitted	0.18	1.00		0.20	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	305	3001		350	3215		3162	1585		1662	1572	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	268	605	466	99	615	86	468	193	205	103	230	274
RTOR Reduction (vph)	0	114	0	0	9	0	0	32	0	0	36	0
Lane Group Flow (vph)	268	957	0	99	692	0	468	366	0	103	468	0
Confl. Peds. (#/hr)	13		11	11		13	9		21	21		9
Heavy Vehicles (%)	2%	1%	2%	0%	1%	0%	2%	0%	0%	0%	1%	1%
Turn Type	pm+pt	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	53.4	53.4		36.4	36.4		19.2	40.5		11.1	32.4	
Effective Green, g (s)	52.4	55.8		35.4	38.8		18.2	43.2		10.1	35.1	
Actuated g/C Ratio	0.43	0.46		0.29	0.32		0.15	0.36		0.08	0.29	
Clearance Time (s)	3.0	6.4		6.4	6.4		3.0	6.7		3.0	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	273	1382		102	1030		475	565		138	455	
v/s Ratio Prot	c0.10	0.32			0.22		c0.15	0.23		0.06	c0.30	
v/s Ratio Perm	c0.32			0.28								
v/c Ratio	0.98	0.69		0.97	0.67		0.99	0.65		0.75	1.03	
Uniform Delay, d1	27.3	25.9		42.3	35.6		51.3	32.6		54.2	43.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	49.1	2.9		81.4	3.5		37.1	2.6		19.5	50.0	
Delay (s)	76.4	28.7		123.8	39.1		88.5	35.2		73.8	93.0	
Level of Service	E	C		F	D		F	D		E	F	
Approach Delay (s)		38.3			49.6			64.0			89.7	
Approach LOS		D			D			E			F	

Intersection Summary

- HCM 2000 Control Delay: 55.6, HCM 2000 Level of Service: E
- HCM 2000 Volume to Capacity ratio: 0.99
- Actuated Cycle Length (s): 121.1, Sum of lost time (s): 16.0
- Intersection Capacity Utilization: 103.3%, ICU Level of Service: G
- Analysis Period (min): 15
- c Critical Lane Group

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	198	533	72	10	591	130	81	147	29	138	191	181
Future Volume (vph)	198	533	72	10	591	130	81	147	29	138	191	181
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0
Storage Lanes	0	0	0	0	0	0	0	0	1	0	0	0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99			0.99		0.98		0.99
Frt	0.987				0.973			0.985		0.927		
Flt Protected	0.988				0.999			0.984		0.950		
Satd. Flow (prot)	0	3211	0	0	3180	0	0	1660	0	1646	1588	0
Flt Permitted	0.597				0.942			0.583		0.534		
Satd. Flow (perm)	0	1937	0	0	2999	0	0	982	0	911	1588	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			33			7				52
Link Speed (k/h)		50			50			50				50
Link Distance (m)		1045.5			1070.0			834.0				207.0
Travel Time (s)		75.3			77.0			60.0				14.9
Confl. Peds. (#/hr)	12		2	2		12	8		22	22		8
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	3%	0%	1%	2%	0%
Adj. Flow (vph)	204	549	74	10	609	134	84	152	30	142	197	187
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	827	0	0	753	0	0	266	0	142	384	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Drummond Road & McLeod Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			2	6
Permitted Phases	4			8				2			6	
Detector Phase	7	4		8	8			2	2		6	6
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0			8.0	8.0		8.0	8.0
Minimum Split (s)	9.5	30.5		30.5	30.5			30.8	30.8		30.8	30.8
Total Split (s)	9.5	61.3		51.8	51.8			42.0	42.0		42.0	42.0
Total Split (%)	9.2%	59.3%		50.1%	50.1%			40.7%	40.7%		40.7%	40.7%
Maximum Green (s)	6.5	54.8		45.3	45.3			35.2	35.2		35.2	35.2
Yellow Time (s)	3.0	4.1		4.1	4.1			4.1	4.1		4.1	4.1
All-Red Time (s)	0.0	2.4		2.4	2.4			2.7	2.7		2.7	2.7
Lost Time Adjust (s)		-2.5			-2.5			-2.8	-2.8		-2.8	-2.8
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Recall Mode	None	C-Max		C-Max	C-Max			Max	Max		Max	Max
Walk Time (s)		9.0			9.0			9.0	9.0		9.0	9.0
Flash Dont Walk (s)		15.0			15.0			15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)		57.3			57.3			38.0	38.0		38.0	38.0
Actuated g/C Ratio		0.55			0.55			0.37	0.37		0.37	0.37
v/c Ratio		0.77			0.45			0.73	0.73		0.42	0.62
Control Delay		23.3			14.0			41.0	29.3		28.2	28.2
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		23.3			14.0			41.0	29.3		28.2	28.2
LOS		C			B			D	C		C	C
Approach Delay		23.3			14.0			41.0	28.5		28.5	28.5
Approach LOS		C			B			D	C		C	C
Intersection Summary												
Area Type:	Other											
Cycle Length:	103.3											
Actuated Cycle Length:	103.3											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	75											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.77											
Intersection Signal Delay:	23.5						Intersection LOS: C					
Intersection Capacity Utilization:	104.2%						ICU Level of Service G					
Analysis Period (min):	15											
Splits and Phases:	4: Drummond Road & McLeod Road											

Queues
4: Drummond Road & McLeod Road

Future Total
Saturday Peak Hour

	→	←	↑	↘	↓
Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	827	753	266	142	384
v/c Ratio	0.77	0.45	0.73	0.42	0.62
Control Delay	23.3	14.0	41.0	29.3	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	14.0	41.0	29.3	28.2
Queue Length 50th (m)	66.1	44.6	46.7	22.2	56.8
Queue Length 95th (m)	94.1	59.3	#87.1	41.1	89.8
Internal Link Dist (m)	1021.5	1046.0	810.0		183.0
Turn Bay Length (m)				20.0	
Base Capacity (vph)	1081	1678	365	335	617
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.77	0.45	0.73	0.42	0.62

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: Drummond Road & McLeod Road

Future Total
Saturday Peak Hour

	↘	→	↙	↗	←	↖	↘	↑	↗	↙	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕		↔	↔	
Traffic Volume (vph)	198	533	72	10	591	130	81	147	29	138	191	181
Future Volume (vph)	198	533	72	10	591	130	81	147	29	138	191	181
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0		4.0		4.0
Lane Util. Factor		0.95			0.95			1.00		1.00		1.00
Frbp, ped/bikes		1.00			0.99			1.00		1.00		0.99
Flpb, ped/bikes		1.00			1.00			1.00		0.98		1.00
Frt		0.99			0.97			0.98		1.00		0.93
Flt Protected		0.99			1.00			0.98		0.95		1.00
Satd. Flow (prot)		3203			3182			1658		1621		1588
Flt Permitted		0.60			0.94			0.58		0.53		1.00
Satd. Flow (perm)		1937			3000			981		910		1588
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	204	549	74	10	609	134	84	152	30	142	197	187
RTOR Reduction (vph)	0	7	0	0	15	0	0	4	0	0	33	0
Lane Group Flow (vph)	0	820	0	0	738	0	0	262	0	142	351	0
Confl. Peds. (#/hr)	12		2	2		12	8		22	22		8
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	3%	0%	1%	2%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		54.8			54.8			35.2		35.2		35.2
Effective Green, g (s)		57.3			57.3			38.0		38.0		38.0
Actuated g/C Ratio		0.55			0.55			0.37		0.37		0.37
Clearance Time (s)		6.5			6.5			6.8		6.8		6.8
Vehicle Extension (s)		2.5			2.5			2.5		2.5		2.5
Lane Grp Cap (vph)		1074			1664			360		334		584
v/s Ratio Prot												0.22
v/s Ratio Perm		c0.42			0.25			c0.27		0.16		
v/c Ratio		0.76			0.44			0.73		0.43		0.60
Uniform Delay, d1		17.8			13.6			28.2		24.5		26.5
Progression Factor		1.00			1.00			1.00		1.00		1.00
Incremental Delay, d2		3.1			0.9			12.1		3.9		4.5
Delay (s)		20.9			14.4			40.3		28.4		31.0
Level of Service		C			B			D		C		C
Approach Delay (s)		20.9			14.4			40.3				30.3
Approach LOS		C			B			D				C
Intersection Summary												
HCM 2000 Control Delay			23.1									C
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			103.3					Sum of lost time (s)		11.0		
Intersection Capacity Utilization			104.2%					ICU Level of Service		G		
Analysis Period (min)			15									
c	Critical Lane Group											

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Future Total Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	117	413	1	10	532	240	3	11	7	228	14	103
Future Volume (vph)	117	413	1	10	532	240	3	11	7	228	14	103
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	60.0		50.0	25.0		80.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	1		0
Taper Length (m)	7.5			7.5		7.5			7.5			7.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00			0.99		0.99
Frt			0.850			0.850			0.955			0.867
Flt Protected	0.950			0.950			0.993		0.950			
Satd. Flow (prot)	1662	3325	1488	1662	3292	1430	0	1660	0	1614	1496	0
Flt Permitted	0.341			0.504			0.993		0.950			
Satd. Flow (perm)	596	3325	1455	881	3292	1399	0	1659	0	1614	1496	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95			247		7		106		
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		1070.0			261.8			326.3		294.0		
Travel Time (s)		77.0			18.8			23.5		21.2		
Conf. Peds. (#/hr)	1		1	1		1	3					3
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	3%	0%	0%
Adj. Flow (vph)	121	426	1	10	548	247	3	11	7	235	14	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	426	1	10	548	247	0	21	0	235	120	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		
Link Offset(m)		0.0			0.0			0.0		0.0		
Crosswalk Width(m)		4.8			4.8			4.8		4.8		
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4		9.4		
Detector 2 Size(m)		0.6			0.6			0.6		0.6		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex		Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0		0.0		

Lanes, Volumes, Timings
 5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Future Total Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA	Split	NA	Split	NA
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases	4		4	8		8						
Detector Phase	7	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0		8.0	8.0	
Minimum Split (s)	9.5	39.2	39.2	39.2	39.2	39.2	37.2	37.2		37.2	37.2	
Total Split (s)	24.0	68.6	68.6	44.6	44.6	44.6	24.0	24.0		39.0	39.0	
Total Split (%)	18.2%	52.1%	52.1%	33.9%	33.9%	33.9%	18.2%	18.2%		29.6%	29.6%	
Maximum Green (s)	21.0	61.4	61.4	37.4	37.4	37.4	16.8	16.8		31.8	31.8	
Yellow Time (s)	3.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1		4.1	4.1	
All-Red Time (s)	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Lost Time Adjust (s)	1.0	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2		-3.2	-3.2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5	4.0	4.0		4.0	4.0	
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max		None	None	
Walk Time (s)		12.0	12.0	12.0	12.0	12.0	11.0	11.0		11.0	11.0	
Flash Dont Walk (s)		20.0	20.0	20.0	20.0	20.0	19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)		0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	71.5	71.5	71.5	58.8	58.8	58.8	20.0	20.0		28.1	28.1	
Actuated g/C Ratio	0.54	0.54	0.54	0.45	0.45	0.45	0.15	0.15		0.21	0.21	
v/c Ratio	0.31	0.24	0.00	0.03	0.37	0.32	0.08	0.08		0.68	0.30	
Control Delay	18.3	16.9	0.0	25.1	26.6	4.5	37.1	37.1		57.5	11.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	18.3	16.9	0.0	25.1	26.6	4.5	37.1	37.1		57.5	11.2	
LOS	B	B	A	C	C	A	D	D		E	B	
Approach Delay		17.2			19.8			37.1			41.8	
Approach LOS		B			B			D			D	
Intersection Summary												
Area Type:	Other											
Cycle Length:	131.6											
Actuated Cycle Length:	131.6											
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green											
Natural Cycle:	125											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.68											
Intersection Signal Delay:	23.7						Intersection LOS: C					
Intersection Capacity Utilization:	64.5%						ICU Level of Service C					
Analysis Period (min):	15											
Splits and Phases:	5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway											

Queues
5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	121	426	1	10	548	247	21	235	120
v/c Ratio	0.31	0.24	0.00	0.03	0.37	0.32	0.08	0.68	0.30
Control Delay	18.3	16.9	0.0	25.1	26.6	4.5	37.1	57.5	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	16.9	0.0	25.1	26.6	4.5	37.1	57.5	11.2
Queue Length 50th (m)	15.8	31.0	0.0	1.5	51.4	0.0	3.3	59.4	3.1
Queue Length 95th (m)	29.8	46.4	0.0	5.9	77.0	18.0	11.3	83.6	18.6
Internal Link Dist (m)	1046.0			237.8			302.3		
Turn Bay Length (m)	60.0	50.0	25.0	80.0					
Base Capacity (vph)	485	1807	833	393	1470	761	258	429	475
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	0.25	0.24	0.00	0.03	0.37	0.32	0.08	0.55	0.25
Intersection Summary									

HCM Signalized Intersection Capacity Analysis
5: Thundering Waters Boulevard/Stanley Avenue & McLeod Road/Marineland Parkway Peak Hour

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔		↔↔		↔	↔	↔
Traffic Volume (vph)	117	413	1	10	532	240	3	11	7	228	14	103
Future Volume (vph)	117	413	1	10	532	240	3	11	7	228	14	103
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98		1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (prot)	1662	3325	1455	1661	3292	1399		1659		1614	1497	
Flt Permitted	0.34	1.00	1.00	0.50	1.00	1.00		0.99		0.95	1.00	
Satd. Flow (perm)	597	3325	1455	880	3292	1399		1659		1614	1497	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	121	426	1	10	548	247	3	11	7	235	14	106
RTOR Reduction (vph)	0	0	0	0	0	137	0	6	0	0	83	0
Lane Group Flow (vph)	121	426	1	10	548	110	0	15	0	235	37	0
Confl. Peds. (#/hr)	1		1	1		1	3					3
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	3%	0%	0%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Split	NA		Split	NA	
Protected Phases	7	4			8		2	2		6	6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	68.3	68.3	68.3	55.6	55.6	55.6		16.8		24.9	24.9	
Effective Green, g (s)	67.3	71.5	71.5	58.8	58.8	58.8		20.0		28.1	28.1	
Actuated g/C Ratio	0.51	0.54	0.54	0.45	0.45	0.45		0.15		0.21	0.21	
Clearance Time (s)	3.0	7.2	7.2	7.2	7.2	7.2		7.2		7.2	7.2	
Vehicle Extension (s)	2.3	2.5	2.5	2.5	2.5	2.5		4.0		4.0	4.0	
Lane Grp Cap (vph)	375	1806	790	393	1470	625		252		344	319	
v/s Ratio Prot	c0.02	0.13			c0.17			c0.01		c0.15	0.02	
v/s Ratio Perm	0.14		0.00	0.01		0.08						
v/c Ratio	0.32	0.24	0.00	0.03	0.37	0.18		0.06		0.68	0.11	
Uniform Delay, d1	17.8	15.7	13.7	20.4	24.2	21.9		47.8		47.7	41.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.3	0.0	0.1	0.7	0.6		0.5		6.0	0.2	
Delay (s)	18.1	16.0	13.7	20.5	24.9	22.5		48.2		53.6	41.9	
Level of Service	B	B	B	C	C	C		D		D	D	
Approach Delay (s)	16.5			24.1			48.2			49.7		
Approach LOS	B			C			D			D		
Intersection Summary												
HCM 2000 Control Delay	27.2			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.40											
Actuated Cycle Length (s)	131.6			Sum of lost time (s)			19.2					
Intersection Capacity Utilization	64.5%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Future Total
Saturday Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	505	137	84	640	143	28
Future Volume (vph)	505	137	84	640	143	28
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)		65.0	105.0		160.0	80.0
Storage Lanes		1	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Ped Bike Factor		0.98	1.00			0.99
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3292	1458	1421	3292	3162	1390
Flt Permitted			0.356		0.950	
Satd. Flow (perm)	3292	1428	532	3292	3162	1372
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		143				29
Link Speed (k/h)	50			50	60	
Link Distance (m)	261.8			166.2	506.9	
Travel Time (s)	18.8			12.0	30.4	
Confl. Peds. (#/hr)		1	1			1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	1%	2%	17%	1%	2%	7%
Adj. Flow (vph)	526	143	88	667	149	29
Shared Lane Traffic (%)						
Lane Group Flow (vph)	526	143	88	667	149	29
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	7.2	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4		9.4		
Detector 2 Size(m)		0.6		0.6		
Detector 2 Type		CI+Ex		CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)		0.0		0.0		

Lanes, Volumes, Timings
6: Stanley Avenue & Marineland Parkway

Future Total
Saturday Peak Hour

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Detector Phase	4	4	8	8	2	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	8.0	8.0
Minimum Split (s)	25.5	25.5	25.5	25.5	38.5	38.5
Total Split (s)	42.5	42.5	42.5	42.5	36.5	36.5
Total Split (%)	53.8%	53.8%	53.8%	53.8%	46.2%	46.2%
Maximum Green (s)	35.0	35.0	35.0	35.0	30.0	30.0
Yellow Time (s)	4.5	4.5	4.5	4.5	4.1	4.1
All-Red Time (s)	3.0	3.0	3.0	3.0	2.4	2.4
Lost Time Adjust (s)	-3.5	-3.5	-3.5	-3.5	-2.5	-2.5
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Recall Mode	None	None	None	None	C-Max	C-Max
Walk Time (s)	0.0	0.0	0.0	0.0	12.0	12.0
Flash Dont Walk (s)	0.0	0.0	0.0	0.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	25.7	25.7	25.7	25.7	45.3	45.3
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.57	0.57
v/c Ratio	0.49	0.25	0.51	0.62	0.08	0.04
Control Delay	22.4	4.3	31.4	24.7	8.8	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	4.3	31.4	24.7	8.8	4.1
LOS	C	A	C	C	A	A
Approach Delay	18.5			25.5	8.1	
Approach LOS	B			C	A	
Intersection Summary						
Area Type:	Other					
Cycle Length:	79					
Actuated Cycle Length:	79					
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green					
Natural Cycle:	65					
Control Type:	Actuated-Coordinated					
Maximum v/c Ratio:	0.62					
Intersection Signal Delay:	20.6			Intersection LOS: C		
Intersection Capacity Utilization:	60.2%			ICU Level of Service B		
Analysis Period (min):	15					
Splits and Phases: 6: Stanley Avenue & Marineland Parkway						
↖ Ø2 (R)	36.5 s		→ Ø4	42.5 s		↖ Ø8
						42.5 s

Queues
6: Stanley Avenue & Marineland Parkway

Future Total
Saturday Peak Hour

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	526	143	88	667	149	29
v/c Ratio	0.49	0.25	0.51	0.62	0.08	0.04
Control Delay	22.4	4.3	31.4	24.7	8.8	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	4.3	31.4	24.7	8.8	4.1
Queue Length 50th (m)	34.4	0.0	11.1	46.0	5.0	0.0
Queue Length 95th (m)	42.8	10.3	23.4	55.7	10.9	4.0
Internal Link Dist (m)	237.8			142.2	482.9	
Turn Bay Length (m)		65.0	105.0		160.0	80.0
Base Capacity (vph)	1604	769	259	1604	1812	798
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.19	0.34	0.42	0.08	0.04
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
6: Stanley Avenue & Marineland Parkway

Future Total
Saturday Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕	↕	↕	↕↕	↕↕	↕
Traffic Volume (vph)	505	137	84	640	143	28
Future Volume (vph)	505	137	84	640	143	28
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frbp, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3292	1427	1419	3292	3162	1372
Flt Permitted	1.00	1.00	0.36	1.00	0.95	1.00
Satd. Flow (perm)	3292	1427	531	3292	3162	1372
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	526	143	88	667	149	29
RTOR Reduction (vph)	0	96	0	0	0	12
Lane Group Flow (vph)	526	47	88	667	149	17
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	1%	2%	17%	1%	2%	7%
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	22.2	22.2	22.2	22.2	42.8	42.8
Effective Green, g (s)	25.7	25.7	25.7	25.7	45.3	45.3
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.57	0.57
Clearance Time (s)	7.5	7.5	7.5	7.5	6.5	6.5
Vehicle Extension (s)	2.9	2.9	2.9	2.9	2.8	2.8
Lane Grp Cap (vph)	1070	464	172	1070	1813	786
v/s Ratio Prot	0.16			c0.20	c0.05	
v/s Ratio Perm		0.03	0.17			0.01
v/c Ratio	0.49	0.10	0.51	0.62	0.08	0.02
Uniform Delay, d1	21.4	18.6	21.6	22.6	7.5	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	2.4	1.1	0.1	0.0
Delay (s)	21.7	18.7	24.0	23.7	7.6	7.3
Level of Service	C	B	C	C	A	A
Approach Delay (s)	21.1			23.7	7.6	
Approach LOS	C			C	A	
Intersection Summary						
HCM 2000 Control Delay		20.8			HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.28				
Actuated Cycle Length (s)		79.0			Sum of lost time (s)	8.0
Intersection Capacity Utilization		60.2%			ICU Level of Service	B
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	↔	↔	↔↔	↔	↔↔	↔↔	↔
Traffic Volume (vph)	23	165	3	496	253	74	5	140	394	145	191	54
Future Volume (vph)	23	165	3	496	253	74	5	140	394	145	191	54
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	130.0		120.0	150.0		225.0	80.0		60.0	80.0		50.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5		7.5		7.5		7.5		7.5		7.5	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Fit Permitted	0.583			0.950			0.621			0.950		
Satd. Flow (perm)	1020	3197	1488	3131	3228	1390	1087	3197	1430	3101	3260	1430
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			149			95			428			95
Link Speed (k/h)		80			80			60				60
Link Distance (m)		507.4			421.7			216.1				150.6
Travel Time (s)		22.8			19.0			13.0				9.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Adj. Flow (vph)	25	179	3	539	275	80	5	152	428	158	208	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	179	3	539	275	80	5	152	428	158	208	59
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.2			7.2			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		4.8			4.8			4.8				4.8
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex				CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8			2		1		6

Lanes, Volumes, Timings
7: Montrose Road & Biggar Road/Lyons Creek Road

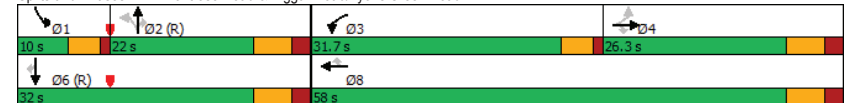
Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4		3	8		8	2	2	2	6
Detector Phase	4	4	4	4	3	8	8	2	2	2	1	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	26.3	26.3	26.3	9.5	26.3	26.3	31.3	31.3	31.3	9.5	31.3	31.3
Total Split (s)	26.3	26.3	26.3	31.7	58.0	58.0	22.0	22.0	22.0	10.0	32.0	32.0
Total Split (%)	29.2%	29.2%	29.2%	35.2%	64.4%	64.4%	24.4%	24.4%	24.4%	11.1%	35.6%	35.6%
Maximum Green (s)	20.0	20.0	20.0	27.2	51.7	51.7	15.7	15.7	15.7	5.5	25.7	25.7
Yellow Time (s)	4.1	4.1	4.1	3.5	4.1	4.1	4.1	4.1	4.1	3.5	4.1	4.1
All-Red Time (s)	2.2	2.2	2.2	1.0	2.2	2.2	2.2	2.2	2.2	1.0	2.2	2.2
Lost Time Adjust (s)	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0	0.0	-2.3	0.0
Total Lost Time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	8.0	8.0	8.0		8.0	8.0	10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	12.0	12.0	12.0		12.0	12.0	15.0	15.0	15.0		15.0	15.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0	0		0	0
Act Effct Green (s)	13.2	15.5	13.2	20.7	40.6	38.3	24.5	26.8	24.5	10.1	41.4	39.1
Actuated g/C Ratio	0.15	0.17	0.15	0.23	0.45	0.43	0.27	0.30	0.27	0.11	0.46	0.43
v/c Ratio	0.17	0.33	0.01	0.75	0.19	0.12	0.02	0.16	0.61	0.46	0.14	0.09
Control Delay	35.4	33.9	0.0	38.9	14.2	2.5	29.6	26.5	7.8	41.5	15.9	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	33.9	0.0	38.9	14.2	2.5	29.6	26.5	7.8	41.5	15.9	2.0
LOS	D	C	A	D	B	A	C	C	A	D	B	A
Approach Delay		33.6			28.0			12.8				23.5
Approach LOS		C			C			B				C

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBL and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	23.5
Intersection Capacity Utilization:	53.7%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 7: Montrose Road & Biggar Road/Lyons Creek Road



Queues

7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	25	179	3	539	275	80	5	152	428	158	208	59
v/c Ratio	0.17	0.33	0.01	0.75	0.19	0.12	0.02	0.16	0.61	0.46	0.14	0.09
Control Delay	35.4	33.9	0.0	38.9	14.2	2.5	29.6	26.5	7.8	41.5	15.9	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	33.9	0.0	38.9	14.2	2.5	29.6	26.5	7.8	41.5	15.9	2.0
Queue Length 50th (m)	4.0	15.2	0.0	47.2	15.2	0.0	0.7	10.7	0.0	13.9	11.1	0.0
Queue Length 95th (m)	11.2	24.1	0.0	60.4	19.0	5.4	3.9	21.1	29.0	23.8	21.2	3.6
Internal Link Dist (m)	483.4			397.7			192.1			126.6		
Turn Bay Length (m)	130.0	120.0	150.0	225.0	80.0	60.0	80.0	50.0				
Base Capacity (vph)	226	792	446	946	1936	838	295	950	700	347	1498	674
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	0.11	0.23	0.01	0.57	0.14	0.10	0.02	0.16	0.61	0.46	0.14	0.09

Intersection Summary

Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	4				3				8			
Permitted Phases	4				8				2			
Actuated Green, G (s)	13.2	13.2	13.2	20.7	38.4	38.4	24.4	24.4	24.4	10.1	39.0	39.0
Effective Green, g (s)	13.2	15.5	13.2	20.7	40.7	38.4	24.4	26.7	24.4	10.1	41.3	39.0
Actuated g/C Ratio	0.15	0.17	0.15	0.23	0.45	0.43	0.27	0.30	0.27	0.11	0.46	0.43
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	149	550	218	720	1459	593	294	948	387	348	1495	619
v/s Ratio Prot	c0.06				c0.17				0.09			
v/s Ratio Perm	0.02				0.00				0.02			
v/c Ratio	0.17	0.33	0.00	0.75	0.19	0.06	0.02	0.16	0.30	0.45	0.14	0.04
Uniform Delay, d1	33.6	32.7	32.8	32.2	14.8	15.2	24.0	23.4	26.0	37.4	14.1	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.0	0.0	4.3	0.2	0.1	0.1	0.4	2.0	0.9	0.2	0.1
Delay (s)	35.1	33.6	32.8	36.5	14.9	15.3	24.1	23.7	28.0	38.3	14.3	14.8
Level of Service	D	C	C	D	B	B	C	C	C	D	B	B
Approach Delay (s)	33.8				28.0				26.9			
Approach LOS	C				C				C			
Intersection Summary												
HCM 2000 Control Delay	27.3				HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	90.0				Sum of lost time (s)				17.0			
Intersection Capacity Utilization	53.7%				ICU Level of Service				A			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

7: Montrose Road & Biggar Road/Lyons Creek Road

Future Total
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↖↗	↘	↖↗	↖↗	↘	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (vph)	23	165	3	496	253	74	5	140	394	145	191	54
Future Volume (vph)	23	165	3	496	253	74	5	140	394	145	191	54
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.3	4.0	6.3	4.5	4.0	6.3	6.3	4.0	6.3	4.5	4.0	6.3
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fit 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)	1662	3197	1488	3131	3228	1390	1662	3197	1430	3101	3260	1430
Fit Permitted	0.58	1.00	1.00	0.95	1.00	1.00	0.62	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1020	3197	1488	3131	3228	1390	1087	3197	1430	3101	3260	1430
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	179	3	539	275	80	5	152	428	158	208	59
RTOR Reduction (vph)	0	0	3	0	0	46	0	0	312	0	0	33
Lane Group Flow (vph)	25	179	0	539	275	34	5	152	116	158	208	26
Heavy Vehicles (%)	0%	4%	0%	3%	3%	7%	0%	4%	4%	4%	2%	4%
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases	4				3				8			
Permitted Phases	4				8				2			
Actuated Green, G (s)	13.2	13.2	13.2	20.7	38.4	38.4	24.4	24.4	24.4	10.1	39.0	39.0
Effective Green, g (s)	13.2	15.5	13.2	20.7	40.7	38.4	24.4	26.7	24.4	10.1	41.3	39.0
Actuated g/C Ratio	0.15	0.17	0.15	0.23	0.45	0.43	0.27	0.30	0.27	0.11	0.46	0.43
Clearance Time (s)	6.3	6.3	6.3	4.5	6.3	6.3	6.3	6.3	6.3	4.5	6.3	6.3
Vehicle Extension (s)	6.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lane Grp Cap (vph)	149	550	218	720	1459	593	294	948	387	348	1495	619
v/s Ratio Prot	c0.06				c0.17				0.09			
v/s Ratio Perm	0.02				0.00				0.02			
v/c Ratio	0.17	0.33	0.00	0.75	0.19	0.06	0.02	0.16	0.30	0.45	0.14	0.04
Uniform Delay, d1	33.6	32.7	32.8	32.2	14.8	15.2	24.0	23.4	26.0	37.4	14.1	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.0	0.0	4.3	0.2	0.1	0.1	0.4	2.0	0.9	0.2	0.1
Delay (s)	35.1	33.6	32.8	36.5	14.9	15.3	24.1	23.7	28.0	38.3	14.3	14.8
Level of Service	D	C	C	D	B	B	C	C	C	D	B	B
Approach Delay (s)	33.8				28.0				26.9			
Approach LOS	C				C				C			

Intersection Summary

HCM 2000 Control Delay	27.3				HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	90.0				Sum of lost time (s)				17.0			
Intersection Capacity Utilization	53.7%				ICU Level of Service				A			
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings
8: Dorchester Road & Jill Drive

Future Total
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	45	3	3	3	9	9	3	651	2	3	694	39
Future Volume (vph)	45	3	3	3	9	9	3	651	2	3	694	39
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.992			0.941						0.993	
Flt Protected		0.957			0.994							
Satd. Flow (prot)	0	1632	0	0	1637	0	0	1697	0	0	1735	0
Flt Permitted		0.957			0.994							
Satd. Flow (perm)	0	1632	0	0	1637	0	0	1697	0	0	1735	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		121.4			166.8			461.8			348.9	
Travel Time (s)		8.7			12.0			33.2			25.1	
Confl. Peds. (#/hr)	2		8	8		2	11		5	5		11
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	33%	3%	0%	0%	0%	3%
Adj. Flow (vph)	48	3	3	3	10	10	3	700	2	3	746	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	23	0	0	705	0	0	791	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		0.0			0.0			7.2			7.2	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.9% ICU Level of Service B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
8: Dorchester Road & Jill Drive


Future Total
Saturday Peak Hour

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	45	3	3	3	9	9	3	651	2	3	694	39
Future Volume (vph)	45	3	3	3	9	9	3	651	2	3	694	39
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	48	3	3	3	10	10	3	700	2	3	746	42
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	54	23	705	791								
Volume Left (vph)	48	3	3	3								
Volume Right (vph)	3	10	2	42								
Hadj (s)	0.17	-0.23	0.05	-0.03								
Departure Headway (s)	7.3	7.0	5.1	5.1								
Degree Utilization, x	0.11	0.04	1.00	1.11								
Capacity (veh/h)	486	493	705	716								
Control Delay (s)	11.2	10.4	55.4	89.7								
Approach Delay (s)	11.2	10.4	55.4	89.7								
Approach LOS	B	B	F	F								

Intersection Summary	
Delay	70.5
Level of Service	F
Intersection Capacity Utilization	61.9% ICU Level of Service B
Analysis Period (min)	15

Lanes, Volumes, Timings
9: Dorchester Road & Oldfield Road

Future Total
Saturday Peak Hour


						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	R
Traffic Volume (vph)	116	58	561	85	76	601
Future Volume (vph)	116	58	561	85	76	601
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0		15.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.955			0.850		
Fit Protected	0.968				0.950	
Satd. Flow (prot)	1602	0	1750	1488	1646	1750
Fit Permitted	0.968				0.950	
Satd. Flow (perm)	1602	0	1750	1488	1646	1750
Link Speed (k/h)	50		60		60	
Link Distance (m)	1040.1		438.6		461.8	
Travel Time (s)	74.9		26.3		27.7	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Heavy Vehicles (%)	0%	3%	0%	0%	1%	0%
Adj. Flow (vph)	145	73	701	106	95	751
Shared Lane Traffic (%)						
Lane Group Flow (vph)	218	0	701	106	95	751
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.5%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
9: Dorchester Road & Oldfield Road

Future Total
Saturday Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	R
Sign Control	Stop		Stop		Stop	Stop
Traffic Volume (vph)	116	58	561	85	76	601
Future Volume (vph)	116	58	561	85	76	601
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	145	72	701	106	95	751
Direction, Lane #						
	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total (vph)	217	701	106	95	751	
Volume Left (vph)	145	0	0	95	0	
Volume Right (vph)	72	0	106	0	0	
Hadj (s)	-0.05	0.00	-0.70	0.52	0.00	
Departure Headway (s)	6.9	6.2	5.5	6.7	6.2	
Degree Utilization, x	0.42	1.21	0.16	0.18	1.29	
Capacity (veh/h)	518	587	643	526	591	
Control Delay (s)	14.7	130.2	8.4	10.0	163.5	
Approach Delay (s)	14.7	114.2		146.2		
Approach LOS	B	F		F		
Intersection Summary						
Delay			117.1			
Level of Service			F			
Intersection Capacity Utilization			57.5%		ICU Level of Service	B
Analysis Period (min)			15			

Lanes, Volumes, Timings
10: Stanley Avenue & Chippawa Parkway

Future Total
Saturday Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Volume (vph)	2	28	212	9	36	2	298	152	6	2	93	111
Future Volume (vph)	2	28	212	9	36	2	298	152	6	2	93	111
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.881			0.995			0.998			0.927	
Fit Protected					0.990			0.968				
Satd. Flow (prot)	0	1542	0	0	1724	0	0	1685	0	0	1622	0
Fit Permitted					0.990			0.968				
Satd. Flow (perm)	0	1542	0	0	1724	0	0	1685	0	0	1622	0
Link Speed (k/h)		60			60			70			60	
Link Distance (m)		372.3			519.4			156.9			312.6	
Travel Time (s)		22.3			31.2			8.1			18.8	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Adj. Flow (vph)	2	33	252	11	43	2	355	181	7	2	111	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	287	0	0	56	0	0	543	0	0	245	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.9%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
10: Stanley Avenue & Chippawa Parkway

Future Total
Saturday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔				↔			↔	
Traffic Volume (veh/h)	2	28	212	9	36	2	298	152	6	2	93	111
Future Volume (Veh/h)	2	28	212	9	36	2	298	152	6	2	93	111
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	2	33	252	11	43	2	355	181	7	2	111	132
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	1099	1079	177	1344	1142	184	243				188	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1099	1079	177	1344	1142	184	243				188	
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	80	71	82	71	100	73				100	
cM capacity (veh/h)	119	161	871	62	148	863	1335				1398	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	287	56	543	245								
Volume Left	2	11	355	2								
Volume Right	252	2	7	132								
eSH	562	119	1335	1398								
Volume to Capacity	0.51	0.47	0.27	0.00								
Queue Length 95th (m)	23.1	16.8	8.6	0.0								
Control Delay (s)	17.9	59.3	6.6	0.1								
Lane LOS	C	F	A	A								
Approach Delay (s)	17.9	59.3	6.6	0.1								
Approach LOS	C	F										

Intersection Summary	
Average Delay	10.6
Intersection Capacity Utilization	65.9%
ICU Level of Service	C
Analysis Period (min)	15

Lanes, Volumes, Timings
11: Lyons Creek Road & Stanley Avenue

Future Total
Saturday Peak Hour

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	↗
Traffic Volume (vph)	381	238	225	73	61	250
Future Volume (vph)	381	238	225	73	61	250
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	55.0			0.0	25.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.967			0.850
Fit Protected	0.950				0.950	
Satd. Flow (prot)	1646	1750	1684	0	1662	1488
Fit Permitted	0.950				0.950	
Satd. Flow (perm)	1646	1750	1684	0	1662	1488
Link Speed (k/h)		50	50		50	
Link Distance (m)		450.7	605.6		812.1	
Travel Time (s)		32.5	43.6		58.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	410	256	242	78	66	269
Shared Lane Traffic (%)						
Lane Group Flow (vph)	410	256	320	0	66	269
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25			15	25	15
Sign Control		Stop	Stop		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.3%
ICU Level of Service A	
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
11: Lyons Creek Road & Stanley Avenue

Future Total
Saturday Peak Hour

	↖	→	←	↗	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↖	↗
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	381	238	225	73	61	250
Future Volume (vph)	381	238	225	73	61	250
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	410	256	242	78	66	269
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total (vph)	410	256	320	66	269	
Volume Left (vph)	410	0	0	66	0	
Volume Right (vph)	0	0	78	0	269	
Hadj (s)	0.52	0.00	-0.14	0.50	-0.70	
Departure Headway (s)	6.6	6.1	6.1	7.5	6.3	
Degree Utilization, x	0.75	0.43	0.54	0.14	0.47	
Capacity (veh/h)	535	578	573	454	540	
Control Delay (s)	25.8	12.4	16.1	10.5	13.6	
Approach Delay (s)	20.6		16.1	13.0		
Approach LOS	C		C	B		
Intersection Summary						
Delay			17.6			
Level of Service			C			
Intersection Capacity Utilization			54.3%		ICU Level of Service	A
Analysis Period (min)			15			